Graduate Courses

The course descriptions listed below were current at the time of printing. Up-to-date course descriptions can be found on the World Wide Web at http://www.uic.edu/depts/grad/courses/.

Accounting (Actg)

417. Advanced Financial Accounting. 4 Hours.
Financial accounting theory for business combinations, consolidated financial statements, international transactions and investments, and partnership accounting. Prerequisite: Actg 316.

435. Auditing. 4 Hours.
Introduction to the audit function; ethical and legal environment; audit standards; objectives and procedures; materiality and audit risk; sampling; auditing in a computer environment; reporting. Extensive computer use required. Prerequisite: Actg 316.

Concepts and provisions of federal income taxation as applicable to individual taxpayers, partnerships, individuals and trusts. Extensive computer use required. Prerequisite: Actg 315.

446. Federal Income Tax II. 4 Hours.
Concepts and provisions of federal income taxation on corporations and partnerships; special problems in reorganization, liquidations, and personal holding companies. Prerequisites: Actg 345 or the equivalent, and declaration of a major.

456. Business Law II. 4 Hours.
Commercial law for partnerships, corporations, secured transactions, bankruptcy, real and personal property, wills and trusts, SEC regulations, unfair trade activities. Prerequisites: Actg 355 or the equivalent, and declaration of a major.

465. Governmental and Non-Profit Accounting. 4 Hours.
Financial transaction analysis and recording system; budget preparation and control; concepts and principles underlying the financial reports of governmental and non-profit organizations. Prerequisite: Actg 316.

474. Accounting Information Systems. 4 Hours.
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. Extensive computer use required. Prerequisites: Actg 110 and IDS 100. Registration for this course is only through Department of Accounting at http://accounting-net.actg.uic.edu.

475. Database Accounting Systems. 4 Hours.
Same as IDS 475. Concepts and principles of designing database systems to perform accounting functions, applications of microcomputer accounting software packages system design tools, and computerized transaction cycles. Extensive computer use required. Prerequisites: Actg 111 and IDS 100.

484. International Accounting. 4 Hours.
Financial accounting for international operations, multinational managerial accounting and control, comparative international accounting, international reporting issues, and international taxation. Prerequisite: Actg 316.

485. Valuation and Analysis. 4 Hours.
Financial analysis and valuation of firms. Corporate strategies, financial reporting issues and market perceptions. Extensive computer use required. Prerequisites: One accounting and one finance class or consent of the instructor.

494. Special Topics in Accounting. 1 to 4 Hours.
Topics rotate in various areas of accounting, including but not restricted to financial, managerial, governmental and nonprofit accounting, law and business ethics. Explores current issues and proposed alternatives. Prerequisites: Two courses in accounting or finance beyond Actg 111 and Fin 300 or the equivalent.

495. Competitive Strategy. 4 Hours.
Multidisciplinary analysis of organization strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

500. Introduction to Financial Accounting. 4 Hours.
No credit given if the student has credit in MBA 501. Concepts and principles of financial accounting for preparation and evaluation of external reports and financial statements. Extensive computer use required. Prerequisite: Admission to the MBA or M.S. in Accounting program.

Accounting theory and practice related to asset valuation, revenue recognition, and the determination of short-term liabilities; aspects of financial statement analysis related to these issues. Prerequisite: Actg 500.

503. Financial Accounting II. 4 Hours.
Contemporary financial accounting issues, including liabilities, pensions, tax allocation, leases, price level reporting, investments, capital transactions and financial statement analysis. Prerequisites: Actg 500 and 502, or the equivalents.

506. Management Accounting. 4 Hours.
Design of cost accounting systems; alternate costing methods; costing for decision making; budget planning and performance evaluation. Prerequisite: Actg 500.

508. Federal Income Tax-Graduate. 4 Hours.
Concepts and provisions of federal income taxation as applicable to individual taxpayers. Prerequisite: Actg 500.

509. Business Law-Graduate. 4 Hours.
Commercial law of contracts, sales, commercial paper, agency, suretyship, insurance law and liability of management. Prerequisite: Actg 500 or the equivalent.

515. Accounting Theory and Paradigms. 4 Hours.
Conventional and regulatory approaches to standard setting and theory construction, conceptual framework and paradigmatic avenues in accounting. Prerequisite: Actg 503 or the equivalent.

516. Financial Statement Analysis. 4 Hours.
Use of financial information by decision makers external to the firm; profitability and risk analysis; financial forecasting and equity valuation. Extensive computer use required. Prerequisite: Actg 502; or approval of the department.

525. Management Control of Strategic Performance. 4 Hours.
Contemporary overview of the management control systems measuring technological activities, measuring value added, outsourcing non-core compensation plan and performance measurement. Extensive computer use required. Prerequisite: Actg 506; or approval of the department.

535. Auditing Theory. 4 Hours.
Philosophy of science and ethics, research methods, experimental economics, and capital market research. Special topics in current auditing issues addressed through the case method. Prerequisite: Actg 335.

545. Taxes and Business Policy. 4 Hours.
The role of taxes in business decisions. Emphasizes integrating taxes with other variables-behavioral, financial, environmental and other. Also discusses the relationship between taxation and financial and managerial accounting. Prerequisites: Actg 345 and 446.

585. Corporate Valuation and Accounting Information. 4 Hours.
Valuation using discounted cash flow and multiples. Use of financial disclosures to construct forecasts. How multiples behave. How accounting affects valuation ratios. Prerequisites: Actg 502 and Fin 510 or 520; or approval of the department.

593. Accounting Research: Methodology and Communication. 4 Hours.
Instruction in research methods, issues, and research appreciation and evaluation together with individual practice in planning, conducting, and reporting professional research projects in accounting and capital markets. Extensive computer use required. Prerequisite: Actg 502.

594. Special Topics in Accounting—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. Prerequisite: Approval of the department.

596. Independent Study in Accounting-Master’s. 1 to 4 Hours.
Independent study on an accounting topic chosen with faculty approval; requires a study plan and a paper of length and specification required by a faculty member. Prerequisites: Actg 515 and 525.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
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**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 healthcare services including currently used models of nursing care delivery. Prerequisite: 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 health care are reviewed in the context of visioning, strategic planning, and tactical planning. Prerequisite: Consent of the instructor.

**505. Nursing Systems Operations Management. 3 Hours.** Same as NuPH 505. Addresses 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. Prerequisite: Consent of the instructor.

**512. Healthcare Human Resources Management. 3 Hours.** Same as NuPH 512. 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. Prerequisite: NuAS 505.

**515. Advanced Nursing Management in Community- Focused Health Services. 3 Hours.** Same as NuPH 515. Theory and research in leadership, management, and community-focused assessment for advanced nursing practice in complex and integrated health systems. Prerequisite: NuSC 528 or consent of the instructor.

**516. Evaluation of Health Services Outcomes for Nursing. 3 Hours.** Same as NuPH 516. Program planning and evaluation in community-focused health services. Measurement of quality, performance, and impact on health programs and services. Interdisciplinary perspective. Integrated quality improvement systems. Prerequisite: NuAS 515, NuPH 515, or consent of the instructor.

**517. Budget and Finance of Health and Nursing Services. 3 Hours.** Same as NuPH 517. Financial management techniques, supply and demand, cost behaviors, and revenue sources, provider reimbursement and public and private health insurance for health and nursing services will be analyzed. Prerequisite: NuAS 505 or NuPH 505.

**518. Field Study in Health and Nursing Management. 3 Hours.** Same as NuPH 518. Field study emphasizing leadership within population-focused nursing management practice including organization and management concepts from public and private perspectives. Prerequisites: NuAS 516 or NuPH 516; and NuAS 517 or NuPH 517; or consent of the instructor.

**520. Internship in Advanced Nursing. 1 to 3 Hours.** May be repeated for credit. Same as NuPH 520. Intensive field study for advanced nursing practice with emphasis on integration of graduate course work. Prerequisite: Consent of the instructor.

**African-American Studies (AAST)**

**410. Seminar in Black Child Development. 4 Hours.** Race, class and cultural theories of black child development. Examination of socialization process and developmental outcomes, with particular attention to social attitudes and behaviors. Prerequisite: AAST 201 or Psch 100 or consent of instructor.

**441. Topics in African History. 4 Hours.** Same as Hist 441. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of African history, African-American studies, or consent of the instructor.


**470. Reading Black Women Writing. 4 Hours.** Same as Engl 480, GWS 470. Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth and twentieth-century black women writers. Prerequisite: AAST 350 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. 4 Hours.** Same as Hist 485. May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. African-American history for students with significant background in the field. Topics vary. Prerequisite: AAST 247 or 248; or Hist 104 or Hist 247 or Hist 248; or consent of instructor.

**490. Topics in African-American Literature. 4 Hours.** May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. Inclusive examination of a selected specialized topic based on instructor’s field. Topics are drawn from research in political science, psychology, sociology, and history. Prerequisite: AAST 100 or consent of instructor.

**492. Topics in Social Science Research. 4 Hours.** May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**Anatomy and Cell Biology (Anat)**

**403. Human Neuroanatomy. 3 Hours.** Morphological organization of the nervous system. Functional correlations of neural structures. Prerequisite: Consent of the instructor.

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

**439. Gross Human Anatomy I. 5 Hours.** Functional and structural anatomy and embryology of the body. Prerequisite: Consent of the instructor.

**440. Gross Human Anatomy II. 2 Hours.** Gross morphology and function of the human body. Prerequisite: Anat 439 or consent of the instructor.

**441. Gross Human Anatomy. 5 Hours.** For allied health students. Functional and structural anatomy of the body. Prerequisites: Consent of the instructor; or enrollment in the M.S. in Biomedical Visualization program.

**442. Cell Structure and Human Histology. 5 Hours.** Structure and function of cells and fundamental tissues. Function and microscopic anatomy of organs. Prerequisite: Consent of the instructor.

**514. The Cytoskeleton: Cellular and Molecular Biology. 1 Hour.** Structure and function of microfilaments, microtubules, intermediate filaments, and their associated proteins. Role of the cytoskeleton in various cellular processes such as cell motility and organelle transport. Role of the cytoskeleton in diseases.

**520. Concepts of Synaptic Function and Morphology. 2 Hours.** Overview of current and classical methods employed in the study of synapses. A review of some of the most interesting aspects of synaptic function, such as sources of synaptic vesicles, synaptic patterns, synaptic plasticity, and synaptic specificity. Prerequisite: Consent of the instructor.

**521. Plasticity in the Nervous System. 2 Hours.** Neural plasticity is the ability to adaptively modify neural structure or function. Topics range from developmental plasticity to aging, including response to injury and neurodegenerative diseases, trophic factors, learning and memory, and neural transplantation. Prerequisite: Anat 403 or consent of the instructor.

**527. Cellular and Systems Neurobiology. 3 Hours.** Same as BioS 527. Molecular and cellular properties of ion channels in neurons and sensory cells and their relationship to brain and sensory systems. Prerequisite: Credit in one neuroscience course or consent of the instructor.
528. Chemical and Molecular Neuroanatomy. 3 Hours. Substantive reviews on topics in molecular neurobiology are presented. Each lecture focuses on the application of data and techniques to the understanding of neural function within intact neuroanatomical systems. Prerequisite: Anat 403 or consent of the instructor.

544. Advanced Craniofacial Anatomy. 3 Hours. Functional and clinical aspects of head and neck anatomy, based on detailed laboratory dissection, original readings, and project work. Prerequisite: Any human gross anatomy course or the equivalent.

554. Neuroendocrinology. 2 Hours. Survey of neuroendocrine integration including neuroendocrine regulation of development, homeostasis, reproduction, and behavior. The hypothalamohypophyseal axis receives special attention from both a morphologic and functional viewpoints. Prerequisite: Anat 403 or the equivalent.

580. Practicum in the Teaching of Anatomy. 1 Hour. No grad credit. S/U grade only. May be repeated for credit. For anatomy and cell biology teaching assistants. Provides an opportunity for supervised discussion and evaluation of materials and methods in teaching the basic anatomical sciences. Prerequisite: Consent of the instructor.

585. Cell Biology. 4 Hours. Same as Phys 585 and MIm 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

586. Cell and Molecular Neurobiology. 3 Hours. Same as BioS 586. Structure and function of voltage-dependent and neurotransmitter-gated ion channels; the role of these ion channels in synaptic transmission, synaptic modification, and neuromodulation. Prerequisite: BioS 442 or consent of the instructor.

595. Department Seminar. 1 Hour. S/U grade only. Oral presentations are made by students each session on timely journal articles followed by in depth discussions of the reported research. Presentation of research by invited lecturers.

596. Independent Study. 1 to 4 Hours. Independent study under the direction of a faculty member.

598. Master's Thesis Research. 0 to 16 Hours. S/U grade only. Thesis research under the direction of a faculty member.

599. Research in Anatomy. 0 to 16 Hours. S/U grade only. Independent research directed by a faculty member.

Ancient Greek (GKa)

498. Advanced Topics in Ancient Greek Literature. 4 Hours. May be repeated for a maximum of 9 hours of credit. Students may register for more than one section per term. Intensive reading of ancient Greek literature. Topics vary. Prerequisite: 4 hours of ancient Greek at the 200 level or the equivalent.

499. Independent Reading. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Individual study under faculty direction. Students qualified by preparation and interest. Prerequisite: 4 hours of ancient Greek at the 200 level or the equivalent.

Anthropology (Anth)

401. Linguistic Anthropology. 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.

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

409. Ancient Maya Writing, Language and Culture. 4 Hours. Same as LALS 409. Recent trends in Maya epigraphy, information gained from Maya hieroglyphs, linguistics, and historical ethnographies are applied to anthropological analyses of past lifeways. Prerequisites: Consent of the instructor.

411. Urban Cultural Problems. 4 Hours. A study of the processes of urbanization and of cultural and social adjustments to the city; illustrated by case studies.

413. Social Organization. 4 Hours. Theory and method in the study of kinship and social organization, for advanced undergraduate and graduate students. Prerequisite: Anth 213 or graduate standing or consent of the instructor.

414. Symbolic Anthropology. 4 Hours. The interpretation of cultures through their ritual, religions, culture and other types of symbolism. Prerequisite: Anth 101 or consent of the instructor.

415. Medical Anthropology. 4 Hours. Survey of the history of non-Western medicine; analysis of ecological relationships behind folk medicine; principles and methods of studying ethnomedicine. Prerequisite: Anth 200 or consent of the instructor.

417. Marxist Approaches to Anthropology. 4 Hours. Issues concerning Marx's theories on primitive societies, the development of his evolutionary model from Morgan's work, and current use of Marxist concepts in anthropology.

418. Fieldwork: Ethnographic and Qualitative Fieldwork Techniques. 4 Hours. Same as Soc 408. Practical introduction to the techniques of anthropologists and qualitative sociologists for researching social settings; participant observation/nonparticipant observation, interviewing, use of documentary sources. Prerequisite: Anth 213 or Soc 202 or consent of the instructor.

420. Seminar in Archaeology and Ethnography. 4 Hours. May be repeated for a maximum of 15 hours of credit. Case studies of investigations in archeology using research monographs and other primary sources. Substantive data and related theoretical problems are examined simultaneously.

421. Geomorphology and Archaeology. 4 Hours. Same as Geog 432. Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geoarchaeology. Prerequisites: Geog 131 or EAEs 101 or consent of the instructor.

422. Prehistory of the Levant and the Nile Valley. 4 Hours. Detailed analysis of Levantine and Nile Valley prehistory during the Pleistocene and early Holocene. Prerequisite: Anth 221 or 222 or consent of the instructor.

424. Violence. 4 Hours. Same as Crj 423. Explores how men and women have experienced violence historically and in modern times. Students examine how violence is perpetrated through words, pictures, physical harm, and silences. Prerequisites: Crj 101 and Crj 200.

425. Field Techniques in Archaeology. 4 Hours. Same as Geog 425. Exposure to field methods in archaeology through participation in an actual research project. Students are instructed in field excavation techniques. Prerequisites: Anth 102 or the equivalent or consent of the instructor. Concurrent registration in Anth 426 or Geog 426 is recommended.

426. Laboratory Techniques in Archaeology. 4 Hours. Same as Geog 426. Exposes students to laboratory methods in archaeology through the analysis of excavated materials. Students are instructed in lab techniques. Prerequisites: Anth 102 or the equivalent or consent of the instructor. Concurrent registration in Anth 425 or Geog 425 is recommended.

427. Theory and Application in Ethnoarchaeology. 4 Hours. Focuses on the application of scientific experimentation and ethnographic information to enhance our understanding of the archaeological record, material culture, and past human behavior. Prerequisite: One 100 or 200-level archaeology course; consent of the instructor.

428. Chiefdoms. 4 Hours. Focus on traditional non-state, yet complex, societies known as "chiefdoms". Explore the organization and evolution of such societies through a combination of ethnographic, historical and archaeological data. Prerequisite: Anth 101 or 102; or consent of the instructor.

429. Archaeological Methods. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Same as Geog 429. This course will familiarize students with various methodologies used by archaeologists and geo-archaeologists. Course will concentrate on a different method each time it is taught.

430. Seminar in Primate Biology. 5 Hours. Theoretical and substantive issues in the study of nonhuman primates and hominids, as represented in current journals and topical volumes.
437. Bioarchaeology. 5 Hours. Provides an overview of mortuary theory and the bioarchaeological methods used to study health and disease, diet, activity patterns, kinship and cultural practices in archaeological populations. Prerequisite: Grade of B or better in Anth 237, and consent of the instructor.

440. The Experience of Culture Difference: Culture Shock. 4 Hours. Explores experience of different cultures, the process of learning a different culture, and issues arising from the nature of the encounter in fieldwork. Prerequisite: One course in social or cultural anthropology, or experience in another culture.

441. Psychoanalytic Anthropology I: Cross-Cultural Theory. 4 Hours. Introduction for social scientists to psychoanalytic theory and methods including Freud’s theories and more recent developments. Cross-cultural tests and applications of psychoanalytic theories. Prerequisite: One course in anthropology or psychology, or consent of the instructor.

442. Psychoanalytic Anthropology II: Cross-Cultural Applications. 4 Hours. Explores ways in which anthropologists and analysts have used psychoanalysis to understand individuals, practices and institutions of other cultures. Prerequisite: Anth 441 or consent of the instructor.

443. Leadership: Psychology, Strategy, Culture. 4 Hours. Psychological and anthropological theories of leadership developed on our culture will be tested against descriptions of leadership in diverse non-Western societies. Prerequisite: One course in anthropology.

444. Dreams, Dreaming, and Dream Beliefs. 4 Hours. The dreaming experience examined from the point of view of psychological interpretation, laboratory experiments and anthropological study of dreams in other cultures. Prerequisite: One course in anthropology or psychology, or consent of the instructor.

453. Seminar in Cultural Ecology. 4 Hours. Same as Geog 453. Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture. Prerequisite: Anth 101 or Geog 151 or consent of the instructor.

455. Quantitative Methods. 4 Hours. Same as Geog 455. 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. Extensive computer use required. Prerequisite: Consent of the instructor.

470. Classic Ethnographies. 4 Hours. Analysis of method and theory reflected in selected classic anthropological works, studied in their historical contexts and contemporary uses. Prerequisite: Anth 101 or 213 or consent of the instructor.

474. Urban Cultures of Africa. 4 Hours. A study of the indigenous urban centers of sub-Saharan Africa; the multicultural cities of colonial and contemporary Africa, and the processes of detribalization.

475. Problems in South American Ethnology. 4 Hours. Same as LALS 475. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given to the influence of Levi-Strauss’ ideas on the formulation of cultural theory in South America. Prerequisite: 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.


479. Culture and Colonialism in South Asia. 4 Hours. Same as AsSt 479 and Hist 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

480. Sociolinguistics. 4 Hours. Same as Ling 480. Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. Prerequisites: Ling 405 or consent of the instructor.

481. Geographic Information Systems I. 4 Hours. Same as Geog 481. Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files. Geocoding. Prerequisites: Geog 100 and one from Geog 278 or 386 or IDS 100, or consent of the instructor.

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

483. Geographic Information Systems III. 4 Hours. Same as Geog 483. Problems encountered in the analysis and portrayal of geographic data. Topics include taxonomy, regionalization, trend surface analysis, time series, Markov probabilities, and computer cartographic procedures for displaying output from analytic procedures. Prerequisite: Anth 482 or Geog 482 or consent of the instructor.

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

490. Independent Study. 1 to 6 Hours. May be repeated for a maximum of 8 hours of credit with the approval of the department. Students may register for more than one section per term. Independent reading under the supervision of a faculty member. Prerequisite: Consent of the instructor.

494. Special Topics in Anthropology. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Reading, study, and discussion of selected problems for graduate students and majors in anthropology. Prerequisite: Approval of the department.

496. Internship. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Only 4 hours of credit may be counted toward the minor in geography. Same as Geog 496. Professional field experience with an agency or organization in the private or public sector on projects related to the student’s area of specialization. Prerequisites: Full graduate standing in anthropology or geography and consent of faculty adviser, head of 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: 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. May be repeated for credit. Theoretical and substantive issues. Prerequisites: Anth 400 or 410 or consent of the instructor.

514. Gender Issues in Cross-Cultural Perspectives. 4 Hours. Same as WS 514. Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. Prerequisites: Anth 500 or consent of the instructor.

520. Seminar in Archaeological Theory and Method. 4 Hours. May be repeated for credit. Theoretical and substantive issues in the study of prehistory and the recovery and interpretation of the archaeological record. Prerequisite: Anth 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. 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: Grade of B or better in Anth 508; or Grade of B or better in BioS 220; or consent of the instructor.

532. Advances in Ancient DNA. 4 Hours. Basic techniques and special concerns in the application of molecular biology techniques to the study of ancient DNA, followed by a discussion of recent advances and contributions to the field. Prerequisites: Grade of B or better in Anth 531 or Grade of B or better in BioS 220.

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

534. Dental and Medical Anthropology Within Human Evolution. 1 to 3 Hours. Same as OSci 590 and PmPg 534. Studies the biological and physical anthropology of hominid teeth and the craniofacial complex with relevant medical anthropology, ethno-pharmacology, forensic sciences, and paleo-pathology topics. Field work required. A lab experience, independent study and a research paper is required for 3 hours of credit. Prerequisite: Consent of the instructor.

570. Regional Application of Anthropology. 4 Hours. May be repeated for credit. The application of a specific theory or the testing of competing theoretical frameworks to data provided by one of the major geographical or cultural areas of the world. Emphasis on deductive reasoning and the derivation and testing of hypotheses with data from several cultures of a single culture area.

594. Special Topics in Anthropology. 4 Hours. May be repeated for a maximum of 9 hours credit. Students may register for more than one section per term. Study of selected topic in anthropology.

595. Graduate Seminar in Anthropology. 1 Hour. S/U grade only. Presentations of current research by faculty followed by student discussion. Course is to be taken during student’s first year in the graduate program as one of the core courses. Prerequisite: Admission to the graduate program in Anthropology.

596. Independent Study. 2 to 6 Hours. May be repeated for a maximum of 12 hours of credit with the approval of the department. Students may register for more than one section per term. Independent research is done under the supervision of a faculty member. Prerequisites: Consent of the instructor.

597. Project Research. 2 to 6 Hours. S/U grade only. Students may register for more than one section per term. The student will do an independent research project with the aid of a faculty advisor. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Research on doctoral dissertation topic. Prerequisite: Advancement to candidacy for the Ph.D. in Anthropology.

Architecture (Arch)

405. Architecture Design Lecture I. 2 Hours. Process of architecture as a synthesis of diverse forces into formal compositions. The struggle to integrate architectural wholes at smaller scales. Prerequisites: Arch 362 and concurrent registration in Arch 406.

406. Architecture Design Laboratory I. 4 Hours. Laboratory case study component of Arch 405. Prerequisites: Arch 362 and concurrent registration in Arch 405.

407. Architecture Design Lecture II. 2 Hours. Process of architecture as a synthesis of diverse forces into formal compositions. The struggle to integrate architectural wholes at larger scales. Prerequisites: Arch 405 and 406 and concurrent registration in Arch 408.

408. Architecture Design Laboratory II. 4 Hours. Laboratory case study component of Arch 407. Prerequisites: Arch 405 and 406 and concurrent registration in Arch 407.

410. Development of Architectural Theory. 4 Hours. The relationship of architectural works to their cultural, technical and critical contexts; historical development of architectural thought. Prerequisite: Graduate standing in the M.Arch. Program.

411. Theory and Critical Analysis in Architecture. 4 Hours. Architectural theory and criticism from historical and contemporary examples; development of architectural theory and relationship between architecture and architectural criticism. Prerequisites: Arch 410 and graduate standing in the M.Arch. Program.

412. Women and the Environment. 4 Hours. Same as GWS 412. Women’s place in the built environment; the role of gender in environmental experience including women as users, designers, planners, policy makers, and critics.

415. Architectural Design Lecture III. 2 Hours. Examination of the relationship of architecture to society, technological change, and structural and environmental innovation. Prerequisites: Arch 307 and 308; and concurrent registration in Arch 416; and approval of the school.

416. Architectural Design Laboratory III. 4 Hours. Laboratory component of Arch 415. Prerequisites: Arch 307 and 308; and concurrent registration in Arch 415; and approval of the school.

430. Computers in Architecture. 4 Hours. The theory, tools and techniques in applications of the computer as a design tool, production and presentation medium of 2D and 3D architectural design and building science. Prerequisite: Graduate standing in the M. Arch. program.

441. Introduction to Architectural Design I. 6 Hours. Visual communication of architectural concepts through two and three dimensional methods; orthographic and paraline drawings, perspective and models. Development of architectural concepts and solution of simple architectural problems. Prerequisite: Graduate standing in the M.Arch. Program.

442. Theory of Architecture and Building Analysis. 4 Hours. Introduction to discipline of architecture considering symbolic and use patterns, compositional, spatial and typological patterns. Prerequisite: Graduate standing in the M.Arch. Program.

443. Professional Practice I. 2 Hours. Legal and ethical considerations in architectural practice; operation and management guidelines. Overview of the history of the professional architectural practice. Prerequisite: Completion of the second plateau or consent of the school.

444. Professional Practice II. 2 Hours. Business and financial considerations in architectural practice; scope of services communications and marketing guidelines. Interrelationship with clients, consultants, collaborators, and the manufacturing and construction industry. Prerequisites: Arch 443 and consent of the school.

445. Introduction to Architectural Design II. 6 Hours. Design of housing in an urban context; analysis and theory of urban fabric and infrastructure; emphasis on architectural form and its relationship to societal factors and user needs. Prerequisites: Arch 452, 462, and 471; or approval of the school; or graduate standing in the M.Arch. III with Advanced Standing (two-year) program.

454. Architectural Design II. 6 Hours. Design of a public building as a comprehensive design; emphasis on on site context, zoning, codes, structural/mechanical systems, and materials in relation to aesthetics. Integration with Arch 464 course material. Prerequisites: Arch 453, 463, 472 and 485; or graduate standing in the M.Arch. III with Advanced Standing (two-year) program.

459. Introduction to Building Science I: Ethics in Building. 4 Hours. Examines the architect’s role in protecting the health, safety and welfare of the public through responsible and ethical building practices. Prerequisite: Approval of the school. Requires concurrent registration in Arch 305 and 306.

460. Introduction to Building Science II: Technics in Building. 4 Hours. Introduction to building construction processes, terminology, principles, conventions, standards, applications, restrictions and communications pertaining to construction materials and assemblies. Prerequisite: Arch 459 or approval of the school.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
461. **Building Science I: Ethics in Building. 4 Hours.** Examines the architect’s role in protecting the health, safety and welfare of the public through responsible and ethical building practices. Prerequisites: Approval of the school and enrollment in the M. Arch. program.

462. **Building Science II: Technics in Building. 4 Hours.** Introduction to building construction processes, terminology, principles, conventions, standards, applications, restrictions and communications pertaining to construction materials and assemblies. Prerequisite: Arch 461.

463. **Building Science III: Systems in Building. 4 Hours.** Analysis and integration of architectural building systems. Building envelope, mechanical, electrical, plumbing, vertical transportation, life safety and structural systems are examined. Prerequisite: Arch 462.

464. **Building Science IV: Theory in Building. 4 Hours.** Exploration into the concept of Total Building Performance. Exploration of conceptual and philosophical issues related to the application of advanced technology in the design, construction and use of buildings. Prerequisite: Arch 463.

470. **Structures I: Structural Analysis. 4 Hours.** Introduction to the analysis of structural elements. Introduction to fundamental structural planning criteria and relevant concepts of tension, compression and bending. Introduction to historical and contemporary structural precedents. Prerequisites: Math 180; and Phys 105 and 106.

471. **Structures II: Material Science. 3 Hours.** Introduction to material properties; strength characteristics of building materials and material assemblies; stress and strain; rigidity and deformation; temperature effects; torsion effects; combined loading of elements and systems. Prerequisites: Arch 470 and approval of the school.

472. **Structures III: Structural Analysis and Material Science. 4 Hours.** Advanced analysis of structural elements including: fundamental structural planning criteria; stability and rigid body equilibrium; material properties/strength characteristics; historical and contemporary structural precedents. Prerequisite: Graduate standing in the M. Arch. program.

473. **Structures IV: Analysis and Design of Steel and Timber Structures. 4 Hours.** Introduction to the planning, analysis and design of structural steel and timber assemblies. Prerequisites: Arch 470 and 471; or 472; and graduate standing. in the M. Arch. program.

474. **Structures V: Analysis and Design of Reinforced Concrete and Masonry Structures. 4 Hours.** Introduction to the planning, analysis and design of reinforced concrete and masonry structures. Prerequisites: Arch 473 and graduate standing in the M. Arch. program.

485. **Theories of Urbanism. 4 Hours.** Introduction to the processes shaping the city and the theories of urbanism, urban infrastructure and urban landscape from the middle of the nineteenth century to the present. Prerequisite: Graduate standing in the M. Arch. Program.

486. **Urban Ecologies and Infrastructures. 4 Hours.** Introduction to dynamic relationship of ecology and infrastructure in the context of contemporary urban landscape. Built and natural environments as inseparable networks of a dynamic process. Prerequisite: Graduate standing in the M. Arch. program.

491. **Architectural Study Abroad. 0–17 Hours.** May be repeated for a maximum of 34 hours of credit. Lectures, seminars, studio and independent travel/study abroad. Architectural design, planning, structures, history and technology. Prerequisites: Completion of at least one year of architectural graduate course work, 3.00 cumulative grade point average in architecture, and approval of the school.

494. **Special Topics in Architecture. 2 to 4 Hours.** May be repeated for a maximum of 8 hours of credit. Current problems. Prerequisites: 12 hours of history of architecture and art and graduate standing in the M. Arch. Program.

499. **Architecture Elective II. 2 to 6 Hours.** May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Special problems in theory, design, building science, or graphic skills (manual or automated). Prerequisite: Completion of architecture graduate course work, or consent of the instructor.

510. **Advanced Architectural Design I: Activist Practice. 8 Hours.** Design of multiple or complex building types with emphasis on varying topics related to architectural design. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school. Restricted to students in final year of M. Arch. program.

511. **Advanced Architectural Design II: Activist Practice. 8 Hours.** Design of a comprehensive, single case study with emphasis on varying topics related to architectural design. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596. Restricted to students in final year of M. Arch. 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. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school. Restricted to students in final year of M. Arch. 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: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596. Restricted to students in final year of M. Arch. 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. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school. Restricted to students in final year of M. Arch. 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: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596. Restricted to students in final year of M. Arch. 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. Prerequisites: Arch 430 and Arch 454 and Arch 464 and Arch 474, or approval of the school. Restricted to students in final year of M. Arch. 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: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596. Restricted to students in final year of M. Arch. 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. Prerequisites: Arch 454 and Arch 464 and Arch 474, or approval of the school. Restricted to students in final year of M. Arch. 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: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554 or Arch 596. Restricted to students in final year of M. Arch. 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 final year of M. Arch. 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 final year of M. Arch. 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 final year of M. Arch. 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 final year of M. Arch. program.

524. Advanced Elective: Special Topics. 4 Hours. Advanced study in varying topics related to architecture. Restricted to students in final year of M. Arch. program.

596. Independent Study for Graduate Students. 1 to 8 Hours. May be repeated for a maximum of 16 hours of credit. Individual study. Prerequisite: Arch 491 or Arch 510 or Arch 512 or Arch 514 or Arch 516 or Arch 518 or Arch 551 or Arch 554; and approval of the school. Restricted to students in final year of M. Arch. program.

598. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 6 hours of credit. S/U grade only. Individual research under faculty direction. Prerequisite: Approval of the school.

Art and Design (AD)

400. Foreign Studies in Art and Design. 1–16 Hours. Graduate credit only with approval of the director of the school and the director of graduate studies. S/U grade only. May be repeated for credit with the approval of the appropriate major area faculty committee, the director of the school and/or director of graduate studies. Study abroad within approved programs of foreign exchange and/or education. Prerequisites: Graduate standing within a major program within the School of Art and Design and approval of the appropriate major area faculty committee, director of the school and/or director of graduate studies.

403. Design Colloquium. 2 Hours. May be repeated for a maximum of 4 hours of credit. Lectures, presentations, and/or demonstrations related to design issues impacting on the professions of graphic design and industrial design. Prerequisite: 8 credit hours of 200-level graphic design or industrial design major courses or the equivalent.

406. Advanced Special Topics in Art and Design. 2 to 5 Hours. May be repeated for credit. Intensive workshops in specific art and design related topics and techniques directed and announced by the instructor. Prerequisite: Consent of the instructor.

408. Computer Art-Design. 5 Hours. May be repeated for a maximum of 15 hours of credit. The computer as a tool for the artist-designer. The design of interactive computer experiences and the production of computer animations. Prerequisite: AD 205 or high-level programming language experience.

409. Electronic Media Events. 5 Hours. May be repeated for a maximum of 15 hours of credit. Using video production tools and computer graphic systems to produce a public event. Prerequisite: AD 208 or 408.

410. Advanced Special Topics in Graphic Design. 2 to 5 Hours. May be repeated for a maximum of 10 hours of credit. Intensive workshops in specific graphic design related topics and techniques directed and announced by the instructor. Extensive computer use required. Prerequisites: AD 315 and consent of the instructor. Portfolio review required.

411. Graphic Design Professional Practice. 5 Hours. Design projects with real-world clients in the private or public sector. The designer/client relationship. Prerequisites: AD 315 and AD 317; and consent of the instructor.

412. Graphic Design Thesis. 5 Hours. May be repeated for a maximum of 10 hours of credit. Thesis topics chosen in consultation with graphic design faculty. Prerequisites: Credit or concurrent registration in AD 315; and credit or concurrent registration in AD 317; and credit or concurrent registration in AD 411; and consent of the instructor.

414. Interactivity in Graphic Design. 5 Hours. Advanced examination of graphic design in the new media technologies. Extensive computer use required. Prerequisites: AD 315 and 317; and credit or concurrent registration in AD 412.

415. Graphic Design Seminar. 5 Hours. Seminars and lectures conducted by faculty, design professionals and individuals from design-related disciplines. Prerequisites: AD 315 and AD 317; and consent of the instructor.

418. Independent Study in Graphic Design. 2 to 5 Hours. May be repeated for a maximum of 10 hours of credit. Supervised independent study in graphic design. Extensive computer use required. Prerequisites: Consent of the instructor. Taken by faculty invitation only.

420. Industrial Design VI. 5 Hours. May be repeated for a maximum of 10 hours of credit with Industrial Design faculty committee approval. Students may register for more than one section per term. Planning of advanced product systems with group projects based on international contexts, human/environmental factors analysis, and advanced technological processes. Advanced audio-visual presentations and technical reports. Prerequisites: Completion of 8 hours of AD 320 and AD 321 or the equivalent, and approval of the school.

421. Industrial Design VII. 5 Hours. May be repeated for a maximum of 10 hours of credit with Industrial Design faculty committee approval. Students may register for more than one section per term. Group projects with planning of advanced product systems based on international contexts, human/environment factors analysis, and advanced technological processes. Advanced audio-visual presentations and technical reports. Prerequisites: Completion of 8 hours of AD 320 and AD 321 or the equivalent, and approval of the school.

422. Interaction Design II. 5 Hours. Extensive computer use required. Advanced 2-D and 3-D methods in the design of interactive products and art works. Includes human factors, 3-D modeling and design of 3-D virtual products. Prerequisites: AD 325; or consent of the instructor.

423. Industrial Design Senior Project. 5 Hours. Application of the principles of problem-solving and industrial design communication methodology to the organization and presentation of a faculty approved senior or graduate project. Prerequisites: AD 422 or the equivalent, and approval of the school.

424. Industrial Design Independent Study. 4 to 8 Hours. May be repeated for a maximum of 16 hours of credit. Supervised independent study in any area of industrial design activity not covered in the regular curriculum. Prerequisites: Completion of 8 hours of AD 320 and AD 321 or the equivalent, and approval of the school.

425. Design Visualization. 5 Hours. May be repeated for a maximum of 15 hours of credit. Extensive computer use required. Advanced applications of computer-aided design software, including 3-D surface modeling and solid modeling. Applied computer-aided manufacturing, robotics, and expert systems. Prerequisite: AD 325, and consent of the instructor.

432. Painting III: Advanced. 5 Hours. May be repeated for a maximum of 15 hours of credit. Advanced painting; emphasis on individual creative initiative and development, in concert with understanding of contemporary formal, expressive, and conceptual issues. Prerequisites: 8 hours of AD 231 and AD 241 and AD 251 and AD 391; or consent of the instructor with portfolio review.

442. Sculpture III: Advanced. 5 Hours. May be repeated for a maximum of 15 hours of credit for graduate students. Independent projects with faculty supervision. Experimentation and in-depth study of contemporary concepts, processes, and techniques to develop a personal, creative, visual language; primarily self-directed. Prerequisites: AD 231 and AD 241 and AD 251 and AD 391; or approval of the school.

460. Advanced Photography. 5 Hours. Instructor originated projects in any area of photographic activity.

461. Photography Tutorial. 5 Hours. Student generated projects.

470. Documentary Film/Video Production. 5 Hours. Group or individual projects dealing with the communication of fact through motion picture or video media. Prerequisite: AD 272.

471. Advanced Film/Video/Animation. 5 Hours. May be repeated for a maximum of 15 hours of credit. Investigation of contemporary concerns in various areas of film and/or video activity.
under the direction of an instructor. Prerequisites: AD 272 or 474, and consent of the instructor.

472. Independent Study in Film/Video/Electronic Visualization. 4 to 12 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one four-hour section per term, or repeat the course in four-hour sections in subsequent terms. Supervised independent study in any area of cinema, video production, or electronic visualization. Prerequisites: 12 hours in any film, video, and/or electronic visualization courses and consent of the instructor.

474. Advanced Animation. 5 Hours. May be repeated for a maximum of 20 hours. Students may register for more than one section per term. Applications of advanced methods in film animation. Creative projects utilizing sound synchronization, computer motion synthesis, and related techniques. Prerequisite: AD 274.

478. Video II. 5 Hours. May be repeated for a maximum of 15 hours of credit. Creative projects using small format video systems. Prerequisite: AD 278.

482. Visual & 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 lower than B. Field work required. Prerequisites: Grade of B or better in AD 281; and credit or concurrent registration in AD 382; and approval of the school.

484. Educational Practice with Seminar I. 6 Hours. Graduate credit only with approval of the school. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. May be repeated once if grade lower than B. Field experience plus lecture, demonstration and discussion. Prerequisites: 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; completion of 100 clock hours of pre-student-teaching field experiences; and approval of the school.

485. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the school. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. May be repeated once if grade lower than B. Field experience, plus lecture, demonstration, and discussion. Prerequisites: 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; completion of 100 clock hours of pre-student-teaching field experiences; and approval of the school.

488. Computer Graphics I. 4 Hours. Same as CS 488. Principles of interactive computer graphics. Raster and vector display, techniques, and hardware considerations. Introduction to two-dimensional and three dimensional rendering. Laboratory. Prerequisite: Credit or concurrent registration in CS 340.

492. Studio Seminar III. 4 Hours. Rigorous examination of historical developments in art as the basis for understanding new approaches to the continuum of contemporary art. Prerequisites: AD 231 and AD 241 and AD 251 and AD 391; and credit or concurrent registration in AD 432 or credit or concurrent registration in AD 442; or approval of the department.

493. Studio Arts Senior Thesis. 1 Hour. A self-curated body of work presented in a gallery setting; a serious visual and conceptual investigation reflecting a culmination of the student’s senior year. S/U grade only. Prerequisites: Credit or concurrent registration in AD 432 or credit or concurrent registration in AD 442 or credit or concurrent registration in AD 451.

494. Special Topics in Art Therapy. 2 to 5 Hours. May be repeated for a maximum of 10 hours of credit. Students may register for more than one section per term. Specializations, new developments in the field, in-depth study of theory, process, application, or independent study. Prerequisite: Consent of the instructor.

499. Cooperative Education. 0 to 4 Hours. May be repeated for credit. S/U grade only. Only 8 hours of credit may be counted toward satisfying requirements for any art and design major. Introduction to professional practice offering students the opportunity to couple academic learning with professional experience in an off-campus placement. Prerequisites: A minimum cumulative grade point average of 3.00 and approval of the school.

500. Art and Design Teaching Internship. 0 to 2 Hours. This course may be repeated. S/U grade only. Practical and theoretical aspects of teaching lecture/lab studio, and/or seminar courses in Art and Design. No graduation credit. Prerequisites: Consent of the instructor, and consent of Director of Graduate Studies. Restricted to MFA students in School of Art and Design.

502. Seminar in Contemporary Theory. 4 Hours. Must be repeated for a minimum of 16 hours of credit. Developments and current issues in contemporary design, studio and media arts: major philosophies, debates, and social/environmental aspects (may include visiting lecturers, critics, and discussants). Prerequisites: Approval of the school, graduate faculty committee and the student’s advisor.

507. Special Projects in Art and Design. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. Student initiated projects not covered in available curriculum. Prerequisites: Consent of the sponsoring instructor and the graduate faculty committee, in the student’s area of specialization.

508. Advanced Electronic Visualization and Critique. 4 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in electronic visualization through a consultive agreement with graduate faculty committee. Prerequisite: Approval of the school graduate faculty committee.

509. Advanced Electronic Visualization. 5 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in electronic visualization through a consultive agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student’s advisor.

510. Advanced Graphic Design and Critique. 4 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in graphic design by each student through consultive agreement with graduate faculty committee. Prerequisites: Approval of the school graduate faculty committee.

511. Advanced Graphic Design. 5 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in graphic design by each student through consultive agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student’s advisor.

520. Advanced Industrial Design and Critique. 4 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in industrial design by each student through consultive agreement with graduate faculty committee. Prerequisites: Approval of the school graduate faculty committee.

521. Advanced Industrial Design. 5 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in industrial design by each student through consultive agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student’s advisor.

530. Advanced Studio Arts and Critique. 4 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in studio arts by each student through consultive agreement with graduate faculty committee. Prerequisites: Approval of the school graduate faculty committee.

531. Advanced Studio Arts. 5 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in studio arts by each student through consultive agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student’s advisor.

550. Introduction to Art Therapy. 4 Hours. History, theory, and professional issues in art therapy. Prerequisite: Admission to the M.A. in Art Therapy program.

551. Art Therapy Methods. 4 Hours. Utilization of art materials for specific client needs; evaluating art work in relation to developmental level and psychodynamic functioning; assessment and treatment planning. Prerequisite: Admission to the M.A. in Art Therapy program.

552. Group Art Therapy. 4 Hours. Principles and skills of group art therapy including application to various populations. Prerequisite: Admission to the M.A. in Art Therapy program.
553. Career Counseling with Art Therapy. 1 Hour. Overview of history, theory and techniques of career development with adolescent and adult clients in art therapy. Prerequisite: Admission to the M.A. in Art Therapy program.

555. Art Therapy Practicum. 4 Hours. Must be repeated for 12 hours of credit. In-depth experience in clinical, educational, or rehabilitative setting in which student conducts art therapy under weekly supervision. Prerequisite: Consent of the art therapy program director.

556. Supervision Seminar I: Assessment. 3 Hours. Art therapy assessment in combination with small group clinical supervision. Prerequisites: AD 550, AD 551, and concurrent registration in AD 555.

557. Supervision Seminar II: Ethics and Professional Practice. 3 Hours. Professional ethics and practice in combination with clinical supervision seminar. Prerequisites: AD 550, AD 551, and concurrent registration in AD 555.

558. Supervision Seminar III: Termination. 3 Hours. Final seminar of clinical supervision with a focus on treatment termination and review of training. Prerequisites: AD 550, AD 551, 8 hours of AD 555, and concurrent registration in AD 555.

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

561. Advanced Photography. 5 Hours. May be repeated for credit. Individualized graduate study; creative projects and research in photography by each student through consultive agreement with graduate advisor. Prerequisites: Approval of the school graduate faculty committee and the student’s advisor(s).

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

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

581. Child and Family Art Therapy. 2 Hours. Art development in normal childhood and under pathological conditions; family system dynamics; art therapy interventions with children and families in various treatment contexts. Prerequisites: AD 550 and AD 551.

582. Art Therapy for Substance Abuse, 1 Hour. Art therapy interventions in the treatment of substance abuse. Prerequisite: AD 550 and AD 551.

583. Multi-Cultural Diversity in Art Therapy. 1 Hour. Issues of ethnicity, class, physical disability, women, sexual preference; art therapy with elderly, homeless, chronically mentally ill: considerations for art therapy treatment. Prerequisites: AD 550 and AD 551.


594. Special Topics in Art and Design. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Selected research topics in art and design directed and announced by the instructor. Prerequisites: Consent of the instructor and the student’s advisor.

597. Master’s Project. 0 to 16 Hours. May be repeated for a maximum of 16 hours of credit. S/U grade only. Independent research under faculty supervision in a specific area of interest. Prerequisites: 20 hours of 500-level courses and consent of the instructor.

598. Master’s Thesis Research: Art Therapy. 0 to 16 Hours. Must be repeated for a total of 8 hours of credit. S/U grade only. Independent research under faculty supervision in an area of the student’s interest. Prerequisite: Approval of the art therapy program director.

599. Master’s Thesis Research: Art Therapy. 0 to 16 Hours. Must be repeated for a total of 8 hours of credit. S/U grade only. Independent research under faculty supervision in an area of the student’s interest. Prerequisite: Approval of the art therapy program director.

Art History (AH)

404. Topics in Architecture, Art and Design. 4 Hours. May be repeated for a maximum of 12 hours of credit when topics vary. Students may register for more than one section per term when topics vary. Selected topics in the history of European and North American architecture, art, and design. Prerequisite: 3 hours of art history at the 200 level or consent of the instructor.

420. History of Architecture I. 4 Hours. Introduction to architecture, urbanism, and architectural theory worldwide from antiquity to 1450.

421. History of Architecture II. 4 Hours. Introduction to architecture, urbanism, and architectural theory worldwide from 1450 to the present. Prerequisite: AH 420.

422. Topics in the Literature of Architecture. 4 Hours. May be repeated for credit when topics vary. Discussion of selected readings in the theory and criticism of architecture. Prerequisite: 3 hours in the history of architecture or consent of the instructor.

423. Topics in Modern and Contemporary Architecture. 4 Hours. May be repeated for credit when topics vary. Selected topics in modern and contemporary architecture. Prerequisite: 4 hours in the history of architecture or consent of the instructor.

424. Topics in Architecture and Urban Form in Chicago. 2 to 4 Hours. Topics on the development of the built environment of the Chicago and metropolitan area, and the effect on its architecture of social, political and economic forces.

430. Contemporary Photography. 4 Hours. May be repeated for credit when topics vary. Developments in the history of photography since 1950. Prerequisite: 3 hours in the history of photography or consent of the instructor.

432. Topics in Film and Video. 4 Hours. May be repeated for credit when topics vary. Selected studies in genres, schools, individual artists, critics, and theorists of film and video. Prerequisite: 3 hours in the history of film or consent of the instructor.

434. Women and Film. 4 Hours. Same as Engl 472 and GWS 472. Roles and representations of women in classical Hollywood, European art and independent feminist cinemas. Prerequisites: Engl 302 or Engl 342 or Engl 361 or Engl 362 or Engl 363; or consent of instructor.

435. Topics in Modern and Contemporary Design. 4 Hours. May be repeated for credit when topics vary. Topics in modern and contemporary design. Prerequisite: 3 hours in the history of design or consent of the instructor.

441. Topics in Medieval Art and Architecture. 4 Hours. May be repeated for credit when topics vary. Selected topics in European art and architecture of the Middle Ages. Prerequisite: 3 hours of medieval art and architecture or consent of the instructor.

450. Topics in Renaissance Art. 4 Hours. Selected topics in Early Renaissance, High Renaissance, or Mannerist Art and Architecture. Prerequisite: 3 hours in art history at the 200-level or above, or consent of the instructor.

460. Topics in Modern and Contemporary Art. 4 Hours. May be repeated for credit when topics vary. Selected topics in 19th and 20th century modern and contemporary art. Prerequisite: 3 hours of modern art and architecture or consent of the instructor.

463. Topics in North American Art and Architecture. 4 Hours. May be repeated for credit when topics vary. Selected topics in North American art and architecture from colonial times to 1945. Prerequisite: 3 hours of North American art and architecture or consent of the instructor.

464. Topics on Art in Chicago. 2 to 4 Hours. Topics on the survey of art in Chicago, from the 19th century to the present, with an emphasis on contemporary Chicago art expressions.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
465. Arts of the Black Atlantic. 4 Hours. Interdisciplinary and discursive explorations of the visual and artistic expressions of artists of African descent in the New World.

470. Topics on Non-Western Art and Architecture. 4 Hours. May be repeated for credit when topics vary. Selected topics in the art and architecture of Africa, Asia, Oceania, and the indigenous peoples of the Americas.

471. Topics in Asian Art and Architecture. 4 Hours. Same as AsSt 471. May be repeated for credit when topics vary. Selected topics in the art and architecture of Asia. Prerequisite: 3 hours of Asian art and/or permission of the instructor.

480. History of Collecting and Museology. 4 Hours. The history of collecting and patronage: public and private collections, museums, and commercial art galleries, government funding and the arts. Exhibition planning, research, selection, and catalog presentation. Prerequisites: AH 110 and 111; or consent of the instructor.

481. Museum Practices. 4 Hours. Administration of visual arts organizations, their budgets, staffing, and structures, accreditation, and long-range planning. Prerequisite: AH 480 or consent of the instructor.

482. Museology Internship. 8 Hours. Practical supervised experience in institutions serving the visual arts. Placement in museums, community art centers, college, commercial, or nontraditional galleries, and public agencies. Prerequisite: AH 481 or consent of the instructor.

485. Introduction to Historic Preservation. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Preservation planning, historic building restoration, and the political and economic factors affecting the conservation of historic resources. Prerequisite: 3 hours of art history at the 200 level or consent of the instructor.

491. Study Abroad in Art History. 0–12 Hours. May be repeated for credit with the approval of the Department. Study abroad within an approved foreign exchange program or department-sponsored program. Prerequisite: Approval of the department.

492. Readings in Art and Architecture History. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Individually planned readings on selected topics under the supervision of a faculty member. Prerequisites: 3 hours of art history above the 100 level and consent of the instructor.

510. Historiography of the Visual Arts, 1750 to 1960. 4 Hours. 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: Graduate standing in the art history program or consent of the instructor.

511. Toward New Histories of the Visual Arts, 1960 to the Present. 4 Hours. Examines the transformation of art history, theory, and criticism since 1960 with regard to issues of gender, class, ethnicity, popular culture, post-colonialism, and contemporary aesthetics. Prerequisite: Graduate standing in the art history program or consent of the instructor.

512. Art History Teaching Seminar. 0 Hours. May be repeated once. S/U grade only. Theoretical and practical aspects of teaching in undergraduate course in the history of the visual arts. Prerequisites: Graduate standing in the art history program and appointment as a teaching assistant in the Department.

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

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

550. Seminar in Renaissance and Baroque Art and Architecture. 4 Hours. May be repeated for credit when topics vary. European art and architecture of the Renaissance.

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

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

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

563. Seminar in North American Architecture and Art. 4 Hours. May be repeated when topics vary. North American art and architecture from the Colonial period to 1945. Prerequisite: Consent of the instructor.

570. Seminar in Non-Western Art and Architecture. 4 Hours. Selected topics in Pre-Columbian, North American Indian, African, and Oceanic Art.

590. MA Paper Research. 0 Hours. S/U grade only. Student will work with advisors on two qualifying papers. Prerequisite: Consent of the instructor.

596. Readings in Art and Architecture. 1 to 4 Hours. Individually planned readings on selected topics under the supervision of a faculty member. Prerequisite: Consent of the instructor.

598. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 8 hours of credit. S/U grade only. Individual research under faculty direction. Prerequisite: Consent of the instructor.

599. PhD Dissertation Research. 0 to 16 Hours. May be repeated for a maximum of 24 hours of credit. S/U grade only. Supervised research on the part of the student. Prerequisites: Consent of the instructor and satisfactory completion of the preliminary examination.

Asian Studies (AsSt)

471. Topics in Asian Art and Architecture. 4 Hours. Same as AH 471. May be repeated for credit when topics vary. Selected topics in the art and architecture of Asia. Prerequisite: 3 hours of Asian art and/or architecture or consent of the instructor.

472. Issues and Events in Twentieth-Century China. 4 Hours. Same as Hist 472. Covers the events, places, people, political movements, ideologies, and issues that shaped twentieth-century China, and considers different approaches to the writing of that history. Prerequisites: Previous course work in Chinese history at the 100 or 200 level is recommended.

473. Topics in East Asian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Same as Hist 473. Specific topics are announced each term. Prerequisite: 3 hours of East Asian history or consent of the instructor.

478. Women in Chinese History. 4 Hours. Same as GWS 478 and Hist 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution and the historiography of the field. Prerequisites: Previous course work in Chinese history or women’s studies is recommended.

479. Culture and Colonialism in South Asia. 4 Hours. Same as Anth 479 and Hist 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

Associated Health Sciences (AHS)

510. Research Methods in Allied Health. 3 Hours. Application of basic concepts of research methodology to allied health, including problem formulation, research design, sampling, measurement and data analysis. Emphasis on critique of research studies and preliminary proposal writing. Prerequisite: Consent of the instructor.

594. Special Topics in Associated Health Sciences. 1 to 4 Hours. Selected topics of interest within disciplinary specialty areas of the allied health professions. Particular attention is given to topics of cross cutting importance to these professions.

595. Seminar in Associated Health Sciences. 1 Hour. S/U grade only. Topics of current interest in a discipline of associated
health sciences. Includes discussions of current journal articles and important new developments in the specific disciplines. Prerequisite: Consent of the instructor.

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

597. Project Research in Associated Health Sciences. 1 to 4 Hours. S/U grade only. Independent investigation of a topic to contribute to the associated health professions. Students investigate a topic/problem in this area, write an article/report, and/or make oral presentations. Prerequisite: Consent of the instructor.

Biochemistry (Bche)

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

460. Biochemistry. 5 Hours. Intended primarily for first-year graduate students. Discussions of chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids. Also includes elements of enzymology. Prerequisite: Organic chemistry.

513. Structure of Biopolymers. 3 Hours. Same as Mlm 513 and PmPgy 513. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: Bche 460 and a year of physical chemistry; or consent of the instructor.

516. Physiology and Biochemistry of Muscle Contraction. 2 Hours. Same as Phys 516. Structure and function of myosin, actin, tropomyosin, troponin, and the sarcoplasmic reticulum; control, energetics, and mechanism of muscle contraction; gene expression.

520. Biochemical Research Techniques I. 3 Hours. Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical methodology. Prerequisites: Organic chemistry and credit or concurrent registration in Bche 460 and consent of the instructor.

521. Biochemical Research Techniques II. 2 to 5 Hours. Students carry out assigned projects in each of two different research laboratories during the semester. Emphasis on the application of biochemical methods in an actual research setting. Prerequisites: Bche 520, graduate standing in the department, and consent of the instructor.

522. Strategies for Effective Scientific Communication. 1 Hour. S/U grade only. Development of critical skills for evaluation, development, and execution of forms of scientific communication, including research and grant proposals, manuscripts describing original research, and review summaries. Prerequisite: Consent of the instructor.

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

532. Medical Biochemistry II. 1 Hour. Chemistry of biopolymers; enzymology; metabolism of carbohydrates, lipids, amino acids and proteins; molecular biology. Intended primarily for medical students. Prerequisites: Completion of Bche 531 and membership in the medical school and consent of the instructor.

533. Nutrition for Medical Students. 2 Hours. Intended primarily for medical students. Biochemistry and physiology of each of the nutrients. Biochemical and nutritional basis of heart disease, hypertension, metabolic bone disease energy expenditure, obesity, malnutrition, regulation of appetite, foods, cancer, and drug/nutrient interactions. Prerequisites: Bche 531 and 532 and membership in the medical school or consent of the instructor.

561. Biochemistry of Cellular Regulation. 3 Hours. Membrane structure and function, transport, receptor and signal transduction mechanisms and growth factors. Cytoskeleton and motility, cell-cell communication, enzyme cascades and cellular control mechanisms. Prerequisite: Bche 460.

562. Gene Structure and Function. 3 Hours. DNA organization and gene structure, transcription and translational control of gene expression. Emphasis given to the regulation of gene expression in selected developmental systems. Prerequisite: Bioe 460 or consent of the instructor.

563. Principles of Molecular Medicine. 3 Hours. A lecture/discussion/writing course which integrates biochemical and molecular biological concepts into a clinical context. Diseases will be described in terms of molecular mechanisms. Prerequisites: Bche 561 and 562; or consent of the instructor.

594. Special Topics in Biochemistry. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Topics of current interest in the field of biochemistry, and may include NMR structural studies, proteinases and their inhibitors, gene regulation, signal transduction, and transcription factors. Prerequisite: Consent of instructor.

595. Seminar and Journal Club. 1 Hour. May be repeated for credit. S/U grade only. Student presentation of research subjects of current importance in biochemistry and related fields, based on current research literature. Prerequisite: Consent of the instructor.

596. Independent Study in Biochemistry. 1 to 3 Hours. May be repeated for a maximum of 4 hours of credit. A maximum of 3 hours of credit may be taken with a single instructor. Students may register for more than one section per term. Introduction to current research through the biochemical literature offered on an individual basis by arrangement. Prerequisite: Consent of instructor.

598. Master's Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Investigation carried out by M.S. candidate under the direction of a faculty member leading to the M.S. in Biochemistry. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent investigation carried out by Ph.D. candidate under the supervision of a faculty member leading to the Ph.D. in Biochemistry. Prerequisite: Consent of the instructor.

Bioengineering (Bioe)

407. Pattern Recognition I. 4 Hours. Same as ECE 407. The design of automated systems for detection, recognition, classification, and diagnosis. Parametric and nonparametric decision-making techniques. Applications in computerized medical and industrial image and waveform analysis. Prerequisite: Math 220.

415. Biomechanics. 4 Hours. Use of rigid and deformable body statics and rigid body dynamics to analyze various aspects of the human musculoskeletal system. Prerequisites: Cemm 204 and ME 210; and either BioS 442 or 443.

420. Introduction to Field and Waves in Biological Tissues. 4 Hours. Principles of electromagnetic and ultrasonic interaction with biological systems; characterization of biological materials; diagnostic and therapeutic uses; and techniques of dosimetry and measurement. Prerequisite: ECE 310.

421. Biomedical Imaging. 4 Hours. Previously listed as Bioe 320. Introduction to engineering and scientific principles associated with X-ray, magnetic resonance, ultrasound, computed tomographic and nuclear imaging. Extensive computer use required. Prerequisites: Math 210 and Phys 142.

430. Bioinstrumentation and Measurements I. 4 Hours. Theory and application of instrumentation used for physiological and medical measurements. Characteristics of physiological variables, signal conditioning devices and transducers. Prerequisites: ECE 210; and BioS 100 or higher.

431. Bioinstrumentation and Measurement Laboratory. 1 Hour. Practical experience in the use of biomedical instrumentation for physiological measurements. Prerequisite: Credit or concurrent registration in Bioe 430.

432. Bioinstrumentation and Measurements II. 4 Hours. Principles of bioinstrumentation for the assessment of physiological function and therapeutic intervention. Prerequisite: Bioe 430.

433. Bioinstrumentation and Measurements II Laboratory. 1 Hour. Laboratory experiments using instruments
Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.


439. Biostatistics. 4 Hours. No credit given if the student has credit in BSTT 400. Statistical treatment of data, model estimation, and inference are treated in a framework of biological experiments and attributes of data generated from such experiments. Extensive computer use required. Recommended knowledge of MATLAB. Prerequisites: MATH 210 and CS 108; and consent of the instructor.


450. Molecular Biophysics of the Cell. 4 Hours. Same as Phys 450. Introduction to molecular length, force, energy scales; statistical thermodynamics of solutions; DNA, RNA and protein structure and function; experimental methods. Prerequisite: Phys 245 or the equivalent.

452. Biocontrol. 4 Hours. Considers the unique characteristics of physiological systems using the framework of linear systems and control theory. Static and dynamic operating characteristics, stability, and the relationship of pathology to control function. Prerequisites: ECE 310 and either BioS 442 or 443.

455. Introduction to Cell and Tissue Engineering. 4 Hours. Foundation of cell and tissue engineering covering cell technology, construct technology, and cell-substrate interactions. Emphasis in emerging trends and technologies in tissue engineering. Prerequisites: BioS 100 and CEMM 260; or the equivalent.

456. Cell and Tissue Engineering Laboratory. 2 Hours. Includes polymer scaffold fabrication, microstamping biomolecules, cellular adhesion and proliferation assays, and immuno/fluorescent tagging. Prerequisite: Bioe 455; or consent of the instructor.

460. Materials in Bioengineering. 4 Hours. Analysis and design considerations of problems associated with prostheses and other implanted biomedical devices. Prerequisites: CEMM 260 and either BioS 442 or 443.

470. Bio-Optics. 4 Hours. Physical principles and instrumentation relevant to the use of light in biomedical research. Several current and developing clinical applications are explored. Prerequisite: Phys 142.

472. Models of the Nervous System. 4 Hours. Mathematical models of neural excitation and nerve conduction, stochastic models and simulation of neuronal activity, models of neuron pools and information processing, models of specific neural networks. Prerequisites: ECE 310 and either BioS 442 or 443.

475. Neural Engineering I. Introduction to Hybrid Neural Systems. 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. Prerequisites: BioS 442 and credit or concurrent registration in Bioe 472.

476. Neural Engineering I Laboratory. 1 Hour. Hands-on experience with computational and experimental models of engineered neural systems, with emphasis on neuroprostheses and biosensors. Animals used in instruction. Prerequisite: Credit or concurrent registration in Bioe 475.

480. Introduction to Bioinformatics. 4 Hours. Computational analysis of genomic sequences and other high throughput data. Sequence alignment, dynamic programming, database search, protein motif, cDNA expression array, and structural bioinformatics. Prerequisite: BioS 100 and CS 201 or consent of the instructor.

481. Bioinformatics Laboratory. 1 Hour. 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: Credit or concurrent registration in Bioe 480; and consent of the instructor.

482. Introduction to Optimization Methods in Bioinformatics. 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. Extensive computer use required. Prerequisites: BioS 100 and CS 201.

494. Special Topics in Bioengineering. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Special topics to be arranged. Prerequisite: Consent of the instructor.

500. Interfacial Biosystems Engineering. 4 Hours. Advanced and detailed exposition of the fundamentals of biological systems using quantitative approaches. Areas of concentration include bioinformatics, cell and tissue engineering, and neuroengineering. Prerequisite: BioS 442.

514. Biotransport. 4 Hours. Same as ChE 514. Diffusion and flow in living systems. Blood rheology and flow. Microcirculation, oxygen transport, diffusive transport across membranes. Membrane structure; water, and ion flows, active transport. Prerequisite: ChE 410 or consent of the instructor.


518. Controlled Drug Delivery. 3 Hours. Same as BpS 518. 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. Prerequisite: Math 220 or approval of the department.

520. Wave Propagation and Scattering in Biological Tissue. 4 Hours. Inverse and direct solution techniques will be utilized in applications of acoustic, electromagnetic and radiation transport methodologies to the characterization of biological media. Prerequisite: Bioe 420.

521. Imaging Systems for Biological Tissues. 4 Hours. Examination of major imaging systems using ionizing and nonionizing energy for characterization of biological tissues and physiological lesions. Prerequisite: Bioe 420.

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: 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: Consent of the instructor.


544. Advanced Theory and Technology of Devices. 4 Hours. Same as ECE 544. Theory, design, and technology of a selected semiconductor device at current research and industrial state-of-the-art level. Prerequisite: ECE 540.

548. Micro and Nanotechnology for Biomedical Applications. 4 Hours. This course covers selected topics in micro- and nano-technology underlying biomedical applications; topics include: microfabrication and nanofabrication; microfluidic processes; neuroMEMS; nanoscale structures as functional biointerfaces. Prerequisite: Phys 244.
552. Advanced Biocontrol. 4 Hours. Modeling and analysis of physiological systems including such topics as adaptive control, statistical analysis, error signal analysis, and the characterization of individual neural control elements. Prerequisite: Bioe 452.

555. MEMS for Biomedical Engineering. 4 Hours. Interaction of biologics with microfabricated surfaces and devices. Protein immobilization and patterning using microlithography. Biointegration and packaging. Biomedical examples of MEMS. Prerequisite: ECE 400.

560. Processing and Properties of Structural Biomaterials. 4 Hours. Considers the inter-relationships between atomic bonding, atomic/molecular structure and material processing to provide a fundamental understanding of the properties and performance of advanced biomaterials. Prerequisite: CEMM 260. Credit in Bioe 460 is recommended.

575. Neural Engineering II. 4 Hours. Neuron and membrane excitation, brain and activation, measurement and processing of neural signals, stimulation of neural tissue, source modeling of neural imaging. Prerequisite: 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, coccyx, retina, and visual cortex. Prerequisites: 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. Prerequisites: Bioe 480 or consent of the instructor. Recommended background: Exposure to biochemistry, or molecular biology, or evolution.

590. Internship in Bioengineering. 1 to 4 Hours. S/U grade only. Current clinical practice experience in a health care setting culminating in a written and oral report. Prerequisites: Bioe 430, 431 and 479.

594. Advanced Special Topics in Bioengineering. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Systematic review of selected topics in bioengineering theory and practice. Subjects vary from year to year. Prerequisite: Consent of the instructor.

595. Seminar in Bioengineering. 0 to 1 Hour. S/U grade only. May be repeated for credit. Students who are presenting seminars should register for 1 hour, others for 0 hour. Recent innovations in bioengineering theory and practice presented by invited speakers, faculty and graduate students.

596. Independent Study. 1 to 5 Hours. May be repeated for credit. Students may register for more than one section per term. Research on special problems not included in thesis research. Prerequisite: Consent of the instructor.

598. Master’s Thesis Research. 0 to 16 Hours. Students may register for more than one section per term. S/U grade only. Research in M.S. thesis project.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated. Students may register for more than one section per term. S/U grade only. Research in Ph.D. thesis project.

**Biological Sciences (BioS)**

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

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

416. Natural Products. 4 Hours. Same as Chem 456. Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. Prerequisite: One year of organic chemistry.

424. Mammalian Histology. 4 Hours. The microscopic anatomy of tissues and organs in relation to their function. Prerequisite: BioS 225 or 272.

429. Laboratory in Electron Microscopy. 3 Hours. Animals used in instruction. S/U grade only. Laboratory instruction in cell preparation and instrument operation in transmission and scanning electron microscopy. Prerequisite: Consent of the instructor.

430. Evolution. 4 Hours. Mechanisms of genetic and phenotypic stability and change in populations and species; modes of speciation and macroevolution; trends in evolution. Lecture and discussion. Prerequisite: BioS 220.

431. Plant and Animal Interactions. 3 Hours. Ecology of non-symbiotic relationships of plants and animals, including protection mutualisms, pollination, seed dispersal, animal herbivory and plant defense. Prerequisites: BioS 100 and 101, or the equivalent; and any 200- or 300-level BioS course.

432. Restoration Ecology. 3 Hours. Philosophical, historical, and ecological basis for ecological restoration, with emphasis on readings in the primary literature and writing. Prerequisite: BioS 330 or the equivalent.

433. 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: 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: BioS 220 and Math 180.

436. Biological Conservation. 3 Hours. Applied ecology of the sustained use of natural resources; emphasis on biological diversity, population increase, multiple-use concept, and land ethics. Lecture, discussion, and term paper. Prerequisite: Credit or concurrent registration in BioS 330 and 331, or consent of the instructor.

439. Field Problems in Biology. 1 to 3 Hours. May be taken either between semesters (registration during preceding semester) or for a full semester. Credit is given on completion of a satisfactory written report. Field research in natural habitats. Prerequisites: Field experience in a previous biological sciences course and consent of the instructor.

440. Plant Physiology. 2 Hours. Structure and function of the plant cell; emphasis on membrane function, water relations, solute absorption and translocation, and photosynthesis. Prerequisites: BioS 100 and 101, or the equivalent; and BioS 222 or 244.

442. Nerve and Muscle Physiology. 4 Hours. Function of excitable cells in neural, muscular, and cardiovascular tissues will be studied at both cellular and system levels. Prerequisite: Two years of biological sciences.

443. Animal Physiological Systems. 4 Hours. Animals used in instruction. Basic function of renal, respiratory, and digestive systems. Integrative role of endocrine systems. Prerequisites: Two years of biological sciences. Credit in BioS 442 is recommended.

448. Environmental Toxicology. 3 Hours. Sources of environmental pollution and their ecological and health effects. Prerequisites: BioS 100 and 101, and one physiology course; and credit or concurrent registration in Chem 232.

450. Advanced Microbiology. 3 Hours. Comprehensive analysis of metabolic, ecological, phylogenic, and cytological diversity among the major groups of eubacteria and archaebacteria. Prerequisites: BioS 350; credit in BioS 456 is strongly recommended.

452. Biochemistry I. 4 Hours. Same as Chem 452. Chemistry of proteins, nucleic acids, carbohydrates, and lipids. Prerequisite: Credit or concurrent registration in Chem 234.

Biochemistry of macromolecules and regulation of macromolecular synthesis. Prerequisite: BioS 452.

456. Microbial Physiology. 4 Hours. Prokaryotic cell structure and function; various pathways of energy generation; microbial photosynthesis; microbial genetics; molecular biology of biosynthesis of amino acids, nucleotides and informational macromolecules. Prerequisite: BioS 350.


466. Principles of Paleontology. 4 Hours. Same as EaEs 466. Theory and methods of evolutionary paleobiology; includes paleoecology, functional morphology, and major features of organic evolution. Prerequisite: BioS 360 or consent of the instructor.

475. Neural Engineering I: Introduction to Hybrid Neural Systems. 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. Prerequisites: BioS 442 and credit or concurrent registration in Bioe 472.

483. Mammalian Neuroanatomy. 5 Hours. Animals used in instruction. Structure and function of the mammalian central nervous system. Prerequisite: BioS 225 or 272.

486. Animal Behavior and Neuroethology. 4 Hours. Animals used in instruction. Neural and behavioral mechanisms of environmental information processing and interaction throughout the animal kingdom; emphasis on invertebrate and lower vertebrates. Prerequisites: BioS 220 and either BioS 225 or 420.

489. Cellular Neurobiology Laboratory. 3 Hours. Recording from and analyzing the activity of nerve cells, neuronal networks, and other electrically excitable tissues. Prerequisite: BioS 286 or the equivalent.

490. Topics in Ecology and Evolution. 3 to 4 Hours. May be repeated for credit. Credit varies according to topic offered. Students may register for more than one section per term. In-depth analysis of advanced topics in ecology and evolution, involving reading primary literature, term paper, student presentations, and critical discussion.

491. Laboratory in Ecology and Evolution. 0 Hours. May be repeated. Students may register for more than one section per term. Laboratory component of BioS 490. Prerequisite: Concurrent registration in BioS 490.

520. Topics in Genetics. 2 Hours. May be repeated for credit. Students may register for more than one section per term. Discussion of selected topics of current interest in genetics. Prerequisites: BioS 220 and 221 and consent of the instructor.

524. Molecular Biology I. 5 Hours. Structural properties and analysis of DNA, RNA, and proteins; principles of cloning and recombinant DNA technologies; DNA replication, repair, recombination, and transposition. Prerequisite: Consent of the instructor.

525. Molecular Biology II. 5 Hours. Gene organization and function in lambda, prokaryotes and eukaryotes; promoters, enhancers, RNA splicing, developmental regulation; protein secretion and targeting. Prerequisite: BioS 524 or consent of the instructor.

526. Molecular and Genetic Analysis of Development. 3 Hours. Same as Gene 526. Examines developmental mechanisms used in animal and plant model systems. Lecture.

527. Cellular and Systems Neurobiology. 3 Hours. Same as Anat 527. Molecular and cellular properties of ion channels in neurons and sensory cells and their relationship to brain and sensory systems. Prerequisite: Credit in one neuroscience course or consent of the instructor.

530. Population Ecology. 3 Hours. Life histories, population processes and interactions, and theories of distribution and abundance. Prerequisites: BioS 220, 221, 330, and 331; and consent of the instructor.

531. Introduction to Ecology and Evolution I. 3 Hours. Concepts, techniques, and skills needed for research in ecology and evolution. Prerequisite: Consent of the instructor.

532. Introduction to Ecology and Evolution II. 3 Hours. Evolutionary and physiological research. Prerequisite: Consent of the instructor.

533. Functional Ecology of Plants and Animals. 3 Hours. Some community attributes can be explained by morphological, behavioral, physiological, developmental, and genetic responses of individuals and populations to rigor, variability, and predictability of environments. Prerequisites: One course in organization biology or physiology (plant or animal).

535. Ecosystems. 3 Hours. Flow of energy and nutrients in aquatic and terrestrial environments. Prerequisite: BioS 330.

539. Seminar in Ecology and Evolution. 0 to 1 Hours. May be repeated for credit. S/U grade only. Graduate student and faculty seminars on selected topics in ecology and evolution. Credit is given only upon completion of a seminar presentation.

559. Special Topics in Biochemistry. 3 to 4 Hours. Same as Chem 559. May be repeated for credit. Students may register for more than one section per term. Selected topics of current interest in biochemistry. Prerequisite: BioS 454 or consent of the instructor.

560. Topics in Paleontology. 3 to 4 Hours. Same as EaEs 560. May be repeated for credit if topic is different for each registration. In-depth analysis of current problems and issues in paleontology, involving reading primary literature, student presentations, and critical discussions. Prerequisite: Consent of the instructor.

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

586. Cell and Molecular Neurobiology. 3 Hours. Same as Anat 586. Structure and function of voltage-dependent and neurotransmitter-gated ion channels; the role of these ion channels in synaptic transmission, synaptic modification, and neuromodulation. Prerequisite: BioS 442 or consent of the instructor.

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

592. Research Seminar. 1 to 2 Hours. May be repeated for credit. S/U grade only. Presentation of student research with an emphasis on problem-solving and theoretical implications. Prerequisite: Consent of the instructor.

593. Introduction to Laboratory Research. 2 to 6 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. A hands-on, in-depth introduction to selected research topics and laboratory techniques designed for the beginning graduate student. Prerequisite: Consent of the instructor.

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

595. Departmental Seminar. 0 Hours. S/U grade only. Weekly seminar by staff and invited speakers. Required of graduate students every semester.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Not to be used for M.S./Ph.D. thesis research. Individualized research projects of limited scope. Prerequisite: Consent of the instructor.
597. Project Research. 2 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. Not to be used for thesis research. S/U grade only. Guided research projects on selected topics in specific fields of advanced modern biology. Prerequisite: Consent of the instructor.

598. Master's Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research in specialized projects under the direction of a faculty member with appropriate graduate standing, leading to completion of the master's thesis. Prerequisite: Consent of the instructor.

599. Doctoral Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research on specialized topics under the direction of a faculty member with appropriate graduate standing, leading to completion of the Ph.D. thesis. Prerequisite: Consent of the instructor.

Biomedical and Health Information Sciences (BHIS)

405. Medical Sciences and Human Pathophysiology. 3 to 4 Hours. No credit given if the student has credit in AHS 420 or HIM 313 or HIM 314. Pathophysiological processes in human diseases and specific disease processes of human organ systems. Medical management of persons with disease and pharmacology related to the disease. Medical terminology. Students who require a medical terminology component register for 4 hours and participate in both laboratory and lecture-discussion; all others register for 3 hours and attend lecture-discussion only. 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. Prerequisites: BHIS 400 and BHIS 480.

420. Biotechnology for Laboratory Sciences. 2 to 3 Hours. A course designed to provide information about good laboratory practices and general laboratory skills for a wide variety of students interested in laboratory methods which may include research, industry, and medical laboratory science. Credit is not given for BHIS 420 if the student has credit for MLS 300 or 302.

433. Principles of Evidence-Based Health Care. 2 Hours. Same as MHPE 433. Qualitative and quantitative assessment of human subject clinical research: locating, evaluating, comparing scientific papers as bases for health care education and practice. Prerequisite: Approval of the department.

437. Health Care Data. 3 Hours. Same as HPA 437. Review of fundamentals constituting a health care information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems.

460. Introduction to Health Informatics. 1 Hour. No credit given if the student has credit in BHIS 400 or NuSc 218 or IPHS 420. Same as PmPr 460. Introduction to information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; storage, retrieval, and networking; system security. Taught online with some essential classroom lectures. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisites: Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. Recommended background: IDS 100 or the equivalent.

461. Information Systems for Health Information Management. 2 Hours. No credit given if the student has credit in BHIS 400. Advanced topics in information technology and systems in a health care setting; collection, analysis and management of healthcare data; special issues related to the role of health information administrators. Extensive computer use required. Prerequisites: IDS 100 and credit or concurrent registration in BHIS 460.

480. Management and Business Practices. 3 Hours. Principles of management with emphasis on business functions, procedures, and organizational structure as applied to various health care settings including private and institutional practice. Prerequisite: Graduate standing in the School of Biomedical and Health Information Sciences or consent of the instructor.

495. Seminar in Biomedical and Health Information Sciences. 1 Hour. S/U grade only. Specific topics are announced each term. Subjects of current interest presented through lectures and journal review.

499. Introduction to Research Methods in BHIS. 1 Hour. S/U grade only. An introductory "nuts and bolts" approach designed to prepare graduate BHIS students for research.

500. Health Informatics Research Methods. 3 Hours. Review of analytic research methods and knowledge discovery techniques critical to the understanding, development and use of information and implementation of information technology. Prerequisite: Credit or concurrent registration in an introductory course in statistics.

501. Statistics for Health Informatics. 3 Hours. Builds on participants’ existing knowledge of descriptive statistics and fundamental inferential statistics for application in the field of health informatics. Emphasizes qualitative methods. Prerequisite: One introductory course in statistics (e.g., Bstt 400 or the equivalent).

505. Legal and Social Issues in Health Informatics. 3 Hours. Examination of the legal and ethical issues involved in computerized health information systems.

510. Health Care Information Systems I. 4 Hours. Same as HPA 510. Examination, through case studies, discussion, and problem-based learning of current information technologies and systems currently in place and on the horizon, in health care organizations and in health science libraries. Taught only on-line. A UIC netid is required. Prerequisite: Consent of the instructor.

511. Healthcare Information Systems II. 3 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: BHIS 510 or consent of the instructor. Registration restrictions: Certification of completion of netlearning HIPAA training module is required for admission to this course.

515. Management of Health Care Communication Systems. 4 Hours. Same as HPA 520. Examination and management of data communications in and between health care facilities including, stenamiation of issues, standards, technologies, and system configurations. Taught only on-line. A UIC netid is required. Prerequisite: BHIS 510 or consent of the instructor.

516. An Introduction to Extensible Markup Language for the Health Professional. 2 Hours. Extensible Markup Language (XML) improves the representation of clinical content in web-based medical records. Students learn use of this language through case study and web-based activities. Prerequisites: BHIS 400 and HIM 317; or consent of the instructor.

520. Health Information Systems Analysis and Design. 4 Hours. Same as HPA 531. A project course applying systems analysis and design theory to health care systems evaluation, modeling and implementation. Taught only on-line. A UIC netid is required. Prerequisite: BHIS 510 or consent of the instructor.

525. Social and Organizational Issues in Health Informatics. 4 Hours. Same as HPA 540. Examines the impact of information systems on the health care organization and applies theory through case study analysis. Taught only on-line. A UIC netid is required. Prerequisites: BHIS 510; and BHIS 515 or BHIS 520 or BHIS 530; or consent of the instructor.

527. Knowledge Management in Healthcare Organizations. 3 Hours. An examination, through readings, case studies, research publications, 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. Prerequisites: Grade of B or better in BHIS 510; and consent of the instructor.

530. Topics in Health Informatics. 4 Hours. Same as HPA 550. The study of advanced topics in various areas of health

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
informatics. Taught only on-line. A UIC netid is required. Prerequisites: BHIS 510; and BHIS 515 or BHIS 520 or BHIS 525; or consent of the instructor.

580. Practicum in Biomedical and Health Information Sciences. 3 to 12 Hours. May be repeated for credit. Field experience under supervision of a professional expert in a biomedical and health information sciences setting that is consistent with the student’s area of study and career goals. Prerequisite: Consent of the instructor.

594. Special Topics in Biomedical and Health Information Sciences. 1 to 3 Hours. May be repeated for credit. Students may register for more than one section per term. Current theories and methods in biomedical and health information sciences. Seminar, literature search, directed study, and discussion format. Prerequisite: Consent of the instructor.

595. Seminar in Health Informatics. 1 Hour. May be repeated for credit. S/U grade only. A seminar designed to develop interpersonal skills necessary to succeed in the health informatics field. Prerequisites: Completion of 23 hours minimum in health informatics; and consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

597. Project Research in Biomedical and Health Information Sciences. 0 to 5 Hours. May be repeated for credit. S/U grade only. 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. Prerequisite: BHIS 499, 500, and 595; and consent of the instructor.

598. Research in Biomedical and Health Information Sciences. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. Independent research in one area of biomedical and health information sciences directed by a faculty member. Prerequisites: Foundation courses in research and statistics, or consent of the instructor.

Biomedical Visualization (BVis)

400. 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.

405. Anatomical Visualization. 3 Hours. Graphic manipulation and representation of human morphology and gross anatomy. Graphic construction skills, visual standards and conventions, data collection methods, and personal sketch style development. Prerequisite: Consent of the instructor.

415. Computer Applications. 2 Hours. Using the internet as a communication tool with emphasis on the World Wide Web: FTP, Telnet, HTML authoring, image processing, navigation and interface design. Prerequisite: Consent of the instructor.

420. Illustration Techniques. 3 Hours. Introduction to line, continuous tone and color rendering techniques. Digital image creation and manipulation, color theory and design, print and electronic publication issues. Prerequisite: BVis 405 or consent of the instructor.

430. Surgical Orientation. 1 Hour. Survey of surgical specialties, including an historical survey and relationship to visual communication. Instruments, aseptic technique, incisions, suturing, principles of wound healing, imaging modalities, and surgical terminology. Prerequisites: BVis 405 and consent of the instructor.

440. Instructional Design. 2 Hours. Instructional design process for print and audiovisual media development in the health sciences. Emphasis on theory in communication, learning, and the instructional design process. Prerequisite: Consent of the instructor.

450. Graphic Design. 2 Hours. Fundamentals of graphic design techniques and imagery production as applied to health science print media. Prerequisite: One year of basic design courses.

460. 3-D Model Design. 2 Hours. Introduction to the biocommunicator’s role in 3-D models, anatomical simulators, prosthetics, health care exhibits. Exploration of materials and techniques for impression taking, sculpting, mold construction, and casting.

480. Business Practices. 2 Hours. Business procedures and organizational structures associated with the role of a biocommunicator in institutional, freelance, and small business settings. Topics range from business forms and procedures to legal and ethical issues. Prerequisite: Consent of the instructor.

500. Biomedical Imaging I. 3 Hours. Methodologies for imaging biological structures at microscopic and macroscopic scales. Human anatomy and histology concepts and terminology are presented in relation to imaging methods. Prerequisite: Consent of the instructor.

501. Biomedical Imaging II. 3 Hours. Continuation of BVis 500. Technical aspects of image processing, analysis, compression, 3-D reconstruction and evaluation are stressed. Prerequisite: BVis 500.

505. Computer-Based Morphometrics. 2 Hours. Biological form measurement and comparison. Concepts of descriptive and inferential statistics applied to problems of measurement and quantification of the biological form. Prerequisite: Consent of the instructor.

515. Advanced Graphic Design. 3 Hours. Application of graphic design techniques to a simulated, multi-component client project. Exploration of conceptualizing techniques and project management. Prerequisite: BVis 450.

520. Advanced Imaging Applications. 3 Hours. Instruction in advanced line imaging and visualization for patient education, editorial and product, and diagnostic image interpretation. Prerequisites: 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, etc. Guest instructors with special expertise utilized wherever feasible. Prerequisites: BVis 420; 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. Prerequisites: Anat 441 and BVis 420, 430, 440, and 450.

540. Computer Visualization. 4 Hours. Construction of three-dimensional computer models of biological and anatomical structures using software modelers, 3-D input devices and medical scans and data. Prerequisite: BVis 415.

542. Computer Animation. 4 Hours. Investigates principles of motion using computer animation techniques to solve contemporary problems in medical education and communication where motion can effectively be used. Production from concept to final presentation. Prerequisites: BVis 415 and 540 and consent of the instructor.

543. Computer Animation II. 4 Hours. Builds on concepts introduced in BVis 542. Further investigation of motion using computer animation techniques to solve contemporary problems in medical education and communication where motion can effectively be used. Prerequisites: 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. Prerequisites: BVis 415 and 440.

550. Simulators and Models. 2 Hours. An extension of the principles learned in BVis 460. Emphasis on materials research and problem-solving strategies for complex 3-D projects. Prerequisite: BVis 460.

554. Anaplastology Materials and Techniques. 2 Hours. Hands-on experience with prosthetic materials and techniques. Emphasis on health and safety issues related to laboratory equipment and clinical procedures. Prerequisites: AHS 420 and Anat 441 and BVis 460.
555. Clinical Anaplastology. 4 Hours. Concepts of prosthetic rehabilitation. Provision of facial/somato prosthetic services in a multidisciplinary clinical setting requiring direct interaction with patients with disfigurements. Emphasis on prosthetic techniques and materials. Prerequisite: Anat 441, AHS 420, and BVis 460, or consent of the instructor.

560. Practicum in Biomedical Visualization. 6 to 12 Hours. Field experience under supervision of a professional expert in a biomedical communication setting that is consistent with student’s area of concentration and career goals. Prerequisite: Consent of the instructor.

594. Special Topics in Biomedical Visualization. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Selected topics in specialty areas of biomedical visualization, depending on sufficient student demand and faculty availability, e.g., pharmaceutical illustration, ocular prosthetic design, etc. Prerequisite: Consent of the instructor.

595. Seminar in Biomedical Visualization. 1 Hour. May be repeated for credit. Topics of current interest in biomedical visualization. Includes discussion of current journal articles and important new developments in the field. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. For students who wish to pursue independent study not related to their project research. Prerequisite: Consent of the instructor.

597. Project Research. 0 to 5 Hours. May be repeated for credit. S/U grade only. Independent investigation which engenders the responsibilities of professionals to contribute to their field. Students investigate a topic/problem in their field, write an article and deliver an oral presentation. Prerequisite: Consent of the instructor.

598. Research in Biomedical Visualization. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research in biomedical visualization directed by a faculty member. Prerequisite: Foundation courses in research and statistics, or consent of the instructor.

Biopharmaceutical Sciences (BpS)

Note: Courses listed under this rubric were previously listed under Pharmacodynamics (PmPd) and Pharmaceutics (PmPc).

423. Adverse Drug Reactions. 2 Hours. Attention focused on the epidemiology and characterization of adverse reactions. Factors which interplay in adverse reactions to medications are discussed. Reactions characterized in relation to organ systems. Prerequisites: Phar 403 and Phar 404; or consent of the instructor.

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 PmPd 430. Credit is not given for BpS 430 if student has credit for EHHS 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.

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: BpS 470.

480. Application of Science to the Law. 4 Hours. Same as CrJ 480. Issues affecting the development, accessibility and admissibility of forensic science services by the criminal justice system; problems which may compromise the quality, fairness and effectiveness of scientific inquiries. Prerequisites: CrJ 210 and 260 or graduate standing.

494. Special Topics of Current Interest in Biopharmaceutical Sciences. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. 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. Prerequisites: 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 course in biopharmaceutical sciences including fundamental principles of pharmaceutics, pharmacokinetics, scientific ethics and research design. Prerequisite: Graduate standing in the Biopharmaceutical Sciences program or approval of the department.

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

503. Laboratory Techniques in Biopharmaceutical Sciences. 3 Hours. No credit given if the student has credit in PmPd 500. Laboratory-based core course in methods and techniques employed in biopharmaceutical sciences research. Prerequisite: BpS 502 or consent of the instructor.

506. Industrial Experience. 4 to 10 Hours. S/U grade only. Recommended to graduate students with no industrial experience. Students spend time working in the pharmaceutical, imaging or cosmetic industry under academic supervision to obtain practical experience. Prerequisites: BpS 501 and 502 and 503 and 510 and 515; and Bttr 400; and GC 401 and 470 and 471; and Bche 460.

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. Prerequisites: 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. Prerequisites: Phar 323 and approval of the department.

518. Controlled Drug Delivery. 3 Hours. Same as Bioe 518. 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. Prerequisite: Math 220 or approval of the department.

519. Percutaneous Drug Delivery. 2 Hours. Modern methods of drug delivery covering the use of enhancers, produgs, iontophoresis and ultrasound are presented. Toxicity testing, regulatory issues for successful marketing and production issues. Prerequisite: Consent of the instructor.

520. Lipid-Based Drug Delivery Systems. 2 Hours. The preparation, characterization, stability, pharmaceutical cosmetic and diagnostic applications of lipid-based drug delivery systems including liposomes, micelles and emulsions prepared with phospholipids. Prerequisites: Phar 323 and approval of the department.

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: 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: 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. Prerequisites: Consent of the instructor and a course in basic pharmacology.

543. Psychoneuroimmunology. 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: 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 will be discussed. Prerequisite: Consent of the instructor.

546. Computer Techniques in Pharmacokinetics. 3 Hours. Computer applications in pharmacokinetics and pharmacodynamics. Principles necessary for understanding the uses, advantages and limitations of computer methods are discussed. Prerequisites: Consent of the instructor.

551. Pharmacological Basis of Therapeutics I. 2 Hours. Pharmacological basis of drugs for the treatment of diseases, including cancer, and conditions, including inflation, of the nervous and gastrointestinal systems. Prerequisites: Credit or concurrent registration in BpS 460 and BpS 502; or approval of the department.

552. Pharmacological Basis of Therapeutics II. 2 Hours. Pharmacological basis of drugs for treatment of diseases, including cancer, and conditions, including inflammation, of the cardiovascular, renal and endocrine systems. Prerequisite: BpS 551; or approval of the department.

555. Pharmacogenomics and Toxicology. 1 Hour. Modern approaches to understanding the molecular basis of individual differences to drug response, including toxicity. Prerequisites: BpS 502 and Bche 460 and Gene 502; or approval of the department.

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

581. Forensic Analysis of Biological Evidence. 4 Hours. Same as CrJ 581 and MLS 581. Forensic blood and physiological fluid identification; DNA typing of biological evidence; report writing; expert testimony. Prerequisite: Consent of the instructor.

582. Forensic Chemistry and Trace Evidence Analysis. 4 Hours. Same as CrJ 582. Trace evidence: hairs, fibers, glass, soil, paint and miscellaneous; nature, chemical, instrumental, microscopical methods of analysis; interpretation and significance of trace similarities; expert testimony. Prerequisite: Consent of the director of graduate studies.

583. Physical Pattern Evidence Analysis. 4 Hours. Same as CrJ 583. Pattern evidence: individualization, reconstruction; fingerprint classification; questioned documents; handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction will be studied in depth. Prerequisites: Consent of the instructor.

584. Forensic Drug Analysis and Toxicology. 4 Hours. Same as MLS 584 and CrJ 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media, with emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the instructor.

586. Topics in Specialty Forensic Examinations. 1 to 4 Hours. May be repeated for credit if topic is different for each registration. Students may register for more than one section per term. Prerequisites: BpS 581 or 582 or 583 or 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

588. Expert Witness Testimony and Courtroom Demeanor. 3 Hours. Trials, hearings, grand jury; expert versus lay witness; personal and behavioral characteristics on the stand; results, reports and courtroom testimony; simulated trial testimony. Prerequisite: Approval of the department.

589. Special Topics in Forensic Science. 3 Hours. May be repeated for credit if topic is different for each registration. Same as CrJ 589. Content may vary but will revolve around the philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to non-criminalistics fields. Prerequisite: Consent of the instructor.

590. Forensic Science Residency. 3 Hours. May be repeated for a maximum of 12 hours of credit. S/U grade only. In-depth training for casework analysis in a specific forensic discipline (e.g. drug identification, DNA typing, fingerprints) in an approved forensics science laboratory. Prerequisites: BpS 581 or 582 or 583 or 584; and consent of the instructor. Students must have credit in the forensic science program core course that covers the specific topic.

591. Topics in Forensic Microscopy. 1 to 4 Hours. May be repeated for credit if topic is different for each registration. Students may register for more than one section per term. Topic may vary but will revolve around microscopical characterization of various materials, with emphasis on forensic laboratory methods and approaches, and interpretation of materials comparisons as evidence. Prerequisites: BpS 582; and consent of the instructor.

592. Forensic Science Internship. 2 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Placement in a forensic science or toxicology laboratory or setting, under the supervision of a faculty member, with an accepted research project or paper required. Prerequisites: BpS 580; and consent of the instructor; and a minimum of 15 hours of credit earned in the M.S. in Forensic Science program.

593. Research in Biopharmaceutical Sciences. 0 to 16 Hours. May be repeated for credit. S/U grade only. Research in biopharmaceutical sciences with the guidance of a faculty mentor. Prerequisite: Approval of the department.

594. Special Topics Biopharmaceutical Sciences. 1 to 4 Hours. May be repeated for a maximum of 4 hours of credit if topic is different for each registration. Content varies. Special topics in biopharmaceutical sciences not covered in regular core or elective offerings. Prerequisites: Consent of the instructor.

595. Departmental Seminar. 1 to 2 Hours. May be repeated for credit. S/U grade only. Departmental seminar for research and experimental techniques in the biopharmaceutical sciences. Also consists of journal club at which students will present an article once a year. Weekly seminar and journal club meet separately from one another. Prerequisite: Approval of the Department.

596. Independent Study in Forensic Science. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Supervised projects may consist of extensive reading or laboratory work, or both, on topics not covered in regular course offerings. Research undertaken for this course may not duplicate that being done for BpS 597 or 598. Prerequisite: Consent of the instructor.

597. Forensic Science Project Research. 3 Hours. S/U grade only. Supervised research in forensic science; a research project to be designed and completed within one semester. Prerequisites: BpS 580; and consent of the instructor and at least the core course in the M.S. in Forensic Science program covering the subject area in which the research is to be conducted.

598. M.S. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 10 hours of credit. A minimum of 6 hours is required. S/U grade only. For students doing M.S. thesis research or thesis writing. Prerequisite: Consent of the instructor.

599. Dissertation Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Ph.D. thesis research. Prerequisite: Consent of the instructor.

Biostatistics (Bstt)

400. Biostatistics I. 3 Hours. Descriptive statistics, basic probability concepts, one- and two-sample statistical inference, analysis of variance, and simple linear regression. Introduction to a statistical computer package such as Minitab or SAS. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

401. Biostatistics II. 4 Hours. Simple and multiple linear regression, stepwise regression, multifactor analysis of variance and covariance, non-parametric methods, logistic regression, analysis of categorical data; extensive use of computer software. Prerequisite: Bstt 400.
Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
in chemical engineering. Includes methods for the solution of problems arising in phase and chemical reaction equilibria, chemical kinetics, and transport.

### 440. Non-Newtonian Fluids. 4 Hours.
Fluid mechanics and transport processes involving non-Newtonian fluids. Purely viscous and viscoelastic behavior. Viscometric functions and rheometry. Heat and mass transfer in non-Newtonian fluids. Prerequisite: ChE 410 or consent of the instructor.

### 441. Computer Applications in Chemical Engineering. 4 Hours.
Numerical applications of computers: artificial intelligence and expert systems for chemical engineering design and on-line diagnosis; data acquisition and control for digital process control; process design calculations.

### 445. Mathematical Methods in Chemical Engineering. 4 Hours.
Advanced mathematical techniques in chemical engineering. Includes infinite series in thermodynamic perturbation theory; Laplace transforms in process control; chemical diffusion transport theories and differential equations. Prerequisite: Math 220 or the equivalent.

### 450. Air Pollution Engineering. 4 Hours.
Same as ME 450. Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion. Prerequisite: ME 321 or consent of the instructor.

### 494. Selected Topics in Chemical Engineering. 1 to 4 Hours.
May be repeated for credit. Students may register for more than one section per term. Systematic study of selected topics in chemical engineering theory and practice. Prerequisite: Consent of the instructor.

### 501. Advanced Thermodynamics. 4 Hours.

### 502. Fluid Phase Equilibria. 4 Hours.
Application of molecular theories of fluids to phase equilibrium systems. Intermolecular potentials, partition functions, correlation functions, chemical potentials, fugacity and activity coefficient and their relationships. Prerequisite: ChE 301 or the equivalent.

### 503. Thermodynamics of Multicomponent Mixtures. 4 Hours.
Thermodynamic theories of mixtures. Molecular principles of various solution theories. Conformal solutions, lattice theories, group contribution function theories, and perturbation and variational theories. Prerequisite: ChE 502 or the equivalent.

### 505. Advanced Statistical Thermodynamics. 4 Hours.

### 510. Separation Processes. 4 Hours.
Advanced coverage of equilibrium stage separation. Multi-component separation and distillation; unsteady state adsorption processes. Separation efficiencies and energy requirements. Prerequisite: ChE 410.

### 511. Advanced Mass Transfer. 4 Hours.
Analysis of diffusion and mass transport in chemical engineering systems. Unsteady state diffusion, convective diffusion, mass transfer coefficient, dispersion, and the study of diffusion and reaction and simultaneous mass transport. Prerequisite: ChE 410.

### 512. Microhydrodynamics, Diffusion and Membrane Transport. 4 Hours.
Theoretical and numerical fluid mechanics of microstructure: potential flow and virtual mass, quasi-static versus transient Stokes flow, integral theorems, multipole expansions, singularity solutions, fluctuations, and current applications. Prerequisite: ChE 410 and 445; or consent of the instructor.

### 514. Biotransport. 4 Hours.
Same as Bio 514. Diffusion and flow in living systems. Blood rheology and flow. Microcirculation, oxygen transport, diffusive transport across membranes. Membrane structure; water, and ion flows, active transport. Prerequisite: ChE 410 or consent of the instructor.

### 524. Characterization Techniques in Catalysis. 4 Hours.
The most common crystallographic, spectroscopic, and physicochemical techniques for characterization of bulk solids, solid surfaces, and gas-solid interactions are surveyed. Prerequisite: Consent of the instructor.

### 527. Advanced Chemical Reaction Engineering. 4 Hours.

### 530. Gas Kinetics. 4 Hours.
Modern theory and experimental methods in the rates of gas reactions. Review of phenomenological kinetics, collision theory, energy transfer, unimolecular reactions, transition state and RRKM theory. Modern applications. Prerequisite: ChE 505.

### 592. Specialized Problems. 4 to 8 Hours.
Specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

### 594. Advanced Topics in Chemical Engineering. 1 to 4 Hours.
May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced topics in chemical engineering theory and practice. Subjects vary from year to year. Prerequisite: Consent of the instructor.

### 595. Seminar in Chemical Engineering Research. 1 Hour.
Advances in chemical engineering research will be discussed in a seminar setting. Students will be expected to make presentations in areas of: catalysis, thermodynamics, transport phenomena and kinetics. Prerequisite: Graduate standing in chemical engineering.

### 598. M.S. Thesis Preparation. 0 to 16 Hours.
May be repeated for credit. S/U grade only. Individual research in specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

### 599. Ph.D. Thesis Preparation. 0 to 16 Hours.
May be repeated for credit. S/U grade only. Individual research in specialized problems under faculty supervision. Prerequisite: Consent of the instructor.

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**Chemistry (Chem)**

### 414. Inorganic Chemistry I. 4 Hours.
Introduction to the principles of inorganic chemistry. Structural and descriptive chemistry of the main-group elements. Prerequisite: Chem 342 or consent of the instructor.

### 415. Inorganic Chemistry Laboratory. 2 Hours.
Advanced inorganic chemistry laboratory. Preparative methods, Schlenk techniques, dry box, Fourier-transform infra-red and UV-visible spectroscopy, crystal growth. Prerequisite: Credit or concurrent registration in Chem 414.

### 416. Inorganic Chemistry II. 4 Hours.
Structural and descriptive chemistry of the transition elements. Prerequisite: Chem 414.

### 421. Instrumental Analysis. 4 Hours.
A survey of contemporary instrumentation for chemical analysis. Emphasis on fundamentals of instrumental methods with actual experience on typical equipment. Includes two weekly three-hour laboratories. Prerequisites: Chem 222 and credit or concurrent registration in Chem 342.

### 432. Intermediate Organic Chemistry. 3 Hours.
Rigorous treatment of the principles upon which modern organic chemistry is developed. Prerequisites: Chem 235 and 342.

### 444. Physical Chemistry III. 3 Hours.
Application of quantum mechanics to molecular spectroscopy, statistical mechanics and activated complex theory. Prerequisite: Chem 346.

### 448. Statistical Thermodynamics. 4 Hours.
Introduction to statistical mechanics, partition functions, chemical equilibrium, ensembles, fluctuations, real gases, Einstein and Debye models of solids, magnetic materials, electrolytes, introduction to liquids. Prerequisite: Chem 346.

### 452. Biochemistry I. 4 Hours.
Same as BioS 452. Chemistry of proteins, nucleic acids, carbohydrates and lipids. Prerequisite: Credit or concurrent registration in Chem 234.

### 454. Biochemistry II. 4 Hours.
Same as BioS 454. Continues Chem 452. Carbohydrate and lipid metabolism, electron transport. Metabolism of amino acids, nucleic acids, proteins. Biosynthesis of
455. Biochemistry Laboratory. 3 Hours. Introduction to experimentation with biochemical systems. Includes gas electrophoresis, protein purification, enzyme kinetics, nucleic acid biochemistry, and cloning techniques. Prerequisites: Chem 422 and concurrent registration in Chem 454.

456. Natural Products. 4 Hours. Same as BioS 416. Biogenetic approach to secondary metabolites. General principles and selected studies of phenolic compounds, terpenes, alkaloids, and other interesting natural products. Prerequisite: One year of organic chemistry.

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

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

472. Teaching Methods in Chemistry. 4 Hours. A course in the methods of teaching high school chemistry, including laboratory and the integration of technology. Extensive computer use required. Prerequisites: 24 semester hours of undergraduate chemistry, including two semesters of laboratory chemistry, ED 210 and physical chemistry are recommended.

474. Teaching Chemistry in High Schools. 1 Hour. May be repeated for credit. S/U grade only. Modern ways to help beginning learners construct in their own minds an understanding of scientific concepts and scientific method. Emphasis on the concepts of chemistry. Prerequisite: Approval of the department.

488. Cooperative Chemistry Practice. 1 Hour. May be repeated for credit. S/U grade only. Off-campus participation in a governmental or industrial training program. Credit is contingent on the submission of a final report. Prerequisite: Concurrent registration in LAS 289 or consent of the instructor.

492. Independent Study. 1 to 2 Hours. May be repeated for credit. S/U grade only. Individual study under supervision of a faculty member in areas not covered in standard courses. Credit is contingent on the submission of a final report. Prerequisites: Grade point average of 2.50 in science courses and consent of the instructor.

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

499. Supervised Research. 3 Hours. May be repeated for a maximum of 6 hours of credit. S/U grade only. Individual research performed under supervision of a faculty member in areas not covered in standard courses. Credit is contingent on the submission of a final report. Research experience is strongly encouraged for career students. Credit in Chem 235 or 314 is recommended.

500. Faculty Research. 1 Hour. S/U grade only. Mandatory for first year students. Faculty present their research interests to new graduate students.

510. Literature Seminar in Inorganic Chemistry. 1 Hour. S/U grade only. Discussion of inorganic research from the current literature. Emphasis on student presentations.

514. Advanced Inorganic Chemistry I. 4 Hours. The synthesis, structure, and bonding of selected main group and transition metal species. Describes materials science applications of these compounds. Prerequisite: Chem 416 or the equivalent.

516. Advanced Inorganic Chemistry II. 4 Hours. Structural and descriptive chemistry of the transition elements; spectroscopy and magnetism. Prerequisite: Chem 416 or the equivalent.

518. Advanced Inorganic Chemistry III. 4 Hours. Synthesis, structure, bonding, and properties of solid-state materials. Prerequisite: Chem 416 or the equivalent or consent of the instructor.

519. Special Topics in Inorganic Chemistry. 3 to 4 Hours. May be repeated for credit. Lectures on topics not represented in regularly scheduled courses.

520. Literature Seminar in Analytical Chemistry. 1 Hour. S/U grade only. Discussion of analytical chemical research from the current literature. Emphasis upon student presentations.

522. Techniques in Mass Spectrometry and Surface Analysis. 4 Hours. Various methods in mass spectrometry. Non-optical applied surface analysis including x-ray photoelectron spectroscopy, Auger spectroscopy, and scanning probe microscopy, instrumentation, applications and data analysis. Prerequisite: Chem 421 or the equivalent.

524. Optical Spectroscopies in Analytical Chemistry. 4 Hours. Theory and experimental methods in infrared, ultraviolet and visible spectroscopies, both absorption and emission. Prerequisites: Chem 346 and 421, or consent of the instructor.

526. NMR Spectroscopy in Analytical Chemistry. 4 Hours. Principles governing one- and multi-dimensional nuclear magnetic resonance (NMR) spectroscopy; applications of NMR to chemical analysis. Prerequisite: Chem 421 and 346, or the equivalents, or consent of the instructor.

528. Chemical Separations. 4 Hours. Fundamentals and recent advances in techniques and technologies for the separation of chemical substances, including both chromatographic and electrophoretic methods. Special emphasis on trace and microscale methods. Prerequisite: Chem 421 or approval of the department.

529. Special Topics in Analytical Chemistry. 3 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Lectures and readings in areas not normally treated in standard courses. Discussion of topics of current interest in analytical chemistry. Prerequisite: Consent of the instructor.

530. Literature Seminar in Organic Chemistry. 1 Hour. S/U grade only. Discussion of organic chemical research from the current literature. Emphasis upon student presentations. Prerequisite: Consent of the instructor.

531. Spectroscopic Organic Structure Determination. 3 Hours. Discussion of principles and modern practice in the elucidation of the structures of organic molecules using NMR, IR, UV, and mass spectrometry. With practical examples. Prerequisite: Chem 234 or the equivalent.

532. Advanced Organic Chemistry I. 4 Hours. Chemical bonding, stereochemistry, organic reaction mechanisms, with emphasis on physical principles. Prerequisite: Chem 432 or the equivalent.


535. Advanced Synthetic Chemistry. 4 Hours. Topics include: control of stereochemistry (cyclic + acyclic), synthesis of complex natural and unnatural products (alkaloids, terpenes, and so forth) and new methodologies. Prerequisite: Chem 533.

536. Physical Organic Chemistry. 4 Hours. Theoretical and experimental methods of studying reaction mechanisms, with an emphasis on kinetic methods and linear free energy correlations. Prerequisite: Chem 533 or consent of the instructor.

539. Special Topics in Organic Chemistry. 3 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Discussion of topics of current interest. Prerequisite: Chem 533.

540. Current Problems in Physical Chemistry. 1 Hour. S/U grade only. Student seminars presented on varied topics in physical chemistry. Special emphasis on the application of quantum mechanics and statistical mechanics to the solving of problems in molecular structure, dynamics, and spectroscopy.

542. Quantum Mechanics. 4 Hours. Exact solutions of the Schroedinger equation for simple systems; variational principle and perturbation theory; many-electron atoms and diatomic molecules and...
4. Structural Analysis II. 4 Hours. Influence lines, approximate analysis of structures including trusses and multistory frames. Credit in Math 410 is strongly recommended.

561. Advanced Chemistry of Metal I. 4 Hours. Applications of the thermodynamics and kinetics of biochemical processes. Prerequisite: Chem 454; and Chem 346 or 344.

562. Advanced Chemistry of Metal II. 4 Hours. The structure of nucleic acids and the role and processing of nucleic acids in various aspects of genetic regulation. Prerequisite: Chem 454.

563. Macromolecular Structure and Dynamics. 4 Hours. Descriptive macromolecular phenomena; translational motions and relation to size and shape; coherent scattering techniques; cooperative transitions; polymer models of non-rigid macromolecules. Prerequisite: Chem 448 or consent of the instructor. Credit in Math 410 is strongly recommended.

564. Special Topics in Geotechnology. 1 to 4 Hours. Prerequisite: Approval of the department.

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622. Special Topics in Geotechnology. 1 to 4 Hours. Prerequisite: Approval of the department.
423. Management of Solid and Hazardous Wastes. 3 Hours. Same as EOHS 472 and Geog 444. Management of solid and hazardous waste, including radioactive waste: landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

425. Environmental Remediation Engineering. 4 Hours. Sources of contamination, regulations, site characterization, impact assessment, waste disposal and containment options, waste treatment options, case studies. Prerequisite: CEMM 315.

427. Engineering Hydrology. 4 Hours. Processes, techniques and concepts in hydrology of interest to the engineer: precipitation, interception, evaporation, groundwater, unit hydrographs, flood routing, and statistics. Prerequisite: CEMM 215.

430. Theory of Elasticity I. 4 Hours. The boundary value problems of linear elasticity. Uniqueness of solution. Reduction to two dimensions: the plane problems, torsion, bending. Polar coordinates and general orthogonal coordinates. Prerequisites: CEMM 204 and Math 481; or the equivalents.

431. Introduction to Continuum Mechanics. 4 Hours. Vectors and tensors, stress, principal stresses and principal axes, deformation, compatibility conditions, constitutive equations, isotropy and mechanical properties of fluids and solids. Prerequisites: CEMM 204 and ME 211.


434. Finite Element Analysis I. 4 Hours. Establishment of basic finite element, matrix relations for one-dimensional heat conduction problems: truss, beam, and frame structural systems. Solution methods of the resulting equations. Introduction to two-dimensional analysis. Prerequisites: CEMM 205 or ME 401 and CS 108.


453. Experimental Stress Analysis. 4 Hours. Structural similarity and dimensional analysis. Strain measurement techniques. Introduction to photoelasticity. Prerequisite: CEMM 430.

454. Structural Analysis and Design of Tall Buildings. 4 Hours. State-of-the-art introduction to structural analysis and design of tall buildings. Load impact on different structural systems. Prerequisites: CEMM 401 or CEMM 409 or the equivalent, or consent of the instructor. Major structural analysis and design courses are recommended background.


471. Thermodynamics of Materials. 4 Hours. Application of chemical and thermodynamic principles to processing and characterization of materials. Prerequisite: CEMM 260.

480. Welding Metallurgy. 4 Hours. Metallurgy of metals joining processes. Selection of processes and design of products manufactured by joining processes. Prerequisite: CEMM 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 timetable.

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

496. Special Problems. 1 to 4 Hours. Special problems or reading by special arrangement with a faculty member. Prerequisite: Consent of the instructor.

500. Design of Concrete Plate and Shell Structures. 4 Hours. Practical design of reinforced concrete slabs, walls, and shells of single and double curvatures. Includes barrel roofs, domes, and storage tanks. Prerequisite: CEMM 310.

501. Urban Transportation. 4 Hours. Transportation technology, and its relation to travel and location phenomena in large urban areas, as a basis for planning, operating and design of multimodal transportation systems. Prerequisites: CEMM 302 and Math 210 and Econ 120.

505. Advanced Soil Mechanics. 4 Hours. Soil structure, stresses in soil mass, fluid flow, consolidation, drained and undrained shear strength, stress-strain relations, laboratory determination of strength and compressibility of soils. Prerequisite: CEMM 315.


508. Urban Travel Forecasting. 4 Hours. Theory and method of forecasting travelers' choices of route, mode, destination, departure time, trip frequency and origin location in congested urban transportation networks. Prerequisites: CEMM 302 and Math 210 and Econ 120.

509. Transportation Networks. 4 Hours. Application of constrained optimization methods to the analysis, planning and design of urban transportation networks. Prerequisites: CEMM 501 and CEMM 508 and Econ 501 and Math 484.

510. Advanced Design of Prestressed Concrete Structures. 4 Hours. Analysis and design of indeterminate prestressed concrete members. Composite beams, torsion, deflections and design and detailing of connections, special topics such as anchorage zone design. Prerequisite: CEMM 410.

515. Embankments and Earth Structures. 4 Hours. Shear strength and consolidation of soils, slope stability analysis, embankments and earth dams, sheet pile walls, braced and tied back walls, slurry walls, tunnel supports. Prerequisite: CEMM 315.

516. Design of Landfills and Impoundments. 4 Hours. Regulatory overview, site selection, waste characterization, design and construction of landfill and impoundment components, operations, performance monitoring, closure plans, long-term impacts and monitoring, economic analysis. Prerequisite: CEMM 315.

518. Pollution Prevention Engineering. 4 Hours. Pollution prevention concepts, planning and economics. Improved manufacturing operations and life cycle assessment. Design for the environment, resource conservation and sustainable development. Prerequisite: CEMM 216.

520. Earthquake Engineering of Concrete Structures. 4 Hours. Earthquake phenomena; response spectrum and design spectrum concepts; dynamic response of structures to earthquakes, methods of analysis; code approach to earthquake-resistant design; alternative approaches. Prerequisite: CEMM 310.

521. Biological Treatment Fundamentals. 4 Hours. Fundamental processes for the biological treatment of wastewater, pollutants, and bioremediation. Growth and metabolism, kinetics, microbial ecology, biogeochemistry, and pollutant biodegradation. Prerequisite: Credit or concurrent registration in CEMM 422; or consent of the instructor. A basic understanding of biology is recommended.
Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.


524. Water Chemistry. 4 Hours. Same as EOHS 542. Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. Prerequisite: EOHS 440 or CEMM 411.

525. Advanced Biological Treatment and Bioremediation. 4 Hours. Advanced biological treatment processes. Stoichiometry of biological reactions, kinetics, bioremediation, biochemical pathways for pollutant biodegradation, immunological and genetic characterization of microbial cultures. Prerequisite: Credit or concurrent registration in CEMM 521; or consent of the instructor.

526. Air-Quality Management II. 2 Hours. Same as EOHS 532. Air quality management: Integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. Prerequisite: CEMM 419 or EOHS 431.


531. Nonlinear Continuum Mechanics. 4 Hours. Matrices and general tensors, isotropic tensor functions, representation theorem, kinematics, polar decompositions, Cauchy-Green tensors, Cauchy stress, Piola-Kirchoff stresses, constitutive laws, frame indiffERENCE, hyperelastic materials and universal solutions. Prerequisite: CEMM 430 or 431.


534. Finite Element Analysis II. 4 Hours. Application of the finite element method to the analysis of complex continuum and structural linear systems. Introduction to error analysis and convergence of the finite element solutions. Prerequisite: CEMM 434.

535. Theory of Vibrations II. 4 Hours. Same as ME 535. Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; Floquet waves; nonlinear vibrations. Prerequisite: CEMM 435 or ME 408 or the equivalent.

536. Nondestructive Testing of Concrete. 4 Hours. Strength and durability of concrete structures by nondestructive evaluation of the material through acoustic, magnetic, thermal, electrical, optical phenomena; nondestructive methodologies for evaluation of concrete structures. Prerequisite: CEMM 310.


541. Mechanics of Composite Materials. 4 Hours. Anisotropic elastic materials; stress analysis for isotropic materials; Siroh formalism for anisotropic materials; singularities at free-edges; stress analysis in composites; wave propagation in composites. Prerequisite: CEMM 430 or the 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: CEMM 434.

545. Nonlinear Finite Element Analysis. 4 Hours. Nonlinear elastostatics, consistent linearization, Newton and modified-Newton methods, line search techniques, arc-length methods. Hyperelasticity, B-bar type methods. Finite deformation elastodynamics, semi-discretization, time-stepping algorithms. Prerequisites: CEMM 531 and 534, or consent of the instructor.

546. Kinetics of Reactions and Phase Transformations in Metals. 4 Hours. Nucleation and growth kinetics, order of transformation, grain growth recovery, recrystallization, solidification, phase transformation in solids, precipitation hardening, spinodal decomposition and martensitic transformations. Prerequisite: Consent of the instructor.

547. 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.

548. 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: IE 201 or the equivalent or consent of instructor. Recommended background: Familiarity with computer spreadsheets.

549. Advanced Special Topics in Civil Engineering, Mechanics and Materials. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from section to section and from semester to semester, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

550. Independent Study. 1 to 4 Hours. Special problems of reading by special arrangement with a faculty member. Prerequisite: Consent of the instructor.

556. Master's Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. MS thesis work under the supervision of a faculty member.

559. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. PhD thesis work under the supervision of an advisor.

Classics (CI)

401. Topics in Greek History. 4 Hours. Same as Hist 401. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

402. Topics in Roman History. 4 Hours. Same as Hist 402. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

404. Roman Law and the Civil Law Tradition. 4 Hours. Same as Hist 404 and CrJ 404. Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. Prerequisite: CrJ 200 or Hist 203 or CrJ 203 or consent of the instructor.

490. The Classics and Their Survival: Literature and Myth. 4 Hours. All readings are in English. Classical myth and literature (Vergil, Ovid, and in particular, Seneca) with emphasis on survival and influence on later literature and culture. Prerequisite: One 200-level course in classics or graduate-level work in literature or consent of the instructor.

498. Special Topics in Classical Civilization. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study of topics in classical civilization. Sample topic: Augustus and his image. Prerequisite: two classics courses at the 200 level.

499. Advanced Independent Study. 4 Hours. Students may register for more than one section per term. Advanced independent study under faculty direction. Reading and papers on chosen topics for qualified students based on preparation and interest. Students must consult with faculty. Prerequisites: Consent of the faculty member and the department.

Committee on Institutional Cooperation (CIC)

500. Committee on Institutional Cooperation. 0 to 16 Hours. Students may register for more than one section per term.
May be repeated for credit. Holding course for UIC doctoral students taking approved coursework at other institutions through the CIC Traveling Scholar Program. Prerequisites: Admission to a doctoral program and approval of the Graduate College.

### Communication (Comm)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>404</td>
<td>Discourse Analysis</td>
<td>4</td>
<td>Nonverbal aspects of communication; rules of communication; speech acts; conversational coherences; acts and sequences in communication; marital communication patterns. Prerequisite: Comm 304 or 315 or 416; or approval of the department.</td>
</tr>
<tr>
<td>410</td>
<td>Rhetorical Criticism</td>
<td>4</td>
<td>Analysis and evaluation of critical standards for rhetorical interpretation. Application of critical standards to contemporary rhetorical events. Prerequisite: Comm 312 and 313; or approval of the department.</td>
</tr>
<tr>
<td>416</td>
<td>Conflict and Communication</td>
<td>4</td>
<td>Students learn to manage and resolve conflict in business, governmental, and community settings. Practical analysis of interpersonal and group conflict cases. Prerequisite: Comm 312, 313 and 315; or approval of the department.</td>
</tr>
<tr>
<td>430</td>
<td>Media, Information and Society</td>
<td>4</td>
<td>News as a distinct form of mass communication, involving social functions and significant questions about facts, truth, knowledge, and values. Prerequisites: Comm 103 and 200; or Comm 300; or approval of the department.</td>
</tr>
<tr>
<td>454</td>
<td>Psychology of Language</td>
<td>3</td>
<td>Same as Ling 474 and Psch 454. Introductory survey of methods, theory and research; linguistic foundations, history, and present status of the field.</td>
</tr>
<tr>
<td>456</td>
<td>Topics in the History of Communications</td>
<td>4</td>
<td>Same as Hist 456. This course introduces students to major developments in the history of communications, with a focus on the political and cultural dimension of technologies. Prerequisite: Consent of the instructor. At least one history course at the 100 level is recommended.</td>
</tr>
<tr>
<td>467</td>
<td>Public Opinion and Political Communication</td>
<td>4</td>
<td>Same as PolS 467. Nature of public opinion and political communication systems. Patterns of opinion distribution and its measurement. Forces shaping public opinion and its impact on public policy. Prerequisite: PolS 200 or the equivalent or consent of the instructor.</td>
</tr>
<tr>
<td>473</td>
<td>Organizations and Their Publics</td>
<td>4</td>
<td>History of relevant theories and models; problem solving: analyzing goals, identifying publics, setting objectives, designing messages, choosing channels, planning implementation (budgeting, staffing, timetables), evaluating effects. Prerequisite: Comm 201 and 306; or approval of the department.</td>
</tr>
<tr>
<td>474</td>
<td>Internship, 3 to 8 Hours</td>
<td></td>
<td>May be repeated for credit. Students may register for more than one section per term. May not be counted toward the Master of Arts degree requirements. Students work in an approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. Prerequisites: 12 hours of upper-division (200 or higher) courses in communication, with a 3.00 grade point average in those courses; recommendation of two faculty members and approval of department obtained in semester prior to internship.</td>
</tr>
<tr>
<td>490</td>
<td>Seminar in Culture and Communication</td>
<td>3</td>
<td>Analysis of contrastive cultural paradigms (interethnic, gender, class) to develop student’s awareness of own socialization and cultural orientation. Prerequisites: Comm 301 plus any other 300-level Communication course; or approval of the department.</td>
</tr>
<tr>
<td>491</td>
<td>Seminar in Media and Communication</td>
<td>3</td>
<td>Analysis of contemporary or historical issues in mediated communication. Prerequisites: Comm 301 plus any other 300-level Communication course; or approval of Department.</td>
</tr>
<tr>
<td>494</td>
<td>Special Topics in Communication</td>
<td>4</td>
<td>May be repeated for a maximum of 12 hours of credit. Contemporary trends in the field of communication. Prerequisites: Comm 200 and 201 and consent of the instructor; or approval of the department.</td>
</tr>
<tr>
<td>498</td>
<td>Independent Study, 1 to 4 Hours</td>
<td></td>
<td>May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. May not be counted toward the minimum M.A. in Communication degree requirements. Individual investigation of special problems (student-initiated or related to faculty research). May be used for special projects, such as interdisciplinary seminars. Prerequisite: Approval of the department.</td>
</tr>
<tr>
<td>500</td>
<td>Introduction to Communication Research</td>
<td>4</td>
<td>History of the field, research traditions, communication viewed as social science; forming research questions, reviewing and critiquing literature, formulating hypotheses and rationale, conceptually defining variables. Prerequisite: Consent of the instructor or graduate standing in communication.</td>
</tr>
<tr>
<td>501</td>
<td>Operationalizing Communication Research</td>
<td>4</td>
<td>Levels of measurement; operational definitions; sampling qualitative and quantitative designs; coding and analysis of data; statistics; pilot testing and instrument/design revision; writing research reports. Prerequisite: Comm 500.</td>
</tr>
<tr>
<td>502</td>
<td>Seminar in Media Studies</td>
<td>4</td>
<td>In-depth, intensive examination of theories, perspectives, and approaches to media studies. Prerequisite: Comm 500 or consent of the instructor.</td>
</tr>
<tr>
<td>503</td>
<td>Seminar in Intercultural Communication</td>
<td>4</td>
<td>Introduction to basic theoretical concepts and important issues in intercultural communication. Prerequisite: Comm 500 or consent of the instructor.</td>
</tr>
<tr>
<td>505</td>
<td>Organizational Communication</td>
<td>4</td>
<td>Classic and current research. Models that examine organizational communication; assessment of organizational problems and conduct of problem-solving research. Prerequisites: Comm 306 and 500, or consent of instructor.</td>
</tr>
<tr>
<td>506</td>
<td>Cross-Cultural Communication</td>
<td>4</td>
<td>Same as Ling 506. Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (interactional etiquette, discourse rules).</td>
</tr>
<tr>
<td>525</td>
<td>Approaches to Rhetorical Criticism</td>
<td>4</td>
<td>May be repeated for a maximum of 12 hours of credit. Contemporary approaches to rhetorical criticism. Each offering focuses upon the distinctive contributions of specified rhetoricians to the theory and practice of rhetorical criticism. Prerequisite: Comm 410.</td>
</tr>
<tr>
<td>534</td>
<td>Mass Communication Theory</td>
<td>4</td>
<td>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.</td>
</tr>
<tr>
<td>537</td>
<td>Topics in Political Communication</td>
<td>4</td>
<td>Same as PA 567, PolS 567. Intensive study of selected aspects; organizational communication in public institutions, urban political communication patterns, communication elites. Independent research using a variety of community research techniques. Prerequisite: Consent of the instructor.</td>
</tr>
<tr>
<td>580</td>
<td>Qualitative Methods in Communication</td>
<td>4</td>
<td>Same as Ling 582. Qualitative methods course analyzing language and culture patterns. Prerequisite: Comm 501 or consent of the instructor.</td>
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<tr>
<td>591</td>
<td>Health Communication</td>
<td>4</td>
<td>Focusing on interpersonal, organizational and public contexts, seminar participants will review current literature in health communication, and apply selected communication concepts to health-related situations. Prerequisite: Graduate standing in communication or enrollment in a health professions school or college or consent of the instructor.</td>
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<tr>
<td>594</td>
<td>Advanced Special Topics in Communication</td>
<td>1 to 4</td>
<td>May be repeated for credit. Student may register for more than one section per term. Advanced topics in communication theory and research. Subject matter varies. Prerequisite: Consent of the instructor.</td>
</tr>
<tr>
<td>596</td>
<td>Independent Research</td>
<td>1 to 4</td>
<td>May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Department approved research projects not included in thesis research. Prerequisites: Consent of the head of the department.</td>
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</table>
598. Thesis Research. 0 to 16 Hours. S/U grade only. Students may register for more than one section per term. Under guidance of an advisor and committee the student develops and conducts a research project addressing a communication problem of a basic or applied nature. Prerequisite: Comm 501.

Community Health Sciences (CHSc)

400. Public Health Concepts and Practice. 3 Hours. Concepts, principles and case studies which provide an overview of the philosophy, purpose, history, organization, functions, tools, activities, and results of public health practice. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

403. The Future of Public Health. 2 Hours. Key public health issues in the United States since the late 1970s. Review of major governmental reports and discussions by public health practice experts.

405. Leadership in Public Health Practice. 3 Hours. Same as HPA 405. Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. Prerequisites: CHSc 400 and consent of the instructor.

411. Nutrition for Public Health Professionals. 3 Hours. Foundation course to introduce nutrition principles and their application to public health populations and problems. Prerequisite: CHSc 400 or consent of the instructor.

419. Public Health Aspects of Sexuality and Women's Health. 3 Hours. Same as GWS 419. An overview of human sexuality from a public health view with special emphasis on family planning, sexuality and behavior effects on women’s health.

421. Family Perspectives on Disability. 3 Hours. Same as DHD 420 and Dis 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

425. Public Health and Aging. 3 Hours. Gerontological public health issues are examined through the psychosocial and physical dimensions of the aging process and interactions between the elderly and the health care system. Prerequisite: CHSc 400 or consent of the instructor.

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. Field work required. Prerequisites: Credit or concurrent registration in Bstt 400, Epid 400, and 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. Prerequisites: Bstt 400 and Epid 400 and CHSc 400.

433. Public Health Planning and Evaluation. 3 Hours. Planning and evaluation for community health programs, including proposal development and evaluation; considerations for community/consumer involvement in planning process. Prerequisite: Credit or concurrent registration in CHSc 442 and CHSc 480; or consent of the instructor.

434. Introduction to Qualitative Methods in Public Health. 3 Hours. Introduction to the major techniques used in qualitative research (observation, participant observation, in-depth interviews). Includes field and in-class exercises, and introduces computer-assisted qualitative data analysis.

441. Introduction to Maternal and Child Health. 3 Hours. Same as GWS 441. Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. Prerequisite: Consent of the instructor. Recommended background: Some knowledge of maternal and child health issues.

442. Introduction to Assessment in Public Health. 2 Hours. Conceptualization and measurement of community health status. Epidemiologic, sociocultural and health systems approaches to assessment, qualitative and quantitative examples, and political and group processes. Prerequisites: Bstt 400, Epid 400 and CHSc 400.

446. Research Methods in Community Health. 3 Hours. Introduction to principles and techniques for scientific investigation of problems in public health research and practice; planning and proposal development; ethics; research design; subject selection; measurement; data collection; program evaluation; and reporting results. Prerequisite: Bstt 400 or the equivalent.

447. Survey Planning and Design. 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. Prerequisites: Bstt 400 or the equivalent. Credit in CHSc 446 or the equivalent is recommended.

450. Introduction to International Health. 3 Hours. Survey of health conditions focusing on Third World issues including consequences of population trends, disease prevalence, prevention, control, and technology transfer in socio-economic context.

454. Women, Health, and International Development. 3 Hours. Introduction to health and development for women in the developing world, including gender analysis, poverty, education, economic productivity, mortality and morbidity patterns and psychosocial health. Prerequisite: CHSc 400 or consent of the instructor.

456. Women's Health: A Primary Health Care Approach. 3 Hours. Same as NuPH 455 and NuSc 455 and NuWH 455. Health promotion and disease prevention in women’s health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

460. Public Health Aspects of Mental Health. 2 Hours. Basic concepts of the community mental health movement: issues of deviance, psychiatric diagnosis, prevention and service delivery. Prerequisite: CHSc 400 or consent of the instructor.

461. Public Health Aspects of Family Violence. 2 Hours. The theory, etiology, treatment and prevention from a public health perspective of child abuse, child sexual abuse, spouse abuse, and elder abuse. Prerequisite: CHSc 400 or consent of the instructor.

464. Survey of Developmental Disabilities. 3 Hours. Same as DHD 464. Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research.

480. Health Education and Health Promotion. 3 Hours. Theories of health, illness behavior and health education for public health professionals; classical health interventions and surveys, approaches for individual and group behavior change.

485. Communications, Mass Media and Public Health. 3 Hours. Examines the development, theoretical bases, and assessments of mass media interventions, and the intended and unintended effects of the mass media in society.

494. Special Topics in Community Health Sciences. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Special topics in community health sciences are presented. Prerequisite: Consent of the instructor.

500. Proseminar in Community Health Sciences. 3 Hours. Analysis of current key literature from behavioral sciences, maternal and child health, gerontology, general and miscellaneous fields of community health sciences. Prerequisites: CHSc 400 and 8 semester hours in student’s major field.

501. Foundations of Public Health Inquiry. 3 Hours. Examination of research paradigms, precepts of theory development, literature synthesis, and ethical principles, all enhance the scholarliness and meaningfulness of doctoral students' public health inquiry. Prerequisite: CHSc 400.

514. Nutritional Epidemiology. 3 Hours. Examination of nutritional epidemiological techniques to the design and population-based nutrition research. Students complete research proposal using nutritional assessment, epidemiology and research skills. Prerequisites: CHSc 411 and Epid 400 and 401, or consent of the instructor.
520. Socio-Economic Aspects of Family Planning. 3 Hours. The social and economic determinants of population and family planning, projections to the future and trends in contraceptive use in both developed and developing countries. Prerequisite: CHSc 450 or consent of the instructor.

525. Dying, Grief and Hospice. 3 Hours. An interdisciplinary course stressing team management of dying persons and their families; includes hospice concepts and a hospice practicum. Prerequisite: CHSc 425 or 426 or consent of the instructor.

527. Critical Issues in Long Term Care Policy. 3 Hours. Same as Epid 548. Advanced seminar to integrate role of survey data collection. Students develop and present questionnaires related to their individual interests. Prerequisite: CHSc 446 or 447; or consent of the instructor.

528. Societal Analysis of Aging, Health and Health Care. 3 Hours. Same as Sociology 528. Analysis of aging, health and health care issues mainly from sociological and public health perspectives. Review and application of appropriate concepts, theories and methods. Prerequisite: CHSc 425 or consent of the instructor.

529. Gerontological Health/Illness Behavior. 2 Hours. Perceptions and behaviors of older adults are examined in reference to illness prevention, health promotion and reactions to acute and chronic illness. Prerequisite: CHSc 480.

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: CHSc 434 or consent of the instructor.

542. Advanced Maternal and Child Health Applied Programs. 3 hours. Interventions and services in health care programs for maternal and child populations. In-depth program analysis and problem solving with emphasis on public sector programs, population needs and program evaluation. Prerequisite: CHSc 441.

543. MCH Policy and Advocacy. 3 Hours. Explores the social, economic and political dynamics which influence the development and implementation of MCH policy and U.S. health policy in general. Prerequisite: CHSc 441 or consent of the instructor.

544. Public Health Aspects of Adolescent Health. 3 Hours. Students research contemporary issues in adolescent health, relating them to physical and emotional development and to policy. Prerequisite: CHSc 441.

545. Reproductive and Perinatal Health. 3 Hours. Same as Epid 545. This course focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. Prerequisites: Bstt 400 and CHSc 400 and Epid 400 and consent of the instructor.

547. Public Health Approaches to Maternal and Child Nutrition. 2 Hours. Advanced seminar to integrate role and application of nutrition for maternal and child populations. Prerequisite: CHSc 411 or CHSc 441 or consent of the instructor.

548. Readings in Reproductive and Perinatal Epidemiology. 1 Hour. Same as Epid 548. Advanced seminar in reproductive/perinatal epidemiology with particular emphasis on methodologic issues. Prerequisites: CHSc 441 and Epid 401 or consent of the instructor. Recommended background: Maternal and child health and epidemiology.

556. Theory & Methods of Needs Assessment in Aging & Disability. 4 Hours. Same as Dis 556, OT 556. This course introduces the bases 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. Prerequisites: 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. Health or behavioral sciences, and research methods background are recommended.

564. Community Integration in Developmental Disabilities. 3 Hours. Same as DHD 564 and Dis 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

577. Survey Questionnaire Design. 3 Hours. Concepts and strategies for developing survey questionnaires for various modes of survey data collection. Students develop and present questionnaires related to their individual interests. Prerequisite: CHSc 446 or 447; or consent of the instructor.

584. Community Organizing for Health. 3 Hours. Focus on the bases of facilitating community organizing processes in health promotion including theories, fieldwork tools, feminist and international perspectives. Field work required. Prerequisite: CHSc 480 or consent of the instructor.

586. Health Behavior Interventions. 3 Hours. Advanced concepts and strategies for the development, implementation, and evaluation of public health interventions to change health behaviors. Individual intervention project proposal or equivalent final paper required. Prerequisites: CHSc 446 and CHSc 480.

594. Advanced Special Topics in Community Health Sciences. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study of topics in maternal and child health, gerontology, psychosocial problems in health and illness, health care delivery, international health, aspects of community health. Prerequisites: Epid 400, Bstt 400, CHSc 400, and consent of the instructor.

595. Seminar in Community Health Sciences. 1 to 3 Hours. S/U grade only. Analysis of current research in community health sciences. Prerequisite: Consent of the instructor.

Computer Science (CS)


415. Computer Vision I. 4 Hours. Previously listed as EECS 487. Computer vision system design. Segmentation and representation of regions and boundaries; image filtering; object recognition; advanced topics (examples: texture, stereo, color); applications. Programming assignments. Prerequisite: CS 202 or MCS 360 or consent of the instructor.

421. Natural Language Processing. 4 Hours. Design of natural language processing systems; part-of-speech tagging, statistical and symbolic parsers; semantic interpretation; discourse and dialogue processing; natural language generation; applications. Prerequisite: CS 301 or MCS 441.

422. User Interface Design and Programming. 4 Hours. Previously listed as EECS 478. User interface design, implementation, and evaluation; user-centered design methodologies, windowing systems, I/O devices and techniques, event-loop programming, user studies. Programming projects. Prerequisite: CS 340.

426. Multimedia Computing. 4 Hours. Processing multimedia information including video, images, audio, text, and specialty data. Multimedia sources, formats, operations, and algorithms. Implementation projects. Prerequisite: CS 202 or MCS 360 or consent of the instructor.

440. Introduction to Software Engineering. 4 Hours. Previously listed as EECS 470. Software life-cycle model, requirement specification techniques, large-scale software design techniques and tools, implementation issues, testing and debugging techniques, software maintenance. Prerequisite: CS 340.

441. Distributed Object Programming Using Middleware. 4 Hours. Extensive computer use required. Design and implementation of distributed object programs using middleware software standards; interface definition languages and programming.
450. Introduction to Networking. 4 Hours. Credit is not given for CS 450 if the student has credit in EECS 433 or ECE 433. Network protocols, algorithms, and software issues. Topics include the open systems interconnect model, data link, network and transport layers, TCP/IP, ATM, mobile networks. Prerequisites: CS 202 and CS 385; and Stat 381 or Stat 401 or EE 342.

455. Design and Implementation of Network Protocols. 4 Hours. Network protocols and their software. Examines OS network interface through network layers. Topics include routing, congestion control, fault tolerance, security, name servers, multicast, and performance. Prerequisites: CS 340 and CS 450.

466. Advanced Computer Architecture. 4 Hours. Credit is not given for CS 466 if the student has credit in EECS 466 or ECE 466. Design of high performance computer architecture. Cost-performance; instruction sets; pipelining; memory hierarchy. Prerequisites: O. Consent of the instructor. Prerequisite: CS 366.

469. Computer Systems Design. 4 Hours. Credit is not given for CS 469 if the student has credit in EECS 469 or ECE 469. Design of high performance computer architecture. Cost-performance; instruction sets; pipelining; memory hierarchy. Credit is not given for CS 469 if the student has credit in EECS 469 or ECE 368.

475. Object-Oriented Programming. 4 Hours. Credit is not given for CS 475 if the student has credit in EECS 475 or ECE 475. Analysis and modeling of digital systems; hardware description languages; CAD tools for simulation, synthesis, and verification of computer systems. Project: a simple processor design. Prerequisite: CS 366.

473. Compiler Design. 4 Hours. Previously listed as EECS 473. Same as MCS 411. Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. Prerequisites: Grade of C or better in either CS 301 or MCS 441, and grade of C or better in CS 202 or CS 360; and grade of C or better in CS 266.

474. Object-Oriented Languages and Environments. 4 Hours. Previously listed as EECS 474. Data abstraction, classes and objects, messages and methods, polymorphism and dynamic binding, inheritance. Object-oriented design. Pure and hybrid object-oriented languages. Prerequisite: CS 340.

475. Object-Oriented Programming. 4 Hours. Credit is not given for CS 475 if the student has credit in EECS 475 or CS 474. OO Paradigm: classes, messages, methods, variables, inheritance, polymorphism; the C++ and Java languages; programming labs required. Extensive computer use required. Prerequisites: CS 202; and consent of the instructor.

476. Programming Language Design. 4 Hours. Previously listed as EECS 476. Same as MCS 415. Definition, design and implementation of programming languages. Syntactic and semantic description; variable bindings, control and data structures; parsing, code generation, optimization; exception handling; data abstraction. Prerequisites: MCS 360 or CS 340.


485. Networked Operating Systems Programming. 5 Hours. Previously listed as EECS 471. Concepts, design, and programming of multi-process and distributed systems; inter-process communications; fault tolerance; distributed programming semantics. Programming assignments and project required. Prerequisite: CS 385.

488. Computer Graphics I. 4 Hours. Previously listed as EECS 488. Same as AD 488. Principles of interactive computer graphics. Raster and vector display, techniques and hardware considerations. Introduction to two-dimensional and three dimensional rendering. Laboratory. Prerequisite: Consent or concurrent registration in CS 340.

491. Seminar. 1 to 4 Hours. Previously listed as EECS 491. May be repeated for credit. Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the Timetable. Prerequisite: Consent of the instructor.

493. Special Problems. 2 to 4 Hours. Previously listed as EECS 493. No graduate credit for computer science majors. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.


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: Grade of B or better in CS 401; or consent of the instructor. Credit in CS 501 and some exposure to basic chemistry and biology are recommended.

503. Applied Graph Theory. 4 Hours. Previously listed as EECS 563. Paths, circuits, trees, cutsets, planarity, duality, matrices and vector space of graphs, directed graphs, coloring, covering, matching and applications to switching networks and computer science. Prerequisite: Consent of the instructor.

505. Computability and Complexity Theory. 4 Hours. Previously listed as EECS 561. Turing machines, undecidability, Rice’s theorem, recursively enumerable sets, complexity theory, hierarchy theorems, alternation, parallel complexity classes, complete problems. Prerequisite: CS 301.

511. Artificial Intelligence II. 4 Hours. Previously listed as EECS 584. Predicate logic and resolution strategies, reasoning under uncertainty, incomplete information reasoning, state and change, planning, temporal reasoning knowledge representation, learning, advanced search techniques and current topics. Prerequisite: CS 411.

513. Logic Programming. 4 Hours. Previously listed as EECS 583. Logic programming theory and its application to databases, knowledge representation and knowledge bases. Prerequisite: CS 411 or 480 or consent of the instructor.


515. Advanced Computer Vision. 4 Hours. Previously listed as EECS 587. Analysis of 3-D scene images. Shape from shading, texture, line drawings, and surface orientation. Surface representation methods and reconstruction of 3-D scenes. Design of knowledge-based vision systems and 3-D applications in robotics and industrial environments. Prerequisite: CS 415.

522. Human-Computer Interaction. 4 Hours. Previously listed as EECS 578. The computer-user interface: media, languages, interaction techniques, user modeling. Human factors in software development. Theory, experimental methods, evaluation, tools. Project required. Prerequisites: CS 422.

523. Multi-Media Systems. 4 Hours. Previously listed as EECS 579. Principles of multi-media interface design for computer applications. Multi-disciplinary approaches to integrating text, still image, animation, and sound into human-computer interfaces. Prerequisite: CS 422 or consent of the instructor.


527. Computer Animation. 4 Hours. Previously listed as EECS 589. Theoretical and practical aspects of computer animation and computer-assisted animation in two and three dimensions and in black and white or full color. Laboratory. Prerequisite: CS 488.


540. Advanced Topics in Software Engineering. 4 Hours. Previously listed as EECS 570. Formal methods; requirements and specification languages; program flow analysis; validation and verification; software metrics; program representations; software tools; software testing; software process. Prerequisite: CS 440 or consent of the instructor.

541. Software Engineering Environments. 4 Hours. Previously listed as EECS 571. Software configuration management;
software quality assurance; software engineering economics; software factory; software reuse; computer-aided software engineering; software prototyping. Prerequisite: CS 540 or consent of the instructor.

542. Distributed Software Engineering. 4 Hours. Previously listed as EECS 572. Fundamental concepts of distributed software. Task allocation algorithms, language concepts for concurrency and communication, analysis methods and tools, and formal models. Prerequisite: CS 440.

545. Formal Methods In Concurrent and Distributed Systems. 4 Hours. Previously listed as EECS 575. Formal methods in concurrent and distributed systems, particularly temporal logic and automata for specifying and reasoning real-time properties. Automated and manual techniques for checking correctness. Prerequisite: Consent of the instructor.

553. Distributed Computing Systems. 4 Hours. Previously listed as EECS 573. Distributed computing systems terminology and design issues. Data communications protocols; distributed operating systems, resource management, and synchronization; security; database systems. Prerequisites: CS 366 and 385.

554. Advanced Topics in Concurrent Computing Systems. 4 Hours. Previously listed as EECS 564. Petri nets, methods and their applications to concurrent, distributed, parallel, and data-flow systems; logic programming and rule-based systems. Prerequisite: Consent of the instructor.

559. Neural Networks. 4 Hours. Previously listed as EECS 559. Artificial neural networks for parallel computing including perceptrons, backpropagation and Kohonen nets, statistical methods in neural computing, Hopfield nets, associative memories, cognition and neocognition. Prerequisite: Consent of the instructor.

560. Fuzzy Logic. 4 Hours. Previously listed as EECS 560. Crisp and fuzzy sets, membership functions; fuzzy operations; fuzzy relations and their solution; approximate reasoning; fuzzy modeling and programming; applications; project. Prerequisite: Consent of the instructor.

565. Algorithms for VLSI Physical Design. 4 hours. No credit given if the student has credit in ECE 565 or EECS 565. Computer-aided physical design of integrated circuits; circuit partitioning and placement; floorplanning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation. Prerequisites: CS 401 and CS 469; or consent of the instructor.

566. Parallel Processing. 4 Hours. Previously listed as EECS 566. Parallel processing from the computer science perspective. Includes architecture (bus based, lockstep, SIMD), programming languages (functional, traditional and extensions), compilers, interconnection networks, and algorithms. Prerequisite: CS 466.

569. High-Performance Processors and Systems. 4 Hours. Previously listed as EECS 569. Instruction-level parallelism, multiple-instruction issue, branch prediction, instruction and data prefetching, novel cache and DRAM organization, high-performance interconnect, compilation issues, case studies. Prerequisite: CS 466.

577. Object Stores. 4 Hours. Previously listed as EECS 577. Use, design, and implementation of object stores. An object store enables object-oriented programming to be extended by storing objects on disk and communicating objects between processes. Prerequisites: CS 385 and 480; and knowledge of C + +; or consent of the instructor.

580. Query Processing in Database Systems. 4 Hours. Previously listed as EECS 580. Same as IDS 511. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: CS 480.

581. Database Management Systems. 4 Hours. Previously listed as EECS 581. Concurrency control; reliability, recovery, data integrity, database machines and current topics. Prerequisite: CS 480.

582. Information Retrieval. 4 Hours. Previously listed as EECS 582. Document retrieval, office automation. Optimal retrieval, relevance feedback, clustered search, construction of clusters, model of term weighting, thesaurus construction, multimedia data, handling of audio and video. Prerequisite: CS 480.

594. Special Topics. 4 Hours. Previously listed as EECS 594. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

595. Departmental Seminar. 0 to 9 Hours. Previously listed as EECS 595. May be repeated. S/U grade only. Seminar by faculty and invited speakers.

596. Individual Study. 1 to 4 hours. May be repeated for credit. Students may register for more than one section per term. For CS majors only. No graduation credit is awarded for MS and PhD students in the Computer Science department. Individual study or research under close supervision of a faculty member. Previously listed as EECS 596. Prerequisite: Consent of the instructor.

597. Project Research. 0 to 9 Hours. Previously listed as EECS 597. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. A research design or reading project approved by the committee appointed by the director of graduate studies. Prerequisite: Consent of the instructor.

598. M.S. Thesis Research. 0 to 16 Hours. Previously listed as EECS 598. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. MS thesis work under the supervision of a graduate adviser. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. Previously listed as EECS 599. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For CS majors only. PhD thesis work under supervision of a graduate adviser. Prerequisite: Consent of the instructor.

Criminal Justice (CrJ)

402. Trial Interaction. 4 Hours. Same as Ling 402. Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. Prerequisites: CrJ 261 and CrJ 350, or consent of the instructor.

404. Roman Law and the Civil Law Tradition. 4 Hours. Same as Hist 404 and CL 404. Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. Prerequisite: CrJ 200 or Hist 203 or CL 203; or consent of the instructor.

405. The Problem of Justice. 4 Hours. Same as PolS 405. Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. Prerequisites: CrJ 101, plus two 200-level courses in criminal justice or two 200-level courses in political science.

421. Juvenile Justice System. 4 Hours. Theories of juvenile delinquency and rule-breaking; juvenile rights; organization and administration of the juvenile justice system in the U.S. Prerequisites: CrJ 210 and 220.

422. Victimization. 4 Hours. Survey of criminal victimization theory and research. Examination of causes, consequences, and prevention of violent crime and of victims’ experiences in the criminal justice system. Prerequisites: CrJ 101 and two 200-level criminal justice courses.

423. Violence. 4 Hours. Same as Anth 424. Explores how men and women have experienced violence historically and in modern times. Students examine how violence is perpetrated through words, pictures, physical harm, and silences. Prerequisites: CrJ 101 and CrJ 200.

424. Gender, Crime, and Justice. 4 Hours. Same as GWS 424. An in-depth examination of the etiology of female crime and the involvement of females in the criminal justice system as offenders, victims, and workers/professionals. Prerequisites: CrJ 101 and CrJ 220; or consent of the instructor.

435. Organized and White Collar Crime in the United States. 4 Hours. Analysis and evaluation of organized crime, including its public perception; sociological, political, and economic impacts as well as past and present enforcement strategies. Prerequisite: Two 200-level criminal justice courses.

442. Comparative Criminal Justice Institutions. 4 Hours. Comparative study of law, jurisprudence, enforcement, and
punishment in Western and non-Western societies, including civil law, common law, and Islamic systems. Prerequisite: Two 200-level criminal justice courses.

456. Community Corrections. 4 Hours. History, processes, and functions of programs organized for sanctioning offenders in community settings, such as probation, parole, halfway houses, restitution, community service, home confinement. Prerequisites: CrJ 350 or 355; plus one 200-level criminal justice course.

480. Application of Science to the Law. 4 Hours. Same as BpS 480. Issues affecting the development, accessibility and admissibility of forensic science services by the criminal justice system; problems which may compromise the quality, fairness and effectiveness of scientific inquiries.

491. Topics in Rule Breaking. 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Content of course varies, addressing major issues. Prerequisites: Six 200- or 300-level criminal justice courses.

492. Topics in Rule Application. 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Content of course varies, addressing major issues. Prerequisites: Six 200- or 300-level criminal justice courses.

500. Law and Society. 4 Hours. Emergence and growth of rule-governed social order; social organization of legal actors; functional aspects of law including social control, dispute resolution; rule interpretation; and the promotion of social and economic enterprises.

520. Criminological Theory. 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.

539. Seminar in Rule Breaking. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific area of rule-breaking such as larceny, criminal violence, corporate crime, political crime, public order criminality or occupational crime. Content varies. Prerequisite: Consent of the instructor.

540. Criminal Justice: Process and Institutions. 4 Hours. Critical examination of the criminal justice system. The dynamics and processes of contemporary police, judicial, and correctional institutions are evaluated in the context of key historical developments and relevant research.

541. The Dynamics of Behavior in Criminal Justice Agencies. 4 Hours. Leading theories of organizational behavior to interpret organizational patterns, functions, and constraints in rule-applying institutions; emphasis on the application of these theories to the problems of planned change.

546. Violence and Victimization. 4 Hours. The field of victimology and victimization theories are introduced including the intersections of race, class, gender, crime and justice. Specifically, students examine criminological theories, social construction of race, class, and gender, legal decision-making, and implications of this for justice in our society.

548. Legal Discourse and Culture in Law and Society. 4 Hours. Discourse, power, and culture in legal settings and analysis of power and resistance in the construction of law as a social fact. Prerequisite: CrJ 500.

555. Corrections: Institutions and Field Operations. 4 Hours. Examines institutions and field services in public and private sectors. Addresses historical and empirical approaches to the analysis of policy and correctional effectiveness; the neo-classical challenge to rehabilitation, and corrections case law. Prerequisite: CrJ 540.

560. Quantitative Methods and Design. 4 Hours. Fundamentals of scientific inquiry, the logic of causal inference, and qualitative methods. Development of critical perspective and identification of weaknesses in research design and measurement. Development of skills in proposal development and data collection unique to criminal justice. Prerequisite: CrJ 262 or consent of the instructor.

561. Qualitative Methods and Design. 4 Hours. Theories and techniques of qualitative research methods, particularly fieldwork and in-depth interviews. Criminal justice problems amenable to these techniques and methods and interrelationship between the researcher role and substantive findings. Prerequisite: CrJ 262 or consent of the instructor.

562. Statistical Applications in Criminal Justice I. 4 Hours. Basic descriptive and inferential statistics, their applications in data analysis, and assumptions underlying use of these procedures in criminal justice research. Prerequisite: CrJ 262 or the equivalent.

563. Evaluation Research in Criminal Justice. 4 Hours. Experimental, quasi-experimental, and non-experimental approaches to evaluation research; indicators of effectiveness. Applications to crime prevention, police, courts, and correctional programs. Prerequisites: One graduate-level course in research methods and consent of the instructor.

564. Statistical Applications in Criminal Justice II. 4 Hours. Introduction to multivariate statistics with emphasis on multiple regression in criminal justice research, analysis and interpretation of regression output, coding of variables and path analysis. Prerequisite: CrJ 562.

570. Advanced Methods in Criminal Justice. 4 Hours. Methodological problems in criminal justice measurement including the identification problem in estimating deterrence and the limitations of survival analysis in estimating recidivism. Students are required to submit a paper demonstrating evidence of independent research skills. Prerequisite: CrJ 560 and CrJ 561 or the equivalent.

580. Forensic Science: Survey and Foundations. 3 Hours. Same as BpS 580. Survey of forensic sciences with emphasis on criminalistics; unique characteristics, underlying philosophies; nature, analytical methods, significance of results with chemical, biological, trace, pattern evidence. Prerequisites: Approval of the department.

581. Forensic Analysis of Biological Evidence. 4 Hours. Same as BpS 581 and MLS 581. Forensic blood and physiological fluid identification; DNA typing of biological evidence; report writing; expert evidence. Prerequisite: Consent of the instructor.

582. Forensic Chemistry and Trace Evidence Analysis. 4 Hours. Same as BpS 582. Trace evidence: hairs, fibers, glass, soil, paint and miscellaneous; nature, chemical, instrumental, microscopical methods of analysis; interpretation and significance of trace similarities; expert testimony. Prerequisite: Consent of the director of graduate studies.

583. Physical Pattern Evidence Analysis. 4 Hours. Same as BpS 583. Pattern evidence: individualization, reconstruction; fingerprint classification, latent print development, AFIS, questioned documents; ink, paper, handwriting comparison; firearms and toolmarks comparisons; scene patterns and reconstruction. Prerequisite: Consent of the instructor.

584. Forensic Drug Analysis and Toxicology. 4 Hours. Same as MLS 584 and BpS 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media. Emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the instructor.

589. Special Topics in Forensic Science. 3 Hours. Same as BpS 589. Content varies. Theoretical, philosophic, moral, and managerial problems associated with criminalistics practice. Topics may include evidence collection, analysis, reporting, and testimony to non-criminalistic fields. May be repeated if topics vary. Prerequisite: Consent of the instructor.

592. Internship in Criminal Justice. 2 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Placement in a criminal justice agency or setting under the supervision of a faculty member with an accepted research project and paper. Prerequisite: Consent of the instructor.

593. Teaching Criminal Justice. 4 Hours. Analysis of current trends in criminal justice education, discussion of the contextual setting of the field, and the development of rudimentary teaching skills.
594. Selected Issues in Crime and Criminal Justice. 4 Hours. May be repeated for a maximum of 12 hours. Students may register for more than one section per term. Current issues and advanced problem areas related to deviance, crime, etiology, labeling, criminal careers, organized crime and victimology.

596. Independent Study or Research. 2 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. Research undertaken for this course may not duplicate that being done for Cr 596. Supervised projects, which may consist of extensive readings in criminal justice, research on special problems not included in the regular course offering. Prerequisites: Consent of the instructor and approval of the director of graduate studies.

597. Project Research. 0 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Satisfactory/Unsatisfactory grade only. Independent research project under the supervision of a faculty member. Prerequisites: Graduate standing in the M.A. in Criminal Justice program and consent of the instructor.

598. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 8 hours of credit. For students doing thesis research or writing. Prerequisites: Consent of the student’s adviser and acceptance of the thesis topic and preliminary thesis outline by the thesis committee.

599. Dissertation Research. 0 to 16 Hours. May be repeated for a maximum of 20 hours of credit. Satisfactory/Unsatisfactory grade only. Research on the topic of the doctoral dissertation. Prerequisites: Consent of the faculty adviser and director of graduate studies.

Curriculum, Instruction, and Evaluation (CIE)

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. 30 hours of fieldwork required. 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. Prerequisite: 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. Prerequisites: Satisfactory completion 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, email networks). Prerequisites: CIE 450 and consent of the instructor. Open to Master’s degree and Ph.D. students. Admission to M.Ed. in Instructional Leadership: Literacy, Language and Culture is recommended.

414. Middle and High School Literacy. 3 Hours. This course focuses on the teaching of reading and writing strategies appropriate for disciplinary learning and expression. Field work required. Prerequisite: 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. Field work required. Prerequisite: 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: 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.

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: Consent of the 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.

480. Technology and Multimedia: Learning Tools in the Classroom. 4 Hours. Same as SpEd 480. New technologies to support teaching and learning in pre-college classrooms.

481. Foundations and 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. Field work required.

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. Recommended background: CIE 481.

483. Methodology of TESOL. 4 Hours. Same as Ling 483. Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. Prerequisite: Consent of the instructor.

484. Curriculum and Instruction in the Middle School. 3 Hours. Philosophy, curriculum, and instructional methods for teaching middle grade students (grades five through eight). Content area reading is included. Prerequisites: Approval of the College of Education; and either Ed 402 or 403; and either Ed 421 or 422 or 445; and either Ed 430 or 431.

494. Special Topics in Curriculum, Instruction and Evaluation. 1 to 4 Hours. May be repeated for a maximum of 12 hours. Students may register for more than one section per term. Exploration of an area not covered in existing course offerings. Content varies. Prerequisite: Consent of the instructor.

500. Proseminar in Curriculum and Instruction. 1 Hour. May be repeated for credit. S/U grade only. Research-oriented colloquia on issues in curriculum and instruction. Serves as introduction to faculty research interests. Provides opportunity to consider issues in research design. Prerequisite: Admission to the Ph.D. in Education program or consent of the instructor.

502. Mathematics and Science in the Elementary School. 4 Hours. Integrating mathematics and science content with issues of teaching and learning, including adapting and developing curriculum, planning, classroom interactions, and assessment in elementary classrooms. Prerequisites: Ed 402 or 403; and either Ed 421 or 422 or 445; and Ed 430; and CIE 460; and a second reading methods course.

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, standards. Extensive computer use required (word processing on writing; search engines for examining literacy curriculum, professional organizations, email networks). Prerequisite: CIE 450 or consent of the instructor. Open to Master’s degree and Ph.D. students. Admission to M.Ed. in Instructional Leadership: Literacy, Language and Culture is recommended.

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. Field work 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: 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. Prerequisites: 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. Prerequisites: CIE 411 and 412.

509. Reading and Writing with Young Children. 4 Hours. Examines the early writing and reading behaviors of children and how these develop during the primary grades. Observation, teaching, and assessing are emphasized. Prerequisites: 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. Must be taken concurrently with CIE 512. Prerequisites: All professional education courses and program requirements must be completed.

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. Prerequisites: CIE 501, 502, and concurrent registration 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: 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: Consent of the instructor.

521. Learning and Teaching Mathematics with Technology. 4 Hours. Can technology support conceptually-based learning of mathematics? Issues of learning, teaching, and equity related to technology in the K-12 mathematics classroom. Prerequisite: Consent of the instructor.

522. Social Context of Mathematics Education. 4 Hours. Examination of contextual, social, and linguistic factors which influence the learning of mathematics; emphasis on sociohistorical and activity theories; and equity in schooling. Prerequisite: Graduate standing in the College of Education or consent of the instructor.

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. Prerequisites: CIE 450; CIE 503 or 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: 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. Prerequisites: CIE 450, 503, and 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, email networks, use of PowerPoint, Excel and SPSS). Prerequisites: CIE 450, 503, and 504; and consent of the instructor. Open only to Master’s degree students. Admission to M.Ed. in Instructional Leadership: Literacy, Language, and Culture is recommended.

532. Staff Development and School Improvement. 4 Hours. Analysis of issues of school improvement and teacher professional development. Emphasis on processes of and alternative approaches to individual and organizational change. Prerequisites: Consent of the instructor and one of the following courses: Ed 430 or CIE 574 or Ed 431, or Ed 543.

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. Prerequisites: CIE 450 or CIE 503 or CIE 504; and consent of the instructor. Requires admission to M.Ed. in Instructional Leadership: Literacy, Language, and Culture program.

536. Colloquium on Literacy. 1 Hour. May be repeated for 12 hours of credit. S/U grade only. Various areas of reading, writing, and literacy including research on teaching, instruction, and use. Prerequisites: Enrollment in a graduate specialization in reading and consent of the instructor.

539. Internship in Instructional Leadership. 4 Hours. May be repeated for a maximum of 8 hours of credit. Conceptualization, development, implementation, analysis, and interpretation of a curriculum and/or instructional improvement in an educational setting (supervised by university faculty and leadership from the setting). Prerequisite: CIE 532.

540. Linguistics for Teachers. 4 Hours. Introduction to linguistic concepts as they apply to teaching in monolingual and bilingual classrooms. Relation of linguistic theory to theories of language and cognition.

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. Field work required. Restricted to graduate students in education, psychology and English. Prerequisites: CIE 450 and either CIE 503 or 504.

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, beat the odds studies) in school decision making and policy. Prerequisites: CIE 450, 503, and 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 non-linear reading environments and designing instructional strategies to enhance multiple literacies. Extensive computer use required. Prerequisite: One social science course or one computing course required. Field work required. Restricted to graduate students in education and psychology and English. Prerequisites: CIE 450, 503, and 504.

544. Foundations of Writing. 4 Hours. Introduction to K-8 writing research, theory and practice, including writing development, processes, test 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, email networks, use of PowerPoint and web-page composers). Prerequisite: CIE 450. Admission to M.Ed. in Instructional Leadership: Literacy, Language, and Culture is recommended.

545. Educational Evaluation. 4 Hours. Examination of theoretical and operational assumptions of alternative evaluation models; analysis and critique of evaluation case-studies. Prerequisite:
Admission to the Ph.D. in Education program or the Ph.D. in Public Policy Analysis Program.

546. Children's and Adolescent Literature. 4 Hours. 
Overviews 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. Prerequisites: CIE 450, 503, 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. Restricted to graduate students in education, psychology and English. Prerequisites: CIE 450; and either CIE 503 or 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. Prerequisites: Consent of the instructor; admission to a degree program in the College of Education. Students in the Ed.D. in Urban School Leadership prerequisites also include PS 550 and PS 552.

550. Conflicts in Curriculum Development. 4 Hours. 
Analysis of theoretical models for curriculum development; special emphasis on conflict, perspectives and methodologies employed in genre theory and research. Prerequisite: Consent of the instructor.

551. Leadership and Educational Supervision. 4 Hours. 
Same as PS 535. Theory and practice of supervisory leadership in educational settings; effects of interactive factors on performance and professional development. Field experience requirement. Prerequisite: ED 430 or 431, or consent of the instructor.

552. Curriculum and Cultural Context. 4 Hours. 
Influence of cultural, political, sociological, and economic factors on curriculum at the instructional, institutional, societal, and ideological levels. Prerequisite: CIE 574 or consent of the instructor.

553. History of Curriculum Thought. 4 Hours. 
Analysis of selected documents on curriculum theory and policy from antiquity to present; secondary treatments and primary sources; interaction of theory and practice. Prerequisite: CIE 574, or consent of the instructor.

556. Proseminar in Literacy, Language, and Culture I. 4 Hours. 
Restricted to first year doctoral students with specialization in Literacy, Language, and Culture. 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. Emphases on developing student inquiry in urban contexts.

557. Proseminar in Literacy, Language, and Culture II. 4 Hours. 
Restricted to first year doctoral students with specialization in Literacy, Language, and Culture. 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. Emphases on developing student inquiry in urban contexts.

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. Emphases upon historical patterns of reading and writing instruction in the U.S. Prerequisite: 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 socio-cultural influences on the definition and practices of literacy in classrooms, at school level, and in out of school contexts. Prerequisite: 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 socio-cultural bases of genre. Prerequisite: 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. Field work required. Computer use required. Prerequisite: 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. Prerequisites: CIE 581 or 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. Prerequisites: Students admitted into Literacy, Language, and Culture doctoral program will be given priority. Must have taken Ed 502 and 503, CIE 563.

568. Research in Children's and Adolescent Literature. 4 Hours. 
May be repeated for a maximum of 8 hours of credit. 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. Prerequisite: 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: Admission to a graduate program in the College of Education or consent of the instructor.

571. Integrating Mathematics, Science, and ESL. 4 Hours. 
Curriculum and instructional issues and practice related to the integration of mathematics, science, and English as a Second Language development. Prerequisite: CIE 481 or consent of the instructor.

572. Assessment in Science and Math Education. 4 Hours. 
Explores different purposes of assessment, generates principles to guide assessment, studies “new” assessment practices, and explores ways to implement them in science and mathematics classes. Prerequisite: Admission to graduate study in education or consent of the instructor.

574. Foundations of Curriculum Design. 4 Hours. 
Curriculum as area of inquiry; historical, philosophical, cultural, and related foundations; variations on curriculum theory and practice; alternative paradigms of curriculum inquiry. Prerequisite: Ed 430 or admission to the Ph.D. in Education program or the Ph.D. in Public Policy Analysis program.

575. Seminar in Research Issues With English Language Learners. 4 Hours. 
May be repeated for a maximum of 12 hours of credit. Selected topics on research in the education of language minority students for advanced MEd and PhD students. Topics vary each semester. Prerequisite: CIE 481.

576. Conceptions of Teaching and Schooling. 4 Hours. 
Philosophical and conceptual analysis of teaching and schooling and the impact of those conceptions on the conduct of educational practice. Prerequisite: CIE 574 or consent of the instructor.

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: Consent of the instructor.

578. Advanced Studies in Qualitative Research Methods. 4 Hours. 
The dynamics of data collection and analysis, the use of theory and interdisciplinary frameworks, and writing up and presenting original research. Prerequisite: Ed 502.
579. Bi-literacy: Theory, Research, and Practice. 4 Hours. Theoretical foundations, research paradigms, and issues focusing on bilingual and bi-literacy practices in and between home, school and community contexts. Prerequisite: 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 is framed, shaped, and constrained by theoretical perspectives. Prerequisite: Students admitted into Literacy, Language, and Culture doctoral program will be given priority.

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: 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. Prerequisites: 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: Consent of the instructor.

585. Seminar in Literacy Studies. 4 Hours. May be repeated for a maximum of 12 hours of credit. Selected topics in literacy theory, research and practice for advanced PhD students. Topics vary each semester. Prerequisite: CIE 563 or 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. Prerequisites: CIE 544; and consent of the instructor. Priorit y 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. Prerequisites: CIE 503 and consent of the instructor.

588. Design Research in the Study of Literacy. 4 Hours. Individual and group participation (including participation on course listserv). 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. Prerequisite: 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 on-line environments. Prerequisite: 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. Prerequisites: CIE 578 or consent of the instructor, and admission to the Ph.D. in Education program or the Ph.D. in Public Policy Analysis program.

592. Apprenticeship in the Teaching of Literacy, Language, and Culture. 1 to 4 Hours. Faculty guidance and supervision of doctoral students’ beginning teaching of literacy in its relationship to language and culture. Variable credit (1-4 hrs) given based upon scope of students’ teaching responsibilities. Prerequisites: Consent of the instructor. Doctoral students with specialization in Literacy, Language, and Culture.

593. Ph.D. Research Project. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the Ph.D. in Education program.

594. Special Topics in Curriculum, Instruction, and Evaluation. 2 to 4 Hours. May be repeated for up to 12 hours of credit. Students may register for more than one section per term. Seminar on a pre-announced topic focusing on methodology, research and educational implications of recent models of learning, problem solving and thinking. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Students design, implement and analyze the results of a research problem in this area of specialization. Prerequisite: Consent of the study advisor.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student’s dissertation. Prerequisite: Consent of the dissertation advisor.

Disability and Human Development (DHD)

401. Foundations of Disability and Human Development. 3 Hours. A critical review of key concepts and issues in disability. Students will develop a framework for understanding disability as a multi-level entity, including the impact of disability at personal, social, and societal levels. Prerequisite: Enrollment in the M.S. in Disability and Human Development program or consent of the instructor.

415. Concepts in Interdisciplinary Research on Disability. 3 Hours. Core methodological skills and concepts of interdisciplinary approaches to disability research. Topics include traditions of inquiry, problem formulation, research designs, and research report writing. Prerequisite: DHD 401 or consent of the instructor.

420. Family Perspectives on Disability. 3 Hours. Same as CHSc 421 and Dis 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

430. Introduction to Disability Policy and Organization. 3 Hours. Legislative, legal, and administrative foundations for the provision of services to persons with disabilities in the U.S. Roles of residential institutions, the independent living movement, class action litigation and advocacy. Prerequisite: DHD 401 or consent of the instructor.

440. Introduction to Assistive Technology: Principles and Practice. 3 Hours. Underlying principles and exemplary practice of assistive technology used by individuals with disabilities, including augmentative communication, seating, mobility, computer access, environmental control, home modifications, and worksite modifications.

441. Adaptive Equipment Design and Fabrication. 3 Hours. Examination of the interaction between design and disability issues through comparison of appropriate design theories, materials, and work with consumers. Some assignments will involve field work.

444. Assistive Technology for Literacy, Learning and Participation in Pre-K through High School. 3 Hours. Same as SpEd 444. Use of communication systems, computers, adapted equipment and strategies to foster participation and inclusion of students in grades preschool through high school.

445. Topics in Disability Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as Engl 445. This course will focus on topics structured around particular aspects of Disability Studies and its practical, cultural, and theoretical implications. Prerequisite: Engl 361 or 362 or 363 or 364; or consent of the instructor.

446. Qualitative Methods in Disability Research. 3 Hours. Comparisons of qualitative and quantitative approaches to research, presentation of commonly used methods, issues of analysis and interpretation, and the use of participatory research methods.

460. Fundamentals of Behavior Analysis. 3 Hours. Introduction to the principles, concepts, and applications of
behavioral principles. Content includes philosophic origins, historic and current practices of experimental and applied behavior analysis. Prerequisite: Credit or concurrent registration in DHD 401 or the equivalent.

464. Survey of Developmental Disabilities. 3 Hours. Same as CHSc 464. Survey of the developmental disabilities field, including basic definitions, history of DD services, relevant public policies and legislation, service delivery systems, and research.

494. Special Topics in Disability and Human Development. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Systematic study of selected topics in disability and human development.

514. Ethical Issues in Disability. 3 Hours. Examines contemporary ethical issues affecting the lives of persons with disabilities and disability professionals. Critiques the application of ethical principles to problems of genetics, treatment decisions, and competency.

515. Statistical Methods in Disability Studies. 3 Hours. Same as Dis 515. Examination of parametric and non-parametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. Prerequisite: An introductory course in statistics.

517. Ethics and Disability: Contemporary Problems. 3 Hours. Same as Dis 517. Ethical theories and ethical decision-making are examined from an interdisciplinary disability studies perspective in relation to people with disabilities. Topics include assisted suicide, de-institutionalization, and genetic discrimination. Prerequisite: DHD 514 or consent of the instructor.

520. Disability and Physical Activity. 3 Hours. Same as MvSc 520. Examination of the foundations of physical activity for persons with disabilities. Emphasis on strategies for promoting physical activity among persons with disabilities in community settings.

532. Community Intervention. 3 Hours. Same as Psc 532. Theory, research and practice of community interventions in public, nonprofit and voluntary settings, e.g., disability organizations; intervention types and effectiveness; role of community intervenor. Prerequisite: Consent of the instructor.

535. Advocacy and Empowerment in Disability. 3 Hours. Same as Dis 535. In-depth review of academic literature on advocacy and empowerment. Relevant theories, research, and interventions in the context of individuals with disabilities will be reviewed.

537. Disability and Health Promotion. 3 Hours. Examines health issues in disability with emphasis on health promotion and preventing secondary disease. Relationship of emerging theories of health promotion to disability are discussed.

541. Advanced Concepts in Disability Research. 3 Hours. Same as Dis 541. Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews.

551. Computers, Communication and Controls in Rehabilitation Technology. 3 Hours. Same as OT 551. Assistive technology course exploring different methods for evaluating controls used to operate computers, communication devices, and powered wheelchairs. Instruction also addresses device features and integration factors.

552. 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: DHD 440 or consent of the instructor. Recommended background: physical therapy, occupational therapy, speech-language pathology, engineering.

553. Program Evaluation: Documenting the Impact of Human Services. 3 Hours. Same as OT 553. This course 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. 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: DHD 440.

560. Behavioral Assessment and Functional Analysis. 3 Hours. Concepts and principles for use of behavioral assessment and functional analysis. Prerequisite: DHD 460 or consent of the instructor.

564. Community Integration in Developmental Disabilities. 3 Hours. Same as CHSc 564 and Dis 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

565. Research Approaches in Rehabilitation Technology Use and Delivery. 3 Hours. Same as Dis 565 and OT 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, worksite and community.

570. Disability and Culture. 3 Hours. Development of a cultural comparative approach in disability studies; American and cross-cultural aspects of disability; imagery of disability; disability and the body; gender and life-course issues, cultures of disability. Prerequisite: DHD 401 or consent of the instructor.

571. Eugenics in America, 1848–1945. 4 Hours. Same as Dis 571. Critical examination of the philosophy and practice of eugenics toward people with disabilities during the period from mid 19th to mid 20th centuries.

572. A Representational History of Disability. 4 Hours. Same as Dis 572. Examines historical and contemporary representations of “the body” to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to “aberrant bodies.”

575. History of Human Differences: Disability Minorities in America. 3 Hours. Historical experiences of disability minorities during the modern era. Focus on American experiences and comparing them to premodern and contemporaneous experiences in Western European societies. Prerequisite: DHD 401 or consent of the instructor.

576. Visualizing the Body. 4 Hours. Same as Dis 576. Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history.

590. Field Experience in Disability and Human Development. 0 to 12 Hours. May be repeated for a maximum of 12 hours of credit. Opportunities for guided experience working with agencies, families, and persons with disabilities providing concrete, practical applications of concepts and principles of disability and human development. Prerequisites: DHD 401 and 415; or consent of the instructor.

593. Independent Research. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisite: Consent of the instructor.

594. Advanced Special Topics in Disability and Human Development. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced selected topics in disability and human development.

595. Seminar in Disability and Human Development. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Identifies and analyzes a broad range of issues related to disability and human development. Topics vary according to student interests and instructor availability. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of a topic under the guidance of a faculty member. Prerequisite: Consent of the instructor.

597. Project Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research project under the
supervision of a faculty member. Prerequisites: Graduate standing in the M.S. in Disability and Human Development program and consent of the instructor.

598. Master's Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Thesis research to fulfill master’s degree requirements. Prerequisites: Graduate standing in the M.S. in Disability and Human Development program and consent of the instructor.

Disability Studies (Dis)

420. Family Perspectives on Disability. 3 Hours. Same as CHSc 421 and DHD 420. Societal trends, family caregiving theories and research methodology, support policies and interventions, and family-centered approaches pertaining to families of persons with disabilities.

501. Disability Studies I. 4 Hours. Provides analysis of contemporary classification and diagnosis systems for disability as well as the conceptual foundations for disability studies as a content area.

502. Disability Studies II. 4 Hours. Current approaches and practices in disability studies, critically considered from a variety of perspectives. Service delivery systems and the influence that civil rights and self determination have had. Prerequisite: Dis 501.

515. Statistical Methods in Disability Studies. 3 Hours. Same as DHD 515. Examination of parametric and nonparametric statistical methods commonly used in disability research with microcomputer applications to supplement text and lecture materials. Prerequisite: Introductory course in statistics.

517. Ethics and Disability: Contemporary Problems. 3 Hours. Same as DHD 517. Ethical theories and ethical decision-making are examined from an interdisciplinary disability studies perspective in relation to people with disabilities. Topics include assisted suicide, de-institutionalization, and genetic discrimination. Prerequisite: DHD 514 or consent of the instructor.

535. Advocacy and Empowerment in Disability. 3 Hours. Same as DHD 535. In-depth review of academic literature on advocacy and empowerment. Relevant theories, research, and interventions in the context of individuals with disabilities will be reviewed.

536. Fatiguing Conditions and Disability. 2 Hours. Same as Path 536, OT 536. Course covers 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. Recommended background: Health or behavioral sciences.

541. Advanced Concepts in Disability Research. 3 Hours. Same as DHD 541. Seminar-based applications of advanced scholarship skills. Topics covered include problem formulation, manuscript development, and critical reviews.

550. Disability in the Urban Environment. 4 Hours. Same as OT 550. Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities.

556. Theory & Methods of Needs Assessment in Aging & Disability. 4 Hours. Same as CHSc 556, OT 556. This course 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. Prerequisites: 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. Same as CHSc 564 and DHD 564. Historical and contemporary issues pertaining to the empowerment and integration of persons with developmental disabilities into community settings.

565. Research Approaches in Rehabilitation Technology Use and Delivery. 3 Hours. Same as DHD 565 and OT 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, work site and community.

571. Eugenics in America, 1848-1945. 4 Hours. Same as DHD 571. Critical examination of the philosophy and practice of eugenics toward people with disabilities during the period from mid 19th to mid 20th centuries.

572. A Representational History of Disability. 4 Hours. Same as DHD 572. Examines historical and contemporary representations of “the body” to demonstrate how cultural concepts such as normalcy, health, and morality are created in reference to “aberrant bodies.”

576. Visualizing the Body. 4 Hours. Same as DHD 576. Survey of key moments in the representational life of disability in film. Film portrayals of disability will be analyzed from the perspective of narrative theory, film grammar, and social history.

589. Current Research in Disability Studies. 1 Hour. May be repeated for a maximum of 10 hours of credit. S/U grade only. A review of the current primary source literature in the area of disability research. Prerequisite: Consent of the instructor.

590. Research Project in Disability Studies. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. S/U grade only. Formal research project for students not having prior research experience. Prerequisite: Consent of the instructor.

593. Independent Research in Disability Studies. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisite: Consent of the instructor.

594. Special Topics in Disability Studies. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Systematic study of advanced selected topics in disability studies. Prerequisite: Consent of the instructor.

595. Interdisciplinary Seminar in Disability Studies. 1 Hour. May be repeated for a maximum of 4 hours of credit. S/U grade only. Students, faculty, and guest speakers present topics addressing current issues in research in the area of disability studies. Prerequisite: Consent of the faculty advisor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of a topic under the guidance of a faculty member. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research in one area of disability studies. Prerequisites: Graduate standing in the Ph.D. in Disability Studies program and consent of the instructor.

Earth and Environmental Sciences (EaES)

400. Field Experience in Earth Sciences. 6 Hours. Application of geologic mapping and other field techniques to a summer field camp in the Black Hills of South Dakota for a period of six weeks. Prerequisites: EaES 330 and 440, or consent of the instructor.


415. Environmental Geochemistry. 4 Hours. Chemical reactions in natural environments; surface chemistry of metals and organic compounds. Clay minerals in soils and sediments. Chemistry of contaminant remediation. Prerequisite: EaES 310 or consent of the instructor.

416. Organic Geochemistry. 4 Hours. Global carbon cycle, chemical composition of biogenic matter, sedimentology and diagenesis of organic matter, molecular fossils, geopolymers, fossil fuels, anthropogenic organic compounds, carbon isotope
Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
596. Advanced Studies in Earth and Environmental Sciences. 1 to 6 Hours. May be repeated for credit. A maximum of 4 hours of credit may be applied towards the requirements for the M.S. degree. Independent study or research under faculty supervision, leading to a written report. Prerequisites: Consent of the head of the department and the faculty member who will supervise the study.

598. Master’s Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual work under the supervision of faculty members in their respective fields. Prerequisite: Consent of the thesis supervisor.

599. Ph.D Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual work under the supervision of faculty members in their respective fields. Prerequisite: Consent of the thesis supervisor.

Economics (Econ)

436. Mathematical Economics. 4 Hours. Application of mathematics to theories of consumer and producer behavior, determination of prices in markets, growth and stability features of macroeconomic models. Prerequisites: Econ 218 or 220; and Econ 345 or Math 165 or Math 180.

441. Teaching Methods in Economics. 4 Hours. Credit earned in Econ 441 may not be used to satisfy Economics credit requirements for the MA or PhD degrees given by the Department of Economics. Credit earned in Econ 441 may be applied toward the degree as an elective. Develops skills in preparing and giving lectures and examinations, computer usage and other aspects of teaching economics and consumer economics at secondary/higher education levels. Prerequisite: one course in graduate-level microeconomics or macroeconomics.

442. Topics in Economic Education. 1 to 4 Hours. May be repeated for credit. Credit for this course may not be used to satisfy the minimum number of Economics credits needed for the MA or PhD in Economics. It may be used as general elective credits for these degree programs or as the Economic Education course requirement for the Certificate in the Teaching of Economics. Students may register for more than one section per term. Topics vary. Course content is announced prior to each term in which it is given. Prerequisite: Consent of the instructor. Prerequisite(s) may vary according to topic.

450. Business Forecasting Using Time Series Methods. 4 Hours. Same as IDS 476. Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multivariable transfer function models. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

472. Real Estate Finance. 4 Hours. Same as Fin 472. Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. Prerequisite: Econ 218 or 220.

475. Real Estate Markets and Valuation. 4 Hours. This course cannot be used for the minimum required courses in Economics for the MA or PhD in Economics. Real estate market analysis. Sales comparison, cost, and income approaches to estimating residential and commercial property values. Statistical procedures for real estate analysis. Prerequisites: Econ 218 or 220; and IDS 270 or Econ 270; or the equivalent; or consent of the instructor.

495. Competitive Strategy. 4 Hours. Multidisciplinary analysis of organizational strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

499. Independent Study in Economics. 1 to 3 Hours. Independent study of a topic not covered in a graduate-level course. Prerequisites: Consent of the Director of Graduate Studies and the instructor.

500. Managerial Economics. 4 Hours. Economic analysis applied to business operations; demand theory; production cost analysis; capital theory; pricing policies; capital budgeting. Prerequisite: Econ 501 or 520.


502. Microeconomics II. 4 Hours. Advanced microeconomic theory. Theories of consumer behavior, uncertainty, general equilibrium, welfare economics. Prerequisite: Econ 501.

504. The Economics of Organization of Business Enterprises. 4 Hours. The economic reasons for the existence of firms, the determinants of firm size and the theory of organizational structure. Prerequisite: Econ 501 or Econ 520.

511. Macroeconomics I. 4 Hours. Static and dynamic theories of income, employment and the price level; advanced treatment of consumption, investment, money demand and aggregate production functions; stabilization theory and policy. Prerequisite: Econ 221.

512. Macroeconomics II. 4 Hours. Neoclassical and modern market-clearing models of real and monetary influences on economic growth, inflation and business cycles. Prerequisite: Econ 511.

513. Special Topics in Macroeconomics and International Economics. 4 Hours. Intense study of selected research topics in macroeconomics and international economics. Topics may vary. Prerequisite: Econ 512.

514. International Trade Policy. 4 Hours. Theoretical models on the causes and consequences of international trade and their empirical validation. Effects of tariff and non-tariff trade policies and preferential trade agreements. Prerequisites: Econ 501; or Econ 520 and 521.

515. International Monetary Policy. 4 Hours. Capital mobility and stabilization policy under fixed and flexible exchange rates; optimum currency areas; reform of international monetary system; problems of liquidity adjustment and confidence. Prerequisite: Econ 511 or 521.

516. Economic Development in an Interdependent World. 4 Hours. Theoretical and empirical studies of economic development with intersectoral and international perspectives; structural change and resource reallocation; factor proportions, substitutability, and movement; export-led growth. Prerequisite: Econ 501 or 520 or consent of the instructor.

520. Microeconomics for Business Decisions. 4 Hours. Credit is not given for Econ 520 if the student has credit in Econ 501 or 540 or MBA 502. Efficient allocation of resources by consumers, profit and non-profit firms and government, regulation of industry, monopoly and imperfect competition, business ethics and the market place, efficiency versus equity, social welfare. Prerequisite: Math 165 or 181 or the equivalent.

521. Macro and International Economics for Business. 4 Hours. Credit is not given for Econ 521 if the student has credit in Econ 511 or MBA 502 and 508. Impact of the macro economy and international economics on business decisions. Determination of economic activity, inflation, interest rates and exchange rates. Role of monetary and fiscal policy.

531. Labor Economics I. 4 Hours. Determinants of wage differentials; analysis of determinants and consequences of investments in human capital (schooling, on-the-job training, health); labor mobility, supply and allocation of time. Prerequisite: Econ 501 or 520.

532. Labor Economics II. 4 Hours. Impact of training, legislation, institutional constraints, and discrimination on the labor market. Focus on demographic groups (race, nativity, ethnicity, gender). Prerequisite: Econ 501 or 520.

533. Economic Development and Human Resources. 4 Hours. Economic theory applied to less developed countries, focusing on human aspects of development. Household economy, employment, earnings; labor productivity, unemployment; migration, population growth, income distribution. Prerequisite: Econ 501 or 520.

534. Econometrics I. 4 Hours. Detailed treatment of the multivariate linear regression model using matrix algebra. Emphasis on formulating and testing static and dynamic econometric models. Prerequisite: Econ 445 or IDS 532.

535. Econometrics II. 4 Hours. Detailed treatment of simultaneous equations estimation; evaluation of alternative
estimators; problems of estimation including PROBIT, LOGIT, TOBIT and error component models. Prerequisite: Econ 534.

536. Advanced Mathematical Economics. 4 Hours. Mathematics theory and applications, including calculus and linear algebra, to theories of consumer and producer behavior, general equilibrium, welfare economics, externalities, and social choice. Prerequisite: Math 181.

537. Business Research and Forecasting I. 4 Hours. Same as IDS 582. The role of research in business; forecasting methods and techniques, including models and their applications. Prerequisites: Econ 534, and at least one statistics course with regression analysis at the 300-level or above.

538. Business Research and Forecasting II. 4 Hours. Same as IDS 583. The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. Prerequisite: IDS 476 or IDS 582 or Econ 537.

540. Economics for the Social Sciences. 4 Hours. Same as PPA 540. Credit is not given for Econ 540 if the student has credit in Econ 501 or 520. Introduction to economics for graduate students in the social sciences. Economic cost, incentives, resource allocation and economic institutions. Supply and demand analysis. Economic behavior of consumers and households, business firms, government and not-for-profit institutions.

551. Economics of Education. 4 Hours. Basic concepts and tools of economics applied to education. Economic implications of educational outcomes for the economy, and for socio-economic structure (e.g., income distribution, fertility patterns, ethnic group differences). Prerequisite: Econ 501 or 520.

552. Economic Demography. 4 Hours. Economic analysis of fertility (number and timing of children), mortality, marriage and divorce, population age structure, the relationship between population growth and economic development. Prerequisite: Econ 501 or 520.

555. Advanced Health Economics. 4 Hours. Same as HPA 543. Topics in the supply and demand for health services; the role of insurance in the medical care industry; public policy issues of cost and quality regulation. Prerequisite: Econ 501 or 520 or consent of the instructor.

560. Industrial Organization. 4 Hours. Analysis of industry structure, behavior and performance; firms in imperfect competition; concentration measurement; oligopoly theory; cartels; price discrimination; vertical and horizontal integration. Prerequisite: Econ 501 or 520 or consent of the instructor.

570. Environmental and Natural Resource Economics. 4 Hours. Analytical methods for evaluating the impacts and control costs of pollution externalities and natural resource changes. Consequent implications for public and business policy. Prerequisite: Econ 501 or Econ 520 or MBA 502.

571. Urban Real Estate and Land Economics. 4 Hours. Economic analysis of urban real estate and land. Real estate appraisal. Demand for urban land; supply of land and improvements. Prerequisite: Econ 501 or 520.

572. Urban Economics. 4 Hours. Urban economic models and economic analysis of urban problems. Firm location, housing, transportation, local public finance. Prerequisite: Econ 501 or 520.

575. Economic Analysis of Public Expenditures. 4 Hours. Microeconomic theory as applied to public expenditure decisions; externalities, shadow prices and investment criteria in cost-benefit analysis; uncertainty and the value of life; extensive illustrative case studies. Prerequisite: Econ 501 or 520.

576. Economics of Taxation. 4 Hours. Analysis of the effects of taxation on economic behavior; taxation and public choice; the effects of taxation on the distribution of income; theory and empirical analysis of welfare effects of taxes; optimal tax theory; issues in tax policy and tax reform. Prerequisite: Econ 501 or 520.

592. Workshop in Economics. 4 Hours. Bridges the transition from coursework to dissertation research. The nature of a Ph.D. dissertation, topic selection, career design, research support networks. Students define a potential dissertation topic, survey the literature, and present it in class. Prerequisite: Comprehensive exams in micro and macro.

593. Internship Program. 0 to 8 Hours. Under the direction of a faculty supervisor, students work in government or a private firm on problems related to their major field of interest. Specific credit allotted is determined by the Graduate Curriculum Committee after receiving the supervisor's recommendation. Prerequisites: Completion of the core courses in the degree program in which the student is enrolled and approval of the internship program by the graduate advisor and the Graduate Curriculum Committee.

596. Independent Study. 1 to 4 Hours. Independent study under faculty supervision. Prerequisite: Consent of the instructor.

598. Master's Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on M.A. thesis. Prerequisite: Consent of the chair of the thesis committee.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on a Ph.D. thesis. Prerequisite: Consent of the chair of the thesis committee.

Education (Ed)

402. Philosophy of Education and Urban School Policy. 3 Hours. Selected social and education philosophies and their impact on urban school curriculum design, school organization, and control.

403. Policy Issues in the History of American Education. 3 Hours. Political, economic, and cultural influences shaping the development of American education policy; emphasis on issues of education theory and practice in their historical settings.

421. Advanced Educational Psychology. 3 Hours. Examines current theory and research on the teaching-learning process with particular attention to general learning and curriculum-relevant problem-solving skills.

422. Advanced Developmental Psychology and Educational Processes. 3 Hours. Same as Psch 422. Examines the relationship between development, learning, and educational processes. Prerequisites: 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. Requires concurrent registration in Ed 430. 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: Admission into a secondary teacher education program.

430. Curriculum, Instruction and Evaluation in Education. 3 Hours. Introduction to curriculum, instruction, and evaluation as areas of inquiry; implications of these areas of inquiry for educational practice; related contemporary problems and issues. Prerequisite: Admission to graduate study in education or consent of the instructor.

431. Improving Learning Environments. 3 Hours. Analysis of structural, normative, and social dimensions of learning environments and their relationships to student learning. Exploration of change processes to improve those environments.

432. Instruction and Evaluation in Secondary Education. 5 Hours. Instructional planning and curriculum design; strategies for instruction and classroom management; forms of formative and summative evaluation; and professional development issues. Field experience required. Prerequisites: Completion of education core courses in the undergraduate teacher certification program; Ed 200 and 210 or, in the graduate teacher certification program, Ed 402 or 403 or Ps 401; and Ed 421 or 422 or 445.

445. Adolescence and the Schools. 3 Hours. Physiological, intellectual, and social development of adolescence. Relations between aspects of adolescent development and the social and academic social demands of secondary schools.

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.

451. Composing a Teaching Life II/Senior Reflective Seminar. 5 Hours. This course provides the capstone experience for graduate students only. 500-level courses are restricted to graduate students.
for students, with a weekly Senior Reflective Seminar in which students reflect upon their teaching through the lenses of the five program curricular strands. Field work required. Prerequisite: Successful completion of Ed 450.

461. Political and Socio-Cultural Perspectives on Special Education. 3 Hours. Same as SpEd 461. Students will examine issues of access and equity through legislation, litigation, and socio-cultural perspectives and be introduced to major theoretical frameworks that influence special education programs. Field work required.

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

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

472. Promoting Academic and Prosocial Behavior I. 3 Hours. Same as SpEd 472. Explores the importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

473. Teaching Math and Science with Adaptations. 3 Hours. Same as SpEd 473. Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. Field work required. Prerequisite: Ed 461 or SpEd 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. Prerequisites: Admission to the Ph.D. in Education program or consent of the instructor.

501. Data and Interpretation in Educational Inquiry. 4 Hours. Data, interpretation, reliability, validity, accuracy, stability, and generalizability from different methodological perspectives; how research design, data collection, and interpretation vary with different philosophical approaches. Prerequisite: Admission to the Ph.D. in Education program or consent of the instructor.

502. Essentials of Qualitative Inquiry in Education. 4 Hours. Hands-on introduction to qualitative research methods, including foundations, practices, and ethics in qualitative research. Prerequisite: Admission to the Ph.D. in Education program or consent of the instructor.

503. Essentials of Quantitative Inquiry in Education. 4 Hours. Same as EPsy 503. Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). Prerequisite: Admission to the Ph.D. in Education program or consent of the instructor.

543. Research on Teaching. 4 Hours. Review and analysis of history, paradigms, methods, and findings of research on teaching. Focus on the development of research questions and strategy. Prerequisites: Ed 490 or 503 or CIE 578, and consent of the instructor.

544. Research Designs for Policy Analysis. 4 Hours. Same as PPA 544. Alternative research design models and program evaluation methodologies; quantitative and qualitative approaches; ethnography and historiography; experimentation and quasiexperimentation; causal modeling. Prerequisites: Admission to the Ph.D. program in Public Policy Analysis and one graduate-level course in statistics.

580. Colloquium on Diversity in Secondary Education. 2 Hours. S/U grade only. This colloquium is 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.

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: 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: Consent of the advisor.

Educational Psychology (EPsy)

420. Social Development of Urban Children. 4 Hours. Same as Psch 420. General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles. Prerequisite: Admission to graduate program in education or psychology, or consent of the instructor.

429. Constructivist Approaches to Development: Piaget and Vygotsky. 4 Hours. Same as Psch 429. Piaget’s and Vygotsky’s theories of development of knowledge. Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language. Prerequisites: Graduate standing in education and Ed 422 or Psch 422 or the equivalent, or consent of the instructor.

446. Characteristics of Early Adolescence. 3 Hours. Same as Psch 423. Physiological, social, emotional and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. Prerequisite: Admission to the Ph.D. program in psychology; or approval of the College of Education or consent of the instructor, and Ed 210 or 421 or 422 or Psch 422.

449. History and Philosophy of Early Childhood Education. 3 Hours. Historical and philosophical foundations of early childhood education. Emphasis on the effects of changing economic, political, and social conditions, values and views of human development. Prerequisite: Ed 210 or the equivalent.

465. Cognitive Development and Disabilities. 3 Hours. Same as SpEd 465. Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and intervention. Field work required. Prerequisite: Ed 461 or SpEd 461 or the equivalent or consent of the instructor.

466. Language Development, Diversity, and Disabilities. 3 Hours. Same as SpEd 466. Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention. Field work required. Prerequisite: Ed 461 or SpEd 461 or the equivalent or consent of the instructor.

467. Social and Emotional Development and Disabilities. 3 Hours. Same as SpEd 467. Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5–21 with and without disabilities. Field work required. Prerequisite: Ed 461 or SpEd 461 or the equivalent or consent of the instructor.

494. Topics in Educational Psychology. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Seminar on a pre-announced topic focusing on methodology, research and educational implications of recent models of learning, problem solving, and thinking. Prerequisite: 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: Consent of the instructor.

500. Proseminar in Educational Psychology. 2 Hours. Same as Psch 550. S/U grade only. Interdisciplinary colloquia on selected topics in educational psychology. Serves as introduction to faculty research foci. Prerequisite: Admission to the Ph.D. in Education program or the Ph.D. in Psychology program, or consent of the instructor.
501. Cognition and Instruction. 4 Hours. Same as Psch 551. Current research on relations among cognitive processes, learning, and instruction. Prerequisite: Admission to the Ph.D. in Education program or the Ph.D. in Psychology program, or consent of the instructor.

502. Social Psychology of Education. 4 Hours. Same as Psch 517. Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. Prerequisite: Admission to the Ph.D. in Education program or the Ph.D. in Psychology program, or consent of the instructor.

503. Essentials of Quantitative Inquiry in Education. 4 Hours. Same as Ed 503. Introduces theory and assumptions behind parametric statistics. Also provides hands-on experience in conducting basic quantitative research (t-test, correlation, regression, analysis of variance). Prerequisite: Admission to the Ph.D. in Education program or consent of the instructor.

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. Prerequisites: Ed 501, and Ed 503 or EPsy 503 or the equivalents or consent of the instructor.

505. Item Response Theory/Rasch Measurement. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as Psch 506. Statistical inference with item response theory models, useful to measure an individual’s performance on a test or questionnaire. Models include parametric, non-parametric, unidimensional, multidimensional, and cognitive. Extensive computer use required. Prerequisites: Ed 501 and EPsy 503 and EPsy 546 or the equivalent; appropriate score on the department placement test.

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. Non-Parametric Statistics and Regression. 4 Hours. Distribution free statistical tests that are robust for small samples. Also, non-parametric (non-linear) regression models that relax the assumptions of classical linear regression. Prerequisites: 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. Prerequisites: EPsy 429 and 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. Prerequisites: Ed 422 and Epsy 429; 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 requirement for Type 04 Certification by providing supervised student teaching experience. Prerequisites: Epsy 519 and 520; and consent of the instructor.

522. Student Teaching in the Primary Grades. 6 Hours. Instructional methods in curricula in primary grades. Field work required. Meets eight weeks of the semester. Meets Illinois State Board of Education requirement for Type 04 Certification. Prerequisites: EPsy 519 and consent of the instructor.

524. Parent and Staff Relations in Early Education. 4 Hours. Methods for involving parents in early childhood programs. The role of the director in program administration and in hiring, training, and supervising teachers and staff. Prerequisite: Consent of the instructor.

526. Development in Infancy and Early Childhood. 4 Hours. Same as Psch 520. Consideration of development in the preschool years. Stress on theory, research, individual child study, and educational implications. Prerequisite: Ed 422 or Psch 422 or the equivalent.

527. Seminar in Moral Development, Character Formation, and Education. 4 Hours. Same as Psch 527. Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. Prerequisite: Ed/Psych 422 or the equivalent, or admission to the Ph.D. program in Education, Ph.D. program in Psychology, or Ph.D. program in Social Work, or consent of the instructor.

528. Cognition and Instruction: Advanced Constructivist Approaches. 4 Hours. Same as Psch 552. Piaget’s and Vygotsky’s theories of knowledge development. Emphasis on competing approaches concerning the relation of thought to action, to language, and to social relations. Prerequisites: EPsy 429 or Psch 429 or the equivalent, and admission into the Ph.D. program in the College of Education or Psychology or consent of the instructor.

530. Achievement Motivation. 4 Hours. Same as Psch 525. The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. Prerequisite: Graduate standing in education or psychology or consent of the instructor.

546. Educational Measurement. 4 Hours. Introduces methods based on true score theory, generalizability theory, and Rasch measurement that are used to address issues of reliability and validity. Prerequisites: Ed 501, and Ed 503 or EPsy 503 or the equivalents or consent of the instructor.

547. Multiple Regression in Educational Research. 4 Hours. Introduction to multiple correlation and regression techniques as tools for the analysis and interpretation of educational and behavioral science data. Prerequisite: EPsy 503.

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. Prerequisites: EPsy 421 and 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. Prerequisites: 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 grading procedures; measure issues in classroom assessment; validity and reliability of classroom assessments. Prerequisites: Ed 421 and 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: EPsy 503.

582. Forging Collaborations with Family and Community. 3 Hours. Same as SpEd 582. Develops skills necessary to work in partnership with the families of children with disabilities, and community members. Prerequisite: SpEd 461 or Ed 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: EPsy 547 or 563.

588. Current and Specialized Topics in Psychometrics. 2 Hours. May be repeated for credit. S/U grade only. Seminar on current and specialized topics in psychometrics. Extensive computer use required. Prerequisites: Credit or concurrent registration in Epsy 546 or credit or concurrent registration in Epsy 550; or credit or concurrent registration in Epsy 503; or consent of the instructor.

589. Topics in Educational Statistics. 4 Hours. May be repeated for credit. Seminar on a pre-announced topic on educational statistical methodology for the analysis of educational data. Prerequisite: EPsy 547.
593. Ph.D. Research Project. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the Ph.D. in Education program.

594. Special Topics in Educational Psychology. 1 to 4 Hours. May be repeated for up to 12 hours of credit. Seminar on a pre-announced topic focusing on methodology, research, and educational implications of recent models of learning, problem solving, and thinking. Prerequisites: Ed 421 and 422, or consent of the instructor.

596. Independent Study. 1 to 4 Hours. 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. Prerequisites: Ed 490 or the equivalent, and consent of the advisor and instructor.

599. Thesis Research. 0 to 16 Hours. Research on the topic of the student’s dissertation. S/U grading only. May be repeated. Students may register in more than one section per term. Prerequisite: Consent of the dissertation advisor.

Electrical and Computer Engineering (ECE)

400. Introduction to Microelectromechanical Systems. 4 Hours. Previously listed as EECS 400. Definition, classification and case studies of transducers, sensors and actuators. Microfabrication methods for microelectromechanical systems (MEMS). Design, simulation and modeling of MEMS. Prerequisites: ECE 346; and Grade of C or better in ECE 220.

401. Quasi-Static Electric and Magnetic Fields. 4 Hours. Previously listed as EECS 401. Static electric and magnetic fields. Material description, boundary value problems. Field energy, its conversion and scaling laws. Quasi-static fields, field diffusion, eddy currents, energy losses. Prerequisites: ECE 346; and Grade of C or better in ECE 220.


412. Introduction to Filter Synthesis. 4 Hours. Previously listed as EECS 412. Fundamentals of network synthesis, filter approximations and frequency transformations. Active filter synthesis using bi-linear and bi-quad circuits. Topics in computer-aided design. Prerequisite: Grade of C or better in ECE 310.

415. Image Analysis and Machine Vision. 4 Hours. Previously listed as EECS 415. Image formation, geometry and stereo. Two-dimensional image analysis by fourier and other 2-D transforms. Image enhancement, color, image segmentation, compression, feature extraction, object recognition. Prerequisite: MATH 310; or Grade of C or better in ECE 310.

418. Digital Signal Processing II. 4 Hours. Previously listed as EECS 418. Computer-aided design of digital filters; quantization and round-off effects; FFT algorithms; number-theoretic algorithms; Hilbert transform; complex cepstrum; multirate signal processing; linear filtering; system identification; matching. Prerequisite: ECE 317.

420. Introduction to Microwave Engineering. 4 Hours. Previously listed as EECS 420. TEM waves in coaxial and strip lines; TE and TM waves in rectangular and circular wave guides; components; resonators. Laboratory and computer simulation required. Prerequisite: ECE 322.

421. Introduction to Antenna Engineering. 4 Hours. Previously listed as EECS 421. Radiation; antenna parameters; theorems of antenna; radiation from linear wire and loop antennas; impedance; linear arrays; traveling wave wire antennas. Design project and computer simulation required. Prerequisite: ECE 322.

422. Wave Propagation and Communication Links. 4 Hours. Previously listed as EECS 422. Antennas and propagation; wave propagation over ground, through ionosphere and troposphere; diversity principles; propagation effects in microwave systems, satellite, space, and radar links. Prerequisites: ECE 311 and ECE 322.


429. Plasma. 4 Hours. Same as Phys 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to kinetic theory. Prerequisite: ECE 322.

430. Statistical Communication and Signal Processing. 4 Hours. Previously listed as EECS 430. Random processes, signal to noise ratio, spectral and correlation analysis, filtering of random processes, bandpass noise, noise in communications, statistical signal processing. Prerequisites: ECE 311 and 341.

431. Analog Communication Circuits. 4 Hours. Previously listed as EECS 431. 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. Prerequisites: ECE 311 and 340.

432. Digital Communications. 4 Hours. Previously listed as EECS 432. Source coding, quantization, signal representation, channel noise, optimum signal reception, digital modulation: ASK, PSK, FSK, MSK, M-ary modulation. Probability of error. Inter-symbol interference. Prerequisites: ECE 311 and 341.

433. Multimedia Communication Networks. 4 Hours. Multimedia systems; compression standards; asynchronous transfer mode; Internet; wireless networks; television; videoconferencing; telephony; applications. Extensive computer use required. Prerequisite: ECE 333.

435. Wireless Communication Networks. 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. Previously listed as EECS 435. Prerequisites: ECE 333 and ECE 432.

436. Computer Communication Networks II. 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. Extensive computer use required. Prerequisite: ECE 333.

442. Power Semiconductor Devices and Integrated Circuits. 5 Hours. Previously listed as EECS 442. Breakdown physics; edge termination techniques; P-i-N and Schottky power rectifiers; power MOSFETs; conductivity-modulated high-power devices; wide bandgap semiconductors; emerging material technologies device modeling. Prerequisite: ECE 340.

448. Transistors. 4 Hours. Bipolar junction transistors, electronic processes in surface-controlled semiconductor and dielectric devices. Properties of MIS field-effect capacitors and transistors, surface and interface effects. Prerequisite: ECE 346.

449. Microdevices and Micromachining Technology. 5 Hours. Same as ME 449. Previously listed as EECS 449. Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Simulation experiments. Laboratory. Prerequisite: ECE 347.

451. Control Engineering. 4 Hours. State-space representation of systems; realization theory; stability; performance; modern control design techniques, including: fuzzy, learning, adaptive and nonlinear control. Prerequisite: ECE 350.

452. Robotics: Algorithms and Control. 4 Hours. Kinematic and dynamic modeling of robots; configuration space; motion planning algorithms; control of robots; sensors and perception; reasoning; mobile robots. Prerequisites: CS 201; and grade of C or better in ECE 210 or grade of C or better in ECE 225.

458. Electromechanical Energy Conversion. 4 Hours. Previously listed as ECE 458. Electromagnetic forces and torque; magnetic circuits and transformers; DC machines; three-phase AC synchronous and induction machines; laboratory-demonstrations. Projects are required. Prerequisite: Grade of C or better in ECE 225.

465. Digital Systems Design. 4 Hours. Previously listed as EECS 465. Switching algebra, combinational circuits, Max, ROM, PLA-based designs, minimization techniques, synchronous and asynchronous sequential circuits (minimization, hazards, races, state assignment, retiming), fault analysis, testing. Prerequisites: ECE 220 or Phys 142 for non-ECE students, and grade of C or better in ECE 265 or grade of C or better in CS 366.

466. Advanced Computer Architecture. 4 Hours. Previously listed as ECE 466. Credit is not given for ECE 466 if the student has credit in CS 466. Design and analysis of high-performance unprocessors. Topics include arithmetic: multiplication, division, shifting; processor: pipelining, multiple function units. Instruct sets; memory: caches, modules; virtual machines. Prerequisite: ECE 366.

467. Introduction to VLSI Design. 5 Hours. Previously listed as ECE 467. Laboratory. MOS, CMOS circuits VLSI technology, CMOS circuit characterization and evaluation. Static and dynamic MOS circuits, system design, faults, testing, and symbolic layout. Advanced topics. Laboratory. Prerequisite: ECE 340.

468. Analog and Mixed-Signal VLSI Design. 5 Hours. Previously listed as ECE 468. Elementary transistor stages and analog components; low-power design; comparison of bipolar, CMOS, and BiCMOS; s-parameters and high-frequency ASIC design and modeling; RF wireless communication system components; behavioral modeling. Prerequisite: ECE 467.

469. CAD-Based Computer Design. 4 Hours. Previously listed as ECE 469. Extensive computer use required. Credit is not given for ECE 469 if the student has credit in CS 469. Use of modern CAD tools for computer system design, hardware, description languages, simulation, design verification, synthesis. Design assignments, projects using CAD. Prerequisites: ECE 368 and ECE 465 and ECE 466.

491. Seminar. 1 to 4 Hours. Previously listed as ECE 491. May be repeated for credit. Topics of mutual interest to a faculty member and a group of students. Offered as announced by department bulletin or the Timetable. Prerequisite: Consent of the instructor.

493. Special Problems. 2 to 4 Hours. Previously listed as ECE 493. No graduate credit for M.S. or Ph.D. in Electrical and Computer Engineering students. Special problems or reading by special arrangement with the faculty. Prerequisite: Consent of the instructor.


515. Image Analysis and Machine Vision II. 4 Hours. Previously listed as ECE 515. Image analysis techniques, 2-D and 3-D shape representation, segmentation, camera and stereo modeling, motion, generic object and face recognition, parallel and neural architectures for image and visual processing. Prerequisite: ECE 415 or consent of the instructor.

516. Optimal and Adaptive Digital Filters. 4 Hours. Previously listed as ECE 516. Properties of signals; optimal filters, Wiener and Kalman filters; signal modeling, adaptive filters channel equalizing, echo canceling, noise canceling, and linear prediction; filter properties. Prerequisite: ECE 317.

517. Digital Image Processing. 4 Hours. Previously listed as ECE 517. Operations on 2-D digital images such as transforms, enhancement, restoration, warping, segmentation, registration, compression, and reconstruction from projection. Prerequisite: ECE 317.


522. Advanced Microwave Theory. 4 Hours. Previously listed as ECE 522. Microwave integrated circuits: analysis, design. Microwave devices: filters, cavities and phase shifters. Millimeter waves: components and circuits, millimeter wave applications. Prerequisites: ECE 420 and 520.

523. Advanced Antenna Engineering. 4 Hours. Previously listed as ECE 523. Radiation from helix and spiral; aperture antennas; linear and planar array synthesis; Hallen’s and other methods for impedance; design of array feeds; reflector and lens antennas. Prerequisites: ECE 421 and 520.

524. High Frequency Electromagnetic Systems and Packaging. 4 Hours. Previously listed as ECE 524. Electromagnetic effects on high-frequency circuits, computer-aided design and simulation of high-frequency integrated circuits. Packaging designs for cross-talk minimization. Prerequisite: ECE 401.

526. Electromagnetic Scattering. 4 Hours. 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. Previously listed as ECE 526. Prerequisite: ECE 520.


528. Fiber and Integrated Optics. 4 Hours. Previously listed as ECE 528. Propagation in thin films and fibers. Mode launching, coupling, and losses. Sources, detectors, modulators, interferometers. Fabrication and measurement techniques. Fiber optics systems. Prerequisite: ECE 520 or the equivalent.

530. Random Signal Analysis. 4 Hours. Previously listed as ECE 530. Probability for communications, properties and series representations of random processes, random processes through linear and non-linear systems, minimum MSE and maximum SNR systems. Prerequisite: ECE 430.


532. Advanced Digital Communications. 4 Hours. Previously listed as ECE 532. Characteristics of digitally modulated
signals; digital signals in additive noise; communication over fading channels and with intersymbol interference; source and channel coding; synchronization; spread spectrum techniques. Prerequisite: ECE 432.

533. Advanced Computer Communication Networks. 4 Hours. Computer and telecommunication networks; integrated (data, voice, and video) services; network performance; Quality of Service provisioning. Prerequisites: ECE 333 and 430.

534. Elements of Information Theory. 4 Hours. Previously listed as ECECS 534. Entropy and mutual information, asymptotic equipartition property stochastic process entropy rates, data compression Kolmogorov complexity, channel capacity, rate distortion theory, information theory applications. Prerequisite: ECE 430.


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. Prerequisites: ECE 432 and ECE 435; or consent of the instructor.

540. Physics of Semiconductor Devices. 4 Hours. Previously listed as ECECS 540. Same as Phys 540. Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions in homogeneous semiconductors; recombination and generation; non-equilibrium processes, radiation and electronic fields; diodes. Prerequisite: ECE 346 or the equivalent.

541. Microelectronic Fabrication Techniques. 4 Hours. Same as ME 541. Current fabrication techniques of microelectronic technology; plasma and CVD processes; etching techniques; ion implantation; surface analytical methods. Previously listed as ECECS 541. Prerequisite: ECE 450.

542. Semiconductor Device Theory. 4 Hours. Theory and design of several semiconductor devices of current interest, from among unipolar devices, bipolar devices, high-speed and microwave devices, and optical devices. Prerequisite: ECECS 540.

544. Advanced Theory and Technology of Devices. 4 Hours. Previously listed as ECECS 544. Same as Bioe 544. Theory, design, and technology of a selected semiconductor device at current research and industrial state-of-the-art level. Prerequisite: ECE 540.


546. Chemical and Biosensors. 4 Hours. Previously listed as ECECS 546. Thermodynamics, adsorption, interfaces. Membranes, biosensor principles. Chemical, gas, electrolyte sensors and their applications. Prerequisite: ECE 449 or the equivalent.


551. Optimal Control. 4 Hours. Previously listed as ECECS 551. Optimal control of dynamic systems in continuous and discrete time. The maximum principle and dynamic programming, considering constraints as they arise in practical systems; optimization performance. Prerequisite: ECE 550.

552. Nonlinear Control. 4 Hours. Previously listed as ECECS 552. Nonlinear phenomena, linear and piecewise linear approximations. Describing function and on-off servomechanisms, phase plane techniques, limit cycle, Lyapunov’s stability theory, bifurcations, bilinear control, vibrational control. Prerequisite: ECE 451.

553. System Identification. 4 Hours. Previously listed as ECECS 553. On-line and off-line identification of control systems in frequency and time domain, considering noise effects, nonlinearities, nonstationarities and distributed parameters. Prerequisite: ECE 550.

559. Neural Networks. 4 Hours. Previously listed as ECECS 559. Artificial neural networks for parallel computing including perceptrons, backpropagation and Kohonen nets, statistical methods in neural computing, Hopfield fields, associative memories, cognition and neocognition. Prerequisite: Consent of the instructor.

560. Fuzzy Logic. 4 Hours. Previously listed as ECECS 560. Crisp and fuzzy sets; membership functions; fuzzy operations; fuzzy relations and their solution; approximate reasoning; fuzzy modeling and programming; applications; project. Prerequisite: Consent of the instructor.

565. VLSI Design Automation. 4 Hours. Previously listed as ECECS 565. Computer-aided physical design of integrated circuits; circuit partitioning and placement; floorplanning; global and detailed routing; timing optimization; general optimization tools: local search, constraint relaxation. Prerequisites: CS 401 and ECE 465.

566. Parallel Processing. 4 Hours. Previously listed as ECECS 566. Parallel processing. Includes multi-computer architectures, parallel programming languages, interconnection networks, and parallel algorithms. Prerequisites: ECE 466 and CS 401.

567. Advanced VLSI Design. 4 Hours. Previously listed as ECECS 567. VLSI subsystem and system design: synthesis, design styles, design process, testing. Case studies; switching networks, graphics engine, CPU. Projects use computer-aided design tools. Prerequisite: ECE 467.

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. Prerequisites: ECE 466 and consent of the instructor.

569. High-Performance Processors and Systems. 4 Hours. Previously listed as ECECS 569. Instruction-level parallelism, multiple-instruction issue, branch prediction, instruction and data prefetching, novel cache and DRAM organization, high-performance interconnect, compilation issues, case studies. Prerequisite: ECE 466.

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. Prerequisites: ECE 346 and Phys 244. Recommended background: It is recommended that students have a 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. Previously listed as ECECS 594. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

595. Departmental Seminar. 0 Hours. Previously listed as ECECS 595. May be repeated. S/U grade only. Seminar by faculty and invited speakers.

596. Individual Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Subject matter varies from term to term and section to section, depending on the specialties of the instructor. Prerequisite: Consent of the instructor.

597. Project Research. 0 to 9 Hours. Previously listed as ECECS 597. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. A research design or reading project approved by the committee appointed by the director of graduate studies. Prerequisite: Consent of the instructor.

598. M.S. Thesis Research. 0 to 16 Hours. Previously listed as ECECS 598. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. MS thesis work under the supervision of a graduate adviser. Prerequisite: Consent of the instructor.
599. Ph.D. Thesis Research. 0 to 16 Hours. Previously listed as EECS 599. S/U grade only. May be repeated for credit. Students may register for more than one section per term. For ECE majors only. PhD thesis work under supervision of a graduate advisor. Prerequisite: Consent of the instructor.

**Engineering (Engr)**


401. Engineering Management. 4 Hours. Theory, strategy, and tactics of the use of project management including project planning, matrix management concept, and team meetings. Extensive computer use required. This is an online web-based course.

402. Intellectual Property Law. 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. Extensive computer use required. This is an online web-based course.

403. Reliability Engineering. 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. Extensive computer use required. This is an online web-based course.

410. Wireless Data. 4 Hours. Data communications, existing Wireless Data Networks, planning, topology, performance, and operation. Extensive computer use required. This is an online web-based course. Prerequisites: A course in Digital Communications and an introductory course in Wireless Communications.

420. Engineering for Success. 1 Hour. S/U grade only. Interactive seminars will be given by persons with engineering degrees having shown high achievement in either engineering or non-engineering endeavors.

494. Special Topics in Engineering. 4 Hours. Course on multidisciplinary engineering topics that vary from term to term depending on current student and instructor interests. May be repeated. Students may register for more than one section per term. Prerequisite: Consent of the instructor.

**English (Engl)**

400. History of the English Language. 4 Hours. Development of English from its Proto-Indo-European origin to the present; detailed examination of the external and internal history of Old, Middle, and Modern English. Prerequisite: Consent of the instructor. Recommended background: Engl 200.

401. Modern English. 4 Hours. This is a course in the sound system, the lexicon, and syntax- semantics of Modern American English taught from the linguistic perspective. Recommended background: Engl 200.

402. Rhetoric. 4 Hours. Intensive study of central topics in rhetorical theory in their historical depth. Prerequisites: Engl 342 or 361 or 370 or 372 or 374 or 375; or consent of the instructor.

403. Introduction to Old English. 4 Hours. The elements of Old English grammar and readings from the literature of England before the Norman Conquest. Prerequisites: Engl 240; and Engl 241 or 242 or 243; or consent of the instructor.

405. Topics in Old English Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Studies in the language and literature of pre-Conquest England. Content varies. Prerequisite: Engl 403 or consent of the instructor.

408. Topics in Medieval Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Topics in English literature from the period 450–1500. Content varies. Prerequisite: Engl 311 or 312 or 313 or 314; or consent of the instructor.

413. Studies in Shakespeare. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a genre, topic or period in Shakespeare’s work. Prerequisites: Engl 312 or 313 or 314; or consent of the instructor.

416. Topics in Renaissance Literature and Culture. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a topic in English literature written between 1500 and 1700. Content varies. Prerequisite: Engl 311 or 312 or 313 or 314; or consent of the instructor.

417. Topics in Restoration and Eighteenth-century Literature and Culture. 4 Hours. May be repeated for a maximum of 8 hours of credit. Focus on a particular topic or theme in British literature 1660–1780. Content varies. Prerequisite: Engl 313 or 314 or 315 or 316; or consent of the instructor.

419. Topics in Romantic Literature and Culture. 4 Hours. May be repeated for a maximum of 8 hours of credit. Concentrates on a particular aspect of British Romantic writing in order to provide a greater depth of study in the period. Content varies. Prerequisite: Engl 313 or 314 or 315 or 316 or 317; or consent of the instructor.

421. Topics in Victorian Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a major author, genre, or theme in the Victorian period. Content varies. Prerequisite: Engl 315 or 316 or 317 or 318; or consent of the instructor.

422. Topics in Postcolonial and World Literatures in English. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a major topic relating American literature to society, culture, history, race, gender, ethnicity. Content varies. Prerequisite: Engl 318 or 319 or 320 or 322 or 333; or consent of the instructor.

426. Topics in American Literature and Culture to 1900. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific topic relating American literature to society, culture, history, race, gender, ethnicity. Content varies. Prerequisite: Engl 324 or 325 or 326 or 327; or consent of the instructor.

427. Topics in American Literature and Culture, 1900–Present. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific topic relating twentieth century literature to society, culture, history, race, gender, ethnicity. Content varies. Prerequisite: Engl 324 or 325 or 326 or 327; or consent of the instructor.

428. Topics in Literature and Culture, 1900–Present. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific topic relating to literature and culture to 1900. Prerequisite: Engl 323 or 324 or 325; or consent of the instructor.

429. Topics in Literature and Culture. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific topic relating to literature and culture to 1900. Prerequisite: Engl 323 or 324 or 325 or 326 or 327; or consent of the instructor.

437. Topics in Poetry and Poetic Theory. 4 Hours. May be repeated for a maximum of 8 hours of credit. Investigations into the nature of poetry. Discussions of issues such as technical, theoretical, formal and historical developments. Topic and readings vary. Prerequisite: Engl 303 or 316 or 355; or consent of the instructor.

440. Topics in Cultural and Media Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a medium, genre, theme, period, influence, or problem in Culture and Cultural Theory. Topics Vary. Prerequisite: Engl 302 or 341 or 342; or consent of the instructor.

441. Topics in Asian American Literature and Culture. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a specific topic relating to Asian American literature and culture. Content varies. Prerequisite: Engl 302 or 341 or 342; or consent of the instructor.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
credit. An advanced seminar that examines various forms of cultural production by Asian American artists of diverse ethnic backgrounds. Topics vary. Prerequisite: Engl 327 or 328 or 359; or consent of the instructor.

443. Topics in Gender, Sexuality and Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Specific study of topics in gender and literature. Content varies. Prerequisite: Engl 361 or 362 or 363; or consent of the instructor.

444. Topics in Theories of Gender and Sexuality. 4 Hours. May be repeated for a maximum of 8 hours of credit. Advanced study of topics related to theories of gender and sexuality. Prerequisite: Engl 361 or 362 or 363; or consent of the instructor.

445. Topics in Disability Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as DHD 445. This course will focus on topics structured around particular aspects of Disability Studies and its practical, cultural, and theoretical implications. Prerequisites: Engl 361 or 362 or 363 or 364; or consent of the instructor.

446. Topics in Criticism and Theory. 4 Hours. May be repeated for a maximum of 8 hours of credit. Focus on a particular critical or theoretical topic, movement, tradition or figure. Content varies. Prerequisite: Engl 361 or 362 or 370 or 372; or consent of the instructor.

448. Topics in Rhetorical Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. 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. Prerequisite: Engl 374 or 375 or 342 or 402; or consent of the instructor.

459. Introduction to the Teaching of English in Middle and Secondary Schools. 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. Field work required. Prerequisite: Completion of the English Composition requirement.

469. Women's Literary Traditions. 4 Hours. Same as GWS 469. An exploration of issues such as the female aesthetic; women’s popular literature; factors that enable creativity; differences of race and class. Prerequisites: Engl 361 or 362 or 363; or consent of the instructor.

470. Topics in Multiethnic Literatures in the United States. 4 Hours. May be repeated for a maximum of 8 hours of credit. Studies in the literatures of American racial and ethnic groups. Content varies. Prerequisites: Engl 328 or 333 or 350 or 351 or 355 or 357; or Engl 359; or consent of the instructor.

471. Topics in Native American Literatures. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as NASH 471. The history and development of literature by and about American Indians. Content varies. Prerequisites: 6 hours of English, African-American Studies, or Latin American Studies; or consent of the instructor.

472. Women and Film. 4 Hours. Same as AH 434, GWS 472. Roles and representations of women in classical Hollywood, European art and independent feminist cinemas. Prerequisites: Engl 302, or 342 or 361 or 362 or 363; or consent of the instructor.

473. Topics in African-American Literature. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Same as AASI 490. African-American literature and culture for students with significant background in the field. Topics vary. Prerequisites: AASI 357 or 360 or Engl 357; or consent of the instructor.

474. Topics in Popular Culture and Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. 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. Prerequisites: Engl 302 or 341, or 342; or consent of the instructor.

478. The Bible as Literature. 4 Hours. Same as JST 478, RelS 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: Grade of C or better in Engl 240; and grade of C or better in Engl 241, 242, or 243; or consent of the instructor.

480. Reading Black Women Writing. 4 Hours. Same as AASI 470 and GWS 470. Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth and twentieth-century black women writers. Prerequisite: AASI 350 or 351 or 355 or 357 or 360; or Engl 350 or 351 or 355 or 361 or 363; or consent of the instructor.

481. Methods of Teaching English in Middle and Secondary Schools. 4 Hours. Theory and practice; emphasis on current approaches to language and literature. All students in the teacher education program must take this course in the term preceding their student teaching. Prerequisite: Consent of the instructor; 9 hours of English.

482. Campus Writing Consultants. 4 Hours. Tutoring in the Writing Center. Students are required to consult with others on their writing. Emphasis on practice and theories of writing. Appropriate for prospective teachers. Prerequisite: 9 hours of English and consent of the instructor. Students must obtain override from Writing Center.

483. Studies in Language and Rhetoric. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a particular topic or movement in language or rhetoric. Content varies.

484. Studies in Language and Cognition. 4 Hours. Examination of relationships among theories of language structure, cognition, and discourse, with applications of such theories to the writing process. Prerequisite: Engl 401 or consent of the instructor.

485. Studies in the English Language and Linguistics. 4 Hours. May be repeated for a maximum of 8 hours of credit. Study of a topic such as language diversity and literacy, theories of grammar, literacy in society, ethnicity and language. Content varies. Prerequisites: 9 hours of English; or consent of the instructor.

486. The Teaching of Writing in Middle and Secondary Schools. 4 Hours. Rhetoric and composition pedagogy. Study of a topic. Content varies. Prerequisite: Consent of the instructor; or 9 hours of English.

489. The Teaching of Reading and Literature in Middle and Secondary Schools. 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 literature. Field work required. Prerequisite: Engl 459; or consent of the instructor.

490. Advanced Writing of Poetry. 4 Hours. May be repeated for a maximum of 8 hours of credit. Advanced work on poetic techniques and practices; emphasis on analysis of student work, using published examples; particular attention to individual student development. Prerequisite: Engl 210 or the equivalent; or consent of the instructor.

491. Advanced Writing of Fiction. 4 Hours. May be repeated for a maximum of 8 hours of credit. Advanced practice; emphasis on analysis of student work and published examples. Prerequisite: Engl 212 or the equivalent; or consent of the instructor.

492. Advanced Writing of Nonfiction Prose. 4 Hours. May be repeated for a maximum of 8 hours of credit. Advanced practice in writing essays articles, reviews or other forms of nonfiction prose. Content varies. Prerequisite: Engl 201 or consent of the instructor.

493. Internship in Nonfiction Writing. 3 Hours. May be repeated once for a maximum of 6 hours of credit, 3 of which may be counted toward a graduate degree in English. Credit is not given for Engl 493 if the student has credit in Engl 593. Individual projects in approved professional setting to practice writing skills at an advanced level. Prerequisites: Engl 201 and 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 application process.

494. Topics in the Teaching of English. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Study of a topic in literature, composition, and/or pedagogy. The content varies with each offering. Prerequisite: Consent of the instructor.

495. Playwriting. 4 Hours. Same as Thtr 423. The development of scripts for stage performance. Prerequisites: Approval
of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.

497. Backgrounds to English and American Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Areas of mythology, mythography, the Bible and major works of literature important to an understanding of English and American literature. Content varies. Prerequisites: Engl 240; and Engl 241 or 242 or 243; or consent of the instructor.

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

499. Educational Practice with Seminar II. 6 Hours. S/U grade only. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Engl 498, and approval of the department.

500. Introduction to Bibliography and Research. 4 Hours. Study of bibliographic tools and research techniques.

501. Introduction to Research in Language, Literacy and Rhetoric. 4 Hours. Surveys disciplinary foundations of research on language, literacy, and rhetoric. Issues and methods are introduced with special emphasis on work relating to culture, cognition, and rhetoric.

503. Theory and Practice of Literary Criticism. 4 Hours. Forms and theories of literary criticism, analysis of their application to specific literary genres and works, and practice in writing literary criticism.

504. Seminar in Literary Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic or movement. Content varies. Prerequisite: Engl 503.

505. Seminar in Old English. 4 Hours. A topic in Old English: emphasis on literature or philology. Content varies. Prerequisite: Engl 404 or the equivalent.

515. Seminar in Middle English Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. The works of Chaucer and other Middle English writers. Content varies. Prerequisite: A minimum of 3 hours in Middle English literature.

518. Newberry Library Seminar in Renaissance Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Late Medieval and Renaissance literature. In conjunction with the Newberry Library Center for Renaissance Studies. Prerequisites: Engl 503 and 3 hours of Medieval or Renaissance literature.

520. Seminar in Renaissance Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. English literature of the sixteenth and seventeenth centuries. Topic varies. Prerequisite: One course in Renaissance literature.

525. Seminar in Restoration and 18th Century Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Content varies. Prerequisite: One course in Restoration or 18th century literature.

530. Seminar in British Romantic Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Advanced study of author(s), topic, movement, or genre. Content varies. Prerequisite: One course in Romantic literature.

535. Seminar in Victorian Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Focus on author, topic, movement or genre. Content varies. Prerequisite: 3 hours of Victorian literature or consent of the instructor.

540. Seminar in Modern Literature in English. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of an author, topic, movement or genre. Content varies. Prerequisite: A minimum of three hours in modern literature.

545. Seminar in American Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Content varies. Prerequisite: One advanced course in American literature.

550. Research Practicum in Ethnography. 4 Hours. May be repeated for a maximum of 12 hours of credit. Conceptualization and implementation of exploratory ethnographic research project.

552. Research Practicum in Language and Cognition. 4 Hours. May be repeated for a maximum of 12 hours of credit. Research design and methods examining theories of the development of literacy and relationships among learner, text, and context. Prerequisite: Engl 484.

553. Research Practicum in Discourse Analysis. 4 Hours. May be repeated for a maximum of 12 hours of credit. Same as Ling 553. 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.

554. Seminar in English Education. 4 Hours. Critical examination of theory and practice in the teaching of English. Content varies.

555. Teaching College English. 4 Hours. S/U grade only. Methods, materials, and practice in teaching college English.

556. Teaching Creative Writing. 4 Hours. S/U grade only. Methods, materials, and practice in teaching creative writing. Prerequisite: Admission to the Program for Writers or consent of the instructor.

558. Topics in Language and Rhetoric. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic or movement in linguistic or rhetorical theory. Content varies. Prerequisite: Engl 401 or 402 or consent of the instructor.

560. Practicum in the Teaching of English. 1 to 4 Hours. No graduation credit. S/U grade only. May be repeated. For English Department teaching assistants. Provides an opportunity for supervised discussion and evaluation of materials and methods used in undergraduate English instruction. Participation in appropriate departmental workshops. Prerequisite: Students may enroll only during terms in which they hold a teaching assistantship in the English Department.

570. Program for Writers: Poetry Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on poems written by students. Prerequisite: Admission to the Program for Writers.

571. Program for Writers: Fiction Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on fiction written by students. Prerequisite: Admission to the Program for Writers.

572. Program for Writers: Novel Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on novels written by students. Prerequisite: Admission to the Program for Writers.

573. Program for Writers: Translation Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on non-fiction written by students. Prerequisite: Admission to the Program for Writers or consent of the instructor.

574. Program for Writers: Non-Fiction Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on non-fiction written by students. Prerequisite: Admission to the Program for Writers.

575. Program for Writers: Experimental Writing Workshop. 4 Hours. May be repeated for a maximum of 12 hours of credit. Emphasis on experimentation by students. Prerequisite: Admission to the Program for Writers.

576. Program for Writers: Editing and Publishing. 4 Hours. Practicum in basic procedures for students desiring careers in publishing, or who wish to understand the stages of production from proposal to publication. Prerequisite: Consent of the instructor.

580. Seminar in Genres of Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. A single genre, such as the Gothic novel, or mode, such as poetry, fiction, or drama.
581. Seminar in Literature and Related Fields. 4 Hours. May be repeated for a maximum of 12 hours of credit. Relation between literature and such fields as fine arts, philosophy, psychology, religion, science, sociology, and politics. Content varies. Prerequisite: 4 hours in area of literature to be studied.

582. Seminar in Multilingual Literatures in the United States. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of literature, genre, movement, topic, or author in American multilingual literatures. Content varies. Prerequisite: Minimum of 3 hours in Native American literature.

583. Seminar in Popular Culture. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a theme, form, era, or methodological approach. Content varies.

584. Seminar in Film. 4 Hours. May be repeated for a maximum of 12 hours of credit. One topic or movement. Content varies. Prerequisite: Minimum of 3 hours in film.

585. Seminar in Language, Literacy and Culture. 4 Hours. May be repeated for a maximum of 12 hours of credit. One author, topic or movement in sociolinguistic theory and literacy studies. Content varies. Prerequisite: Enlg 485 or previous coursework in sociolinguistic or ethnographic research.

586. Seminar in Language and Cognition. 4 Hours. May be repeated for a maximum of 12 hours of credit. Interdisciplinary readings relating language and cognition from writing, rhetoric, cognitive psychology, and linguistics on a particular topic. Prerequisite: Enlg 484.

587. Seminar in the History of Literacy or Rhetoric. 4 Hours. May be repeated for a maximum of 12 hours of credit. One author, topic, or movement in rhetorical theory from antiquity through the 19th century. Prerequisites: Enlg 409 and 418 or consent of the instructor.

588. Seminar in the Theory of Language and Rhetoric. 4 Hours. May be repeated for a maximum of 12 hours of credit. One author, topic, or movement in modern rhetorical theory. Prerequisites: Enlg 409 and 418 or consent of the instructor.

592. Preliminary Examination Research. 1 to 8 Hours. May be repeated for a maximum of 12 hours of credit. S/U grade only. Supervised research and reading in preparation for the preliminary examinations. Prerequisites: Consent of the instructor and consent of the Director of Graduate Studies.

593. Graduate Internship in Nonfiction Writing. 1 to 4 Hours. Credit is not given for Enlg 593 if the student has credit in Enlg 493. May be repeated; a maximum of four hours of credit may be applied toward a graduate degree in English. Directed field experience in an approved professional setting to practice writing, editing, and research skills at an advanced level. Prerequisites: Consent of the English Department Internship Coordinator. Resume and writing samples are required.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. S/U grade only. For students involved in dissertation research and writing. Prerequisites: Consent of the instructor and Director of Graduate Studies.

597. Master's Project Research in English. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. No more than 4 hours of Enlg 597 may be applied toward the degree. S/U grade only. Supervised research and reading that facilitates the student in preparation of the Project research. Prerequisites: Open only to Master’s degree students; and consent of the instructor and Director of Graduate Studies.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. For students involved in dissertation research and writing. Prerequisites: Consent of the instructor and Director of Graduate Studies.

English as a Second Language (ESL)

401. Teaching Methods for International Teaching Assistants. 1 to 3 Hours. No graduation credit. S/U grade only. Basic communication and presentation skills for international teaching assistants. The culture of the American college classroom. Prerequisite: Score of 150 on the Test of Spoken English (TSE or Speak Test) and consent of the instructor.

Environmental and Occupational Health Sciences (EOHS)

400. Principles of Environmental Health Sciences. 3 Hours. Environmental influences on health: population, food, energy; community hygiene and injury control; solid/hazardous wastes, air and water pollution, radiation; industrial hygiene and occupational health. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

405. Environmental Calculations. 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.

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. It is taught on-line. Prerequisite: 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, control of chemical, biological, and physical agents in the workplace. Application to preliminary surveys, measurement of exposure, and evaluation of control measures. Prerequisite: EOHS 400 or consent of the instructor.

424. Environmental Acoustics. 2 Hours. Fundamentals of noise generation/propagation; filtering; weighting; hearing biomechanics; health effects; audiometry; hearing control methods; sound fields; directivity; diffraction/barriers; regulations; instrumentation; control. Prerequisite: General college physics and ordinary calculus, or consent of the instructor.

428. Industrial Hygiene Laboratory I. 2 Hours. Detailed methods and experiments for measuring chemical, biological, and physical agents; and methods for evaluating the effectiveness of control measures. Prerequisites: EOHS 400, 405 and 421; or consent of the instructor.

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

438. Air Quality Laboratory. 2 Hours. Basic instrumentation and procedures related to measurement and surveillance of ambient air quality. Methods for collection and identification of gaseous and particulate pollutants. Prerequisite: EOHS 405 or consent of the instructor.

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

450. Principles of Occupational and Environmental Medicine. 2 Hours. Causes, transmission, control and prevention of the physical/chemical environmental stressors in the work environment; industrial processes and hazards, contrasts between developed and developing countries.

455. Environmental and Occupational Toxicology. 3 Hours. General and applied toxicology as it relates to environmental and occupational exposures to hazardous agents. Emphasis on basic principles, specific types of toxicity, and major classes of toxic agents. Prerequisites: Chem 232 and 234 and BioS 100 or the equivalent courses, or consent of the instructor.

461. Community Health and Consumer Protection. 2 Hours. Prevention of health hazards due to infectious and chemical agents and physical processes, especially in the home and small community environments; role of health agencies. Prerequisite: EOHS 400 or consent of the instructor.

472. Management of Solid and Hazardous Wastes. 3 Hours. Same as CEMM 423 and Geog 444. Management of solid and hazardous waste, including radioactive waste: landfills,
incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

482. Occupational Safety Science. 2 Hours. Principles of occupational safety, safety regulations, accident investigation procedures and engineering, behavioral, and administrative techniques for occupational accident control. Prerequisite: EOHS 421 or consent of the instructor.

495. Environmental/Occupational Health Seminar. 1 Hour. Discussions of current environmental health and occupational health topics, with presentations by students, faculty members and visiting scientists.

512. Water and Wastewater Treatment. 3 Hours. Water and wastewater characterization: physical, chemical and biological methods of water and wastewater treatment; regulatory and control trends; and environmental impact determinations. Prerequisite: EOHS 411 or consent of the instructor.

523. Engineering Controls/Ventilation. 4 Hours. Design/evaluation of engineering control technology for workplace hazards: process modification, industrial ventilation, air cleaning, shielding, toxic air contaminants, mechanical hazards, (non)ionizing radiation, temperature. Prerequisites: EOHS 405, 421 and 428, or consent of the instructor.

529. Industrial Hygiene Laboratory II. 2 Hours. Field work: comprehensive industrial hygiene surveys of local work places. Health hazard analysis, design of sampling strategies, collection of field data, report preparation. Prerequisites: EOHS 428 and 438, or consent of the instructor.

532. Air Quality Management II. 2 Hours. Same as CEMM 526. Air quality management: Integration of diverse aspects. Data interpretation; standards setting; policy implementation; equipment design; hazardous spill modeling; indoor air pollution; case studies. Prerequisite: EOHS 431 or CEMM 419.

542. Water Chemistry. 4 Hours. Same as CEMM 524. Chemical equilibria and kinetic principles as applied to processes occurring in natural and engineered water systems. Prerequisite: EOH 440 or CEMM 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. Same as Epid 554. Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards. Prerequisites: Epid 401, Bstt 401 and EOHS 400; or consent of the instructor.

556. Risk Assessment in Environmental and Occupational Health. 3 Hours. Methodologies for utilizing toxicological and epidemiological data to estimate health risks due to exposures to pollutants in environments. Prerequisites: EOHS 405, Bstt 401, and Epid 400; or consent of the instructor.

558. Industrial Toxicology. 2 Hours. Clinical toxicology and mechanisms of workplace toxicants: metals, fibers, dusts, and organics. Diagnosis and treatment. Prerequisite: EOHS 400 and 457.

570. Hazardous Materials Management. 3 Hours. Definition and application of methods for managing hazardous materials: site health and safety plan development; remediation technique evaluations; incinerator design; computerized hazard response program applications. Prerequisites: EOHS 405, 421, and 428; or consent of the instructor.

584. Radiation Protection. 3 Hours. Radioactivity, energetics, kinetics, interactions, external protection, dosimetry, recommendations and standards, measurement, radon. Prerequisite: EOHS 405 or consent of the instructor.

594. Advanced Special Topics in Environmental Health. 1 to 4 Hours. Environmental/occupational topics of current importance to public health: pollution, industrial hygiene, and related topics. Variable course contents arranged to supplement the existing curriculum. Prerequisite: Consent of the instructor.

597. Advanced Laboratory Projects in Environmental Health. 1 to 4 Hours. Application and integration of sampling and measurement techniques for characterization of inside and ambient environments. Individuals or groups supervised by EOHS faculty members. Prerequisite: Consent of the instructor.

Epidemiology (Epid)

400. Principles of Epidemiology. 3 Hours. Introduction to descriptive and analytic epidemiology, determinants of health and disease in populations, and application of the epidemiologic methods to disease control; includes use of basic epidemiologic software. Prerequisite: Credit or concurrent registration in Bstt 400 or consent of the instructor. Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

401. Quantitative Methods in Epidemiology I. 2 Hours. Design and analysis of cohort and case-control studies, through stratified analysis. Bias, confounding and interaction effects will be closely examined. Prerequisites: Epid 400 and Bstt 400, or consent of the instructor.

402. Quantitative Methods in Epidemiology II. 2 Hours. Advanced statistical analysis for case-control and cohort studies. Includes analysis for trend, pair matching, life-tables, sample size and power, and logistic and Poisson regression. Prerequisites: Epid 401, and credit or concurrent registration in Bstt 401; or consent of the instructor.

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

409. The Epidemiology of HIV/AIDS. 2 Hours. Review of the HIV/AIDS pandemic and the global response to it focusing on patterns of transmission, risk factors and prevention/intervention. Prerequisite: Epid 400 or consent of the instructor.

410. Epidemiology of Infectious Diseases. 2 Hours. Epidemiology of selected infectious diseases, including incidence, prevalence and control of disease. Epidemiic investigation is emphasized. Prerequisite: Epid 400 or consent of the instructor.

411. Epidemiology of Chronic Diseases. 3 Hours. Selected topics in chronic diseases with critical analysis of current epidemiologic literature. Prerequisite: Epid 400 or consent of the instructor.

412. Introduction to Psychosocial Epidemiology. 2 Hours. Reviews landmark studies of psychosocial and psychiatric disorders in U.S. communities; evaluates research methodology, case definition, identification, and empirical findings. Prerequisite: Epid 400 or consent of the instructor.

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: Epid 400 or consent of the instructor.

428. Epidemiology of Violence. 2 Hours. Reviews public health aspects of violence-related mortality and morbidity, examines existing data bases and conceptual frameworks focusing on etiology, epidemiology, surveillance and prevention. Prerequisite: Epid 400 or consent of the instructor.

471. Population. 4 Hours. Same as Soc 471. The measurement and study of major trends and differentials in fertility, mortality, migration, growth, and compositional characteristics of the population of the United States and other nations. Prerequisite: 6 hours of upper-division sociology, including Soc 201 or consent of the instructor.

494. Introductory Special Topics in Epidemiology. 1 to 4 Hours. Special topics in infectious or chronic disease epidemiology. Course content will vary from semester to semester. Prerequisite: Epid 400 or consent of the instructor.

501. Advanced Quantitative Methods in Epidemiology. 3 Hours. Advanced quantitative methods used in the analysis of case-control and cohort studies, including computer
applications. Prerequisites: Epid 401 and Bltt 401, or consent of the instructor.

510. Advanced Epidemiology of Infectious Diseases. 2 Hours. Controversies regarding the etiology, transmission and prevention of selected infectious diseases. Literature reviews and study designs developed by students are a prominent part of course. Prerequisite: Epid 410 or consent of the instructor.

513. Epidemiology of Aging. 2 Hours. Current methodological and public health issues in the epidemiology of aging will be explored. Prerequisites: Epid 401 or 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. Prerequisites: Epid 401 and 411; or consent of the instructor.

516. Advanced Cancer Epidemiology. 2 Hours. Critical review of the epidemiology of selected cancer sites to promote synthesis of knowledge, awareness of methodologic issues, and stimulate future research. Prerequisites: Epid 501 and 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: Epid 411 or consent of the instructor.

518. The Epidemiology of Pediatric Diseases. 3 Hours. Familiarizes the student with issues unique to research on children. Lecture topics include epidemiology of childhood diseases, important research studies, and methodologic problems specific to studying children. Prerequisites: Epid 401 and Bltt 400; or consent of the instructor.

519. Research Protocol and Grant Development. 1 Hour. Satisfactory/Unsatisfactory grade only. A review of funding options and examples of developing fundable research proposals. Prerequisite: Epid 400.

520. Genetics in Epidemiology. 2 Hours. Topics in genetic/molecular epidemiology, including genetics, population genetics, molecular biology, molecular genetics. Familiarizes students with laboratory/statistical concepts and applications in epidemiological studies. Prerequisite: Epid 401 or consent of the instructor.

545. Reproductive and Perinatal Health. 3 Hours. Same as CHSc 545. Focuses on the epidemiology of key reproductive and perinatal health outcomes and relevant health services and health policies. Prerequisites: Bltt 400 and CHSc 400 and Epid 400 and consent of the instructor.

548. Readings in Reproductive and Perinatal Epidemiology. 1 Hour. Same as CHSc 548. Advanced seminar in reproductive/perinatal epidemiology with particular emphasis on methodologic issues. Prerequisites: CHSc 441 and Epid 401 or consent of the instructor. Recommended background: Maternal and child health and epidemiology.

554. Occupational and Environmental Epidemiology. 2 Hours. Same as EHSc 554. Methods and issues of environmental epidemiology: outbreak, cluster-analysis, cross-sectional, case-control, cohort, ecological, and time series designs; contemporary issues: cancer and reproductive hazards. Prerequisites: Epid 401, Bltt 401 and EHSc 400; or consent of the instructor.

591. Current Epidemiologic Literature. 2 Hours. S/U grade only. Student presentation of recently published scientific papers of epidemiologic interest, to promote breadth of knowledge and critical examination of evidence. Prerequisite: Epid 401 or consent of the instructor.

594. Advanced Special Topics in Epidemiology. 1 to 4 Hours. Special topics in infectious or chronic disease epidemiology or epidemiologic methods. Course content will vary from semester to semester. Prerequisite: Epid 401 or consent of the instructor.

595. Epidemiology Research Seminar. 1 to 2 Hours. S/U grade only. Thesis research of graduating students and ongoing research by faculty and outside guests will be presented and critically evaluated. Prerequisite: Epid 400 or consent of the instructor.

Finance (Fin)

412. Portfolio Management. 3 Hours. Development of portfolio theory; establishment of portfolio objectives for individuals, corporations, banks, pension and mutual funds; evaluation of portfolio performance. Prerequisite: Fin 310.

415. Fixed Income Securities. 3 Hours. Valuation of fixed income securities, term structure estimation and arbitrage trading with practical application using real data. Prerequisite: Fin 310.

416. Options and Futures Markets. 3 Hours. History and institutional structure of options and futures markets. Uses of futures and options for arbitrage, speculation, and hedging by managers of domestic and multinational organizations. Analysis of factors that determine futures and options prices. Prerequisite: Fin 310.

430. Introduction to Money and Banking. 3 Hours. Payment and banking systems; credit and market risk management; The Federal Reserve System; globalization of monetary, banking, and regulatory systems. Prerequisite: Fin 300.

431. Theory and Structure of Financial Markets. 3 Hours. The distribution of saving and credit over time and risk categories. The financial services industry. Administration and regulation of global money, security, and derivatives markets. Prerequisite: Fin 300.

442. International Finance. 3 Hours. Financial management within an international context. International monetary system and financial markets, management of foreign investments, working capital management, exchange risks, taxation, and earnings reports. Prerequisites: Fin 300 and 310.

444. Small Business Finance. 3 Hours. Aspects of acquiring funds for small business enterprises. Topics include the trade-off of liquidity and profitability, management of working capital, and capitalization. Prerequisite: Fin 300.

465. Property and Liability Insurance. 4 Hours. Using property and liability insurance to manage risk. Topics may include fire, marine, consequential loss, crime, title, automobile, and workers’ compensation insurance. Prerequisite: Fin 300 or consent of the instructor.

466. Life and Health Insurance. 4 Hours. Types, uses, and evaluation of life and health insurance. Economics of the industry. Regulation and taxation. Prerequisite: Fin 300 or consent of the instructor.

472. Real Estate Finance. 4 Hours. Same as Econ 472. Finance principles applied to real estate; financing of residential and income-producing real estate; real estate development finance; secondary mortgage market; taxation and real estate finance. Prerequisite: Econ 218 or 220.

494. Special Topics in Finance. 2 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Course is repeatable if topic varies. Students may register for more than one section per term. An intensive study of a selected topic in finance. Topics vary by sections and by term. Prerequisite: Consent of the instructor.

495. Competitive Strategy. 4 Hours. Multidisciplinary analysis of organization strategy and policy using case method and/or business simulation. Assignments involve extensive library research as well as oral and written reports. Prerequisite: Consent of the instructor.

500. Introduction To Corporate Finance. 4 Hours. No credit given if the student has credit in MBA 504. Theory of corporate finance: goal of the firm, time value of money, investment decisions (under certainty and uncertainty), net present value, capital markets, and corporate financing decisions. Prerequisites: Acct 500; credit or concurrent registration in Econ 520; admission to the MBA program or approval from 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: Fin 500.

512. Portfolio Analysis. 4 Hours. Development of portfolio theory; establishment of portfolio objectives; evaluation of portfolio performance; investment objectives for individuals, corporations, banks, pension and mutual funds, and their interrelation with economic environment. Prerequisite: Fin 510.

516. Theory and Structure of Options and Futures Markets. 4 Hours. History and institutional structure of options and futures markets. Uses of futures and options for arbitrage,
speculation and hedging by financial and production managers of domestic and multinational organizations. Analysis of factors that determine futures and options prices. Prerequisite: Fin 510.

520. Corporate Finance. 4 Hours. Advanced topics in corporate finance including capital structure, dividend policy, financial restructuring, bankruptcy, and leasing. Emphasis on recent developments in corporate finance and financial economics. Prerequisite: Fin 500.

530. Money and Banking. 4 Hours. The functions of money; monetary standards; development and operation of commercial banking and the Federal Reserve System. Theories of the supply and demand for money; effects of monetary changes on economic activity, interest rates, and income. Prerequisite: Fin 500.


544. Entrepreneurial and New Venture Financing. 4 Hours. The financing of new business. Estimating cash needs and then determining sources to finance them. This course is designed for those wanting to start their own business. Prerequisite: Fin 500.

551. Financial Decision Making I. 4 Hours. First foundation course for the study of modern financial economics. Two-period individual consumption and portfolio decisions under uncertainty and their implications for the valuation of securities. Prerequisite: Consent of the instructor.

571. Empirical Issues in Finance. 4 Hours. The methodology used in analyses of market efficiency, asset pricing and capital allocation. Prerequisites: Fin 500 and consent of the instructor.

594. Special Topics in Finance. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. An intensive study of a selected topic in finance. Topics vary by sections and by term. Prerequisite: Consent of the instructor.

596. Independent Study in Finance. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Independent study under the direction of a faculty member. Must be arranged before the start of the semester. Prerequisite: Consent of the department head or instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Independent study under the direction of a faculty member. Must be arranged before the start of the semester. Prerequisite: Consent of the department head or instructor.

French (Fr)

401. Reading French for Graduate Students. 4 Hours. Taught in English. Credit may not be applied toward a graduate degree. Grammar, vocabulary, general and specialized reading practice; for graduate students wishing to fulfill French reading requirements for the Ph.D. Prerequisites: Some prior experience with elementary French recommended; and consent of the instructor.

413. French Feminist and Gender Theory. 4 Hours. Same as GWS 413. An introduction to French theories of gender, including feminisms influenced by Lacanian psychoanalysis, political philosophy, and multicultural studies. Taught in English. Students who intend to use French 413 toward the major in French must complete assignments in French. Prerequisite: FR 301 or FR 302; or consent of the instructor.

415. French Literature of the Middle Ages. 4 Hours. May be repeated for a maximum of 12 hours of credit. Introduction to major medieval genres (epic, romance, lyric, theater, allegory) works and authors, such as le Chanson de Roland, Tristan, Chrétien de Troyes, Marie de France, Villon. Prerequisite: FR 301 or consent of the instructor.

416. Topics in Sixteenth-Century French Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Intensive analysis of Renaissance literature (Rabelais, Montaigne, Marguerite de Navarra, poetry of the Pleiade, etc.) in the cultural context of Humanism and the Reformation. Prerequisite: FR 301 or consent of the instructor.

417. Topics in Seventeenth-Century French Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Intensive study of Baroque and Classicism, with focus on major genres: theater (Corneille, Moliere, Racine); poetry (La Fontaine); prose (Pascal, de Sèvigné); novel (de Lafayette). Prerequisite: FR 301 or consent of the instructor.

418. Topics in Eighteenth-Century French Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Introduction to the literature and philosophy of the Enlightenment through representative authors (Rousseau, Diderot, etc.) and major genres (novel, essay, conte, theater, etc.). Prerequisite: FR 301 or consent of the instructor.

419. Topics in Nineteenth-Century French Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Major genres and works from Romanticism to realism, naturalism, and symbolism will be studied within the context of the social, cultural and political movements of the century. Prerequisite: FR 301 or consent of the instructor.

420. Topics in Twentieth-Century French Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Storries of literary movements (surrealism, existentialism, nouveau roman, theater of the absurd) and intensive analysis of works by major authors from Proust to Beckett. Prerequisite: FR 301 or consent of the instructor.

422. Francophone Novel. 4 Hours. May be repeated for a maximum of 12 hours of credit. Intensive analysis of a topic in Francophone literature. Scope includes Quebec, Africa, the Antilles, and French novelists outside of France. Prerequisite: FR 301 or consent of the instructor.

433. Advanced Oral and Written French. 4 Hours. Exercises in French pronunciation; oral interpretation of different texts (familiar style and formal discourse); discussion of newspapers, magazine articles; practice in critical writing. Prerequisite: FR 334 or consent of the instructor.

440. Topics in French and Francophone Cinema. 3 Hours. May be repeated for a maximum of 12 hours of credit. Intensive analysis of a topic in Francophone cinema. Focus on Francophone films chosen around a period or theme or genre. Topics vary. Taught in English. Students who intend to use French 440 toward the major in French must complete assignment in French. Prerequisite: FR 302 or 301 or consent of the instructor.

448. Foundations of Second Language Teaching. 4 Hours. Same as Ger 448 and Span 448. 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. Taught in English. Prerequisites: Three courses at the 200- and 300-levels; and consent of the instructor.

449. Teaching Second Language Literacy and Cultural Awareness. 4 Hours. Same as Ger 449 and Span 449. 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. Taught in English. Prerequisite: Consent of the instructor.

461. French Civilization I: Medieval and Renaissance. 4 Hours. Lectures and discussion in French. Interdisciplinary approach to French civilization of the Middle Ages and the Renaissance including history, literature, the beaux-arts, and philosophy. Prerequisite: FR 302 or consent of the instructor.

462. French Civilization II: Seventeenth and Eighteenth Centuries. 4 Hours. Lectures and discussion in French. Interdisciplinary approach to French civilization of the seventeenth and eighteenth centuries including history, literature, the beaux-arts, and philosophy. Prerequisite: FR 302 or consent of the instructor.

463. French Civilization III: Nineteenth and Twentieth Centuries. 4 Hours. Lectures and discussion in French. An interdisciplinary approach to French civilization of the
nineteenth and twentieth centuries, including history, literature, beaux-arts, and philosophy. Prerequisite: Fr 302 or consent of the instructor.

464. Topics in French Civilization. 4 Hours. May be repeated for a maximum of 12 hours of credit. An interdisciplinary approach to French civilization, including history, literature, beaux-arts, and philosophy. Each topic focuses on a specific period between the Middle Ages and the present. Prerequisite: Fr 302 or consent of the instructor.

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

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

481. Foreign Language Teaching Methodology. 4 Hours. Same as Span 450 and Ital 460. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisite: Three courses at the 200 and 300 levels.

496. Independent Study. 1 to 4 Hours. Supervised study in an area not covered by regularly scheduled courses under the direction of a faculty member designated by the chairperson of the department. Prerequisites: French major and consent of the department.

502. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours. Same as Span 502. No credit given if student has credit in Span 450 or Fr 450 or Ger 407. This course introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice. Taught in English. Prerequisite: Appointment as a teaching assistant. For students outside the department: consent of the instructor.

510. Seminar in Literary Studies. 4 Hours. May be repeated for credit; beyond 12 hours of credit, consent of the director of graduate studies required. Topics vary.

560. Seminar in Cultural Studies. 4 Hours. May be repeated for a maximum of 12 hours of credit. Topics vary.

570. Seminar in Literary Theory and Criticism. 4 Hours. Same as Span 570. This course may be repeated only with consent of the instructor and for a maximum of 8 hours of credit. Theories of literary production and reception; their application to the practice of literary criticism. Specific themes and topics vary. Taught in English.

575. French Abroad. 0 to 16 Hours. May be repeated for a maximum of 33 hours of credit. Lectures, seminars and practical work in francophone literature and civilization in France. Prerequisite: Consent of the department.

596. Independent Study. 1 to 4 Hours. Supervised study in an area not covered by regularly scheduled courses under the direction of a faculty member designated by the chairperson of the department. Prerequisites: Graduate standing in French and approval of the department.

598. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 8 hours of credit. Prerequisite: Approval of the director of graduate studies.

**Gender and Women’s Studies (GWS)**

403. Culture and Sexuality: Cultural History of Same-Sex Relations. 4 Hours. Lesbian/gay studies; issues in the history of (homo)sexuality; cultural and historical analysis of same-sexuality in several periods, including our own.

412. Women and the Environment. 4 Hours. Same as Arch 412. Women’s place in the built environment; the role of gender in environmental experience including women as users, designers, planners, policy makers, and critics.

413. French Feminist and Gender Theory. 4 Hours. Same as Fr 413. An introduction to French theories of gender, including feminisms influenced by Lacanian psychoanalysis, political philosophy, and multicultural studies. Taught in English. Students who intend to use French 413 toward the major in French must complete assignments in French. Prerequisite: FR 301 or FR 302; or consent of the instructor.

419. Public Health Aspects of Sexuality and Women's Health. 3 Hours. Same as CHSc 419. An overview of human sexuality from a public health view with special emphasis on family planning, sexuality and behavior effects on women’s health.

424. Gender, Crime, and Justice. 4 Hours. Same as CrJ 424. An in-depth examination of the etiology of female crime and the involvement of females in the criminal justice system as offenders, victims, and workers/professionals. Prerequisites: CrJ 101 and 220; or consent of the instructor.

425. Sociology of Gender. 4 Hours. Same as Soc 424. Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family; economy. Prerequisite: 6 hours of upper-division sociology or gender and women’s studies courses or consent of the instructor.

439. Gender and Cultural Production. 4 Hours. Same as Ger 439. May be repeated for a maximum of 8 hours of credit if topic is different for each registration. Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. Taught in English. Students who intend to use Ger 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

441. Introduction to Maternal and Child Health. 3 Hours. Same as CHSc 441. Title V maternal and child health programs; concepts of delivery risks by age; effective interventions and public sector organization for delivery of MCH services. Prerequisite: Consent of the instructor. Recommended background: Some knowledge of maternal and child health issues.

450. Women and Mental Health Nursing. 3 Hours. Same as NuSc 450 and NuWh 450. Theories of female psychology; women’s daily lives and mental health; gender differences in mental illness; strategies for improving women’s mental health. Prerequisite: Consent of the instructor. Students enrolled in College of Liberal Arts and Sciences must have credit in Psc 100; and Psc 270 or 315 or GWS 315.

469. Women's Literary Traditions. 4 Hours. Same as Engl 469. An exploration of issues such as the female aesthetic; women’s popular literature; factors that enable creativity; differences of race and class. Prerequisites: Engl 361 or 362 or 363; or consent of the instructor.

470. Reading Black Women Writing. 4 Hours. Same as ASAS 470 and Engl 480. Examines inscriptions of race, gender, class, and sexuality as they shape the literary and critical practices of nineteenth and twentieth-century black women writers. Prerequisite: ASAS 350 or 351 or 355 or 359 or 360; or Engl 350 or 351 or 355 or 361 or 363; or consent of the instructor.

472. Women and Film. 4 Hours. Same as AsSt 478 and Hist 478. Roles and representations of women in classical Hollywood, European art and independent feminist cinemas. Prerequisites: Engl 302, or 342 or 361 or 362 or 363; or consent of instructor.

474. History and Archives. 4 Hours. Same as Hist 474. Introduction to archival preservation and management. Under faculty supervision, students will create a records management plan for an organization to preserve documents of historical importance. Includes internship at an external agency. Prerequisite: 3 hours of history or consent of the instructor.

478. Women in Chinese History. 4 Hours. Same as AsSt 478 and Hist 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution and the
Topics in the History of Women. 4 Hours. Same as Hist 484. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or gender and women’s studies or consent of the instructor.

Gender and Politics. 4 Hours. Same as PolS 485. Impact of gender on basic categories of Western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. Prerequisites: PolS 190 and one 200-level course in political theory, or consent of the instructor.

Advanced Topics in the Study of Sexuality. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Special study at an advanced level of a topic concerning sexuality. Prerequisite: 3 hours in gender and women’s studies or consent of the instructor.

Advanced Topics in Gender and Women’s Studies. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specialized study of a problem, topic or issue relevant to the interdisciplinary area of gender and women’s studies at the advanced level. Content varies.

Feminist Theories. 4 Hours. An analysis of important trends in historical and contemporary feminist theories.

Feminist Methodologies. 4 Hours. An exploration of feminist methodologies and pedagogy from an interdisciplinary perspective.

Gender Issues in Cross-Cultural Perspective. 4 Hours. Same as Anth 514. Selected substantive and theoretical issues in the cross-cultural study of gender roles, conceptions, and relations. Prerequisite: Anth 500, or consent of the instructor.

Theoretical Perspectives on Women and Gender. 3 Hours. Same as Psch 515. Critical examination of psychological theories and research on women and gender, including biological, psychoanalytic, socialization, power, and social constructionist perspectives. Prerequisite: Graduate standing in Psychology; or GWs 315 or Psch 315; and consent of the instructor.

Social Work with Women. 3 Hours. Same as SocW 525. Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. Prerequisites: SocW 410; or consent of the instructor.

Language and Gender. 4 Hours. Same as Ling 540. 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.

Race, Class, and Gender Dimensions of Crime and Justice. 4 Hours. Same as Crl 547. Theories addressing the intersections of race, class, gender, crime and justice. Specifically, students examine criminological theories, social construction of race, class, and gender; legal decision-making, and implications of this for justice in our society.

Women in Education. 4 Hours. Same as Ps 583. An overview of girl’s and women’s educational experiences and placement within the academic structure (as students, professionals and intellectuals). The impact of gender on the realization of educational, economic and social opportunities. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

Special Topics in Gender and Women’s Studies. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Study of a problem, topic or issue relevant to the interdisciplinary area of gender and women’s studies. Content varies. Prerequisite: Consent of the instructor or one course in gender and women’s studies.

Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Topics and plan of study must be approved by the instructor. Prerequisite: Consent of the instructor.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.

Geography (Geog)

Topics in Regional Geography. 4 Hours. May be repeated for a maximum of 6 hours of credit. Geographic analysis of cultural and environmental systems of a political, economic, or climatic region of the world as defined by the instructor. Prerequisites: One upper-division course in each of the areas of skills, systematic and regional/urban geography.

Areal Organization of Urban Systems. 4 Hours. The physical, economic, social, and political aspects of the internal patterns and external arrangements of cities in the Western world. Prerequisite: One 200-level course in either urban or economic geography.

Field Techniques in Archaeology. 4 Hours. Same as Anth 425. Exposures to field methods in archaeology through participation in an actual research project. Students are instructed in field excavation techniques. Prerequisites: Anth 102 or the equivalent or consent of the instructor. Concurrent registration in Geog 426 or Anth 426 is recommended.

Laboratory Techniques in Archaeology. 4 Hours. Same as Anth 426. Exposes students to laboratory methods in archaeology through the analysis of excavated materials. Students are instructed in lab techniques. Prerequisites: Anth 102 or the consent of the instructor. Concurrent registration in Geog 425 or Anth 425 is recommended.

Archaeological Methods. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Same as Anth 429. This course will familiarize students with various methodologies used by archaeologists and geo-archaeologists. Course will concentrate on a different method each time it is taught.

Advanced Landform Geography. 4 Hours. Genesis of surficial landforms and processes that sculpt them. Prerequisite: Geog 131 or Geol 101 or consent of the instructor.

Geomorphology and Archaeology. 4 Hours. Same as Anth 421. Relevance of geomorphic processes and landform development to archaeology; role of geomorphology in archaeological surveys, paleogeographic reconstruction, and archaeological interpretation. Elements of geomorphology. Prerequisite: Geog 131 or EaES 101 or consent of the instructor.

Topics in Resource Management and Policy. 4 Hours. May be repeated for a maximum of 6 hours of credit. Selected topics dealing with environmental problems at local, regional or global levels. Topics vary. Prerequisite: Geog 341 or 361, or consent of the instructor.

Environmental Hazards and Risks. 4 Hours. Environmental risks of natural and technological hazards; causes and consequences to people; social theories of risks; coping mechanisms used to reduce risk. Prerequisite: Geog 251 or 441 or consent of the instructor.

Management of Solid and Hazardous Wastes. 3 Hours. Same as EOH 472 and CEMM 423. Management of solid and hazardous waste, including radioactive waste: landfills, incineration, recycling, composting, source reduction, groundwater and air pollution impacts, control, regulations, siting, health impacts.

Seminar in Cultural Ecology. 4 Hours. Same as Anth 453. Cultural ecology and cultural evolution, emphasizing peasant farming and other subsistence systems. Soil management under shifting and sedentary agriculture. Prerequisite: Anth 101 or Geog 151 or consent of the instructor.

Quantitative Methods. 4 Hours. Same as Anth 455. 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. Extensive computer use required. Prerequisite: Consent of the instructor.

Location and Land Use. 4 Hours. Environmental, demographic, and institutional influences on land availability/use at global/local scales; geographies of production/use intensity; market/ governmental controls over land/users. Prerequisite: Geog 361 or consent of the instructor.

Geographic Modeling of Transportation Systems. 4 Hours. Discussions of the principles of spatial interaction, emphasizing passenger movements, commodity flows, the
practicality of network analysis, and the impact of transportation facilities on land use and regional development. Prerequisites: Geog 100 and 161.

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

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

475. Thematic Cartography. 4 Hours. Discussion and projects involving representation of real-world areal patterns; preservation of geodetic, locational and informational relationships; information generalization and reconstruction; computer software, and programs for computer-assisted cartography. Prerequisite: Geog 276 or 278 or consent of the instructor.


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

481. Geographic Information Systems I. 4 Hours. Same as Anth 481. Components and performance properties of geographic information systems. Geographic hierarchies and data structures. Problems and solutions in handling large geographic files. Geocoding. Prerequisites: Geog 100 and one from Geog 278 or 386 or IDS 100, or consent of the instructor.

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

483. Geographic Information Systems III. 4 Hours. Same as Anth 483. Problems encountered in the analysis and portrayal of geographic data. Topics include taxonomy, regionalization, trend surface analysis, time series, markov probabilities, and computer cartographic procedures for displaying output from analytic procedures. Prerequisite: Geog 482 or Anth 482 or consent of the instructor.

484. Qualitative Methods in Geographic Research. 4 Hours. Use of qualitative methods in geographic research. Research design choices, data collection and analysis, writing. Applications in environmental and urban geography. Prerequisite: Geography major or minor or Geog 481 or consent of the instructor.

486. Analysis of Geographic Patterns. 4 Hours. Analytical methods for evaluating arrangements of points, lines and subareas across regions. Development of noncentral measures of spatial association as an alternative to correlation analysis. Prerequisite: Geog 482 or consent of the instructor.

491. History and Philosophy of Geography. 4 Hours. The philosophy of geography, its theory and research techniques. Analysis of bibliographic sources; criticism of papers on assigned topics. Prerequisite: Declared major or minor in geography or consent of the instructor.

496. Internship. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as Anth 496. Professional field experience with an agency or organization in the private or public sector on projects related to the student’s area of specialization. Prerequisites: Full graduate standing in anthropology or geography and consent of faculty adviser, head of department, or the director of internship programs.

505. Seminar on the Geography of Colonialism and Neocolonialism. 3 Hours. May be repeated for a maximum of 6 hours of credit. Colonialism: historical, political and development geographies. Colonialism in the evolution of Europe and the Third World. Anti-colonial liberation movements. Theories of neocolonialism, underdevelopment, dependency. Prerequisite: Geog 353 or 401 or consent of the instructor.

511. Topics in Urban Geography. 3 Hours. May be repeated for a maximum of 9 hours of credit. Critical analysis of selected theories, methods and problems of urban and settlement geography. Prerequisite: One 400-level course in urban, economic, or transportation geography.

530. Seminar in Physical Geography. 3 Hours. May be repeated for a maximum of 6 hours of credit. General topic to be defined by instructor; specific approved topic to be defined, researched and discussed by student. Prerequisite: Geog 431 or 421 or consent of the instructor.

541. Seminar on Resource Management and Policy. 3 Hours. May be repeated for a maximum of 6 hours of credit. Social policy issues in the resolution of resource management conflicts. Topics will vary. Prerequisite: Geog 441 or 461 or consent of the instructor.

551. Research Seminar on the Ecology of Mapping Behavior. 4 Hours. Mapping behavior examined cross-culturally, historically, and developmentally. Ecological functions of mapping in macro-spatial behavior. Prerequisite: Consent of the instructor.

575. Seminar in Cartography. 3 Hours. May be repeated for a maximum of 6 hours of credit. Review of recent developments in computer mapping and identification of mapping needs. Research on conceptual and program solutions to computer mapping problems. Prerequisites: Geog 475 and Geog 481; or consent of the instructor.

589. Geographic Information Systems for Planning. 4 Hours. Same as UPP 508. Applications of Geographic Information Systems to urban planning and policy making. Prerequisite: Graduate standing in urban planning and policy or consent of the instructor.

592. Research Proposal Design. 1 Hour. Research techniques, including problem definition, literature search, and methodological design. Prerequisite: Geog 595.

595. Departmental Seminar. 3 Hours. S/U grade only. Review of contemporary geographic theory in academic research and professional practice. Prerequisite: Graduate standing in geography.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Independent research on approved topic not related to thesis preparation. Prerequisite: Consent of the faculty advisor and the instructor.

598. Master’s Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 16 hours of credit. Independent research on a topic approved for a graduate thesis. Prerequisite: Consent of the thesis research advisor.

Germanic Studies (Ger)

400. German for Reading Knowledge. 4 Hours. Credit may not be applied toward a degree or minor offered by the Department of Germanic Studies. Does not satisfy the graduation requirement in foreign languages. Preparation for the Graduate Proficiency Exam. Basic components of German grammar, sentence structure, and vocabulary. Selected texts in humanities, social sciences, and natural sciences.

401. Advanced Practice in German Language Skills. 4 Hours. Majors and minors outside the Department of Germanic Studies may repeat this course for a maximum of 6 hours of credit. Communicative use of German techniques for understanding written and spoken texts, practicing conversation and writing texts such as essays, compositions, letters, and email. Area: language. Prerequisite: Ger 212 or the equivalent. Recommended background: Credit or concurrent registration in Ger 310.

404. Yiddish for Reading Knowledge. 4 Hours. Basic components of Yiddish grammar, sentence structure, and vocabulary. Selected texts in the original language will be studied. Preparation for the Graduate Proficiency Exam. Prerequisite: Ger 211 or consent of the instructor or graduate standing.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
407. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours. This course focuses on theory and practice of communicative language teaching and explores current approaches of task-based instruction, testing, and media-enhanced instruction. Taught in English. Pedagogical examples are in German. Ten hours of high school observation required. Area: language. Prerequisite: Ger 212 or the equivalent.

408. Introduction to Translation Theory. 4 Hours. The study of translation theory and its application to translating German texts of various types into English. Appropriate for students who want to become translators. Area: language.

411. The City as Cultural Focus. 4 Hours. May be repeated for a maximum of 8 hours of credit. Taught in English. No knowledge of German required. Students who intend to use Ger 411 toward a degree offered by the Department of Germanic Studies will do assignments in German. Interdisciplinary study of urban culture with focus on German-speaking countries. Area: literature/culture. Prerequisites: For majors and minors in the Department of Germanic Studies only: Ger 212 or the equivalent; or consent of the instructor.

420. Germanic Cultural Studies I: Genres. 4 Hours. May be repeated for a maximum of 12 hours of credit if topics vary. Concentration on a genre, with stress on cultural analysis and theoretical inquiry. Students who intend to use Ger 420 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

421. Germanic Cultural Studies II: Authors, Movements, Periods. 4 Hours. May be repeated for a maximum of 12 hours of credit if topics vary. Critical analysis of texts in the biographical, social, cultural, and historical context. Students who intend to use Ger 421 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

422. Germanic Cultural Studies III: Themes. 4 Hours. May be repeated for a maximum of 12 hours of credit if topics vary. Explores themes in German-speaking societies, such as the family, xenophobia, crime, and science, with stress on literary analysis and interpretation. Students who intend to use Ger 422 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

430. Classical German Philosophy. 4 Hours. Introduction to German philosophy and intellectual history through the critical analysis of major authors and texts. Prerequisite: one 300-level course in Germanic Studies or consent of the instructor.

437. Contemporary Germanic Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit if topics vary. Literature of the German-speaking world since World War II, with emphasis on current issues and recent critical approaches to literature. Area: literature/culture.

438. The Faust Legend. 4 Hours. Discusses Goethe’s Faust within the context of European and non-European literatures. Traces the origins, significance, and interpretation of the Faust figure. Area: literature/culture.

439. Gender and Cultural Production. 4 Hours. Same as GWS 439. May be repeated for a maximum of 8 hours of credit if topics vary. Issues of gender representation and gender politics examined through the use of theoretical texts or through the study of women authors. Taught in English. Students who intend to use Ger 439 toward a degree offered by the Department of Germanic Studies will do assignments in German. Area: literature/culture. Prerequisite: Ger 212; or consent of the instructor.

448. Foundations of Second Language Teaching. 4 Hours. Same as Fr 448 and Span 448. 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. Taught in English. Prerequisites: Three courses at the 200- and 300-levels; and consent of the instructor.

449. Teaching Second Language Literacy and Cultural Awareness. 4 Hours. Same as Fr 449 and Span 449. 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. Taught in English. Prerequisite: Consent of the instructor.

450. Business Operations in German-Speaking Countries. 4 Hours. The political, cultural, historical, and economic environment in which business operates in the German-speaking countries; the effects of this environment on international business. Knowledge of German not required.

461. German Abroad. 0 to 17 Hours. May be repeated for a maximum of 34 hours of credit. Taken in a German-speaking country. Lectures, seminars, and practical work in German language, literature, and civilization. Prerequisites: Ger 104 or the equivalent; a 2.75 overall grade point average and a 3.00 grade point average in German; and approval of the department.

470. Exploring the Field of Germanic Studies. 4 Hours. Team-taught. Research in film studies, gender studies, Jewish culture, minorities, literary studies, intellectual history, applied linguistics in Germanic Studies. Each unit taught by different faculty member from Department of Germanic Studies.

480. Hegel Studies. 4 Hours. This course may be repeated for credit if the topics vary. 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). Taught in English. Area: literature/culture. Prerequisite: Ger 430 or consent of the instructor. Recommended background: Phil 224 or 425.

492. Internship in International Business. 0 to 12 Hours. May be repeated for credit with approval of the department. S/U grade only. Student placement in an international organization or firm in a German-speaking country or its U.S. subsidiary or division. Prerequisites: Ger 211; and a GPA of 2.00; and consent of the instructor; concurrent registration in Ger 493 or registration in Ger 493 the semester immediately following.

493. Internship Seminar: Business. 1 to 4 Hours. May be repeated for credit with approval of the department. A maximum of 4 hours of credit may be applied toward a graduate degree offered by the Department of Germanic Studies. Academic component of the internship experience. Studies in the field of the internship and further investigation of related topics. Prerequisite: Ger 211; and credit or concurrent registration in Ger 492; and a GPA of 2.00; and consent of the instructor.

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

495. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Ger 494, and approval of the department.

513. Germanic Culture from the Enlightenment to the 1848 Revolution. 4 Hours. May be repeated for credit if topics vary. Representative works and authors studied in a cultural context.

514. Germanic Culture from the Industrial Revolution to the Present. 4 Hours. May be repeated for credit if topics vary. Representative works and authors studied in a cultural context.

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 as cultural contexts, as well as to their function as components of modern social institutions. Taught in English. Students will be asked to watch films outside of class.

531. Seminar in Special Topics. 4 Hours. May be repeated for a maximum of 12 hours of credit if topics vary. In-depth study of a theme, genre or other element in Germanic literature and culture not confined to a single historical period. Topics vary.
Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.

572. The Role of Reading in Second Language Acquisition. 4 Hours. This course analyzes current theoretical and research directions in text comprehension processes as well as reading as a source of input for second language acquisition. Taught in English.

593. Internship Seminar: Academic Training. 4 Hours. Training in instruction of literature and culture courses at the college level. Students will be involved in a faculty-taught culture/literature course.

596. Independent Study for Graduate Students. 1 to 4 Hours. Prerequisite: Consent of the instructor.

598. Master's Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research under faculty supervision on a topic approved by the Graduate Program Committee. Prerequisites: Consent of the supervising faculty member and committee approval.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research for the Ph.D. Prerequisites: Departmental approval and consent of the instructor.

Graduate College (GC)

401. Scientific Integrity and Responsible Research. 0 Hours. S/U grade only. Meets during the first seven weeks of the term on the west side of campus, and on the east side of campus during the last seven weeks. Designed to meet NIH requirements for formal training in the responsible conduct of research. Ethical and legal issues in the conduct of research; University of Illinois at Chicago research standards, regulations, and procedures.

470. Essentials for Animal Research. 1 Hour. S/U grade only. This course will acquaint the students with the regulations, sources of information, humane principles and ethical considerations involving the appropriate use of animals for research and teaching purposes.

471. Experimental Animal Techniques. 2 Hours. Animals used in instruction. S/U grade only. Noninvasive and invasive techniques commonly used in laboratory animals are performed with emphasis placed upon the proper use of anesthetic, analgesics and aseptic techniques. Prerequisite: GC 470.

473. Seminar in Comparative Medicine. 1 to 2 Hours. S/U grade only. Selected fields of interest and research in comparative medicine will be presented in the areas of comparative biology, model development and experimental techniques. Prerequisite: GC 471 or consent of the instructor.

491. Graduate Study Abroad. 0 to 16 Hours. May be repeated for a maximum of 12 hours of credit. Lectures, seminars, and independent travel/study abroad in conjunction with an approved graduate program. Prerequisites: Approval of the Graduate College.

Graduate College—Life Sciences (GCLS)

501. Biochemistry. 3 Hours. This course covers 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. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering 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. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor.

503. Cell Biology and Integrative Physiology. 4 Hours. Students cannot obtain credit for both this course and Bche 561 or Phyb/Anat/Milm 855. 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. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor.

504. Research Methods I. 1 Hour. May be repeated for credit. Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor.

505. Research Methods II. 2 Hours. May be repeated for credit. Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor.

506. GEMS Research Rotation. 2 to 5 Hours. May be repeated for credit. S/U grade only. Research rotation course in which first year students from the GEMS program will undertake research projects in laboratories affiliated with this program. Animals used in instruction. Prerequisites: Open only to Ph.D. degree students.

510. Integrative Biology. 3 Hours. This is an advanced level, intensive course addressing fundamental topics of developmental biology, immunology, and cancer biology, with concentration on thematic issues that integrate these subjects. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor. Prerequisites: Satisfactory completion of GCLS 501, 502, and 503; or demonstrated proficiency in the material covered in those courses.

511. Molecular Genetics. 3 Hours. This is a 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. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor. Prerequisites: Satisfactory completion of GCLS 501, 502 and 503; or demonstrated proficiency in the material covered in these courses.

515. Receptor Pharmacology and Cell Signaling. 3 Hours. No credit given if the student has credit in Pcol 505 or Phyb 505. An advanced course on cell-surface and nuclear receptors and mechanisms of signaling through receptors. The course provides an overview of receptor theory, hands-on data analysis and lectures and discussions on various signaling mechanisms. Registration restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Biomedical Engineering or Biological Sciences; or consent of the instructor. Prerequisites: Satisfactory completion of GCLS 501, 502 and 503; or demonstrated proficiency in the material covered in these courses.

Health Policy and Administration (HPA)

400. Principles of Management in Public Health. 3 Hours. A detailed discussion of the conceptual and theoretical foundations to the principles of management with an emphasis on public health and health care settings. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by consent as space permits. To obtain consent, see the SPH registrar.

401. Behavioral Sciences in Public Health. 2 Hours. Provides grounding in the behavioral sciences with applications to public health. Examines individual, institutional, and societal responses to the psychosocial factors influencing health and illness. Prerequisite: Enrollment restricted to public health students; other graduate and professional students admitted by the consent of the SPH registrar as space permits.

402. Social Ethics and Public Health. 3 Hours. Applications of ideas from philosophy, law, political science and economics to analyze the ethical basis of public health policies and programs.

403. U.S. Health Care System. 3 Hours. Overview of the U.S. 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. Same as CHSc 405. Utilizing public health core functions, this course explores leadership style and practice through case studies and techniques which enhance leadership development. Prerequisites: CHSc 400 and consent of the instructor.

417. Quality Management in Health Services. 2 Hours. Surveys development of quality management in health services, and theoretical basics and diverse perspectives of quality management and regulation. Presents relevant research and management methodologies. Prerequisites: HPA 400 and CHSc 400.

429. Introduction to Health Services Research. 2 Hours. Introduction to health services research using classic studies and current topics which examine access, cost, quality, and organization of health care. Prerequisite: HPA 400.

430. Introduction to Public Health Policy Analysis. 3 Hours. Identifies and discusses health status as a function of public policy; policymaking to improve the public's health; current health policy topics and methodology.

431. Law and Public Health. 3 Hours. Surveys basic concepts and content in major areas of health law; explains the sources of legal authority; and develops familiarity with legal language and thinking.

432. Public Health Advocacy. 3 Hours. Examination of the courts, government agencies, legislatures and public opinion and an analysis of their decision making; planning an advocacy campaign using strategic analysis.

437. Health Care Data. 3 Hours. Same as BHIS 437. Review of fundamentals constituting a health care information system. How data is transformed into information and then again transformed into knowledge through integrated computer systems.

444. Health Care Budgeting and Strategic Planning. 3 Hours. Budgeting systems in healthcare; budgeting techniques, flexible budgeting, cost behavior and forecasting, revenue and expense analysis; strategic planning in healthcare agencies; continuous quality improvement.

463. Managerial Health Economics. 3 Hours. Uses managerial economics to study the health care system: demand for medical services; role of health insurance; productivity/cost measurement; labor markets and competition. Prerequisite: HPA 400 or consent of the instructor.

465. Health Information and Decision Support Systems. 4 Hours. Introduction to computer assisted management information and decision systems in health organizations: analysis and design of databases; data and information flow; reports; and uses microcomputers. This is an on-line course.

494. Introductory Special Topics in Health Policy and Administration. 1 to 4 Hours. Introductory topics in health administration, policy analysis, health care financing, cost-effectiveness evaluation. Topics vary by semesters.

510. Health Care Information Systems I. 4 Hours. Same as BHIS 510. Examination, through case studies, discussion, and problem-based learning of current information technologies and systems currently in place and on the horizon, in health care organizations and in health science libraries. Taught only on-line. A UIC netid is required. Prerequisite: Consent of the instructor.

511. Organization Theory Applied to Health Programs. 3 Hours. Classical and modern organization theories applied to health programs. Includes organization structure and goals, management functions and processes, and managerial controls and evaluation. Prerequisite: HPA 400 or consent of the instructor.

516. Health Personnel Management. 3 Hours. Health personnel policies and programs, human resources requirements, recruitment, development, performance appraisal, salary and wage administration, and management/labor relations in the health industry. Prerequisites: HPA 400 and consent of the instructor.

520. Management of Health Care Communication Systems. 4 Hours. Same as BHIS 515. Examination and management of data communications in and between health care facilities including examination of issues, standards, technologies, and system configurations. Taught only on-line. A UIC netid is required. Prerequisite: HPA 510 or BHIS 510 or 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: Bstt 401, and HPA 400 or consent of the instructor.

524. Case Management and Managed Care: Theory and Practice. 3 Hours. Case management as a public health and managed care intervention is applied to such problems as chronic diseases, mental illness, AIDS, and maternal and child health.

527. Critical Issues in Long Term Care Policy. 3 Hours. Same as CHSc 527. Long-term care organization, financing, delivery utilization and policy, emphasizing affordability, access and quality in a managed care environment. Prerequisites: CHSc 400 and 425 or consent of the instructor.

529. Multidisciplinary Research Methods in Clinical Practice I. 2 Hours. Overview of research methods used in surveys and the study of outcomes in clinical practice. Includes developing a research proposal in a clinical setting. Prerequisites: Graduate standing in the School of Public Health and HPA 400, Epid 400, and Bstt 400; or consent of the instructor.

530. Public Health and the Political Process. 3 Hours. Analyzes theoretical basis of political action in public health and the potential justifications for public health regulations and policies. Prerequisite: HPA 402, 430, 431, or 432, or consent of the instructor.

531. Health Information Systems Analysis and Design. 4 Hours. Same as BHIS 520. A project course applying systems analysis and design theory to health care systems evaluation, modeling and implementation. Taught only on-line. A UIC netid is required. Prerequisite: HPA 510 or consent of the instructor.

540. Social and Organizational Issues in Health Informatics. 4 Hours. Same as BHIS 525. Examines the impact of information systems on the health care organization and applies theory through case study analysis. Taught only on-line. A UIC netid is required. Prerequisites: BHIS 510 or HPA 510; and BHIS 515 or HPA 520 or BHIS 520 or HPA 531 or BHIS 530 or HPA 550; or consent of the instructor.

543. Advanced Health Economics. 4 Hours. Same as Econ 555. Topics in the supply and demand for health services; the role of insurance in the medical care industry; public policy issues of cost and quality regulation. Prerequisite: Econ 501 or 520 or consent of the instructor.

550. Topics in Health Informatics. 4 Hours. Same as BHIS 530. The study of advanced topics in various areas of health informatics. Taught only on-line. A UIC netid is required. Prerequisites: HPA 510 or BHIS 510; and HPA 520 or BHIS 515 or HPA 531 or BHIS 520 or HPA 540 or BHIS 525; or consent of the instructor.

551. Marketing Health Programs. 3 Hours. Concepts of marketing as a management tool; application of marketing to health care: the marketing process, marketing resources, and strategies for accomplishing marketing objectives. Prerequisite: HPA 400 or Mktg 563 or consent of the instructor.

554. Measuring and Improving Quality in Healthcare. 3 Hours. Provides theoretical and practical examination of the key measurement methods currently in use in the quality management field. Focus is on skills development in quality improvement methods. Prerequisites: Bstt 400, Epid 400, and HPA 417; or consent of the instructor.

555. National Health Assurance. 2 Hours. An examination of American society, its effect on the evolution of U.S. health care system, efforts/proposals to reform it, and predictions for the future. Prerequisite: HPA 403 and consent of the instructor.

556. U.S. Mental Health Policy. 2 Hours. Public policies which have supported the U.S. mental health service system from 1946 to the present. Theory, development, and evaluation of mental health policy in the US. Prerequisites: HPA 400 and HPA 450; and either Epid 400 or Bstt 400.

557. Measurement in Health Services Research. 3 Hours. Presents measurement, reliability and validity theory and assessment using correlation, internal consistency, factor analysis and others. Application in developing, analyzing and reporting behavioral
and/or organizational measures. Prerequisites: Bstt 400 and 401; or consent of the instructor.

558. Behavioral Measures in Public Health. 3 Hours. Examination of methodology, statistical analyses and reporting of behavioral measures used in public health. Criteria given for measurement selection, sources of information and psychometric descriptions. Prerequisites: Bstt 400 and 401; or consent of the instructor.

559. U.S. Mental Health Services Research. 2 Hours. The development, conduct, and evaluation of mental health programs in the U.S. from 1946 to the present. Program theory and evaluative research on the spectrum of services. Prerequisites: HPA 400 and 430; and either Epid 400 or Bstt 400.

563. Web-Based Public Health Information Systems. 3 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 on-line course. Prerequisites: HPA 465; consent of the instructor is mandatory. Unless otherwise permitted, restricted to students in public health informatics track.

564. Geographic Information System Application in Public Health. 4 Hours. Examination of GIS applications in Public Health and the process of designing a GIS-based public health investigation. This is an on-line course. Prerequisites: Bstt 400 and HPA 465; and consent of the instructor.

565. Datamining Applications in Public Health. 3 Hours. This course presents the key public health information system sources, describes the process of datamining and introduces the student to a sample of datamining techniques. Extensive computer use required. Prerequisite: Bstt 400.

571. Measuring Performance and Improving Quality in Public Health. 3 Hours. Explores the need and the use of tools to measure performance and reengineer systems in public health and in health care. Prerequisite(s): HPA 400 and CHSc 400; or consent of the instructor.

594. Advanced Special Topics in Health Policy and Administration. 1 to 4 hours. Advanced topics in health administration, policy analysis, health care financing, cost-effectiveness evaluation. Topics vary by semester. Prerequisite: Consent of the instructor.

History (Hist)

400. Topics in Ancient History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

401. Topics in Greek History. 4 Hours. Same as CI 401. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

402. Topics in Roman History. 4 Hours. Same as CI 402. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or classics.

404. Roman Law and the Civil Law Tradition. 4 Hours. Same as CI 404 and CJ 404. Roman law and its relationship to values and social structure; social analysis through law; continental law tradition. Prerequisite: CJ 200 or CI 203 or Hist 203 or consent of the instructor.

406. Topics in Medieval History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisites: 3 hours of history or consent of the instructor.

409. Topics in Early Modern European History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

410. Topics in Modern European History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

411. Topics in Modern European History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

420. Teaching the Social Sciences. 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. Prerequisites: 9 hours of credit in the social sciences and approval of the instructor.

421. Topics in British and Irish History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 6 hours of history or consent of the instructor.

424. Topics in French History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: One 200-level course in French or European history or consent of the instructor.

429. Topics in Italian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

433. Topics in Eastern European History. 4 Hours. Same as Slav 433. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

435. Topics in Russian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

441. Topics in African History. 4 Hours. Same as AASit 441. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of African history, African-American studies, or consent of the instructor.

451. Topics in Colonial American History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of U.S. history or consent of the instructor.

452. Topics in Revolutionary and Early National United States History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

453. Topics in Nineteenth-Century United States History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

454. Topics in Twentieth-Century United States History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of U.S. history or consent of the instructor.

455. Topics in Southern History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

456. Topics in the History of Communications. 4 Hours. Same as Comm 456. This course introduces students to major developments in the history of communications, with a focus on the political and cultural dimension of technologies. Prerequisite: Consent of the instructor. Recommended background: At least one history course at 100 level.

461. Topics in Latin American History. 4 Hours. Same as LALS 461. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history, Latin American and Latino Studies, or consent of the instructor.

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

473. Topics in East Asian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Same as AsSt 473. Specific topics are announced each term. Prerequisite: 3 hours of East Asian history or consent of the instructor.

474. History and Archives. 4 Hours. Same as GWS 474. Introduction to archival preservation and management. Under faculty supervision, students will create a records management plan for an organization to preserve documents of historical importance. Includes internship at an external agency. Prerequisite: 3 hours of history or consent of the instructor.

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

476. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Hist 475, and approval of the department.

477. Topics in Middle Eastern History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

478. Women in Chinese History. 4 Hours. Same as AsSt 478 and GWS 478. Focuses on scholarship on women in Chinese society throughout history, dealing with topics such as marriage and family, literacy, career options, women in revolution and the historiography of the field.

479. Culture and Colonialism in South Asia. 4 Hours. Same as Anth 479 and AsSt 479. Examines the emergence of colonial cultures of domination and resistance on the Indian subcontinent from the 18th century to 1947.

480. Topics in Economic History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

481. Topics in Social History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

482. Topics in Migration History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

483. Topics in the History of Public Policy. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

484. Topics in the History of Women. 4 Hours. Same as GWS 484. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or gender and women’s studies or consent of the instructor.

485. Topics in African-American History. 4 Hours. Same as AASt 481. May be repeated for credit. Students may register for more than one section per term if topic is different for each registration. African-American history for students with significant background in the field. Topics vary. Prerequisite: Hist 104 or 247 or 248 or consent of the instructor.

486. Topics in the History of Science. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours in history.

487. Topics in the History of Sexuality. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours in history or consent of the instructor.

488. Topics in Urban History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Prerequisite: 3 hours of history.

489. Topics in Military History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

490. Topics in Diplomatic History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Prerequisite: 3 hours of history.

491. Topics in Constitutional History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

492. Topics in Intellectual History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

493. Topics in Historiography. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

494. Topics in Political History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history.

495. Topics in Religious History. 4 Hours. Same as RelS 495. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

496. Topics in Race, Ethnic and Minority History. 4 Hours. Same as AASt 496. May be repeated for credit. Specific
topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

497. Topics in Cultural History. 4 Hours. May be repeated for credit. Specific topics are announced each term. Students may register for more than one section per term. Prerequisite: 3 hours of history or consent of the instructor.

498. Topics in Quantitative Methods. 4 Hours. May be repeated for credit. Specific topics are announced each term. Students may register for more than one section per term. Prerequisite: 3 hours of history or consent of the instructor.

500. Colloquium on the Teaching of History. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

501. Introduction to Graduate Study in History. 4 Hours. Required for graduate students in the M.A. and Ph.D. in History programs. Introduction to history as a discipline and profession. Approach is comparative and by topic. Prerequisite: Graduate standing in history.

502. Seminar on Ancient History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

507. Colloquium on Medieval History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Topics on themes of medieval history. Specific topics are announced each term.

508. Seminar on Medieval History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

511. Colloquium on European History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

512. Seminar on European History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

521. Colloquium on British History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

522. Seminar on British History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

531. Colloquium on Russian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

532. Seminar on Russian History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

541. Colloquium on African History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Readings on select topics in African history.

542. Seminar on African History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

551. Colloquium on American History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

552. Seminar on American History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

561. Colloquium on Latin American History. 4 Hours. Same as LALS 561. May be repeated for credit. Students may register for more than one section per term. Topics on themes in Latin American History. Specific topics are announced each term.

562. Seminar on Latin American History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Research in topics. Prerequisite: Consent of the instructor.

580. Chicago Consortium in Ancient History. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. Holding course for graduate students taking approved coursework at other universities through the Chicago Consortium in Ancient History. Prerequisite: Approval of the director of graduate studies and admission to a graduate program.

591. Preliminary Examination and Dissertation Prospectus Preparation. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. S/U grade only. Under the supervision of a faculty mentor, the student will prepare for the preliminary examination and prepare the dissertation prospectus required by the department. Prerequisite: Approval of the Department or completion of all didactic course work in the Ph.D. in History program.

592. Colloquium on Approaches to History. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading in topics. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Prerequisite: Preliminary examination.

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 and cancer, and pediatrics). Prerequisite: HN 320 or consent of the instructor.

421. Clinical Practice II. 4 Hours. S/U grade only. Practical experiences in the nutritional management and support of selected disease processes such as cancer, gastrointestinal and hypermetabolic states. Prerequisites: 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. Prerequisites: HN 309 and HN 420; or consent of the instructor.

423. Clinical Practice III. 5 Hours. S/U grade only. Clinical practicum which focuses on the nutritional management of critically ill patients or specialized patient populations (renal and pediatric patients). Prerequisites: HN 421; and credit or concurrent registration in HN 422; or consent of the instructor.

450. Professional Practice. 6 Hours. S/U grade only. Extended practicum which integrates acquired skills, knowledge, and attitudes in dietetics. Special emphasis on current dietetic issues facing the health care professional. Prerequisite: HN 423 or consent of the instructor.

480. Field Study. 2 Hours. Provides practical experience to develop/strengthen the student’s knowledge and skills in an area of nutrition practice. Prerequisite: HN 410 or consent of the instructor.

510. Nutrition-Physiological Aspects. 3 Hours. A thorough discussion of the absorption, transport, and metabolism of macronutrients, plus factors affecting these processes. Treats in an integrated fashion how various organs participate. Prerequisites: HN 410 and PhyB 341 or the equivalent, or consent of the instructor.

514. Vitamins in Human Nutrition. 2 Hours. Clinical aspects of vitamin requirements and metabolism in human nutrition; bioavailability, nutrient interactions and interrelationships of vitamins with various disease states. Prerequisite: HN 410 or consent of the instructor.

515. Minerals in Human Nutrition. 2 Hours. Clinical aspects of essential mineral requirements and metabolism in human nutrition; bioavailability, nutrient interactions and trace and ultratrace elements. Prerequisite: HN 410 or consent of the instructor.

520. Maternal Nutrition and Early Development. 2 Hours. Physiological and biochemical basis of human requirements for nutrients during pregnancy, factors affecting nutritional management of normal pregnancy and lactation, and special
conditions during pregnancy. Prerequisite: HN 410 or consent of the instructor.

522. Advances in Pediatric Nutrition. 2 Hours. An overview of normal pediatric nutrition and in-depth nutrition for various problems and diseases of children. Prerequisite: HN 410 or consent of the instructor.

525. Nutrition and Aging. 2 Hours. Factors affecting the human requirements for nutrients during aging, emphasizing the physiological and biochemical changes related to the nutritional needs of the elderly. Prerequisite: HN 410 or consent of the instructor.

530. Research Methods in Human Nutrition. 3 Hours. Research designs in human nutrition; conceptual issues in clinical and population studies; problems in collection and analysis of dietary, behavioral, and self-reported data. Prerequisite: AHS 510 or consent of the instructor.

532. Evaluation of Nutritional Status. 3 Hours. Community and clinical considerations in nutrition status surveillance and monitoring systems; characterization in the collection, standards and reference population development. Prerequisite: HN 410 or consent of the instructor.

535. Nutrition and Human Performance. 2 Hours. Same as MvSc 535. Nutrition which impacts on human performance; impaired performance due to nutritional problems; aspects relevant to the professional athlete. Prerequisites: HN 410 and either PhyB 341 or MvSc 532, or consent of the instructor.

541. Research on Clinical Nutrition Problems. 2 Hours. Development and conduct of research on clinical nutrition problems, patient outcomes, or nutrition or food service delivery systems within a hospital or ambulatory care setting. Prerequisite: Consent of the instructor.

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. Prerequisites: HN 200 and BStt 400 and BStt 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: HN 422 or consent of the instructor.

580. Advanced Field Practicum. 2 Hours. Advanced practice experience in a specialized area of human nutrition and dietetics. The practicum may be carried out in a clinical setting, business, industry or government agency. Prerequisite: HN 410 or consent of the instructor.

581. Dietetics/Nutrition Instructional Practicum. 2 Hours. Teaching practicum in clinical dietetics and/or nutrition. Prerequisites: HN 410 and 570 and 201 or the equivalent, or consent of the instructor.

594. Special Topics in Human Nutrition. 1 to 4 Hours. May be repeated for credit. Advanced course dealing with selected topics. Topics vary from year to year and may include drug/nutrient interaction, protein metabolism, nutrition and behavior, nutrition and exercise. Prerequisite: HN 410 or consent of the instructor.

595. Seminar in Human Nutrition. 1 Hour. May be repeated for credit with the approval of the department. S/U grade only. Topics of current interest in human nutrition. Includes discussions of current journal articles and important new developments in the specific disciplines. Prerequisite: HN 410 or consent of the instructor.

596. Independent Study in Human Nutrition. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Study in selected areas of human nutrition is carried out under the direction of a faculty member. Modes of investigation are determined by the nature of the problem selected. Prerequisites: Admission to the HN graduate program and consent of the instructor.

597. Project Research. 1 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to pursue a project other than thesis research. Prerequisite: Consent of the instructor.

598. Research in Human Nutrition. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent research in one area of human nutrition. Prerequisite: Consent of the instructor.

599. Ph. D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent dissertation research by the student, under the guidance of the advisor. Prerequisite: Consent of the faculty advisor.

Industrial Engineering (IE)

412. Dynamic Systems Analysis I. 4 Hours. Same as ME 412. Classical control theory, concept of feedback, laplace transform, transfer functions, control system characteristics, root locus, frequency response, compensator design. Prerequisite: ME 308.

446. Quality Control and Reliability. 4 Hours. Principles of statistical quality control including control by variable and by attribute, construction and use of control charts for variables, fraction defectives and number of defects and use of standard plans, reliability and life cycle testing. Prerequisite: IE 342.

461. Safety Engineering. 4 Hours. Accident losses; standards and codes; hazards control; accident investigations; mechanical injuries; heat, pressure, and electrical hazards; fires and explosions; toxic materials and radiation; vibration and noise; course project. Prerequisite: IE 342.

463. Plant Layout and Materials Handling. 4 Hours. Facilities design functions, computer-aided plant layout, facility location, warehouse layout Minimax location, deterministic and probabilistic conveyor models. Prerequisite: IE 471.

464. Virtual Automation. 4 Hours. Same as ME 464. Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing; industrial robots and automated factory models within virtual environments. Prerequisites: IE 201; and CS 107 or 108.

465. Manufacturing Information Systems. 4 Hours. Design and implementation of supervisory control and data acquisition systems; manufacturing systems controller and communication networks. Prerequisites: Consent of the instructor; and familiarity with computer programming.

466. Production Planning and Inventory Control. 4 Hours. Principles of demand forecasting, production planning, master scheduling, critical path scheduling, job sequencing, design and control of deterministic and stochastic inventory systems, material requirement planning. Prerequisites: IE 345 and 471.


468. Virtual Manufacturing. 4 Hours. Same as ME 468. Virtual reality applications in manufacturing systems design, manufacturing applications of networked virtual reality, virtual reality modeling of occupational safety engineering. Prerequisite: CS 107 or 108.

471. Operations Research I. 4 Hours. IE graduate students cannot take this course for credit. Introduction to operations research, formulation of linear programming problems, simplex methods, duality theory, sensitivity analysis, network models, and integer linear programming. Prerequisite: Math 210.


494. Special Topics in Industrial Engineering. 4 Hours. May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

542. Advanced Computational Methods for Product and Process Design. 4 Hours. Same as ME 542.
Deterministic and statistical methods for modeling and optimizing engineering systems, in the broad context of product design, manufacturing process development, and designing for life cycle issues. Prerequisite: Programming language experience.

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: 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: CS 102 or 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, experimental design. Prerequisite: IE 467.

569. Advanced Virtual Manufacturing. 4 Hours. Same as ME 569. Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. Prerequisite: Consent of the instructor.

571. Statistical Quality Control and Assurance. 4 Hours. Same as IDS 571. The importance of quality in products and services, quality surveillance, Deming’s management method, Ishikawa’s seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

575. 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: 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: IE 471 or the equivalent.

594. Current Topics in Industrial Engineering. 4 Hours. May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

595. Seminar on Industrial Engineering Research. 1 Hour. S/U grade only. Advances in industrial engineering research will be discussed in a seminar setting. Students will be expected to make presentations in various areas, as well as invited faculty speakers. Prerequisite: Graduate standing in industrial engineering.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Individual study under close supervision of a faculty member. Prerequisite: Consent of the instructor.

598. M.S. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual research in specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual research on specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

Information and Decision Sciences (IDS)

400. Advanced Business Programming Using Visual Tools. 4 Hours. Visual extended business language capabilities, including creating and using controls, menus and dialogues, objects and instances, mouse events, graphics, file-system controls. Prerequisite: IDS 201 or a programming course in mathematics or computer science, or consent of the instructor.

401. Business Data Structures and Operating Systems. 4 Hours. Data structures; file structures. Searching and sorting; algorithm design and analysis. Operating systems; process management; memory management; processor management; file systems; case studies; programming projects. Prerequisite: IDS 201.

405. Business Systems Analysis and Design. 4 Hours. Theory of analysis, design and development of information systems; information management and database management systems; data management and analysis; case studies in systems implementation and evaluation. Prerequisite: IDS 201.

406. Business Systems Design Project. 4 Hours. Selected issues in the design, development, and evaluation of computer-based business information systems: forms design, general software systems, users interfaces, research systems, quality control, and documentation standards. Includes a project at an outside company or University office. Prerequisites: IDS 201 and 405 or the equivalent courses; or consent of the instructor. Business Administration students must have declared a major.

410. Business Database Design. 4 Hours. Computer software techniques used in business with emphasis on information management and database management systems. Data management and analysis. Major types of database management systems, query languages. Prerequisite: IDS 201.

412. Distributed Business Systems. 4 Hours. Organizational aspects and underlying concepts of distributed business systems, decentralization versus centralization issues, costs of distributed computing, and performance evaluation measures. Prerequisites: IDS 400 or 401, and credit or concurrent registration in IDS 410; or consent of the instructor.

413. Internet Technology and Management. 3 Hours. No credit given if the student has credit in IDS 424. This course covers 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. Extensive computer use required. Prerequisites: IDS 400 and 410.

420. Business Systems Simulation. 4 Hours. Simulation analysis of the operations of a system from the perspective of the entire company; optimal decisions are generated for the controllers of the systems. Prerequisites: IDS 201 and IDS 355 and Math 205 or the equivalent courses.

422. Knowledge Management Systems. 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. Prerequisites: IDS 355 and IDS 410 or consent of the instructor.

435. Operations Research I. 4 Hours. Linear programming, simplex algorithm, duality, sensitivity analysis, convex programming, parametric programming. Transportation and assignment problems, goal programming. Prerequisites: IDS 355, and Math 205 or the equivalent. Business Administration students must have declared a major.

437. Operations Research II. 4 Hours. Markov chains, queuing theory, stochastic inventory control theory, dynamic programming. Prerequisites: IDS 355 and Math 205 or the equivalent. Business Administration students must have declared a major.

446. Decision Analysis. 4 Hours. Prior and posterior distributions, conjugate priors, value of information, applications to decision making in business. Prerequisite: IDS 371.

450. Advanced Operations Management. 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. Extensive computer use required. Prerequisite: IDS 355 or the equivalent. Business Administration students must have declared a major.

454. Introduction to Supply Chain Management. 4 Hours. Supply Chain Management is studied as an information-intensive, integrated system for managing material flows, logistics and inter-organizational partnership to deliver products and services. Prerequisite: IDS 450.
460. Survey Sampling: Theory and Methods. 4 Hours. Planning and analyzing surveys. Topics include simple random sampling, stratified sampling, systematic sampling, ratio estimation and cluster sampling. Case studies with applications to real situations are discussed. Prerequisite: IDS 371.

462. Statistical Software for Business Applications. 4 Hours. Statistical software in business applications and data mining. SAS and other packages such as SPSS, MATLAB, Maple, Splus, B34S, SCA. Prerequisite: IDS 371 or consent of the instructor.

470. Multivariate Analysis. 4 Hours. Introduction to the structure and analysis of multivariate data. Emphasis on the multivariate normal model. Regression; tests concerning multivariate means, classification; discriminant analysis, principal components. Prerequisites: IDS 371; and Math 205 or Math 310 or Math 320.

472. Statistical Methods for Information Systems & Data Mining. 4 Hours. No credit given if the student has credit in IDS 572. Updating statistical databases. Cluster analysis, logistic regression, classification and regression trees, neural networks, path analysis. Applications to marketing, quality assurance, operations management, human resources management. Prerequisite: IDS 371 or the equivalent.

474. Quality and Productivity Improvement Using Statistical Methods. 4 Hours. Directed experimentation for quality and productivity improvement, quality surveillance, design and analysis of two-level factorial experiments and multi-level experiments, data transformation. Prerequisite: IDS 371 or consent of the instructor.

475. Database Accounting Systems. 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. Extensive computer use required. Prerequisites: Actg 111 and IDS 100.

476. Business Forecasting Using Time Series Methods. 4 Hours. Same as Econ 450. Autoregressive, moving average, and seasonal models for time series analysis and business forecasting. Forecasting using multi-variable transfer function models is also included. Prerequisite: IDS 371 or Econ 445 or consent of the instructor.

478. Regression Analysis. 4 Hours. Data collection and exploration; model building; variable least squares; residual analysis; variable selection; multicollinearity; ridge regression; nonlinear regression; nonparametric regression. Prerequisite: IDS 371.

494. Topics in Information and Decision Sciences. 3 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Topics vary, selected readings, case analysis. Prerequisite: Consent of the instructor.

495. Competitive Strategy. 4 Hours. Multidisciplinary analysis of organizational strategy and policy using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

499. Independent Study in Information and Decision Support Systems. 3 to 4 Hours. May be repeated for a maximum of 9 hours of credit. Intensive study of selected topics determined in consultation with the instructor and department head. Prerequisites: Major in information and decision sciences and consent of the instructor.

500. Information Systems in Organization. 4 Hours. Use of information technology in business; planning, management, and strategic use of information technology including the role of enterprise-wide systems, the Internet, and electronic commerce. Prerequisite: Admission to the MBA Program.

504. Introduction to Electronic Commerce. 4 Hours. Addresses issues on electronic commerce for businesses and consumers, considering topics such as competition, distribution, infrastructure on the Internet, shopping, and product characteristics.

505. Business Information Systems Analysis and Design. 4 Hours. A student who has taken IDS 405 must see an advisor to determine whether another graduate course from IDS, Math, or Computer Science must be substituted for IDS 505. Analysis, design and development of information systems. Management concerns in systems design, development, and evaluation. Prerequisite: IDS 500; or consent of the instructor.

507. Advanced Systems Analysis and Design Project. 4 Hours. Principles and concepts of analysis, design and development of information systems including project management. Includes a project at an outside company or University office. Prerequisite: Consent of the instructor, and completion of three MS in MIS courses.

508. E-Commerce Project. 4 Hours. Electronic commerce project initiated by local small and medium enterprises, teaming students with technical or entrepreneurial skills/interests, supervised by faculty on board of directors. Prerequisites: IDS 504 or Mgmt/ Mktg 558; and consent of the instructor.

509. Business Object Programming and Design. 4 Hours. Principles and concepts of analysis, design and development of information systems using structured and object oriented methodologies, tools and techniques. Prerequisite: IDS 401.

510. Business Database Systems. 4 Hours. A student who has taken IDS 410 must see an advisor to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 510. Software technology as used in business, emphasizing information management and database systems. Data management, data analysis, major types of database systems, query languages, security, and control. Applications to business systems. Prerequisite: IDS 500.

511. Query Processing in Database Systems. 4 Hours. Same as CS 580. Query processing in deductive databases and in distributed/parallel databases systems. Prerequisite: CS 480.

513. Enterprise Components and Web Services. 4 Hours. This course 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: IDS 505 or IDS 510.

515. E-Business Strategy and Management. 4 hours. Examines how businesses can maximize the benefits attained from the Internet. Covers e-business transition, business-to-business models, digital business, e-business strategy formulation and implementation. Prerequisite: IDS 500 or 504 or 514.

516. Planning Models and Decision Support Systems. 4 hours. Analysis, design and development of decision support systems. Managerial and behavioral concerns in decision support system design, development and evaluation. Prerequisite: IDS 505 or IDS 510.

517. Enterprise Application Infrastructure. 4 Hours. The course explores the choices available for building an enterprise applications infrastructure. Topics such as advanced applications design, and development, tools, methodologies and technologies will be covered. Extensive computer use required. Prerequisites: IDS 201 or IDS 400; and IDS 401; and IDS 410 or the equivalent.

518. Electronic Marketing. 4 Hours. Same as Mktg 518. Overview of the electronic marketing value chain. Internet and web technologies, system design, payment systems, business requirements for e-marketing, design and ethical issues. Prerequisite: Mktg 500 or MBA 506 or consent of the instructor.

519. Topics in Information Systems. 4 Hours. May be repeated for credit if topics vary. Selected topics in information systems, information management and information technology. Content varies. Topics will be announced. Prerequisites: IDS 505 or IDS 510; and consent of the instructor.

520. Distributed Processing and Telecommunication Systems. 4 Hours. Topics include components of telecommunications and distributed information systems, data communication devices, computer networks, configuration management and distributed databases. Prerequisite: IDS 505 or IDS 510.

521. Advanced Database Management. 4 Hours. Data analysis for database design; logical data modeling, transaction
modeling; implementation models; physical database design; database tuning and performance evaluation; database decomposition; distributed database; database security. Prerequisite: IDS 505 or IDS 510.

523. Audit and Control of Information Systems. 4 Hours. Modeling and analysis of information systems application in organizations; measurement of effectiveness; strategies for implementation and updating; interface with other management control systems. Prerequisite: IDS 505 or 510.

525. Seminar in Information and Decision Sciences. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Topics vary from term to term depending on the interests of the instructor. Prerequisite: Admission to the PhD program in Business Administration or the PhD program in Management Information Systems.

526. Computer Performance Evaluation and Modeling. 4 Hours. A student who has taken IDS 426 must see an advisor to determine whether another graduate course from IDS, Mathematics, or CS must be substituted for IDS 526. Probabilistic, simulation and statistical techniques for modeling computer systems with a view to evaluating their performance. Models of multi-programming systems, multi-access systems input/output systems, priority queues, and paging systems. Prerequisites: IDS 532; and IDS 505 or IDS 510.

529. Seminar on Management Information Systems. 4 Hours. May be repeated for credit. Special research topics in management information systems. Topics vary from term to term depending on the interests of the instructor and students. Prerequisite: IDS 505 or IDS 510.

532. Introduction to Operations Management. 4 hours. Credit is not given for IDS 532 if the student has credit in MBA 507 and 509. 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. Prerequisite: 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: Credit or concurrent registration in IDS 532, or consent of the instructor.

552. Supply Chain Management. 4 hours. Structure of inventory decision and operating procedures; single and continuous systems for both single and multiple products; order quantity and periodic review models; demand forecasting. Prerequisite: Credit or concurrent registration in IDS 532, or consent of the instructor.

553. Production 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: IDS 532.

570. Statistics for Management. 4 Hours. Survey of statistical methods and applications for business and management. Prerequisite: Admission to any business graduate program or consent of the instructor.

571. Statistical Quality Control and Assurance. 4 Hours. Same as IE 571. The importance of quality in products and services, quality surveillance, Deming’s management method, Ishikawa’s seven tools, control charts, acceptance sampling, quality improvement using directed experiments. Prerequisite: At least one term of statistics.

572. Data Mining for Business. 4 Hours. No credit given if the student has credit in IDS 472. Introduction to data mining for business. Applications to marketing, credit scoring, quality assurance, operations management and human resources management. Prerequisite: IDS 532.

577. Research Methodology I. 4 Hours. Use of statistics and computers in research. Data collection and organization, survey sampling, questionnaire design, experimental design. Prerequisites: IDS 532 or the equivalent and admission to the Ph.D. program in Business Administration.

578. Research Methodology II. 4 Hours. Data analysis, including estimation, hypotheses testing, nonparametric methods, analysis of variance, regression analysis, economic forecasting, and time series. Prerequisite: IDS 577 or the equivalent.

582. Business Research and Forecasting I. 4 Hours. Same as Econ 537. The role of research in business; forecasting methods and techniques, including models and their applications. Prerequisites: Econ 534 and at least one statistics course with regression analysis at the 300-level or above.

583. Business Research and Forecasting II. 4 Hours. Same as Econ 538. The role of research in business; forecasting methods and techniques, including multivariate time series models and their applications. Prerequisite: IDS 476 or 582 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: Consent of the instructor.

596. Independent Study in Information and Decision Sciences. 1 to 4 Hours. Students may register for more than one section per term. May be repeated. Independent study under the direction of a faculty member. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Research on topic of the doctoral dissertation. Prerequisite: Consent of the instructor.

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**Interdisciplinary Public Health (IPHS)**

494. Introductory Special Topics-Interdepartmental. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Introductory special topics in public health. Course content will vary from semester to semester.

530. Practicum in Mental Health Diagnosis. 4 to 8 Hours. Review of mental health diagnostic process. Students in psychosocial epidemiology participate with medical students in a psychiatry clerkship. Prerequisites: CHSc 460 and consent of the instructor.

540. Advanced Public Health Practices. 3 Hours. Develop a proposal for the solution or alleviation of the public health problem studied in IPHS 440 by a team of health professionals, faculty, and students. Prerequisite: IPHS 440.

594. Advanced Special Topics-Interdepartmental. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced special topics in public health. Course content will vary from semester to semester.

595. Seminar in Interdisciplinary Public Health Sciences. 1 to 3 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Analysis of current research in public health. Course content may vary from semester to semester. Prerequisite: Consent of the instructor.

596. Independent Study in Public Health. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Selected aspects of specific public health problems; independent study under close supervision of faculty. Prerequisite: Consent of instructor who has supervised at least one course in the area of the independent study.

598. Research in Public Health Sciences-M.S. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the thesis requirements for the Master of Science degree. Prerequisite: Consent of the instructor.

599. Research in Public Health Sciences-Ph.D. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Individual research in public health directed by a faculty member. Directed toward the dissertation for the Doctor of Philosophy degree. Prerequisite: Consent of the instructor.

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**Italian (Ital)**

411. Literary Forms in Early Renaissance. 4 Hours. The development of epic poetry (Pulci, Boiardo, Ariosto) within the literary, political, and social context (Machiavelli and Castiglione). Prerequisite: Ital 310 or consent of the instructor.
412. Literary Forms in Late Renaissance and Baroque. 4 Hours. Representative literary works of the genres of the late sixteenth and seventeenth centuries: epic poem of Tasso and poetry of Marino. The birth of the Commedia dell’Arte form. Prerequisite: Ital 310 or consent of the instructor.

420. Modern Italian Literature I. 4 Hours. Eighteenth-century theater: Metastasio, Goldoni, Alfieri. Literary development from Vico to Foscolo. Prerequisite: Ital 311 or consent of the instructor.

421. Modern Italian Literature II. 4 Hours. From Romanticism to Decadentism: emphasis on the work of Leopardi and Manzoni; analysis of poems by Carducci, Pascoli, D’Annunzio, Gozzano. Prerequisite: Ital 311 or consent of the instructor.

422. Contemporary Italian Literature. 4 Hours. The Novel from Verismo to Umberto Eco: readings from Verga, Svevo, Moravia, Calvino. Hermetic poetry: emphasis on Ungaretti, Montale, Sereni, Luzzi. Theater: from Pirandello to Fo. Prerequisite: Ital 322 or consent of the instructor.

450. Divina Commedia I. 4 Hours. An in-depth study of the Divine Comedy against the philosophical and theological background of the Middle Ages. Covers Inferno and half of Purgatorio. Prerequisite: Ital 310 or consent of the instructor.

451. Divina Commedia II. 4 Hours. An in-depth study of the Divine Comedy against the philosophical and theological background of the Middle Ages. Covers Paradiso and half of Purgatorio. Prerequisite: Italian 310 or consent of the instructor.

460. Foreign Language Teaching Methodology. 4 Hours. Same as Span 450 and Fr 481. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisites: Three courses at the 200 and 300 levels.

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

462. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Ital 461, and approval of the department.

Jewish Studies (Jst)

478. The Bible as Literature, 4 Hours. Same as Engl 478 and ReIS 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: Grade of C or better in Eng 240, and grade of C or better in Eng 241 or 242 or 243; or consent of the instructor.

494. Topics in Jewish Studies. 4 Hours. May be repeated for a maximum of 6 hours of credit if topics vary. Selected topics in Jewish studies. Prerequisite: JSt 101 or JSt 102 or consent of the instructor.

Kinesiology (Kine)

See Movement Sciences (MvSc)

Latin (Lat)

499. Independent Reading. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Individual study under faculty direction. Prerequisite: 4 hours in Latin at the 200 level or the equivalent.

Latin American and Latino Studies (LALS)

409. Ancient Maya Writing, Language and Culture. 4 Hours. Same as Anth 409. Recent trends in Maya epigraphy, information gained from Maya hieroglyphs, linguistics, and historical ethnographies are applied to anthropological analyses of past lifeways. Prerequisites: Consent of the instructor.

427. Studies in Language Policy and Cultural Identity. 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 includes other countries and languages. Same as Span 427. Taught in English. Prerequisite: Reading and writing knowledge of Spanish.

461. Topics in Latin American History. 4 Hours. Same as Hist 461. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history, Latin American and Latino studies, or consent of the instructor.

475. Problems in South American Ethnology. 4 Hours. Same as Anth 475. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention will be given to the influence of Levi-Strauss’ ideas on the formulation of cultural theory in South America. Prerequisite: Anth 213 or consent of the instructor.

491. Interdisciplinary Seminar in Latin American Studies. 4 Hours. May be repeated for credit if topics vary. Specific topics as announced each semester. In-depth study of selected topics such as: language and education, Latin American populism, the family, democratization, industrialization and ideological currents. Prerequisite: Latin American and Latino Studies major or consent of the instructor.

493. Seminar in Latin American/Latino Cultural Studies. 4 Hours. Latin American/Latino cultural studies theory and method: everyday life and popular culture, related to socioeconomic, political, transnational/professional processes. Postmodern, postcolonial and subaltern perspectives. Prerequisite: LALS 101 or 102 or consent of the instructor.

495. Topics in Latino Community Studies. 4 Hours. May be repeated for credit if topic is different for each registration. In-depth study of Latino communities and current issues from an interdisciplinary perspective, with emphasis on the learning and use of investigative methodologies. Prerequisite: Latin American and Latino Studies major or consent of the instructor.

499. Advanced Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Individual advanced reading or research project in Latin American or U.S. Latino studies, with instructor’s consent and supervision. Prerequisite: Open, with consent of the instructor, to graduate students and Latin American and Latino Studies majors with at least a 3.00 grade point average. Students in other programs or with lower than a 3.00 grade point average are admitted at instructor’s discretion only.

501. Latinos and Latin America in Transnational Context. 4 Hours. Analysis of transnational processes linking Latin America and Latinos in the U.S. The impact of globalization on migration, culture, identity, work, health, education, family, and politics.

561. Colloquium on Latin American History. 4 Hours. Same as Hist 561. May be repeated for credit. Students may register for more than one section per term. Topics on themes in Latin American history. Specific topics are announced each term.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the direction of a faculty member. Prerequisite: Consent of the instructor.

Liberal Arts and Sciences (LAS)

494. Topics in Cultural Studies. 4 Hours. An interdisciplinary approach to a current cultural debate. Topics will vary. May be repeated for credit if topics vary. Taught at the Field Museum.

Linguistics (Ling)

402. Trial Interaction. 4 Hours. Same as CrJ 402. Language use, culture, and law in the trial process. Analysis of qualitative methods applied to legal processes and change. Prerequisites: CrJ 261 and CrJ 350, or consent of the instructor.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
405. Introduction to General Linguistics. 4 Hours. Introduction to the theories and methods of the phonological, morphological, and syntactic analysis of language. The historical development of languages. Language use.

415. Linguistic Structures I. 4 Hours. Introduction to key concepts in the field, including descriptive and prescriptive grammars, competence and performance, and human language as a system; articulatory phonetics, phonology, morphology.

425. Linguistic Structures II. 4 Hours. Fundamentals of semantics and syntax within the broad frameworks of generative and functional linguistics, including key concepts such as sense reference, utterance, sentence, form and function.

440. Semantics. 4 Hours. Introduction to the theories and methods of semantic analysis. Prerequisite: Linguistics 405 or consent of the instructor.

453. Dialectology. 4 Hours. Geographical and social variations in language. Prerequisite: Linguistics 410 or consent of the instructor.

459. Topics in Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Topics vary. Prerequisite: Consent of the instructor.

474. Psychology of Language. 3 Hours. Same as Comm 454 and Psch 454. Introductory survey of methods, theory, and research; linguistic foundations, history, and present status of the field.

480. Sociolinguistics. 4 Hours. Same as Anth 480. Variations in language that correlate with variation in societies and smaller social groups; interactions of languages and societies. Prerequisite: Linguistics 405 or consent of the instructor.

483. Methodology of TESOL. 4 Hours. Same as CIE 483. Methods of teaching listening, speaking, reading, and writing to speakers of English as a second or foreign language. Prerequisite: Consent of the instructor.

496. Independent Study, 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. S/U grade only. Students are assigned to this course at the discretion of the department. Independent study in an area of linguistics not normally covered by regular course offerings. Prerequisites: 9 hours of linguistics and approval of the head of the department.

506. Cross-Cultural Communication. 4 Hours. Same as Comm 506. Analysis of different theoretical approaches to cross-cultural communication (sociolinguistic, attributional); contrastive analysis of Western and non-Western cultural systems (intercultural etiquette, discourse rules).

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. Same as GWS 540. 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.

551. Research Practicum in Sociolinguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. 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. Prerequisites: Ling 407 or 480; or consent of the instructor.

553. Research Practicum in Discourse Analysis. 4 Hours. May be repeated for a maximum of 12 hours of credit. Same as English 553. 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.

556. Second Language Learning. 4 Hours. Same as Span 556. An introduction to research findings and methods in second language learning. Prerequisite: Consent of the instructor.

559. Seminar in Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Advanced study in linguistics. Topics vary. Prerequisite: Consent of the instructor.

582. Qualitative Methods in Communication. 4 Hours. Same as Comm 580. Qualitative methods course analyzing language and culture patterns. Prerequisite: 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: Linguistics 483.

586. Classroom Testing for TESOL. 4 Hours. Theory and practice in the creation and evaluation of classroom tests for TESOL.

594. Internship in TESOL 1 to 12 Hours. S/U grade only. May be repeated for a maximum of 13 hours of credit. Observation, tutoring, and supervised teaching for teachers of English as a second or foreign language. Prerequisites: Linguistics 583 and consent of the instructor.

596. Independent Study in Linguistics. 1 to 6 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Students are assigned to this course at the discretion of the department. Independent study and research on a topic other than that approved for a graduate thesis. Prerequisites: Consent of the instructor and approval of the head of the department.

597. Research in Linguistics. 0 to 16 Hours. May be repeated for credit with the approval of the department. A maximum of 4 hours of credit may be applied toward the M.A. in Linguistics degree. S/U grade only. Open only to degree candidates. Independent research in linguistics. Prerequisites: Consent of the instructor and the director of graduate studies.

598. Master’s Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Open only to degree candidates. Students engaged in thesis research and writing are assigned to this course at the discretion of the department. Independent research on a topic approved for a graduate thesis. Prerequisites: Consent of the thesis supervisor and approval of the head of the department.

Lithuanian (Lith)

410. Structure of Lithuanian. 4 Hours. Synchronic analysis of the structure of Lithuanian; emphasis on discourse analysis of oral and written texts. Prerequisite: 18 hours of Lithuanian or the equivalent or Linguistics 405.

425. Translation of Lithuanian Texts. 4 Hours. Problems of translating Lithuanian texts; workshop in translating Lithuanian works into English. Prerequisite: Lithuanian 302 or consent of the instructor.

499. Independent Study, 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

510. History of Lithuanian Language. 4 Hours. Development of Lithuanian from its Indo-European origins to the formation of the standard language; the aspects of Lithuanian literary language and its lexical, syntactical and stylistic problems.

515. Lithuanian Linguistics and Poetics. 4 Hours. Linguistic and stylistic analysis of Lithuanian texts based on contemporary theories of style.

520. Topics in Historical Lithuanian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. 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. Taught in Lithuanian. Prerequisite: 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. May be repeated for a maximum of 12 hours of credit. Study of a genre, movement, or topic. Content varies.
560. Studies in Lithuanian Realism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

565. Studies in 20th Century Lithuanian Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author or movement. Content varies.

570. Studies in Lithuanian Literary Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Function of literary criticism in all epochs of Lithuanian literature.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

Management (Mgmt)

430. Family Business Management. 3 Hours. Competitive strengths/weaknesses of a family business, dynamics of family interactions within the overlapping family, management and ownership systems. Prerequisites: Consent of the instructor. Prior experience in a family business is recommended.

444. Industrial Sociology. 4 Hours. Same as Soc 444. Analysis of industrial society and industrial institutions; the meaning of work and work relations; technology and economic change. Prerequisites: 6 hours of upper-division sociology or management or consent of the instructor.

445. Organizational Analysis and Practice. 3 Hours. Emphasis on organizational theories and models to analyze and improve functioning and performance of organization. Structure, technology, environmental adaptation, and managerial control systems are considered. Prerequisite: Mgmt 340.

447. Organizations. 4 Hours. Same as Soc 447. Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisite: 6 hours of upper-division sociology, management, or political science; or consent of the instructor.

452. Organizational Behavior. 3 Hours. Emphasis on understanding and managing people at work. Analysis of individual, group and organization topics including leadership, motivation, attitudes, group dynamics, and organizational culture. Prerequisite: Mgmt 340.

453. Human Resource Management. 3 Hours. Examination of the activities involved in attracting, retaining, and motivating employees. Topics include planning, selection, compensation, performance appraisal, succession, and legal issues. Prerequisites: Mgmt 340 and 350.


455. Introduction to Entrepreneurship. 3 Hours. Same as Mktg 454. Awareness and realistic understanding of the new venture formations process, role of the entrepreneur in the economy and society, entrepreneurial characteristics overview and self-evaluation. Prerequisites: Fin 300, Mgmt 340, and Mktg 360; or consent of the instructor.


463. Negotiation and Conflict Resolution. 3 Hours. Strategies and techniques for successful agreement negotiation and business conflict resolution. Includes applications to classic situations such as collective bargaining, interpersonal relations, and stakeholder concerns. Prerequisite: Mgmt 340.

465. Compensation and Reward Systems. 3 Hours. Examination of compensation and reward systems designed to enhance employee motivation and performance. Topics include pay structure design, incentive systems, and benefits. Prerequisites: Mgmt 453 and 454.

466. Managerial Effectiveness Through Diversity. 3 Hours. Management of diverse work forces. Discrimination, affirmative action, career development, socialization and social change policies; historical, psychological, sociological, legal and managerial viewpoints. Prerequisite: Mgmt 340.

467. Impact of Technological Change. 3 Hours. Examines the impact of technological change upon the business environment and the managerial process. Emphasis on alternative futures and the planning necessary to attain desired ends. Prerequisites: Mgmt 340 and 350.

470. Career Planning and Development. 3 Hours. Individual and organizational perspectives in career planning. Self-direction, networking, support facilities, and corporate management systems are considered. Prerequisite: Mgmt 340 or the equivalent.

471. Management and Organizational Development. 3 Hours. Strategies for promoting the creativity, flexibility, and productivity of the organization and its management personnel. Readings and case studies from the public and private sectors. Prerequisites: Mgmt 340 and 452; or consent of the instructor.

480. Transportation Systems Management. 3 Hours. Provides a fundamental knowledge of problems and practices encountered in the management of transportation systems. Includes impact of public policy, capital facilities, industry structure, costs, operations pricing, and environmental relationships. Prerequisites: Mgmt 340 and 350; or consent of the instructor.

481. Managerial Logistics. 3 Hours. Management of activities governing the flow of materials and products through stages of production and distribution. Includes design of logistical systems and use of mathematical techniques. Prerequisite: IDS 355 or consent of the instructor.


494. Special Topics in Management. 3 Hours. Exploration of areas not covered in existing course offerings or study of selected topics in greater depth. Subject matter will vary from semester to semester. Prerequisite: 9 hours of 400-level management courses, or consent of the instructor.

495. Competitive Strategy. 4 Hours. Multidisciplinary analysis of organization strategy and policy, using case method and/or business simulation. Assignments involve extensive library research and oral and written reports. Prerequisite: Consent of the instructor.

499. Independent Study in Management. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Independent study of an approved topic in management. Student must prepare a written report under the guidance of the instructor. Prerequisite: Consent of the department head.

502. Entrepreneurship. 4 Hours. No credit given if the student has credit in MBA 510. Same as Mktg 502. Launching new ventures and entrepreneurial companies; components of successful business plans and feasibility studies; perceptual processes of opportunity recognition; entrepreneurial creativity and innovation. Career opportunities. Prerequisites: Acct 500 and Mktg 500 or the equivalent courses.

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: 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. Prerequisites: Admission to the MBA or M.S. in Accounting program.

541. Organizational Behavior. 4 Hours. No credit given if the student has credit in MBA 505. The organization as a social system. Topics include leadership, interpersonal effectiveness, group behavior, managing change, conflict management, motivation and
behavior, and interpersonal communications. Prerequisite: Admission to MBA or MS in Accounting program.

553. Human Resource Management. 4 Hours. Human resource management programs and policies. Staffing, training and development; historical evolution of personnel policies, modern labor force and technological trends; supervision, wage and salary administration, human resource research and utilization. Prerequisite: Mgmt 541.

554. Collective Bargaining and Managerial Processes. 4 Hours. Structure and conduct of collective bargaining and the effects of collective representation on the managerial function in public, private, and nonprofit institutions. Prerequisite: Mgmt 541 or the equivalent.

555. Entrepreneurship: New Venture Formation. 4 Hours. Same as Mktg 555. Awareness and understanding of new venture creation and/or acquisition by developing a plan for a business; assessment of personal entrepreneurial potential. Prerequisite: Mgmt 502 or Mktg 502; 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 management systems and ideologies. Prerequisite: Mgmt 541.

558. Entrepreneurial Electronic Commerce. 4 Hours. Same as Mktg 558. The role of electronic commerce in entrepreneurship; competitive practices, marketing strategies, financing options, creating an e-commerce business plan. Prerequisites: Acct 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. Same as Mktg 559. Field work required. Prerequisite: Mgmt 502 or Mktg 502.

563. Seminar: Topics in Collective Bargaining. 4 Hours. Recent developments in both the private and public sectors related to the collective bargaining process. Prerequisite: Mgmt 554.

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. Prerequisite: 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: Mgmt 553.

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: 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: 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 micro level of human resource management. Prerequisite: PhD student status or consent of the instructor.

578. Organization and Management Development. 4 Hours. The theories, analytic approaches and skills development needed for introducing organizational change affecting units, task groups and individuals and for establishing good working relationships. Prerequisite: Mgmt 541.

579. Contemporary American and International Management. 4 Hours. Student teams evaluate case studies, present findings and recommendations for business strategies and research corporations of visiting executives, prepare presentations, and critique lectures.

580. Strategic Planning. 4 Hours. The process of strategic planning in complex organizations. Skill in development and evaluation of strategy is facilitated through use of business simulation and case analyses. Prerequisite: Mgmt 541.

581. Administrative Structure and Organizational Design. 4 Hours. An advanced exploration of theories of administrative structure and organizational design. Course topics include: conceptual models; macro, middle and micro level variables and principles and strategies of organizational change and development. Prerequisite: Mgmt 541.

582. Management of Innovation and Technological Change. 4 Hours. Analysis of the role of organization structure and management processes in fostering innovation. Emphasis on issues in research and development, flexible manufacturing, government policy, and technology transfer. Prerequisite: Mgmt 541.

587. Seminar: Topics in Organizational Behavior and Human Resources. 4 Hours. Topics of current research interest in human resource systems and organizational behavior. Focuses on current issues in published literature and unpublished research. Prerequisite: PhD student status or consent of the instructor.

588. Seminar: Topics in Strategic Management. 4 Hours. Selected topics and current problems in organizational strategy. Research and field work in strategic planning. Application of theory and concepts to problems in strategic management. Prerequisite: Mgmt 541.

589. Seminar: Topics in Human Resource Management. 4 Hours. Recent literature including parameters of the field, system designs and applications, information systems, and studies of work systems, quality of work life, productivity and career management. Prerequisite: PhD student status or consent of the instructor.

590. Seminar in Policy. 4 Hours. Study of strategies and policies that influence the long-term survival, growth, and character of business firms; strategy formulation and implementation in domestic and international organizations. Prerequisite: Enrollment in the final year of the MBA program.

591. Research Apprenticeship. 2 to 4 Hours. May be repeated for credit. S/U grade only. Directed training in conducting research in specific areas of management, and in developing skills related to the research. Prerequisite: Consent of the instructor.

594. Special Topics in Management. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. An intensive study of a selected topic in management. Topics vary by section and by term. Prerequisite: Consent of the instructor.

596. Independent Study in Management. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Independent study under direction of a faculty member. Prerequisite: Consent of the head of the Department of Management.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Students may register for more than one section per term. Independent research on topic approved for the doctoral dissertation. Prerequisite: Consent of the instructor.

Marketing (Mktg)

452. Principles of Retailing. 3 Hours. Theory and practice in the making of retailing decisions; merchandising policies, buying policies, and activities; pricing policies and practices, promotional policies, credit policies, and practices. Prerequisite: Mktg 360.

454. Introduction to Entrepreneurship. 3 Hours. Same as Mgmt 455. Awareness and realistic understanding of the new venture formation process; role of the entrepreneur in the economy and society; self-evaluation; venture feasibility. Prerequisites: Fin 300, Mgmt 340 and Mktg 360, or consent of the instructor.

461. Consumer Market Behavior. 3 Hours. Understanding consumer decision processes; steps in decision making, including need recognition, perception, cognition and attitude formation; effect of environmental social, psychological, and individual difference factors on consumer decision making. Prerequisite: Mktg 360 or consent of the instructor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Description</th>
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<tbody>
<tr>
<td>462.</td>
<td>Marketing Research</td>
<td>3</td>
<td>An investigation of the gathering, analyses and interpretation of information used in solving marketing problems. Pertinent modern research techniques from mathematics and the behavioral sciences are employed in developing an analytical framework. Prerequisites: Mktg 360.</td>
</tr>
<tr>
<td>463.</td>
<td>Marketing Channels</td>
<td>3</td>
<td>Principles of developing an integrated distribution system; relationship to firm’s marketing structure; evaluation of decisions on sources; evaluation of decisions on raw-material sources, plant and warehouse location, outlets; analysis of products through marketing channels. Prerequisites: Mktg 360. Business Administration students must have declared a major, or have received consent of the instructor.</td>
</tr>
<tr>
<td>464.</td>
<td>Entrepreneurial Consulting</td>
<td>3</td>
<td>Student teams diagnose and recommend solutions to problems and opportunities facing Chicago area entrepreneurs and smaller enterprises. Apply previous coursework. Prerequisites: Mktg 454 or Mgmt 455; and Econ 218 or Econ 220; and 6 credit hours of other entrepreneurship courses.</td>
</tr>
<tr>
<td>465.</td>
<td>Marketing Management</td>
<td>3</td>
<td>Seminar. Development of marketing plans and programs to achieve the firm’s marketing objectives. Emphasis on individual and group research and presentation of plans from the perspective of the marketing manager. Business case analysis. Prerequisite: 15 hours of marketing.</td>
</tr>
<tr>
<td>466.</td>
<td>Comparative Marketing Systems</td>
<td>3</td>
<td>Treats the topic of domestic marketing systems in other countries, their structures and processes, in a framework of comparative cultural, political, economic, and social systems. Prerequisites: Mktg 360 or consent of the instructor. Business Administration students must have declared a major.</td>
</tr>
<tr>
<td>469.</td>
<td>International Marketing</td>
<td>3</td>
<td>How firms sell across international frontiers; problems of product modification, pricing, intercultural communication, preparation for shipment, documentation. Focuses on small firms and multinational corporations. Prerequisite: Mktg 360 or consent of the instructor.</td>
</tr>
<tr>
<td>473.</td>
<td>The Personal Selling Effort in Marketing</td>
<td>3</td>
<td>Analysis of selling strategies and tactics in different situations, problems of managing sales force. Emphasis will be placed on applications of the behavioral sciences. Prerequisite: Mktg 461 or consent of the instructor.</td>
</tr>
<tr>
<td>474.</td>
<td>Advertising and Sales Promotion</td>
<td>3</td>
<td>The management, planning, creation, evaluation, and use of advertising and sales promotion. Prerequisite: Mktg 461 or consent of the instructor.</td>
</tr>
<tr>
<td>475.</td>
<td>Product Management</td>
<td>3</td>
<td>Development and review of new and existing products during their life cycles, the evolution of products and services from a creative idea to their withdrawal from the market. Prerequisite: Mktg 462 or consent of the instructor.</td>
</tr>
<tr>
<td>476.</td>
<td>Industrial Marketing</td>
<td>3</td>
<td>Unique concepts and strategies applied when businesses market to other organizations and institutions. Derived demand, systems selling, bid pricing, national account programs, and using distributors. Prerequisite: Mktg 360 or consent of the instructor.</td>
</tr>
<tr>
<td>494.</td>
<td>Special Topics in Marketing</td>
<td>3</td>
<td>Intensive study of selected problems. Reading assignments from scholarly and professional journals, emphasis on covering relatively few areas in great depth. Prerequisite: Business Administration students must have declared a major.</td>
</tr>
<tr>
<td>499.</td>
<td>Independent Study in Marketing</td>
<td>3</td>
<td>May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Topic and research methodology is to be determined by consultation with the instructor. Prerequisites: Major in marketing. Consent of the head of the department and the instructor must be obtained prior to registration.</td>
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<tr>
<td>500.</td>
<td>Introduction to Marketing</td>
<td>4</td>
<td>No credit given if the student has credit in MBA 506. Client/consumer behavior and the way institutions respond to such behavior through the planning, pricing, promotion, and distribution of goods and services. Prerequisite: Consent of the instructor.</td>
</tr>
<tr>
<td>502.</td>
<td>Entrepreneurship</td>
<td>4</td>
<td>No credit given if the student has credit in MBA 510. Same as Mgmt 502. Launching new ventures and entrepreneurial companies; components of successful business plans and feasibility studies; perceptual processes of opportunity recognition; entrepreneurial creativity and innovation. Career opportunities. Prerequisites: Actg 500 and Mktg 500 or the equivalent courses.</td>
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<tr>
<td>518.</td>
<td>Electronic Marketing</td>
<td>4</td>
<td>Same as IDS 518. Overview of the electronic marketing value chain. Internet and web technologies, system design, payment systems, business requirements for e-marketing, design and ethical issues. Prerequisite: Mktg 500 or MBA 506 or consent of the instructor.</td>
</tr>
<tr>
<td>555.</td>
<td>Entrepreneurship: New Venture Formation</td>
<td>4</td>
<td>Same as Mgmt 555. Awareness and understanding of new venture creation and/or acquisition by developing a plan for a business; assessment of personal entrepreneurial potential. Prerequisite: Mktg 502; or consent of the instructor.</td>
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<tr>
<td>558.</td>
<td>Entrepreneurial Electronic Commerce</td>
<td>4</td>
<td>Same as Mgmt 558. The role of electronic commerce in entrepreneurship; competitive practices, marketing strategies, financing options, creating an e-commerce business plan. Prerequisites: Actg 500 or MBA 501; and Mktg 500 or MBA 506.</td>
</tr>
<tr>
<td>559.</td>
<td>Entrepreneurial Consulting</td>
<td>4</td>
<td>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. Same as Mgmt 559. Field work required. Prerequisite: Mgmt 502 or Mktg 502.</td>
</tr>
<tr>
<td>560.</td>
<td>Marketing Management</td>
<td>4</td>
<td>The structural system for the management of marketing; environmental considerations; goal determinations; the sequential process; marketing planning; product-market integration; channel components; demand stimulation; evaluation and audit. Prerequisite: Mktg 500; or consent of the instructor.</td>
</tr>
<tr>
<td>561.</td>
<td>Consumer Behavior</td>
<td>4</td>
<td>Application of knowledge from the behavioral sciences to the study of consumer behavior. Individual and group influences on consumer preferences and purchasing patterns are considered. Both theory and application are stressed. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>563.</td>
<td>Information for Marketing Decisions</td>
<td>4</td>
<td>Definition and selection of appropriate research techniques for solving specific marketing problems. Establishment and administration of information systems giving firms a systematic, continuing appraisal of its market position. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>565.</td>
<td>Marketing Communication and Promotional Strategy</td>
<td>4</td>
<td>How a firm uses advertising, public relations, sales promotion, and personal selling to communicate with its customers. The functional characteristics of each of these is assessed in terms of varying marketing situations in the process of formulating the firm’s strategy. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>571.</td>
<td>International Business Operations</td>
<td>4</td>
<td>Centers attention on the policies and problems of firms operating across international frontiers and the social questions they generate. Attention is directed at investing overseas, licensing agreements, joint ventures and contracting. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>572.</td>
<td>International Marketing</td>
<td>4</td>
<td>Focuses on firms which operate internationally from their home country base. Attention is directed toward working with overseas distributors, promotion and pricing problems, governmental export assistance, and physical distribution matters. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>573.</td>
<td>Marketing Channels Management</td>
<td>4</td>
<td>Operations of various institutions that constitute the channel(s) for marketing goods and services. Emphasis on the practices of institutions at each level in the distribution system and the interaction that occurs among them. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>574.</td>
<td>Product Planning</td>
<td>4</td>
<td>In-depth coverage of all aspects of the product, service, and program planning process. Conceptual aspects as applied to new and existing product entries. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>576.</td>
<td>Industrial Marketing</td>
<td>4</td>
<td>Buyer behavior, industrial segmentation, derived demand, national account programs, system selling, bid pricing. Industrial promotion mix, mass communications and management of sales force. Prerequisite: Mktg 500.</td>
</tr>
<tr>
<td>581.</td>
<td>Seminar in Consumer Behavior</td>
<td>4</td>
<td>Theories and concepts relevant to consumer behavior; the decision-making process in consumer behavior. Prerequisites: Mktg 502, Econ 502, or Mgmt 502.</td>
</tr>
</tbody>
</table>
process for both profit and nonprofit goods and services. Prerequisite: Admission to the Ph.D. program in Business Administration.

583. Seminar on Marketing Theory. 4 Hours. Emphasis on marketing literature evolution and development of marketing practices that reflect/influence the basic literature. Attention devoted to how other fields have contributed to marketing thought. Prerequisite: Admission to the Ph.D. program in Business Administration.

584. Product Innovation and Development. 4 Hours. An in-depth investigation of the factors affecting the new product strategy of the firm and its management of product innovation. Prerequisite: Admission to the Ph.D. program in Business Administration.

585. Seminar: Topics in Quantitative Models in Marketing. 4 Hours. Formulation of conceptual and quantitative models that relate marketing activities and behaviors to other behaviors or sales or profits. Examines methods that researchers have used to test hypothesized marketing models. Prerequisite: Admission to the Ph.D. program in Business Administration.

586. Advanced International Marketing. 4 Hours. Concepts and problems pertaining to export marketing with emphasis on multinational businesses. Includes product modification, differential pricing, national social and commercial policies, promotion, logistical issues. Prerequisite: Admission to the Ph.D. program in Business Administration.

587. Advanced Marketing Research. 4 Hours. Multi-dimensional scaling, conjoint analysis including hybrid analysis, choice models including multinomial logit and probit models, selectivity models. Prerequisite: Admission into the Ph.D. program in Business Administration.

588. Marketing Communications. 4 Hours. The firm’s use of the elements of the promotion mix; advertising, personal selling, sales promotion, publicity and public relations for effective communication with its markets. Prerequisites: Admission to Ph.D. program in Business Administration.

589. Services Marketing. 4 Hours. Distinctive aspects of services marketing examined from both a conceptual and managerial perspective with focus on the research frontiers and questions in services marketing. Prerequisite: Admission to the Ph.D. program in Business Administration.

590. 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: Mktx 500.

596. Independent Study in Marketing. 1 to 4 Hours. Students may register for more than one section per term. Independent study under the direction of a faculty member. Prerequisite: Enrollment by petition to the director of the MBA program.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. Emphasizes clinical experiences and management of acute and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuSc 530 and/or consent of the instructor.

596. Independent Study. 0 to 8 Hours. May be repeated for credit. Prerequisite: Admission to the MBA program.

Maternal-Child Nursing (NuMC)

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. Prerequisite: 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: NuMC 507 or NuWH 507 or consent of instructor.

510. Advanced Nursing Care of the Well Infant, Child and Adolescent. 3 Hours. Emphasizes prevention, health promotion and maintenance for all childhood age groups through teaching, counseling, guidance and support of children and their families. Prerequisite: Credit or concurrent registration in NuSc 530 or consent of the instructor.

511. Primary Care Management of Acute/Chronic Conditions in Childhood. 3 Hours. Emphasizes clinical decision making and management of acute episodic illnesses and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuSc 530 and/or consent of the instructor.

512. Practicum in Advanced Pediatric Primary Care I. 1 to 4 Hours. May be repeated for credit. Emphasizes clinical experiences in prevention, health promotion and maintenance through teaching, counseling, guidance and support of children and their families. Prerequisites: Credit or concurrent registration in NuMC 510 and NuSc 532; or consent of the instructor.

513. Practicum in Advanced Pediatric Primary Care II. 1 to 4 Hours. May be repeated for credit. Emphasizes clinical experiences and management of acute episodic and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuMC 512; or consent of the instructor.

514. Practicum in Advanced Pediatric Primary Care III. 1 to 4 Hours. May be repeated for credit. Emphasizes clinical experiences that integrate prevention, health promotion and maintenance, and clinical management of acute episodic and stable chronic illnesses commonly encountered in pediatric ambulatory health care settings. Prerequisite: Credit or concurrent registration in NuMC 513; or consent of the instructor.

515. Advanced Parent-Infant Nursing. 3 Hours. Examines the process of parenting in low-risk and at-risk populations, and health status and behavior of the neonate. Prerequisite: NuMC 508 or consent of the instructor.

516. Advanced Nursing Care of Perinatal and Pediatric Health Problems. 4 Hours. Integration of theory and research into the management/care of selected clinical problems in maternal-child populations. Prerequisite: NuMC 508 or NuSc 530 or the equivalent.

517. Health Care of Women I. 4 Hours. Same as NuWH 517. Health care of women through the lifespan with an emphasis on health promotion and disease prevention, fertility control and pregnancy care. Prerequisites: Credit or concurrent registration in NuMC 507 and NuSc 532; or consent of the instructor.

518. Health Care of Women II. 4 Hours. Same as NuWH 518. Health care of women through the lifespan with an emphasis on the parturition, the puerperium, and common health and pregnancy problems. Prerequisites: NuMC 508 and NuMC 517 or NuWH 517; or consent of the instructor.
519. Health Care of Women III. 4 Hours. Same as NuWH 519. Health care of women through the lifespan with an emphasis on gynecologic and primary care. Prerequisites: NuMC 518 or NuWH 518; and NuSc 531, 532, 535.


524. Dimensions of Midwifery and Women’s Health Practice. 3 Hours. Examines the complex functions and roles of women’s healthcare providers. Prerequisites: NuMC 519 and 525; NuSc 528 and 529.

525. Practicum: Health Care of Women. 1 to 8 Hours. May be repeated for credit. Clinical experiences to develop nurse-midwifery and nurse practitioner competencies in the health care of women. Prerequisites: NuMC 517, NuSc 531 and 532.

528. Practicum Birth and the Newborn. 1 to 8 Hours. May be repeated for credit. Clinical experiences to develop beginning competence in the nurse-midwifery care of women and their newborns during parturition. Prerequisites: NuMC 518, NuSc 531 and 532.

Mathematical Computer Science (MCS)


411. Compiler Design. 4 Hours. Same as CS 473. Language translation: lexical analysis, parsing schemes, symbol table management, syntax and semantic error detection, and code generation. Development of fully-functional compiler. Prerequisites: Grade of C or better in either CS 301 or MCS 441, and grade of C or better in CS 202 or MCS 360; and grade of C or better in CS 266.

415. Programming Language Design. 4 Hours. Same as CS 476. Definition, design and implementation of programming languages. Syntactic and semantic description; variable bindings, control and data structures; parsing, code generation, optimization; exception handling; data abstraction. Prerequisites: MCS 360 or CS 340.

421. Combinatorics. 4 Hours. The pigeonhole principle, permutations and combinations, generating permutations and combinations, binomial coefficients, inclusion-exclusion principle, recurrence relations and generating functions, special counting sequences, Polya theory of counting. Prerequisites: Grade of C or better in MCS 261 or CS 202; and grade of C or better in Math 310 or 320 or 330.

423. Graph Theory. 4 Hours. Basic concepts of graph theory including Eulerian and hamiltonian cycles, trees, colorings, connectivity, shortest paths, minimum spanning trees, network flows, bipartite matching, planar graphs. Prerequisites: Grade of C or better in MCS 261 or CS 202; and grade of C or better in Math 310 or 320 or 330.

425. Codes and Cryptography. 4 Hours. Mathematics of communications theory, basic information theory necessary to understand both coding theory and cryptography, basic ideas and highlights of both coding theory and cryptography, including public-key cryptosystems. Prerequisites: Grade of C or better in MCS 261 or CS 202; and grade of C or better in Math 310 or 320 or 330.

441. Theory of Computation I. 4 Hours. Introduction to formal languages; relations between grammars and automata; elements of the theory of computable functions. Prerequisite: Grade of C or better in MCS 261 or CS 202.

451. Object-Oriented Programming in C++. 4 Hours. No credit given if the student has credit in CS 474. C++ as an object-oriented language, classes and member functions, access control, class scope, constructors, destructors, overloading, conversions, streams, derived classes, polymorphism through virtual functions, templates, class libraries. Extensive computer use required. Prerequisite: Grade of C or better in MCS 360 or the equivalent; or consent of the instructor.

471. Numerical Analysis. 4 Hours. Introduction to numerical analysis; floating point arithmetic, computational linear algebra, iterative solution to nonlinear equations; interpolation, numerical integration, numerical solution of ODEs, computer subroutine packages. Prerequisite: Grade of C or better in MCS 275 or in CS 102 or in CS 108; or consent of the instructor.

481. Computational Geometry. 4 Hours. Algorithmic problems on sets of points, rectangles, intervals, arcs, chords, polygons. Counting, reporting, location, intersection, pairing; static and dynamic data structures. Prerequisite: Grade of C or better in MCS 401 or consent of instructor.

494. Special Topics in Computer Science. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Topics in mathematical computer science, such as symbolic computation, automated reasoning, cryptography or geometric algorithms. Prerequisite: Approval of the department.

496. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.


503. Mathematical Methods for Algorithm Analysis. 4 Hours. Discrete mathematical techniques useful in algorithm analysis; summation methods, floor/ceiling expressions, modular arithmetic techniques, harder binomial identities, special numbers, generating functions, asymptotics. Prerequisites: Grade of C or better in MCS 401 and MCS 421.

504. Mathematics and Information Science for Industry Workshop. 4 Hours. May be repeated for credit. Students may register for more than one section per term. A project-based course on one or more topics in applied mathematics, statistics, or computer science, motivated by industrial problems. The topics vary from year to year. Prerequisites: a grade of B or better in MCS 401, 471 and 507.

507. Mathematical, Statistical and Scientific Software. 4 Hours. The design, analysis, and use of mathematical, statistical, and scientific software. Prerequisite: A grade of B or better in MCS 360 or an equivalent course; or consent of the instructor.

521. Combinatorial Optimization. 4 Hours. Combinatorial optimization: network flows, bipartite matching, Edmonds algorithm for non-bipartite matching, the matching polytope, matroids, greedy algorithms, matroid union and intersection algorithms, matroid polyhedra, polymatroids. Prerequisites: MCS 423 and Stat 471.

531. Error-Correcting Codes. 4 Hours. Finite fields, cyclic codes, quadratic residue codes, BCH codes, decoding schemes. Reed-Muller codes, weight distributions, codes and designs. Prerequisites: Grade of C or better in MCS 261; and grade of C or better in Math 310 or Math 330.

541. Computational Complexity. 4 Hours. Time and space complexity of computations, classification of math problems according to their computational complexity. P not equal NP problem. Prerequisite: Consent of the instructor.

542. Theory of Computation II. 4 Hours. Undecidability and computational complexity. Complexity measures for Turing machines, random access machines, Boolean circuits, Boolean logic, predicate calculus, basic concepts of automated theorem proving. Prerequisite: MCS 441.

548. Mathematical Theory of Artificial Intelligence. 4 Hours. Valiant’s learning model, positive and negative results in learnability, automaton inference, perceptrons, Rosenblatt’s theorem.
convergence theorem, threshold circuits, inductive inference of programs, grammars and automata. Prerequisites: MCS 541.

551. Generic Programming and the C++ Standard Template Library. 4 Hours. Generic programming in C++. Templates, namespaces, smart pointers, reference counting. Algorithms, ranges, concepts and modeling. Iterators, function objects, adaptors, and containers. Algorithms and container classes in the STL. Extensive computer use required. Prerequisite: Grade of C or better in MCS 451 or in an equivalent course in C++.

563. Analytic Symbolic Computation. 4 Hours. Analytic computation, including integration algorithms, differential equations, perturbation theory, mixed symbolic-numeric algorithms and other related topics. Prerequisites: Grade of C or better in MCS 460 or the equivalent, and Math 480 or consent of the instructor.

565. Mathematical Theory of Databases. 4 Hours. Abstract systems for databases, syntax and semantics of operational languages, dependencies and normal forms, axiomizations, queries and query optimization, null values, algebraic interpretations.


572. Introduction to Supercomputing. 4 Hours. Introduction to supercomputing on vector and parallel processors; architectural comparisons, parallel algorithms, vectorization techniques, parallelization techniques, actual implementation on real machines. Prerequisites: MCS 471 or 571, or consent of the instructor.

575. Computer Performance Evaluation. 4 Hours. Modeling of computer systems, basic queues, central server models, Little’s Law, operational analysis, Markovian networks, Jackson and BCMP networks, product form solutions, computational algorithms, mean value analysis, approximation methods. Prerequisites: Stat 401 and MCS 412, or consent of instructor.

590. Advanced Topics in Computer Science. 4 Hours. Students may register for more than one section per term. Topics in areas such as: mathematical aspects of artificial intelligence, symbolic methods in mathematics, mathematical cryptography, automated reasoning. Topics may vary from term to term. Prerequisite: Approval of the department.

591. Advanced Topics in Combinatorial Theory. 4 Hours. May be repeated for credit. Some of the following topics: combinatorial enumeration, designs, graph theory, matroid theory, combinatorial matrix theory, Ramsey theory. Contents vary from year to year. Prerequisites: MCS 423.

592. Advanced Topics in Error-Correcting Codes. 4 Hours. Topics of current interest in coding theory including codes which are of practical value and which shed light on various mathematical areas. Prerequisites: MCS 531, or consent of instructor.

593. Graduate Student Seminar. 1 Hour. May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.

595. Graduate Seminar. 1 Hour. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Prerequisite: Approval of the department.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading course sponsored by a faculty member. Prerequisites: Approval of the instructor and the department.

597. MISI Master's Project. 2 to 4 Hours. May be repeated for a maximum of 4 hours of credit. S/U grade only. Specialized project under close faculty supervision to satisfy the project requirement for the M.S. degree in Mathematics and Information Science for Industry. Prerequisites: MCS 504 and approval of the department.

598. Master's Thesis. 0 to 16 Hours. S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master's thesis. Prerequisites: Approval of the department.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research work under the supervision of a faculty member leading to completion of a doctoral thesis. Prerequisite: Approval of the department.

Mathematics (Math)

410. Advanced Calculus I. 4 Hours. Functions of several variables, differentials, theorems of partial differentiation. Calculus of vector fields, line and surface integrals, conservative fields, Stokes's and divergence theorems. Cartesian tensors. Prerequisite: Grade of C or better in Math 210.

411. Advanced Calculus II. 4 Hours. Implicit and inverse function theorems, transformations, Jacobians. Point-set theory. Sequences, infinite series, convergence tests, uniform convergence. Improper integrals, gamma and beta functions, Laplace transform. Prerequisite: Grade of C or better in Math 410.

413. Analysis I. 4 Hours. The real number system, continuous functions, differentiability, the Riemann integral. Prerequisite: Grade of C or better in Math 215 or consent of the instructor.

414. Analysis II. 4 Hours. Sequences and series of functions. Uniform convergence. Taylor's theorem. Real valued functions of several variables, curves and vector fields, line and surface integrals. Prerequisite: Grade of C or better in Math 413.

417. Complex Analysis with Applications. 4 Hours. Complex numbers, analytic functions, complex integration, Taylor and Laurent series, residue calculus, branch cuts, conformal mapping, argument principle, Rouché's theorem, Poisson integral formula, analytic continuation. Prerequisite: Grade of C or better in Math 210.

419. Models in Applied Mathematics. 4 Hours. Introduction to mathematical modeling; scaling, graphical methods, optimization, computer simulation, stability, differential equation models, elementary numerical methods, applications in biology, chemistry, engineering and physics. Prerequisites: Grade of C or better in Math 220 and in MCS 260.

425. Linear Algebra II. 4 Hours. Canonical forms of a linear transformation, inner product spaces, spectral theorem, principal axis theorem, quadratic forms, special topics such as linear programming. Prerequisite: Grade of C or better in Math 320.

427. Analysis in Several Variables. 4 Hours. Properties of Cartesian n-space the derivative, inverse and implicit function theorems, extrema, line integrals, vector calculus theorems, change of variables, differential forms, generalized Stokes's theorem. Prerequisites: Grade of C or better in Math 320, and grade of C or better in Math 410 or 411 or 413 or 414.

430. Formal Logic I. 4 Hours. Credit is not given for both Math 430 and Phil 416. First order logic, syntax and semantics, completeness-incompleteness. Prerequisite: Grade of C or better in MCS 261 or Math 320 or CS 202.

435. Foundations of Number Theory. 4 Hours. Primes, divisibility, congruences, Chinese remainder theorem, primitive roots, quadratic residues, quadratic reciprocity, and Jacobi symbols. The Euclidean algorithm and strategies of computer programming. Prerequisites: Grade of C or better in Math 215; or Grade of C or better in Math 210 and Grade of C or better in MCS 261.


442. Differential Geometry of Curves and Surfaces. 4 Hours. Frenet formulas, isoperimetric inequality, local theory of surfaces, Gaussian and mean curvature, geodesics, parallelism, and the Gauss-Bonnet theorem. Prerequisites: Grade of C or better in either Math 410 or 427; and grade of C or better in Math 320.

445. Introduction to Topology I. 4 Hours. Elements of metric spaces and topological spaces including product and quotient spaces, compactness, connectedness, and completeness. Examples
from Euclidean space and function spaces. Prerequisites: Grade of C or better in Math 410 or 411 or 413.

446. Introduction to Topology II. 4 Hours. Topics in topology chosen from the following: advanced point set topology, piecewise linear topology, fundamental group and knots, differential topology, applications to physics and biology. Prerequisite: Grade of C or better in Math 445.


494. Special Topics in Mathematics. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisite: Approval of the department.

496. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of instructor and the department.

500. Recursion Theory I. 4 Hours. Same as Phil 560. Primitive recursion, recursive and recursively enumerable sets, the arithmetic hierarchy, Post’s problem and the finite injury priority method. Prerequisite: MCS 441.

502. Metamathematics I. 4 Hours. Same as Phil 562. First order logic, completeness theorem and model theory. Prerequisite: Math 430 or consent of the instructor.

503. Metamathematics II. 4 Hours. Same as Phil 563. Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. Prerequisite: Math 502 or Phil 562.

504. Set Theory I. 4 Hours. Same as Phil 565. Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. Prerequisite: Math 430 or 502 or Phil 562.

506. Model Theory I. 4 Hours. Same as Phil 567. Introduction to stability theory: categoricity, stability, forking, finite equivalence relation theory, indiscernibles, orthogonality. Prerequisite: Math 502 or Phil 562.

507. Model Theory II. 4 Hours. Same as Phil 568. Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. Prerequisite: Math 506 or Phil 567.


510. Universal Algebra II. 4 Hours. Discriminator and directly representable varieties, ultraproducts and quasivarieties, finitely based equational theories, commutator and center. Prerequisite: Math 509.

512. Advanced Topics in Logic. 4 Hours. Same as Phil 569. Students may register for more than one section per term. Advanced topics in modern logic; e.g., descriptive set theory, model theory of fields, theory of hierarchies, stable groups. Prerequisite: Approval of the department.

513. Advanced Topics in Universal Algebra and Lattice Theory. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Special topics. Prerequisites: Approval of the department.

514. Number Theory I. 4 Hours. Introduction to classical, algebraic, and analytic number theory. Euclid’s algorithm, unique factorization, quadratic reciprocity, and Gaussian sums, quadratic forms, real approximations, arithmetic functions, Diophantine equations.

515. Number Theory II. 4 Hours. Introduction to classical, algebraic, and analytic number theory. Algebraic number fields, units, ideals, and p-adic theory. Riemann Zeta-function, Dirichlet’s Theorem, Prime Number Theorem. Prerequisite: Math 514.

516. Second Course in Abstract Algebra I. 4 Hours. Structure of groups, Sylow theorems, solvable groups; structure of rings, polynomial rings, projective and injective modules, finitely generated modules over a PID. Prerequisites: Math 330 and 425.

517. Second Course in Abstract Algebra II. 4 Hours. Rings and algebras, polynomials in several variables, power series rings, tensor products, field extensions, Galois theory, Wedderburn theorems. Prerequisite: Math 516.

518. Representation Theory. 4 Hours. Major areas of representation theory, including structure of group algebras, Wedderburn theorems, characters and orthogonality relations, idempotents and blocks. Prerequisites: Math 517.

519. Algebraic Groups. 4 Hours. Classical groups as examples; necessary results from algebraic geometry; structure and classification of semisimple algebraic groups. Prerequisite: Approval of the department.

531. Advanced Topics in Algebra. 4 Hours. May be repeated. Students may register for more than one section per term. Research-level topics such as groups and geometries, equivalencies of module categories, representations of Lie-type groups. Prerequisite: Approval of the department.

532. Real Analysis I. 4 Hours. Introduction to real analysis. Lebesgue measure and integration, differentiation, L-p classes, abstract integration. Prerequisite: Math 411 or 414 or the equivalent.

534. Real Analysis II. 4 Hours. A continuation of Math 533. Prerequisite: Math 417.


536. Complex Analysis II. 4 Hours. Normal families, Riemann mapping theorem. Analytic continuation, harmonic and subharmonic functions, Picard theorem, selected topics. Prerequisite: Math 535.

537. Introduction to Harmonic Analysis I. 4 Hours. Fourier transform on L(p) spaces, Wiener’s Tauberian theorem, Hilbert transform, Paley Wiener theory. Prerequisites: Math 533 and either Math 535 or Math 417.


546. Advanced Topics in Analysis. 4 Hours. Students may register for more than one section per term. Subject may vary from semester to semester. Topics include partial differential equations, several complex variables, harmonic analysis and ergodic theory. Prerequisite: Approval of the department.

547. Algebraic Topology I. 4 Hours. The fundamental group and its applications, covering spaces, classification of compact surfaces, introduction to homology, development of singular homology theory, applications of homology. Prerequisites: Math 330 and 445.

548. Algebraic Topology II. 4 Hours. Cohomology theory, universal coefficient theorems, cohomology products and their applications, orientation and duality for manifolds, homotopy groups and fibrations, the Hurewicz theorem, selected topics. Prerequisite: Math 547.


550. Differentiable Manifolds II. 4 Hours. Vector bundles and classifying spaces, lie groups and lie algebras, tensors, Hodge
theory, Poincare duality. Topics from elliptic operators, Morse theory, cobordism theory, deRham theory, characteristic classes. Prerequisite: Math 549.

551. Riemannian Geometry. 4 Hours. Riemannian metrics and Levi-Civita connections, geodesics and completeness, curvature, first and second variation of arc length, comparison theorems. Prerequisites: Math 442 and 549.

552. Algebraic Geometry I. 4 Hours. Basic commutative algebra, affine and projective varieties, regular and rational maps, function fields, dimension and smoothness, projective curves, schemes, sheaves, and cohomology, positive characteristic.

553. Algebraic Geometry II. 4 Hours. Divisors and linear systems, differentials, Riemann-Roch theorem for curves, elliptic curves, geometry of curves and surfaces. Prerequisite: Math 552.

554. Complex Manifolds I. 4 Hours. Holomorphic functions in several variables, Riemann surfaces, Sheaf theory, vector bundles, Stein manifolds, Cartan theorem A and B, Grauert direct image theorem. Prerequisites: Math 517 and 535.

555. Complex Manifolds II. 4 Hours. Dolbeault Cohomology, Serre duality, Hodge theory, Kadaira vanishing and embedding theorem, Lefschetz theorem, Complex Tori, Kahler manifolds. Prerequisites: Math 517 and 535.

568. Topics In Algebraic Topology. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Homotopy groups and fibrations. The Serre spectral sequence and its applications. Classifying spaces of classical groups. Characteristic classes of vector bundles. Prerequisite: Math 548 or consent of the instructor.

569. Advanced Topics In Geometric and Differential Topology. 4 Hours. Topics from areas such as index theory, Lefschetz theory, cyclic theory, KK theory, non-commutative geometry, 3-manifold topology, hyperbolic manifolds, geometric group theory, and knot theory. Prerequisite: Approval of the department.

570. Advanced Topics In Differential Geometry. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Subject may vary from semester to semester. Topics may include eigenvalues in Riemannian geometry, curvature and homology, partial differential relations, harmonic mappings between Riemannian manifolds, hyperbolic geometry, arrangement of hyperplanes. Prerequisite: Approval of the department.

571. Advanced Topics In Algebraic Geometry. 4 Hours. May be repeated for credit. Students may register for more than one section per term. Various topics such as Algebraic curves, surfaces, higher dimensional geometry, singularities theory, moduli problems, vector bundles, intersection theory, arithmetical algebraic geometry, and topologies of algebraic varieties. Prerequisite: Approval of the department.

574. Applied Optimal Control. 4 Hours. Introduction to optimal control theory; calculus of variations, maximum principle, dynamic programming, feedback control, linear systems with quadratic criteria, singular control, optimal filtering, stochastic control. Prerequisite: Math 411 or 427, or consent of the instructor.

575. Integral Equations and Applications. 4 Hours. Fredholm and Volterra equations, Fredholm determinants, separable and symmetric kernels, Neumann series, transform methods, Wiener-Hopf method, Cauchy kernels, nonlinear equations, perturbation methods. Prerequisite: Math 411 and 417 and 481, or consent of the instructor.

576. Boundary Value Problems. 4 Hours. Distributions, Green’s functions, alternative theorem, regular and singular Sturm-Liouville problems, spectral theory, potential theory, method of images, complex variable methods, equations of evolution. Prerequisites: Math 320 and 417 and 481; or consent of the instructor.

577. Advanced Applied Partial Differential Equations. 4 Hours. Quasilinear and nonlinear first order PDE’s, shock solutions, second order equations, cylinder and sphere problems, Wave, Laplace and diffusion equations, maximum principles, nonlinear wave motion. Prerequisites: Math 410 and 417 and 481.

578. Asymptotic Methods. 4 Hours. Asymptotic series, Laplace’s method, stationary phase, steepest descent method, Stokes phenomena, uniform expansions, multi-dimensional Laplace integrals, Euler-MacLaurin formula, irregular singular points, WKBJ method. Prerequisites: Math 417 and 481, or consent of the instructor.

579. Singular Perturbations. 4 Hours. Algebraic and transcendental equations, regular perturbation expansions of differential equations, matched asymptotic expansions, boundary layer theory, Poincare-Lindstedt, multiple scales, bifurcation theory, homogenization. Prerequisite: Math 481 or consent of the instructor.

580. Mathematics of Fluid Mechanics. 4 Hours. Development of concepts and techniques used in mathematical models of fluid motions. Euler and Navier Stokes equations. Vorticity and vortex motion. Waves and instabilities. Viscous fluids and boundary layers. Asymptotic methods. Prerequisites: Grade of C or better in Math 410 and Grade of C or better in Math 417 and Grade of C or better in Math 481.

581. Special Topics In Fluid Mechanics. 4 Hours. Geophysical fluids with applications to oceanography and meteorology, astrophysical fluids, magnetohydrodynamics and plasmas. Prerequisite: 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. Prerequisites: Math 417 and 481; or consent of the instructor.

583. Wave Propagation and Scattering II. 4 Hours. Solutions of reduced wave equations for scattering of scalar, vector, and dyadic waves; separable and nonseparable problems. Representations: Green’s function integrals, complex integrals. Various approximations. Prerequisite: Math 582.

584. Applied Stochastic Models. 4 Hours. Applications of stochastic models in chemistry, physics, biology, queueing, filtering, and stochastic control, diffusion approximations, Brownian motion, stochastic calculus, stochastically perturbed dynamical systems, first passage times. Prerequisite: Stat 401 and Math 417 and 481, or consent of the instructor.

585. Computational Finance. 4 Hours. Introduction to the mathematics of financial derivatives; options, asset price random walks, Black-Scholes model; partial differential techniques for option valuation, binomial models, numerical methods; exotic options, interest-rate derivatives. Prerequisites: Grade of C or better in Math 220 and Grade of C or better in Stat 381; or consent of the instructor.

589. Teaching and Presentation of Mathematics. 2 Hours. No graduation credit awarded for students enrolled in the Master of Science in the Teaching of Mathematics degree program. Required for teaching assistants in MSCS. Strategies and techniques for effective teaching in college and for mathematical consulting. Observation and evaluation, classroom management, presenting mathematics in multidisciplinary research teams.

590. Advanced Topics in Applied Mathematics. 4 Hours. Topics from areas such as: elastic scattering, nonlinear problems in chemistry and physics, mathematical biology, stochastic optimal control, geophysical fluid dynamics, stability theory, queuing theory. Prerequisite: Approval of the department.

591. Seminar on Mathematics Curricula. 4 Hours. Examination of research and reports on mathematics curricula. Analysis of research in teaching and learning mathematics. Development of using technology in mathematics teaching. Prerequisite: Enrollment in Doctor of Arts program in mathematics or consent of the instructor.

592. Seminar on Mathematics: Philosophy and Methodology. 4 Hours. Problems related to teaching and learning mathematics. Analysis of work of Piaget, Gagne, Bruner, Ausabel, Freudenthal, and others and their relation to mathematics teaching. Prerequisite: Enrollment in Doctor of Arts program in mathematics, or consent of the instructor.

593. Graduate Student Seminar. 1 Hour. May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in a learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.
594. Internship in Mathematics. 0 to 8 Hours. May be repeated for a maximum of 8 hours of credit. S/U grade only. Only 4 credit hours count toward the 32 credit hours required for the M.S. in MISI degree. Does not count toward the 12 credit hours of 500-level courses requirement. Under the direction of a faculty advisor, students work for government or industry on problems related to their major field of interest. At the end of internship, the student must present a seminar on the internship experiences. Prerequisites: Completion of the core courses in the degree program in which the student is enrolled and approval of the internship program by the graduate advisor and the Graduate Studies Committee.

595. Research Seminar. 1 Hour. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Prerequisite: Approval of the department.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.

598. Master’s Thesis. 0 to 16 Hours. S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master’s thesis. Prerequisite: Approval of the department.

599. Thesis Research. 0–16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research work under supervision of a faculty member. Prerequisite: Approval of the department.

Mathematics Teaching (MthT)

400. Methods of Teaching Secondary Mathematics I. 4 Hours. Philosophies, issues, techniques, and styles of teaching high school mathematics. Implications of psychological models. Mathematics in the evolving curriculum. Preparation of lessons. To be taken in the year prior to student teaching. Prerequisites: Grade of C or better in MthT 410; good academic standing in M.S. in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above.

401. Methods of Teaching Secondary Mathematics II. 4 Hours. Philosophies, issues, techniques, and styles of teaching high school mathematics. Implications of psychological models. Mathematics in the evolving curriculum. Preparation of lessons. To be taken in the year prior to student teaching. Prerequisites: Grade of C or better in Math 210; and enrollment in the M.S. in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above.

410. Advanced Euclidean Geometry I. 4 Hours. A transformational approach to the geometry of the Euclidean plane is developed through the use of specific activities. Prerequisites: Grade of C or better in Math 210.

411. Advanced Euclidean Geometry II. 4 Hours. Axioms for Euclidean geometry are developed based upon reflections. Further concepts in Euclidean geometry which arise from these axioms are explored. Prerequisite: Grade of C or better in MthT 410.

420. Methods of Structures Programming I. 4 Hours. Structured programming teaching aids such as Karel the Robot and ELAN0, data types, control structures, procedures, functions, efficiency of algorithms, arrays and recursion. Prerequisite: Grade of C or better in Math 210.

430. Mathematical Analysis for Teachers 1. 4 Hours. Basic properties of numbers, functions, graphs, limits, continuity, completeness of the system of real numbers. Prerequisite: Grade of C or better in Math 210 or consent of the instructor.

435. Abstract Algebra. 4 Hours. Sets, properties of integers, groups, rings, fields. For students in the Master of Science in the Teaching of Mathematics program only. Other students enroll in Math 330. Prerequisites: Grade of C or better in Math 210 and enrollment in the M.S. in the Teaching of Mathematics program.

438. Educational Practice with Seminar I. 6 Hours. 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. Prerequisites: 2.50 grade point average in mathematics courses at the level of calculus or above; successful completion of 100 clock hours of pre-student-teaching field experiences; and approval of the department.

439. Educational Practice with Seminar II. 6 Hours. 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. Prerequisites: Credit or concurrent registration in Math 438; and approval of the department; and a 2.50 grade point average in mathematics courses at the level of calculus or above; and successful completion of 100 clock hours of pre-student-teaching field experiences.

450. Concepts in Elementary School Mathematics I. 4 Hours. Advanced analysis of concept development and teaching methods. Sorting, classifying, counting, number tracks, addition, subtraction, group, place value, length, area and alternative teaching strategies. For elementary school teachers. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or the consent of the instructor.

460. Geometric Measurement and Numerical Methods. 4 Hours. Classical problems of length, area and volume, including numerical trigonometry, are explored using a scientific calculator. Do not purchase a calculator for the course until after the first day of class. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or the consent of the instructor.

465. Teaching Algebra for Understanding. 4 Hours. Manipulatives and other representations of mathematical concepts used for teaching algebra to middle grade students. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or the 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. Maximumminimum problems solved directly by graphing, then by derivatives. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

467. Introduction to Number Theory with Application. 4 Hours. Classical topics of elementary number theory and how they pertain to teaching the upper grades. Primes, GCF, LCM, divisibility, floor and ceiling functions, Gaussian Residue, lattices. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

468. Geometry with Applications for Middle Grade Teachers. 4 Hours. Plane and solid figures and their properties. Polygons and polyhedra. Euler’s formula. Volume versus surface area. Spacial visualization; two dimensional representations of three dimensional figures. Prerequisite: Admission to the Mathematics Education Concentrators Program or consent of the instructor.

470. Teaching Mathematics with Science: An Activity Approach I. 4 Hours. Introduction to basic variables (length, area, volume, mass, time) and the Scientific Method (picture, table, graph, questions). Extensive use of TIMS project curriculum. For elementary school teachers. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

480. Microcomputers in Elementary School Mathematics I. 4 Hours. Introduction to microcomputers and their use in elementary school mathematics. Basic microcomputer functions, educational software programs, pedagogical and curricular implications, and implementations questions. For elementary school teachers. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

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: Prerequisites may vary according to topic.

491. Topics in Teaching Elementary/Junior High School Mathematics. 1 to 5 Hours. Course content is

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
announced prior to each term in which it is given. May be repeated.
Students may register in more than one section per term. Prerequisite: 
Prior to each term in which it is given. May be repeated.
Students may register in more than one section per term. Prerequisite: 
Prior to each term in which it is given. May be repeated.
Students may register in more than one section per term. Prerequisite: 

501. Introduction to Higher Geometry. 4 Hours. Projective geometry, as an extension of Euclidean geometry, treated synthetically and/or algebraically. Desargue’s and Pappus’ theorems, subgeometries, cones and the underlying skew field. For graduate students in mathematics teacher education programs. Other students enroll in Math 440. Prerequisites: Grade of C or better in Math 425 and grade of C or better in Math 330.

502. Concepts in Elementary School Mathematics II. 4 Hours. Directed numbers, addends, changing units, rounding, error and accuracy, units of measurement, decimal and common fractions, function machines, number lines, calculators, geometric shapes, descriptive statistics. For elementary school teachers. Prerequisite: MhTh 430 or consent of the instructor.

505. Teaching Geometry: An Activity Approach. 4 Hours. Informal geometry using manipulatives, elementary topological concepts, polygons, polyhedra, metric geometry, motion geometry, geometric constructions, spherical geometry, introduction to research on the learning of geometry. For elementary school teachers. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

509. Practicum in Teaching Elementary School Mathematics. 4 Hours. Culumnating experience for students in the M.S. in the Teaching of Mathematics program (option for elementary school teachers). Major project is required. Supervised weekly seminars. Prerequisites: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers) and consent of the instructor.

510. Topics in Teaching Elementary/Junior High School Mathematics. 1 to 5 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

512. Intermediate Heat Transfer. 4 Hours. Topics in conduction, convection and radiation with emphasis on exact solutions: extended surfaces, internal and external flows, surface radiation, combined modes of heat transfer and selected topics. Prerequisite: ME 321 or consent of the instructor.


515. Propulsion Theory. 4 Hours. Thermodynamics and fluid mechanics of air-breathing engines, performance of rockets; chemical and nuclear rockets. Prerequisite: ME 419 or the equivalent.


521. Intermediate Heat Transfer. 4 Hours. Topics in conduction, convection and radiation with emphasis on exact solutions: extended surfaces, internal and external flows, surface radiation, combined modes of heat transfer and selected topics. Prerequisite: ME 321 or consent of the instructor.

522. Heating, Ventilation and Air-Conditioning. 4 Hours. Refrigeration systems and heat-pump, mass transfer in humidification, solar heat transfer in buildings, heating and cooling loads, air-conditioning computer project. Prerequisite: ME 321.

523. Heat Exchangers. 4 Hours. Classification; heat transfer and pressure drop analysis, flow distribution, transient performance, surface selection and geometrical properties, codes and standards. Prerequisites: ME 321 and 211.


526. Applied Combustion. 4 Hours. Topics in combustion, providing both a theoretical and applied understanding of combustion processes as they relate to furnaces. Internal and external combustion engines; pollutant formation. Prerequisite: ME 325.

527. Solar Engineering. 4 Hours. Applications; solar geometry and intensities; applied heat transfer topics; flat plate and concentrating collectors; energy storage; analysis of heating and cooling systems. Prerequisite: ME 321 or consent of the instructor.

530. Mathematical Analysis for Teachers II. 4 Hours. Derivatives, inverse functions, Riemann integral, trigonometric functions, logarithmic and exponential functions. Prerequisite: Grade of C or better in MhTh 430, or consent of the instructor.

550. Concepts in Elementary School Mathematics II. 4 Hours. Directed numbers, addends, changing units, rounding, error and accuracy, units of measurement, decimal and common fractions, function machines, number lines, calculators, geometric shapes, descriptive statistics. For elementary school teachers. Prerequisite: MhTh 430 or consent of the instructor.

560. Introduction to Analytic Geometry and Calculus. 4 Hours. For elementary school teachers. Do not purchase a calculator until after the first day of class. Programmable calculators used to investigate ideas and applications of analytic geometry, differential and integral calculus. Examples and ideas relevant to elementary mathematics and science curricula. Prerequisite: MhTh 460 or consent of the instructor.

565. Teaching Geometry: An Activity Approach. 4 Hours. Informal geometry using manipulatives, elementary topological concepts, polygons, polyhedra, metric geometry, motion geometry, geometric constructions, spherical geometry, introduction to research on the learning of geometry. For elementary school teachers. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers), or consent of the instructor.

575. Principles of Probability and Statistics. 4 Hours. For elementary school teachers. Probability, descriptive and inferential statistics, implications for teaching. Emphasis on collection and analysis of data, classroom activities and software. Prerequisite: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers), or consent of the department.

589. Practicum in Teaching Elementary School Mathematics. 4 Hours. Culumnating experience for students in the M.S. in the Teaching of Mathematics program (option for elementary school teachers). Major project is required. Supervised weekly seminars. Prerequisites: Admission to the M.S. in the Teaching of Mathematics program (option for elementary school teachers) and consent of the instructor.

590. Topics in Teaching Secondary Mathematics. 1 to 5 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

591. Topics in Teaching Elementary/Junior High School Mathematics. 1 to 5 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. Prerequisites: May vary according to topic.

592. Topics in Advanced Mathematics for Teachers. 1 to 5 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which it is given. For students in the M.S. in the Teaching of Mathematics program. Prerequisites: May vary according to topic.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisite: Approval of the instructor and the department.
428. Numerical Methods in Mechanical Engineering. 4 Hours. Introduction to numerical solution methods for problems in mechanical engineering. Example problems include heat transfer, fluid mechanics, thermodynamics, mechanical vibrations, dynamics, stress analysis, and other related problems. Prerequisite: CS 108.


444. Interdisciplinary Product Development I. 3 Hours. Cross-functional teams (w/students from AD 420/423 and Mktg 594) research and develop new product concepts. Focus on the identification of technologically appropriate product design problems. Year-long (w/ME 445) project course. Prerequisite: Consent of the instructor.

445. Interdisciplinary Product Development II. 4 Hours. Cross-functional teams (w/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. Year-long (w/ME 444) project course. Prerequisites: ME 444; and consent of the instructor.


449. Microdevices and Micromachining Technology. 5 Hours. Previously listed as ECECS 449. Same as ECE 449. Microfabrication techniques for microsensors, microstructures, and microdevices. Selected examples of physical/chemical sensors and actuators. Simulation experiments. Laboratory. Prerequisite: ECE 347.

450. Air Pollution Engineering. 4 Hours. Same as ChE 450. Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion. Prerequisite: ME 321 or consent of the instructor.

464. Virtual Automation. 4 Hours. Same as IE 464. Fundamentals of manufacturing and automation modeling using CAD/CAM and computer-integrated manufacturing methods; concepts of virtual manufacturing, industrial robots and automated factory models within virtual environments. Prerequisites: IE 201; and CS 107 or 108.

468. Virtual Manufacturing. 4 Hours. Same as IE 468. Virtual reality applications in manufacturing systems design, manufacturing applications of networked virtual reality, virtual reality modeling of occupational safety engineering. Prerequisite: CS 107 or 108.

494. Special Topics in Mechanical Engineering. 4 Hours. May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

501. Advanced Thermodynamics. 4 Hours. Thermodynamic laws of closed and open systems; exergy destruction; property relations, single phase systems, Gibbs-Duhem relations, multiphase systems, equilibrium; engineering applications. Prerequisite: ME 325.

502. Applied Stress Analysis II. 4 Hours. Concepts from theory of elasticity, stress-raisers such as notches and holes, mechanical behavior of materials including yielding and fractures, thick-walled cylinders and rotating disks, thermal stresses, and plastic behavior. Prerequisite: ME 401.


509. Advanced Kinematics II. 4 Hours. Spatial transformation and displacements. Design for body guidance; applications to function-generators. Analyses utilizing various operators for closure; dualization; branching, rotatability; differential kinematics; numerical solutions. Prerequisite: ME 409.

510. Robotic Manipulators. 4 Hours. Description of robotic manipulator; gripper trajectory execution; manipulator design, degree-of-freedom, mobility, workspace, special link positions; static and dynamic force transmission. Prerequisite: ME 409 or 410 or 413; or consent of the instructor.

512. Automatic Control of Mechanical Systems. 4 Hours. Modeling and analysis of mechanical systems. Performance specification and evaluation. Modern control system design and analysis techniques. Real-time computer control of engines, manufacturing processes, biomechanical systems. Prerequisite: ME 412 or consent of the instructor.

513. Principles and Design of Mobile Robots. 4 Hours. Introduction to mobile robots; analysis and design of gaits; leg and body design; energy efficiency, kinematics and dynamics of legged systems. Prerequisite: ME 320.


518. Fundamentals of Turbulence. 4 Hours. Mathematical description of turbulence field; kinematics of homogeneous turbulence; correlation and spectrum tensor, dynamic behavior of isotropic turbulence, universal equilibrium theory; nonisotropic turbulence. Prerequisites: ME 417 and 418.

521. Heat Conduction. 4 Hours. Analysis of heat transfer in solids including separation of variables, superpositions, Du Hamel's theorem, integral transforms, similarity transformations, and approximate methods. Prerequisite: ME 321 or consent of the instructor.

522. Convective Heat Transfer. 4 Hours. Conservation equations. Momentum heat and mass transfer in laminar and turbulent boundary layers. Internal and external flows and heat transfer. Heat transfer with phase change. Special topics in convective heat transfer. Prerequisite: ME 321 or consent of the instructor.

524. Thermal Radiation. 4 Hours. Fundamentals of radiative transfer; energy exchange between surfaces and in enclosures, radiative transfer in the presence of an attenuating medium, combined radiation, conduction, convection problems. Prerequisite: ME 421 or consent of the instructor.


528. Numerical Heat Transfer. 4 Hours. Numerical methods for solving convection, conduction and radiation problems in heat transfer. Iterative methods with shooting; local nonsimilarity methods perturbation methods; finite difference methods; grid generation. Prerequisites: ME 421 and CS 108 or consent of the instructor.


531. Thermophysics of Gas Flows. 4 Hours. Kinetic theory of gases. Transport properties, quantum mechanical analysis of
atomic and molecular structures, atomic scale collision phenomena, propagation, emission, and phenomena, propagation, emission, and absorption of radiation.


535. Theory of Vibrations II. 4 Hours. Same as CEMM 535. Harmonic vibrations; vibrations of a string; vibrations of a beam; vibrations of a membrane; periodic systems; flquet waves; nonlinear vibrations. Prerequisite: CEMM 435 or ME 408 or the equivalent.


541. Microelectronic Fabrication Techniques. 4 Hours. Same as ECE 541. Current fabrication techniques of microelectronic technology; plasma and CVD processes; etching techniques; ion implantation; surface analytical methods. Previously listed as EECS 541. Prerequisite: ECE 540.


548. Advanced Computer Aided Manufacturing. 4 Hours. Analysis and design of computer-integrated systems for process planning, production planning and control of discrete part manufacturing activities. Prerequisite: ME 447.

569. Advanced Virtual Manufacturing. 4 Hours. Same as IE 569. Manufacturing systems design optimization using virtual environments, optimization of manufacturing decision support using virtual reality interfaces, analysis and evaluation of virtual environments. Prerequisite: Consent of the instructor.

594. Current Topics in Mechanical Engineering. 4 Hours. May be repeated for credit. Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor. Prerequisite: Consent of the instructor.

595. Seminar on Mechanical Engineering Research. 1 Hour. S/U grade only. Advances in mechanical engineering research will be discussed in a seminar setting. Students will be expected to make presentations in various areas, as well as invited faculty members. Prerequisite: Graduate standing in mechanical engineering.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 4 hours of credit. Students may register for more than one section per term. Individual study under close supervision of a faculty member. Prerequisite: Consent of the instructor.

598. M.S. Thesis Research. 0 to 16 Hours. S/U grade only. May be repeated for credit. Individual research in specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

599. Ph. D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual research on specialized problems under close faculty supervision. Prerequisite: Consent of the instructor.

Medical-Surgical Nursing (NuMS)

530. Nursing Management of Acutely Ill Patients I. 3 Hours. Advanced practice in medical-surgical nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and management of adults with common health problems in acute care. Prerequisites: Credit or concurrent registration in NuSC 530, NuSC 531, and 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. Prerequisites: NuMS 530 and concurrent registration in NuSC 533.

533. Acute Care Clinical Nurse Specialist Practicum I. 3 to 5 Hours. May be repeated for credit. This is the first in a series of three practica emphasizing the core competencies of the acute care clinical nurse specialist. Prerequisite: NuMS 530.

534. Acute Care Nurse Practitioner Practicum I. 4 to 6 Hours. May be repeated for credit. Practicum emphasizing the clinical evaluation, symptom management, education and case management of adults with common health problems in acute care. Prerequisite: Credit or concurrent registration in NuMS 530.

535. Acute Care Clinical Nurse Specialist Practicum II. 3 to 5 Hours. May be repeated for credit. This is the second in a series of three practica emphasizing the core competencies of the acute care clinical nurse specialist. Prerequisite: NuMS 535.

536. Acute Care Nurse Practitioner Practicum II. 4 to 6 Hours. May be repeated for credit. Practicum emphasizing the clinical evaluation, symptom management, education and case management of acutely ill adults. Prerequisites: Credit or concurrent registration in NuMS 532 and 534.

537. Acute Care Clinical Nurse Specialist Practicum III. 3 to 6 Hours. May be repeated for credit. This is the third in a series of three practica emphasizing the core competencies of the acute care clinical nurse specialist. Prerequisite: NuMS 535.

538. Acute Care Nurse Practitioner Practicum III. 4 to 6 Hours. May be repeated for credit. Practicum emphasizing the comprehensive clinical evaluation and management of adults with complex health problems in acute care. Prerequisite: NuMS 536.

540. Pathophysiological Basis of Disease. 3 Hours. Provides a foundation for clinical therapeutics through an understanding of mechanisms of disease. Basic concepts of pathophysiologic processes at the cellular and molecular and systems level are examined with application of clinical disease in adults. Prerequisite: NuSc 530; or consent of the instructor; or equivalent course.

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. Prerequisites: NuMS 530, 534, 540, 560; and NuSc 530 and 532.

545. Biometrics and Applied Statistics. 4 Hours. Application of recent procedures in statistical analysis. Emphasis is on design of experiments and regression analysis; use of BMDP software on Mainframe/VAX computers. Prerequisite: NuSc 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: 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: NuMS 544.

549. Laboratory Techniques for Nursing Research. 3 Hours. Animals used in instruction. Techniques in laboratory research for nursing science. Basic physiological and biochemical methods and equipment, animal models, human subjects, safe laboratory practice, development from conceptualization through execution. Prerequisite: NuSc 530.

550. Common Geriatric Health Problems. 3 Hours. Advanced practice in geriatric nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and management of common and uncomplicated problems for older adults. Prerequisites: NuSc 530, 531, and 532.

552. Management of Complex Geriatric Health Problems. 3 Hours. Advanced practice in geriatric nursing. Emphasizes pathophysiology, etiologies, clinical evaluation and
management of complex health problems in older adults. Prerequisite: Consent of the instructor.

553. GCNS Practicum I: Common Geriatric Health Problems. 3 to 5 Hours. May be repeated for credit. This is the first in a series of three practica emphasizing clinical practice, research, and consultation related to care of older adults with common health problems. Prerequisite: NuMS 550.

554. GNP Practicum I: Management of Common Health Problems. 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: NuMS 550.

555. GCNS Practicum II: Complex Geriatric Health Problems. 3 to 5 Hours. May be repeated for credit. This is the second in a series of three practica emphasizing clinical practice, education, research and consultation related to the care of older adults with acute and chronic conditions. Prerequisites: NuMS 550 and 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: NuMS 544 or 554.

557. GCNS Practicum III: Integrative Practice. 3 to 6 Hours. May be repeated for credit. This is the third in a series of three practica emphasizing clinical practice, education, research and consultation related to care of older adults. Prerequisite: 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: 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. Prerequisites: 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 NuSc 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: Consent of the instructor.

564. Pain: Etiology, Assessment, Management. 2 Hours. The causes of pain and the variety of instruments used to assess and measure pain management in relation to chronic and acute pain. Prerequisite: Consent of the instructor.

570. Common Adult and Geriatric Health Problems. 3 Hours. Advanced practice in adult and geriatric. Emphasizes clinical evaluation and management of common and complicated problems in adults and older adults. Prerequisite: Consent of the instructor.

Medical Education (MHPE)

431. Research Design & Grant Writing for Educational Research Projects. 2 Hours. Introduction to the skills necessary to plan a research project and write a research grant proposal in an area of health professions education using a systematic approach. Prerequisite: Consent of the instructor.

433. Principles of Evidence-Based Health Care. 2 Hours. Same as BHIS 433. Qualitative and quantitative assessment of human subject clinical research; locating, evaluating, comparing scientific papers as bases for health care education and practice. Prerequisite: Approval of the Department.

439. Writing for Scientific Publication. 2 Hours. Instruction and workshop explores the process of fully preparing and submitting a manuscript to a health professions journal. Students must bring analyzed data set. Prerequisite: Consent of the instructor.

441. Clinical Decision Making. 2 Hours. Introduction to descriptive and normative theories of decision making; interpretation of diagnostic tests; measuring patient preferences; decision analysis and cost-effectiveness analysis; psychology of judgment and choice. Prerequisite: Consent of the instructor.

Medical Humanities (MHum)

494. Special Topics in Medical Humanities. 1 to 4 Hours. May be repeated for credit. Presents special topics in selected aspects of medical humanities for health professionals. Prerequisite: Requisites may vary by section, depending upon topic.

Medical Laboratory Sciences (MLS)

413. Independent Study. 1 to 3 Hours. May be repeated for credit. Students may register for more than one section per term. Study of topics of limited scope using scientific problem-solving methods and appropriate resources. Prerequisite: Consent of the instructor.

417. Clinical Experience I. 7 Hours. May be repeated for credit with approval. Supervised clinical laboratory experience at an affiliated institution. Prerequisites: Completion of required MLS discipline courses and consent of the coordinator.

418. Clinical Experience II. 7 Hours. May be repeated for credit with approval. Continuation of MLS 417. Supervised clinical laboratory experience at an affiliated institution. Prerequisites: Completion of sequence of required MLS discipline courses and consent of the coordinator.
442. Clinical Immunology. 2 Hours. Histocompatibility, cell mediated immunity, antibody diversity; interactions and assessment of cellular immunity. Hypersensitivity mechanisms, allergy, immunodeficiency diseases, autoimmunity and transplantation. Prerequisite: MLS 361 or consent of the instructor.

446. Current Issues in Clinical Laboratory Science. 2 Hours. Laboratory personnel certification/licensure; government regulations; physician office testing/consulting; information systems; education/management issues; ethics; patient protect; patient interactions; role of allied health professionals; career opportunities; future trends.

447. Clinical Correlations for Clinical Laboratory Scientists. 3 Hours. Case studies will assist entry-level clinical laboratory professionals to integrate discipline-specific knowledge from clinical chemistry, hematology, immunohematology, immunology, and clinical microbiology into a comprehensive concept of the patient. Prerequisite: Concurrent registration in MLS 417 or MLS 418 or the equivalent; or consent of the instructor.

455. Medical Mycology, Parasitology, Virology. 3 Hours. Introduction to medical mycology, parasitology, and virology, including clinical aspects of isolation, classification, physiology and replication; pathogenesis of non-protocaryotic infectious agents. Prerequisites: MLS 350 and consent of the instructor.

527. Clinical Laboratory Method Evaluation. 3 Hours. Same as Path 527. Development and comparison of clinical laboratory methods; also, statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. Prerequisite: Consent of the instructor.

560. Blood Groups: Systems and Serology. 3 Hours. Focus on human blood group systems; biochemistry, inheritance, serologic activity, clinical significance, and disease association. Topics include fundamentals of immunology, molecular biology, and genetics. Extensive computer use required. Taught only on-line. A UIC netid is required. Prerequisites: General knowledge of immunohematology and consent of the instructor.

561. Clinical Immunohematology and Transfusion. 3 Hours. Focus on transfusion medicine practice and therapy. Topics include 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 on-line. A UIC netid is required. Prerequisites: MLS 560 and consent of the instructor.

562. Principles and Methods in Immunohematology I. 3 to 4 Hours. Focus on theoretical and practical concepts used in blood procurement and product manufacturing. Topics include blood donor suitability, collection, testing, component preparation, labeling, storage, quality management systems. Extensive computer use required. Lecture-discussion taught only on-line. 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. Prerequisites: Credit or concurrent registration in MLS 560 and consent of the instructor.

563. Principles and Methods in Immunohematology II. 3 to 4 Hours. Focus on theoretical and practical concepts used in the organization and management of blood centers and transfusion services. Topics include intro to lab financial management, cost accounting, coding, staffing, ethics, and legal issues. Extensive computer use required. Lecture-discussion taught only on-line. 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. Prerequisites: MLS 562; and credit or concurrent registration in MLS 561; and consent of the instructor.

564. Current Trends in Immunohematology. 1 Hour. May be repeated for a maximum of 2 hours of credit. S/U grade only. Advanced studies of current trends; assigned topics in current literature reviewed and discussed. Extensive computer use required. Taught only on-line. A UIC netid is required. Prerequisites: General knowledge of immunohematology and consent of the instructor.

580. Practicum in Medical Laboratory Sciences. 1 to 4 Hours. May be repeated for a maximum of 6 hours of credit. Field experience under supervision of a professional expert in a medical laboratory sciences setting that is consistent with the student’s focus of study and career goals. Prerequisite: Consent of the instructor.

581. Forensic Analysis of Biological Evidence. 4 Hours. Same as BpS 581 and CrJ 581. Forensic blood identification and typing; body fluid identification and typing; blood group, isoenzyme, serum protein typing; electrophoresis; isoelectric focusing; DNA typing; reporting results; expert testimony. Prerequisite: Consent of the instructor.

584. Forensic Drug Analysis and Toxicology. 4 Hours. Same as CrJ 584 and BpS 584. Analysis of commonly abused drugs in their solid-dosage form and in biological media. Emphasis on modern instrumental methods and interpretation of results. Prerequisite: Consent of the instructor.

594. Special Topics in Medical Laboratory Sciences. 1 to 3 Hours. Students may register for more than one section per term. Current theories and methods in medical laboratory sciences. Seminar, literature search, directed study, and discussion format. Topic areas include clinical chemistry, clinical microbiology, clinical immunology, immunohematology, and hematology. Prerequisites: Consent of the instructor.

595. Seminar in Medical Laboratory Sciences. 1 Hour. S/U grade only. Topics of current interest in medical laboratory sciences. Includes discussions of current journal articles and important new developments in the clinical laboratory disciplines. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research.

597. Project Research in Medical Laboratory Sciences. 0 to 5 Hours. May be repeated for credit. S/U grade only. Independent investigation that engages the responsibilities of professionals to contribute to their field. Students investigate a topic/problem in their field, write an article and deliver an oral presentation. Prerequisite: Consent of the instructor.

598. Research in Medical Laboratory Sciences. 0 to 16 Hours. Students may register for more than one section per term. S/U grade only. Independent research in one area of medical laboratory sciences directed by a faculty member. Prerequisite: Foundation courses in research methods (such as AHS 510) and statistics, or consent of the instructor.

Medicinal Chemistry (MdCh)

412. Pharmaceutical Applications of Genomics and Bioinformatics. 2 Hours. Same as PmMP 412. Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. Prerequisites: Phar 331 or consent of the instructor; one or two semesters of basic molecular biology and/or biochemistry with a grade of B or better.

560. Organic Medicinal Chemistry I. 3 Hours. Organic reactions are discussed in terms of their mechanisms and utility in the field of medicinal chemistry, particularly in the synthesis of medicinal agents. Prerequisites: One year of organic chemistry with laboratory.

561. Principles of Medicinal Chemistry. 4 Hours. Requires concurrent registration in MdCh 592. Concerns basic chemical and physical principles necessary for an understanding of drug action. These principles are applied in the design and discovery of medicinal agents. Prerequisites: One year each of undergraduate organic chemistry and biochemistry.

562. Spectroscopy in Medicinal Chemistry. 3 Hours. The fundamental principles used to determine structure and conformation in molecules, emphasizing spectroscopic methods useful in solving structural problems and in analyzing dynamic biological processes. Prerequisite: Consent of the instructor or one year of physical chemistry.

564. Physical Medicinal Chemistry. 3 Hours. Focuses on kinetics and thermodynamics in biological systems. Applications to drug action will be emphasized. Prerequisite: One year of physical chemistry.

565. Experimental Techniques in Medicinal Chemistry. 3 Hours. Lectures and laboratories on the isolation
and identification of xenobiotics from biological matrices, variables affecting the metabolism of xenobiotics, and other physical techniques used in the study of medicinal agents. Prerequisites: MdCh 561 and 562.

571. Organic Medicinal Chemistry II. 3 Hours.
Heterocyclic chemistry foundation for bio-organic mechanisms of enzyme reactions. Enzymes involved in biosynthesis and metabolism, particularly those that are targets for drug action or involved in drug metabolism. Prerequisites: MdCh 460 and 561.

572. Drug Design. 2 Hours.
Quantitative structure-activity relationships, computer graphics, molecular modeling and simulation, and chemometrics as applied to drug design and discovery. Prerequisite: MdCh 561.

573. Principles of Stereochemistry. 1 Hour.
Principles of molecular structure and stereochemistry for medicinal and natural products chemists focusing on stereochemical structures rather than synthesis. Prerequisites: Credit or concurrent registration in MdCh 560 and one year of organic chemistry with lab; or consent of the instructor.

592. Research Techniques in Medicinal Chemistry. 2 Hours. May be repeated for a maximum of 6 hours of credit. S/U grade only. Provides an initial biweekly informal seminar series with program faculty presenting a discussion of the ongoing research in her/his laboratory. Lectures/discussions will occur for the first part of the semester and an intensive lab experience will be for the remainder of the semester. To be taken fall and spring semesters of the first year of graduate study.

594. Special Topics in Medicinal Chemistry. 2 to 4 Hours. May be repeated for a maximum of 4 hours of credit. An advanced course covering selected topics which may include new spectroscopic, theoretical, chemometric, and synthetic approaches to biomolecular structure and function. Prerequisites: MdCh 561 and 562 and one year of physical chemistry and one semester of biochemistry or consent of the instructor.

595. Seminar in Medicinal Chemistry. 1 Hour. S/U grade only. Presentation on a current research topic.

598. Master's Research in Medicinal Chemistry. 0 to 16 Hours. S/U grade only. Thesis research to fulfill master's degree requirements.

599. Doctoral Research in Medicinal Chemistry. 0 to 16 Hours. S/U grade only. Research for doctoral students.

Medicinal Chemistry and Pharmacognosy (PmMP)

412. Pharmaceutical Applications of Genomics and Bioinformatics. 2 Hours. Same as MdCh 412. Introduction to genomics and bioinformatics for advanced pharmacy students. Principles of gene expression, DNA sequencing in bacterial and human genomes, with emphasis on diagnostic and therapeutic applications. Prerequisites: Phar 331 or consent of the instructor; 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 agents. Upper division elective taught simultaneously with MdCh 560, however, does not meet the prerequisite requirement of the medicinal chemistry graduate program. Prerequisite: 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: Consent of the instructor.

426. Microorganisms as Agents of Human Disease. 3 Hours. Fundamental aspects of bacterial, fungal and viral pathogenesis, therapy, control and prevention of infectious diseases. Prerequisite: Consent of the instructor.

455. Microbiology Laboratory Rotation. 3 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. S/U grade only. Course in basic and applied methods essential for the study of nucleic acids, immunoglobulins, gene transfer, cell fusion, virological and immunological methods.

513. Structure of Biopolymers. 3 Hours. Same as Bche 513 and PmPg 513. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: Bche 460 and a year of physical chemistry; or consent of the instructor.

514. Immunology. 5 Hours. Concepts in immunology, immunogenetics, molecular immunology, cellular immunology and immunopathology at the intermediate level. Prerequisites: An undergraduate course in molecular biology or genetics, consent of the instructor and concurrent registration in Bche 460 or the equivalent.

553. Molecular Biology of Cells and Viruses. 3 Hours. Animal viruses including basic structure and viral nucleic acids; emphasizes molecular organization of viral genomes; cellular and molecular events during virus replication and viral transformation. Prerequisite: MIm 552 or consent of the instructor.

554. Molecular Aspects of Microbiology. 3 Hours. Basic concepts of prokaryotic and eukaryotic genetics; gene structure and function; gene expression; molecular aspects of mutation and recombination; chromosome structure and function. Prerequisite: Bche 460.

560. Molecular Microbiology. 5 Hours. Credit is not given for MIm 560 if the student has credit in MIm 552. Genetics, molecular biology and physiology of bacteria, viruses, and Eukaryotic cells. Special emphasis on genetic regulation. Prerequisite: Concurrent registration in Bche 460.

585. Cell Biology. 4 Hours. Same as Anat 585 and PhyB 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

594. Special Topics in Microbiology, Immunology and Virology. 1 to 2 Hours. Advanced topics are covered in depth. Topics vary yearly. Prerequisites: MIm 451, 552, 553, and 455, Bche 460, and consent of the instructor.

595. Seminar in Microbiology and Immunology. 1 Hour. S/U grade only. Topics of current research interest are presented by guest lecturers from outside institutions in areas of molecular biology, bacteriology, virology and immunology.

598. Research in Molecular Biology and Immunology. 0 to 16 Hours. S/U grade only. M.S. thesis research on problems in microbiology, immunology, virology and molecular biology. Prerequisite: Graduate standing in Microbiology and Immunology.

599. Research in Molecular Biology and Immunology. 0 to 16 Hours. S/U grade only. Ph.D. thesis research on problems in microbiology, immunology, virology and molecular biology. Prerequisite: Graduate standing in Microbiology and Immunology.

Molecular Genetics (Gene)

501. Faculty Research Seminars. 1 Hour. S/U grade only. Should be taken in the first year in the Ph.D. in Molecular Genetics program. Faculty presentation of research areas within molecular genetics. Prerequisite: Graduate standing in the Ph.D. in Molecular Genetics program or consent of the instructor.

502. Somatic Cell and Human Genetics. 4 Hours. The genetics of somatic cells and advanced human genetics. Gene transfer, mutagenesis, drosophila genetics, genetic linkage and human disease, cancer genetics, and gene therapy. Prerequisite: Bche 460 or consent of the instructor.

503. Research Methods in Genetics. 5 Hours. May be repeated for a maximum of 10 hours of credit. Open only to students in the Molecular Genetics program. Laboratory course in experimental methods in molecular genetics. Prerequisite: Consent of the instructor.

512. Experimental Design and Analysis in Molecular Genetics. 4 Hours. Methods and logic in the analysis of gene function, gene cloning, analysis of genetic changes, studies of gene expression, design of experimental controls. Prerequisite: Bche 460 or consent of the instructor.

513. Molecular Basis of Cell Growth and Differentiation. 4 Hours. Oncogenes, tumor suppressor
proteins and growth factors, and their roles in tumorigenesis, cell growth, differentiation and development. Prerequisite: Beche 460 or consent of the instructor.

514. Structure and Function of Nucleic Acids. 4 Hours. Describes the structure and function of nucleic acids. Unravels the basic molecular mechanisms underlying heredity, including replication, transcription and recombination. Prerequisite: Beche 460 or consent of the instructor.

515. Journal Club. 1 Hour. May be repeated for credit. Student presentation and critical analysis of recent journal articles and current topics in molecular genetics. Prerequisite: Consent of the instructor.

526. Molecular and Genetic Analysis of Development. 3 Hours. Same as BioS 526. Examines developmental mechanisms used in animal and plant model systems. Lecture. Prerequisite: Consent of the instructor.

594. Special Topics in Molecular Genetics. 1 to 4 Hours. May be repeated for credit if topic varies for each registration. Advanced course on selected topics in molecular genetics. Topics will vary from year to year. Prerequisite: Consent of the instructor.

595. Student Research Seminars. 1 Hour. May be repeated for credit. S/U grade only. Research presentations by graduate students to the Molecular Genetics program. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Independent dissertation research by the student, under the guidance of the advisor. Prerequisite: Advanced standing in the Ph.D. in Molecular Genetics program.

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: MvSc 100.

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.

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: MvSc 252.

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: MvSc 360 or the equivalent; 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: Grade of C or better in MvSc 352; 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. Grade of C or better in MvSc 352; 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. Extensive computer use required. Prerequisite(s): Chem 114 and MvSc 352; or consent of the instructor.

460. Advanced Exercise and Musculoskeletal Function. 3 Hours. Mechanics and muscular analysis of human motion through the scientific study and application of selected physical principles. Previously listed as Kine 428. Prerequisite: MvSc 360; 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: 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 252 and 352 and 372; 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. S/U grading only. May be repeated.

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, credit or concurrent registration in MvSc 490, 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 program, 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 Methods in Movement Sciences. 3 Hours. Training in research methods as they pertain to the specific areas of research in movement sciences. A research paper is required. Previously listed as Kine 500.

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: 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: 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 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: 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 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: BioS 422 or consent of the instructor.

529. Exercise Genomics. 3 Hours. Molecular mechanisms by which cells adapt to increases and decreases in physical activity. Emphasis on understanding genomic, transcriptional, translational and post-translational sites of control. Previously listed as Kine 529. Prerequisite: BioS 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: 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: 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: 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: 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: 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: 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 advisor.

593. Internship in Movement Sciences. 0 to 6 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. Credit is not given for MvSc 593 if the student has credit in MvSc 597 or 598. Previously listed as Kine 593. Prerequisite: 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: 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: 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. S/U grading only. May be repeated. Previously listed as Kine 597. Prerequisite(s): MvSc 500 and consent of the advisor and director of graduate studies.

598. Master's Thesis Research. 0 to 16 Hours. Thesis work under the supervision of a graduate advisor. S/U grading only. May be repeated. Previously listed as Kine 598. Prerequisite(s): MvSc 500 and consent of the advisor and director of graduate studies.

599. Ph.D. Thesis Research. 0 to 16 Hours. Independent research by the student under the supervision of the thesis advisor. S/U grading only. May be repeated. Previously listed as Kine 599. Prerequisite: Students must have passed the preliminary exam.

Music (Mus)

490. Music Education: Special Topics. 1 to 4 Hours. May be repeated for credit. An investigation of various topics in music education pertinent to practicing music teachers.

Native American Studies (NAST)

471. Studies in Native American Literatures. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as Engl 471. The history and development of literature by and about American Indians. Content varies. Prerequisite: 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 Standard-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: Consent of the instructor.

Neuroscience (Neus)

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

Nursing Sciences (NuSc)

420. Pathophysiology and Pharmacotherapeutics. 7 Hours. Course provides 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: NuSc 251 and 252. Must enroll concurrently in NuSc 420.

421. Integrated Health Care: 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: Must enroll concurrently in NuSc 420.

422. Integrated Health Care: 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. Prerequisites: NuSc 420 and 421.

424. Integrated Health Care: 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 of literature by and about American Indians. Content varies. Prerequisites: NuSc 420 and 421.

425. Integrated Health Care: Clinical Practice I. 7 Hours. Provides 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. Prerequisites: NuSc 420 and 421. Must enroll concurrently in NuSc 422 and 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. Prerequisites: NuSc 420 and 421.

440. Wholistic Health: Use of Self. 2 Hours. Comprehensive mind, body and spiritual health care. Spiritual assessment of self, individuals and families. Self as a therapeutic agent/provider for wholistic health care. Prerequisite: 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 health care services, communities, and systems to foster planned change. Prerequisite: 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: Consent of the instructor. Students enrolled in the College of Liberal Arts and Sciences must have credit in Pshc 100 and Pshc 270 or Pshc 315 or GWS 315.

455. Women’s Health: A Primary Health Care Approach. 3 Hours. Health promotion and disease prevention in women’s health. Includes community experience with community women. Primary health care approaches examined. Same as CHSc 456, and NuWH 455. Prerequisite: 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 health care delivery setting. S/U grade only. May be repeated. Prerequisite: 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: 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. S/U grade only. No graduation credit.

505. Philosophy of Science for Health Research. 3 Hours. Traces the development of scientific reasoning and explanation from Aristotle to the present, focusing on the nature of knowledge and role of truth for health research. Prerequisites: NuSc 527 or the equivalent and consent of the instructor.

506. Theory and Theory Development for Nursing Research. 3 Hours. Methods of theory development and critical analysis of selected biological, behavioral, health service, and grand nursing theories which form the basis of nursing science are examined. Prerequisite: NuSc 505.

511. Advanced Research Design. 4 Hours. In-depth analysis of research design, including such areas as design appropriateness and validity, sampling, research ethics, and interpretation. Application of the content to nursing and related fields. Prerequisites: NuSc 527 or the equivalent and consent of the instructor.

515. Measurement in Health Research. 4 Hours. Qualitative and quantitative measurement theories; assessment of reliability, validity, and data quality. Critical analysis of measurement issues across the continuum of measures in health research. Prerequisite: NuSc 511 or the equivalent or consent of the instructor.

517. Advanced Research Practicum. 1 to 4 Hours. An intensive guided research practicum in design, data collection, psychometric analysis or specific analytic technique relevant to the student’s research specialization. S/U grade only. May be repeated to a maximum of 6 hours. Must be repeated for a minimum of 3 hours of credit. Prerequisites: NuSc 515 and two advanced statistics courses.

525. Intermediate Statistics. 3 Hours. Application and interpretation of statistical techniques appropriate for health sciences. Prepares students to think quantitatively, use computer to perform statistical analysis, and assess data critically. Prerequisite: An undergraduate statistics course.

526. Nursing Inquiry I. 2 Hours. The first of a two-course sequence on the process and application of nursing inquiry; emphasizes approaches to inquiry, theory analysis, constructs, measurement and theory generation. Prerequisite: Credit or concurrent registration in NuSc 525 or the equivalent.

527. Nursing Inquiry II. 2 Hours. Continuation of NuSc 526, emphasizing the methods of theory development and theory testing in selected areas of nursing sciences. Ethical issues in research. Prerequisite: NuSc 526.

528. Health, Environment, and Systems. 2 Hours. Examination of international, national and local environments for health, health systems, health policy and their outcomes. Influence of social, cultural and ethical factors.

529. Issues of Advanced Practice in Nursing. 1 Hour. 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: NuSc 528.

530. Physiologic Basis of Nursing Practice Across the Lifespan. 4 Hours. Advanced contemporary physiologic principles and their relevance to clinical practice. Content topics will include developmental (lifespan) physiologic changes. Prerequisite: An undergraduate physiology course or consent of the instructor.

531. Pharmacotherapeutics in Advanced Practice in Nursing. 3 Hours. Advanced principles of pharmacotherapeutics. Includes legal issues, client adherence, and medication selection factors. Prerequisites: Credit or concurrent registration in NuSc 530; or credit or concurrent registration in NuSc 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: NuSc 210 or the equivalent or consent of the instructor.

533. Applied Pharmacotherapeutics in Advanced Practice in Nursing. 1 Hour. May be repeated for a maximum of 2 hours of credit. Application of pharmacology principles to sub-specialty populations. Prerequisite: Credit or concurrent registration in NuSc 531.

535. Biological Basis of Disease. 4 Hours. Provides 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. Prerequisites: 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: Consent of the instructor.

541. Teaching Practicum for the Nurse Educator. 3 Hours. Application or educational theory, methods, and strategies for nursing education, curriculum development, program evaluation or education administration in classroom, school, clinical or other selected settings. Prerequisites: Credit or concurrent registration in NuSc 540 or credit or concurrent registration in NuSc 543; and consent of the instructor.

542. Curriculum Processes in Nursing Education. 3 Hours. Builds on basic instructional strategies to prepare the nurse educator for faculty role in various levels of programs, including curriculum design and evaluation. Prerequisite: Consent of the instructor.

543. Issues for Nurse Educators and Administrators. 3 Hours. Focuses on issues in nursing education administration in the context of society, health care, and nursing, especially strategic planning, resources, political influences, conflict, change and leadership. Prerequisite: Consent of the instructor.

544. Qualitative Research in Nursing. 4 Hours. Major approaches to qualitative research including design, conduct, reporting, and firsthand experience in data collection and analysis. Prerequisite: Consent of the instructor.
548. Methodological Issues for Cross-Cultural Research 2 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. Prerequisites: NuSc 511; and consent of the instructor.

550. Issues for Research and Practice in Women's Health. 3 Hours. Same as NuWH 550. Analysis of gender-related definitions of health and illness theories and research evaluation criteria for women's health care practice are developed as a basis for research. Prerequisite: Consent of the instructor.

555. Theories and Methods in Women's Health Nursing Research. 3 Hours. Same as NuWH 555. Critical analysis of theoretical and methodological approaches in women's health nursing research. Emphasis on evaluation scheme useful to researchers. Prerequisites: NuSC 550 or NuWH 550; and consent of the instructor.

560. Theoretical Basis for Primary Health Care. 3 Hours. Students analyze the conceptual basis of primary health care applicable to diverse communities and develop a primary health care model specific to a community of interest.

561. Ethical Issues in Primary Health Care. 3 Hours. Examination of the ethical components of primary health care as a philosophy, strategy, and level of care; and explication of personal framework for analysis of a specific health issue. Prerequisite: NuSc 560 or consent of the instructor.

562. Primary Health Care Research Methods. 3 Hours. Conceptual issues, advanced methodologies and dissemination strategies for scientifically sound and policy relevant global primary health care research. Building community relationships for primary health care research. Prerequisites: NuSc 560 and NuSc 511 or the equivalent or consent of the instructor.

565. Advanced Research in Women's Health. 1 to 2 Hours. Same as NuWH 565. Advanced seminar for doctoral students in graduate nursing concentration in women's health. Faculty and students present and critique on-going and developing research. Prerequisite: Consent of the instructor.

570. International Dimensions in Women's Health. 3 Hours. Same as NuWH 570. Critical examination of the health of women from a global perspective. Emphasizes resource and strategies nurse researchers use to monitor women's health across cultures and countries. Prerequisite: Consent of the instructor.

575. Minority Women's Health Nursing. 3 Hours. Same as NuWH 575. Theoretic and descriptive overview of the health concerns and health conditions of women from ethnic/racial minority backgrounds with implications for nursing research and practice. Prerequisite: Consent of the instructor.

585. Advanced Research Seminar. 1 to 2 Hours. May be repeated for credit: a minimum of 2 hours credit is required; a maximum of 4 hours of credit may be applied toward the Ph.D. degree. Students may register for more than one section per term. S/U grade only. Integrates theory and methods for health research. Topics vary according to student interests and instructor availability. Prerequisites: Consent of the instructor. Open only to PhD degree students.

590. Leadership in Scientific Careers. 1 Hour. S/U grade only. For doctoral students only. Analyzes components of leadership in science at the national and global levels. Analyzes factors and issues of the discipline affecting a research career. Analyzes the interdependency of the science to policy cycles of influence. Prerequisite: NuSc 517.

594. Special Topics: Advanced. 1 to 3 Hours. May be repeated for credit. Students may register for more than one section per term. Discusses selected topics of current interest. Offered according to sufficient student demand and instructor availability. Prerequisite: Consent of the instructor.

595. Seminar in Nursing. 1 to 3 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Identifies and analyzes a broad range of issues related to modern nursing and nursing research. Topics vary according to student interests and instructor availability. Prerequisite: Consent of the instructor.

596. Independent Study: Graduate. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Selected problems in nursing are investigated under the direction of a graduate faculty member. Modes of investigation are determined by the nature of the nursing problem selected. Prerequisite: Consent of the instructor.

597. Master's Project. 0 to 16 Hours. S/U grade only. Master's student project research. Prerequisite: Consent of the instructor.

598. Thesis Research: Master's. 0 to 16 Hours. S/U grade only. Master's student thesis research. Prerequisite: Consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. Doctoral student thesis research. Prerequisite: Consent of the instructor.

Occupational Therapy (OT)

401. Occupational Performance in Adults and Adolescents. 4 Hours. Reviews the primary developmental aspects and roles of adolescence and adulthood. Personal and environmental factors that influence occupational performance and prevention and wellness models to facilitate occupational functioning. Prerequisite: Admission to the M.S. in Occupational Therapy program.

406. Development of a Therapeutic Self. 3 Hours. Emphasizes understanding and developing foundational skills in therapeutic use of self and forms of therapeutic reasoning. Group theory and process is introduced and group leadership skills developed. Prerequisite: Admission to the M.S. in Occupational Therapy Program.

407. Introduction to Occupational Therapy Practice. 2 Hours. Overview of the role of the therapist and aspects of occupational therapy practice in multiple settings. The basics of assessment, treatment planning, intervention, and documentation; as well as service delivery systems and current issues. Prerequisite: Admission to the M.S. in Occupational Therapy program.

411. Occupational Performance in Children. 4 Hours. Developmental theories concerning factors influencing the development of occupational performance in infancy, childhood, and early adolescence. Developmental assessment methods and tools. Prerequisites: Grades of C or better in OT 401 and 407 and consent of the instructor.

412. Human Structure and Function. 5 Hours. Anatomical and physiological basis for occupational performance. Features structure and function of musculoskeletal, cardiovascular and nervous systems and application of biomechanical principles. Prerequisite: Admission to the M.S. 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 processes affecting occupational functioning and assessment and treatment related to psychosocial problems. Prerequisites: Grade of C or better in OT 401; and Grade of C or better in OT 407; and consent of the instructor.

420. Community Practicum. 1 Hour. May be repeated for credit. S/U grade only. Field experience in a community agency serving an urban population. Emphasis is on service learning in context and the development of professional behaviors. Field work required. Prerequisite: Admission to the M.S. in Occupational Therapy program.

422. Medical Conditions. 1 Hour. S/U grade only. This self-paced course reviews etiology, clinical manifestation, clinical course, and general medical and rehabilitative management of common medical conditions; emphasis placed on musculoskeletal, neurologic, cardiopulmonary, and psychiatric disorders. Prerequisite: Admission to the M.S. in Occupational Therapy program.

424. Contexts of Occupational Therapy Practice. 2 Hours. Trends in health care, reimbursement, legislation, and disability policy and how they affect occupational therapy. The policy process and development of an advocacy role. Exposure to
community based practice and consultation roles. Prerequisite: Grade of C or better in OT 407.

428. Fieldwork Level I. 3 Hours. Application of occupational therapy theory and therapeutic reasoning in a 40-hour week fieldwork experience with the opportunity to develop beginning therapeutic skills and professional behavior. Prerequisites: Grades of C or better in OT 411, 412, and 416; and satisfactory completion of OT 422; and consent of the instructor.

436. Occupational Therapy Practice: Functional Movement and Mobility. 5 Hours. Application of occupational therapy evaluation and intervention skills to children and adults with occupational performance deficits resulting from mobility and movement dysfunction. Prerequisites: Grades of C or better in OT 411, 412, and 416, and satisfactory completion of OT 422.

437. Occupational Therapy Practice: Cognition and Perception in Action. 4 Hours. The impact of impaired cognitive and perceptual processes on occupational performance of children and adults with neurological conditions, cognitive and intellectual disabilities and psychiatric disabilities. Prerequisites: Grades of C or better in OT 411, 412, and 416, and satisfactory completion of OT 422.

448. Fieldwork Level IIA. 8 Hours. S/U grade only. First of two supervised, full-time 12-week practica with emphasis on application of occupational therapy theory, development of psychomotor skills, reasoning client related problems, and professional socialization as an entry-level occupational therapist. Prerequisites: Grades of C or better in OT 428, 436, and 437; and consent of the instructor.

449. Fieldwork Level IIB. 8 Hours. S/U grade only. Second of two supervised, full-time 12-week practica with emphasis on application of occupational therapy theory, development of psychomotor skills, reasoning client related problems, and professional socialization as an entry-level occupational therapist. Prerequisites: Grades of C or better in OT 428, 436, and 437; and consent of the instructor.

500. Theories of Occupational Therapy. 4 Hours. Develops an understanding of the theoretical basis of occupational therapy and the impact of theory on clinical practice. Covers the history of knowledge and practice development in the field. Focuses on specific practice models developed as guides to clinical reasoning. Prerequisite: Consent of the instructor.

510. Research in Occupational Therapy. 3 Hours. Introduction to basic elements of research design relevant to occupational therapy practice. Prepares student to become critical consumer of research in occupational therapy and related fields. Includes qualitative and quantitative approaches to research. Prerequisites: Admission to the M.S. in Occupational Therapy program, or consent of the instructor. Recommended background: Statistics and research methods.

515. Synthesis I. 1 Hour. S/U grade only. Integrating theory, practice and research knowledge and skills across courses using case studies, and small group learning activities. Prerequisites: Grades of C or better in OT 401, 406, 407, 500, and AHS 510.

526. Assistive Technology and the Environment. 3 Hours. Assessing the need for, delivering, and evaluating the outcomes of occupationally-based technology and environmental interventions with people with disabilities within the home, school, workplace and community. Prerequisites: Grades of C or better in OT 411, 412, 416, and AHS 510.

530. Advanced Field Experience: Clinical Specialization in Occupational Therapy. 1 to 4 Hours. S/U grade only. Provides opportunity for the student interested in advanced occupational therapy practice to observe a master clinician and participate in treatment and/or clinical research. Prerequisite: Consent of the instructor.

531. Advanced Field Experience in Occupational Therapy Management. 1 to 4 Hours. S/U grade only. Practicum experience working with an experienced professional to develop projects or programs in student’s interest area, e.g., administration, middle management, consultation, program evaluation, and grantsmanship. Prerequisite: Consent of the instructor.

532. Advanced Field Experience: Occupational Therapy Education. 1 to 4 Hours. S/U grade only. Provides opportunity to observe, prepare, and present lectures/labs to occupational therapy students in technical or professional curricula or to develop skills as a clinical educator. Prerequisite: Consent of the instructor.

534. Socio-Cultural Aspects of Occupational Therapy. 3 Hours. Addresses social and cultural contexts in which chronic illness and disability are experienced; contexts which impact that experience, and broad contexts in which recovery accommodation, and occupational therapy treatment occur. Prerequisites: Grades of C or better in OT 424, 428, and 526.

535. Synthesis II. 2 Hours. S/U grade only. Integrating advanced theory, practice and research knowledge and skills across courses using complex individual and programmatic case studies and small and large group intervention planning activities. Prerequisites: Grade of C or better in OT 424, 428 and 526; and satisfactory completion of OT 422.

536. Fatiguing Conditions and Disability. 2 Hours. Same as Psch 536, Dis 536. Course covers 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.

540. Advanced Topics in Occupational Therapy Research and Evaluation. 4 Hours. Students may register for more than one section per term. In-depth presentation of selected research/measurement strategies. Specific topics vary and include single system design, survey research, ethnography, evaluation of clinical effectiveness. Prerequisite: Consent of the instructor.

541. Advanced Human Occupation Theory and Application. 4 Hours. Provides an advanced understanding of evaluation, intervention, program development and research based on the model of human occupation. Focuses on use of the model to address psychosocial problems in a range of disabled persons. Prerequisite: OT 400 or consent of the instructor.

550. Disability in the Urban Environment. 4 Hours. Same as Dis 550. Features of urban contexts that influence experiences of persons with disabilities are examined as they exacerbate problems or enhance resources in low income communities.

551. Computers, Communication and Controls in Rehabilitation Technology. 3 Hours. Same as DHD 551. Assistive technology course exploring different methods for evaluating controls used to operate computers, communication devices, and powered wheelchairs. Instruction also addresses device features and integration factors.

553. Program Evaluation: Documenting the Impact of Human Services. 3 Hours. Same as DHD 553. This course 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. Recommended background: Interest in research, health or behavioral sciences, and implementation and evaluation of community initiatives and community-based organizations.

555. Synthesis III. 2 Hours. S/U grade only. Integrating advanced theory, practice and research knowledge and skills from advanced fieldwork and coursework using complex case studies and small group assessment and intervention planning activities from students’ fieldwork experiences. Prerequisite: OT 448.

556. Theory & Methods of Needs Assessment in Aging & Disability. 4 Hours. Same as CHSc 556, Dis 556. This course 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. Prerequisites: 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. Administration and Management in Occupational Therapy. 3 Hours. Overview of issues related to administration and management in varied settings in which occupational therapists practice. Topics include management
functions, service planning, quality improvement, financial management and accreditation. Prerequisite: OT 555.

565. Research Approaches in Rehabilitation Technology Use and Delivery. 3 Hours. Same as DHD 565 and Dis 565. Advanced course in the design and critical analysis of research on the delivery and long term use of rehabilitation technology and universal access modifications by people with disabilities within the home, school, work site and community.

594. Special Topics in Occupational Therapy. 1 to 4 Hours. New course under development and selected seminar topics of current interest to faculty and students. Prerequisite: Consent of the instructor.

595. Seminar in Occupational Therapy. 1 Hour. S/U grade only. Pre-thesis seminar. Students participate in faculty-student discussion and activities related to individual areas of research/thesis. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. This course is for graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

597. Project Research. 4 to 8 Hours. May be repeated for a maximum of 8 hours of credit. S/U grade only. Independent scholarship focusing on problems of application in field. Students undertake an action project, create a method for dissemination, and orally present the project. Prerequisite: Graduate standing in the M.S. in Occupational Therapy program and consent of the instructor.

598. Research in Occupational Therapy. 0 to 16 Hours. S/U grade only. Students may register for more than one section per term. M.S. students are required to take a minimum of 7 credit hours. Independent research in occupational therapy, directed by a faculty member. Prerequisite: Foundation courses in research methods (such as AHS 510) and statistics or consent of the instructor.

599. Independent Study. 1 to 4 Hours. S/U grade only. Faculty-supervised independent study not included in regular course work in their field of interest related to oral tissues. Prerequisite: Consent of the instructor.

598. Research in Oral Pathology. 0 to 16 Hours. S/U grade only. Independent thesis research on basic biomedical phenomena or specific oral disease(s). Prerequisite: Consent of the advisor.

Oral and Maxillofacial Surgery (OSur)

510. Conscious Sedation and General Anesthesia. 3 Hours. S/U grade only. May be repeated for credit. Didactic lectures in all phases of pain and anxiety control supplemented with clinical experience in administration of general anesthetic and inhalation and intravenous sedatives.

511. Oral Surgery Seminar. 2 Hours. S/U grade only. Lecture, seminars, conferences and journal clubs dealing with current topics of clinical and research interest.

513. Craniofacial Deformity Seminar. 1 Hour. S/U grade only. May be repeated for credit. Discusses the investigation, evaluation, treatment planning and follow-up monitoring of patients with dentofacial deformities. Prerequisite: Admission to the oral and maxillofacial surgery residency or orthodontics graduate program.


532. Diagnosis and Treatment Planning in Orthognathic Surgery. 2 Hours. Non-orthognathic surgical topics of practical interest to orthodontists and their professional interrelationships with oral and maxillofacial surgeons.

533. Oral and Maxillofacial Surgery Literature Review. 2 Hours. S/U grade only. This course will cover the methodology for critical review of medical literature and discuss key articles appearing in appropriate medical journals.

561. Physical Diagnosis. 4 Hours. In-depth methods of obtaining a history and performing physical diagnosis of the entire body through theoretical and practical lesions.

Oral Medicine and Diagnostic Sciences (OMDS)


501. Advanced Oral Pathology I. 2 Hours. Detailed consideration of oral cysts, odontogenic tumors, and diseases of facial bones, blood and lymphoreticular systems, and salivary glands. Journal literature used. Prerequisite: OMDS 424 or the equivalent.

502. Advanced Oral Pathology II. 2 Hours. Detailed consideration of oral cancer and other lesions of oral mucosa, dental caries, inflammatory periodontal disease, skin lesions and microscopic diagnosis techniques. Journal literature used. Prerequisite: OMDS 424 or the equivalent.

519. Electron Microscopy Seminar. 1 Hour. A student speaker makes a seminar type presentation about a topic and follows this with a discussion involving electron microscopy. Prerequisite: Consent of the instructor.

527. Oral Biology Seminar. 1 Hour. Same as Hlst 514. S/U grade only. Invited speakers present the progress of current research work in their field of interest related to oral tissues. Prerequisite: Consent of the instructor.

529. Electron Microscopy in Dentistry. 1 Hour. Same as Hlst 515. Principles, theory, and practice of transmission and scanning electron microscopy, and energy dispersive x-ray microanalysis. Processing, sectioning, staining and examination of tissues. Prerequisite: Consent of the instructor.

595. Seminar in Oral Pathology. 2 Hours. S/U grade only. Reviews, reports, and discussion topics are drawn from the literature and material of surgical oral pathology. Prerequisite: Consent of the instructor.

598. Research in Oral Pathology. 0 to 16 Hours. S/U grade only. Independent thesis research on basic biomedical phenomena or specific oral disease(s). Prerequisite: Consent of the advisor.

Oral Sciences (OSci)

451. Research Methodology. 1 Hour. Primarily intended for students enrolled in the Master of Science in Oral Sciences degree program. Designed to help the student understand, utilize and appreciate the process of scientific inquiry. Prerequisite: Matriculation into the Master of Science in Oral Sciences program, or courses in basic biological sciences or the equivalent background and consent of the instructor.

452. Biological Basis of Oral Diseases. 2 Hours. Focuses on the biological basis of oral disease and modern concepts in the biomedical sciences. Prerequisites: Matriculation into the Master of Science in Oral Sciences program, or BChe 411 and Hstl 451 or the equivalent courses, or consent of the instructor.

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-pharmoacology, forensic sciences, and paleo-pathology topics. Same as Anth 534 and PmPg 534. Field work required. A lab experience, independent study and a research paper is required for 3 hours of credit. Prerequisite: Consent of the instructor.

580. Seminar in Oral Sciences I. 1 Hour. S/U grade only. Faculty led. Presentation and discussion of original research followed by a question/answer/discussion session between faculty members presenting, supporting faculty and students. Prerequisite: Graduate standing in the Master of Science in Oral Sciences program or consent of the instructor.

581. Seminar in Oral Sciences II. 1 Hour. S/U grade only. Student led. Seminars include presentations and discussion of selected key papers by the student in his or her field of research. Prerequisite: Graduate standing in the Master of Science in Oral Sciences program or consent of the instructor, and OSci 580.

593. Independent Research in Oral Sciences. 1 to 8 Hours. S/U grade only. Faculty supervised research projects. Research may not duplicate that being done in OSci 598. Prerequisite: Consent of the instructor.

594. Special Topics in Oral Sciences. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Content varies. Selected topics of current interest in oral sciences. Prerequisites: Graduate or postgraduate standing and consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Faculty-supervised independent study not included in regular course offerings. Prerequisite: Consent of the instructor.
598. Master's Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Thesis research to fulfill master's degree requirements. Prerequisites: Matriculation into the Master of Science in Oral Sciences program and consent of the Director of Graduate Studies.

Orthodontics (Ortd)
513. Craniofacial Growth and Development. 4 Hours. Physiology of the stomatognathic system, behavioral development, implications of craniofacial growth and development, reactions of periodontal tissues to applied force and prevalence; causes of malocclusion. Prerequisite: Matriculation into Certificate Program in Orthodontics or M.S. in Oral Sciences program.

521. Methodologies in Craniofacial Research. 1 Hour. Demonstration and discussion of the techniques and methods employed in the study of the structure, growth and function of the craniofacial region.

524. Craniofacial Anomalies I. 2 Hours. Introduction to a variety of orofacial clefts, etiology, clinical presentation, growth and development and habilitation via an interdisciplinary team approach. Longitudinal analysis of cases with cleft lip and palate.

525. Craniofacial Anomalies II. 1 Hour. Introduction to treatment aspects of patients with orofacial clefts and to a variety of craniofacial anomalies, their etiology, clinical presentation, growth and development and habilitation through a team approach. Clinical rotations through the Center for Craniofacial Anomalies. Prerequisite: Ortd 524.

537. Biostatistics Applied to Craniofacial Research. 2 Hours. Multivariate statistical techniques applied to craniofacial growth research. Prerequisites: Ortd 523 and a basic univariate statistics course.

595. Seminar in Orthodontics. 1 to 2 Hours. May be repeated for a maximum of 13 hours of credit. S/U grade only. Presentations by selected guest lecturers on research or clinical material relating to matters of interest to the Department of Orthodontics. Prerequisite: Enrollment in the orthodontics postgraduate or oral sciences graduate program.

Pathology (Path)
421. General Pathology-Dental. 3 Hours. Basic principles of pathological processes. Prerequisites: Anat 440, Path 407, and PhyB 401, or consent of the instructor.

422. Systemic Pathology-Dentistry. 3 Hours. Disease process affecting specific organs. Prerequisite: Path 421.

425. General Pathology. 3 Hours. Basic principles of pathological processes, including tissue injury and repair, inflammation, circulatory disturbances, retrograde processes and tissue responses to specific infectious agents and neoplasms. Prerequisites: Anat 440 or 425 or the equivalent; and PhyB 401 or the equivalent; or consent of the instructor.

426. Organ Pathology. 5 Hours. The disease processes affecting specific organs and anatomic systems. Prerequisite: Path 425 or consent of the instructor.

427. Clinical Pathology. 4 Hours. Practical application of the clinical aspects of laboratory medicine. Emphasizes problem solving at the laboratory level and clinico-pathological correlation. Prerequisite: Path 425 and consent of the instructor.

501. Experimental Pathology. 3 Hours. Survey of experimental pathology: general principles and techniques. Prerequisites: Path 425 and 426 or the equivalents, or consent of the instructor.

503. Molecular Pathology. 2 Hours. Molecular pathology principles and techniques; application to unfold molecular basis of disease. Molecular diagnostic testing to determine disease by examining RNA, DNA or protein. Prerequisite: Path 501.

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: Consent of the instructor.

507. Physiological Basis of Pathology. 2 Hours. Same as Hstl 507. Subject matter allied to general pathology but going deeper into physical chemistry and physiological principles, as set forth in N.R. Joseph’s Comparative Physical Biology. Prerequisite: Hstl 401; or Path 421 and 422.

508. Clinical Pathophysiology I. 3 Hours. Pathophysiologic alterations that occur as the result of disease. Emphasizes the following disease processes: neoplastic, infectious, immunological, hematologic, cardiovascular, respiratory, and renal. Prerequisites: Path 425 and Path 426.

509. Clinical Pathophysiology II. 3 Hours. Continuation of Pathology 508. Pathophysiologic disease processes in the following systems: gastrointestinal, hepatobiliary, nervous, female and male genitourinary, skin, musculoskeletal and endocrine. Prerequisite: Path 508.

522. Clinical Biochemistry. 5 Hours. Clinical chemistry principles and techniques and its role in diagnosis and treatment; chemistry of major body constituents in health and disease; effective use of the laboratory. Prerequisite: Bche 460 or the equivalent.

527. Clinical Laboratory Method Evaluation. 3 Hours. Same as MLS 527. Includes development and comparison of clinical laboratory methods; also, statistical methods of evaluating sensitivity, specificity, precision, accuracy, predictive value, and cost effectiveness. Prerequisite: Consent of the instructor.

530. Medical Bacteriology. 3 Hours. Principles, theory and practice of diagnostic bacteriology and infectious diseases. Prerequisite: MIm 452 or the equivalent.

534. Medical Mycology, Parasitology and Virology. 3 Hours. An advanced microbiology course on the latest theoretical and practical concepts of human pathogenic fungi, protozoa, helminths and viruses and their relation to disease and diagnosis. Prerequisite: MIm 452 or consent of the instructor.

595. Pathology Seminar and Journal Club. 2 Hours. S/U grade only. Weekly seminar and journal club covering selected fields of interest and research in pathology.

598. Master's Thesis Research. 0 to 16 Hours. Students may register for more than one section per term. S/U grade only. Research in experimental pathology towards a PhD degree.

599. PhD Thesis Research. 0 to 16 Hours. Students may register for more than one section per term. S/U grade only. Research in experimental pathology towards a PhD degree.

Pediatric Dentistry (PedD)
410. Principles and Methods in Dental Research I. 2 Hours. Introduces students to several of the more commonly used statistical procedures for testing hypotheses; provides students with a beginner’s set of tools for using statistics. Prerequisites: Enrollment in post-graduate or graduate program in pediatric dentistry.

411. Principles and Methods in Dental Research II. 2 Hours. Designed to provide the student with an understanding of the scientific method. Prerequisite: PedD 410.

501. Dental Pediatrics I. 2 Hours. The pathophysiology and biologic basis of the neurologically, mentally and medically compromised developing child and the implications to dental management and research.

502. Dental Pediatrics II. 2 Hours. The pathophysiology and biologic basis of the neurologically, mentally and medically compromised developing child and the implications to dental management and research. Prerequisite: PedD 501.

595. Pediatric Dentistry Seminar. 2 Hours. S/U grade only. Presentation and discussion of current literature and research in pediatric dentistry, medical and dental aspects of pulp therapy, traumatology, fluorides and cariology. Provides behavior guidance and application of material from other areas.

Pharmaceutics (PmPc)
See Biopharmaceutical Sciences (BpS)

Pharmacodynamics (PmPd)
See Biopharmaceutical Sciences (BpS)

Pharmacognosy (PmPg)
480. Biological Evaluation of Natural Products. 3 Hours. Short-term procedures useful for the discovery and
characterization of natural product drugs, with related laboratory experiments, and principles of more advanced drug development. Prerequisite: Consent of the instructor.

510. Research Techniques in Pharmacognosy. 3 Hours. Introduction to the techniques used in pharmacognosy.

511. Advanced Pharmacognosy. 4 Hours. A theoretical and applied course designed to acquaint the student with the occurrence, isolation, characterization, identification, biosynthesis and activity profile of biologically active natural products. Prerequisite: PmPg 510 or the equivalent or consent of the instructor.

512. Microscopy of Natural Drug Products. 3 Hours. Use of microscopic methods in the identification of natural drugs and herbal products, with emphasis on the use of light and scanning electron microscopes. Prerequisite: PmPg 517 or consent of the instructor.

513. Structure of Biopolymers. 3 Hours. Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Prerequisites: BChe 460 and a year of physical chemistry; or consent of the instructor.

515. Structure Elucidation of Natural Products I. 2 Hours. A review of modern spectroscopic and chemical techniques as applied to the determination of structure of natural products. Prerequisites: PmPg 511 and MdCh 562.

516. Structure Elucidation of Natural Products II. 2 Hours. A review of modern spectroscopic and chemical techniques as applied to the determination of structure of alkaloidal natural products. Prerequisites: PmPg 511 and MdCh 562.

517. Problem-Solving in Plant Taxonomy. 4 Hours. Principles and concepts in plant taxonomy, which include identification, classification, nomenclature, discussion of major recent/modern systems, family characterization and field work methods. Prerequisite: Consent of the instructor.

518. Correlative Phytochemistry. 2 Hours. Distributional correlation of well-defined groups of secondary phytocomponents with existing plant classification systems as an aid in the search for biologically active natural products. Prerequisite: PmPg 517.

520. Ethnopharmacology Field Work. 4 Hours. Studies of plants used by indigenous peoples as medicinal agents, in defined geographic areas, primarily through interviews with medicine men and the populace. Plant material will be collected for subsequent study. Prerequisites: PmPg 517 or consent of the instructor. Contingent on the availability of funds for travel support.

521. Recent Advances in Pharmacognosy. 2 Hours. A review of recent progress in the chemistry, biosynthesis and biological properties of natural products. Prerequisite: PmPg 511.

522. Laboratory Techniques in Pharmaceutical Biotechnology I. 3 Hours. Students will perform laboratory research rotations as assigned by the Biotechnology track faculty in the three laboratories of the Center for Pharmaceutical Biotechnology in the College of Pharmacy. Prerequisite: Credit or concurrent registration in BChe 460; or consent of the instructor.

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: PmPg 522 or consent of the instructor.

534. Dental and Medical Anthropology Within Human Evolution. 1 to 3 Hours. Same as Anth 534 and OSci 590. Studies the biological and physical anthropology of hominid teeth and the craniofacial complex with relevant medical anthropology, ethno-pharmacology, forensic sciences, and paleo-pathology topics. Field work required. A lab experience, independent study and a research paper is required for 3 hours of credit. Prerequisite: Consent of the instructor.

569. Predictive Strategies in Pharmacognosy. 2 Hours. Consideration of the methods employed for the selection of plants that are most likely to yield biologically active compounds. Prerequisites: Demonstration of competency in organic chemistry, botany and pharmacology.

595. Seminar in Pharmacognosy. 1 Hour. May be repeated for a maximum of 2 hours of credit. S/U grade only. Presentation on a current research topic.

598. Master's Research in Pharmacognosy. 0 to 16 Hours. S/U grade only. Research for completion of master's degree.

599. Doctoral Research in Pharmacognosy. 0 to 16 Hours. May be repeated for credit. S/U grade only. Research for students in the pharmacognosy doctoral program.

Pharmacology (Pcol)

425. Medical Pharmacology. 6 Hours. Animals used in instruction. This is a College of Medicine course and does not follow the regular academic calendar. A lecture, conference and laboratory course on human pharmacology. Drug mechanisms, toxicities and kinetics are presented as a foundation to therapeutic application. Prerequisites: BChe 460 and general human physiology.

430. Principles of Toxicology. 2 Hours. No credit given if the student has credit in EOHS 457. Same as BpS 430. Examines the toxic effects of drugs and chemicals on organ systems. Lectures emphasize basic principles, effects on specific organ systems, major classes of toxic chemicals, and specialized topics such as forensic and industrial toxicology.

505. Receptors and Cell Signaling. 3 Hours. Same as PhyB 505. Lecture/discussions of theoretical and experimental aspects of cellular receptors and signaling processes. Topics include receptor theory and signal transduction mechanisms. Prerequisite: BChe 460 or consent of the instructor.

508. Drug Metabolism and Disposition. 2 Hours. Animals used in instruction. Basic principles underlying the metabolism and disposition of drugs. Biochemical mechanisms influencing the therapeutic and/or toxic effects of drugs and other foreign compounds. Prerequisite: Consent of the instructor.


530. Pharmacology and Biology of the Vessel Wall. 2 Hours. Regulation of physiological and pathological processes in the cardiovascular system; e.g. endothelial barrier, cell adhesion, smooth muscle proliferation, angiogenesis, endothelial gene expression. Pharmacological treatment of cardiovascular diseases. Prerequisites: BChe 460 and PhyB 401; or consent of the instructor.

540. Ion Channels: Structure, Function, Pharmacology and Pathology. 2 Hours. Same as PhyB 540. 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. Recommended background: One undergraduate course in Biochemistry and one in Physiology, or consent of the instructor.

594. Special Topics. 1 Hour. May be repeated for credit. Organized presentation and discussion of rapidly developing research areas in molecular, cellular and systems pharmacology. Prerequisite: Consent of the instructor.

595. Pharmacology Seminar. 1 Hour. May be repeated for credit. S/U grade only. Presentation of research and/or current literature by invited lecturers and students.

598. M.S. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under supervision of a graduate advisor.

599. Ph.D. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under supervision of a graduate advisor.

Pharmacy (Phar)

400. Pharmacokinetics. 3 Hours. Concepts and principles in pharmacokinetics including theories and basis for drug receptor actions, drug absorption, distribution, excretion and biotransformation. Prerequisites: Credit or concurrent registration in Phar 322 and 332 and PhyB 302.

401. Principles of Drug Action and Therapeutics I. 3 Hours. Integration of medicinal chemistry, pharmacology,
pharmaco-therapeutics, pharmacokinetics and toxicology in the drug actions related to the disease states associated with the endocrine, renal, optical and auditory systems. Prerequisites: PhyB 302 and Phar 400 and Phar 342; and second year standing in Doctor of Pharmacy program.

402. Principles of Drug Action and Therapeutics II. 4 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics and toxicology in the areas of the autonomic nervous system, cardiology, lipid disorders and hypertension. Prerequisites: PhyB 302; and Phar 342 and 400 and second year standing in Doctor of Pharmacy program.

403. Principles of Drug Action and Therapeutics III. 3 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the areas of pain management and psychiatric disorders. Prerequisites: Consent of the instructor; or Phar 352 and 401 and 402; and second year standing in Doctor of Pharmacy program.

404. Principles of Drug Action and Therapeutics IV. 3 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the areas of women’s and men’s health, respiratory disorders, diabetes and pediatrics. Prerequisites: Consent of the instructor; or Phar 352 and 401 and 402 and second year standing in Doctor of Pharmacy program.

405. Principles of Drug Action and Therapeutics V. 3 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the areas of drug abuse, cerebrovascular diseases, parkinson’s and epilepsy. Prerequisites: Consent of the instructor; or Phar 351 and 401 and 402; and third year standing in Doctor of Pharmacy program.

406. Principles of Drug Action and Therapeutics VI. 3 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the area of infectious disease. Prerequisites: Consent of the instructor; or Phar 353 and 401 and 402; and third year standing in Doctor of Pharmacy program.

407. Principles of Drug Action and Therapeutics VII. 4 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the areas of transplants, gastrointestinal disorders, body fluids, nutrition, and the impact of drug therapies on a geriatric person. Prerequisites: Consent of the instructor; or Phar 353 and 401 and 402; and third year standing in Doctor of Pharmacy program.

408. Principles of Drug Action and Therapeutics VIII. 3 Hours. Integration of medicinal chemistry, pharmacology, pharmaco-therapeutics, pharmacokinetics, and toxicology in the areas of bones and joints, hematological disorders, oncology. Prerequisites: Consent of the instructor; or Phar 353 and 401 and 402 and third year standing in Doctor of Pharmacy program.

460. Introduction to Health Informatics. 1 Hour. No credit given if the student has credit in BHIS 400 or NuSc 218 or IPHS 420. Same as BHIS 460. Introduction to information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; storage, retrieval, and networking; system security. Taught online with some essential classroom lectures. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisites: Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. Recommended background: IDS 100 or the equivalent.

Pharmacy Administration (PmAd)

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. Prerequisites: Third-year standing in the Doctor of Pharmacy program or second-year standing in the Doctor of Pharmacy program with consent of the instructor, or graduate standing in pharmacy.

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. Prerequisites: Epid 400 or Btt 400; and Phar 355 or PmAd 502; or consent of the instructor.

502. Research Methods in Pharmacy Administration. 3 Hours. Focuses on “how-to-do” a research project and “why-to-use” a particular technique including meta-analysis, path analysis, conceptualization, measurements and data processing. Prerequisites: Soc 500 and consent of the instructor.

507. Pharmacy and Its Environment. 2 Hours. Factors directly influencing the practice of pharmacy. Roles of the pharmacist as affected by contemporary organizational, legislative, societal and fiscal environments. Prerequisite: Admission into the M.S. or Ph.D. in Pharmacy program.

510. Problems in Pharmacy Management. 3 Hours. Selective managerial problems relative to pharmacy practice. Field work involves data collection based on individual and group models of the managerial decision process. Prerequisite: PmAd 482 or the equivalent.

516. Drug Insurance. 3 Hours. Theoretical constructs and practical problems in designing, operating, and evaluating large drug insurance programs including quality assurance techniques to facilitate rational prescribing and dispensing. Prerequisites: PmAd 507 and consent of the instructor.

525. Medication, Identity and Illness. 3 Hours. Concepts and principles of human behavior related to pharmacy practice including understanding of patient behavior and methods to facilitate patient and inter-professional communication. Prerequisites: PmAd 321 or consent of the instructor.

535. Health Policy and Pharmaceutical Care. 3 Hours. Regulatory controls and reform proposals covering drug approval, manufacturing, marketing and use, including problems of drug diversion, lag, orphan products, and patent restoration. Prerequisite: PPA 500.

571. Principles of Pharmacoconomics. 3 Hours. Evaluation of pharmaceutical services and its role in pharmaceutical firms, in shaping public policy and evaluating the outcome of patient care after drug therapy intervention. Prerequisites: Econ 511 and HPA 522 and PmAd 511 or the equivalents.

594. Special Topics in Pharmacy Administration. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Topics vary. Intensive analysis of contemporary issue(s) associated with delivery and financing of pharmaceutical products and professional services.

595. Departmental Seminar. 1 Hour. S/U grade only. May be repeated for credit. Presentation by students, faculty and visiting experts. Topics to be arranged. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Individual research under direction of a member of the faculty. Prerequisites: PmAd 502 or consent of the instructor.

598. Master’s Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Open only to degree candidates. Independent research on topic approved by student’s graduate committee. Prerequisite: Consent of the committee.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Open only to degree candidates. Independent research on topic approved by student’s graduate committee. Prerequisite: Consent of the committee.

Pharmacy Practice (PmPr)

430. Critical Care I. 2 Hours. Advanced pharmacotherapeutics course that will concentrate on the medical
management and the pharmacotherapist’s role in the management of the critically ill patient. Prerequisites: Phar 402, 403, 404, 405, 406 and concurrent registration in Phar 407 and 408; and completion of second year of the program.

460. Introduction to Health Informatics. 1 Hour. No credit given if the student has credit in BHIS 400 or NuSc 218 or IPHS 420. Same as BHIS 460. Introduction to information technology and systems in a healthcare setting; collection, analysis and management of healthcare data; storage, retrieval, and networking; system security. Taught online with some essential classroom lectures. Students must have an active UIC NetID with valid password and access to a computer and the Internet. Prerequisites: Students should demonstrate basic computing skills including knowledge of an office productivity suite (MS Office or other), electronic mail, and Internet browsers. Recommended background: IDS 100 or the equivalent.

Philosophy (Phil)

400. Philosophical Writing. 1 Hour. Philosophical issues covered will vary from semester to semester. Must be taken in conjunction with designated 400-level courses. Prerequisites: Major in philosophy and concurrent registration in a 400-level philosophy course as designated in the Timetable.

401. Theory of Knowledge. 4 Hours. Survey and analysis of key topics in epistemology, such as skepticism, the nature of propositional knowledge, justification, perception, memory, induction, other minds, naturalistic epistemology. Prerequisite: Phil 201 or consent of the instructor.

403. Metaphysics. 4 Hours. Intensive treatment of one or more topics, such as free will, personal identity, causation, existence, substance and attribute, the nature of the mind. Prerequisite: Phil 203 or 226 or 426 or consent of the instructor.

404. Philosophy of Science. 4 Hours. Selected works on the aims and methods of science; the status of scientific theories, natural laws, and theoretical entities; the nature of scientific explanation. Prerequisites: Phil 102 or 210; and one 200-level course in philosophy; or consent of the instructor.

406. Philosophy of Language. 4 Hours. Intensive treatment of one or more topics, such as meaning and reference, communication, the structure of language, language and thought, and the relation of language to reality. Prerequisite: Phil 102 or one 200- or 400-level logic course or Phil 226 or consent of the instructor.

410. Introduction to Formal Logic. 4 Hours. Review of predicate logic and of introductory set theory. The concept of a formal system. Notions of completeness and soundness. Introduction to Godel’s first incompleteness theorem. Prerequisite: Phil 210 or consent of the instructor.

416. Metalegal I. 4 Hours. Students who have taken Math 430 may not register for this course. Should be taken in sequence with Phil 417. Metatheory for sentence and predicate logic. Completeness and compactness theorems and their applications. Prerequisite: Phil 210 or consent of the instructor.

417. Metalegal II. 4 Hours. Effective computability and recursive functions. Peano arithmetic. Arithmetization of syntax. Incompleteness and undecidability: Godel’s and Church’s theorems. Prerequisite: Phil 416 or consent of the instructor.

420. Plato. 4 Hours. May be repeated once for credit with the consent of the department. Careful reading of selected works. Prerequisite: Phil 220 or 221 or 3 courses in philosophy or consent of the instructor.

421. Aristotle. 4 Hours. May be repeated once for credit with the consent of the department. Careful reading of selected works. Prerequisite: Phil 220 or 221 or 3 courses in philosophy or consent of the instructor.

422. Medieval Philosophy. 4 Hours. Study of selected philosophers such as Augustine, Boethius, Averroes, Maimonides, Aquinas, William of Ockham, Buridan, Suarez. Prerequisite: Phil 220 or 221 or 420 or 421 or consent of the instructor.

423. Studies in Early Modern Philosophy. 4 Hours. May be repeated once for credit with the consent of the department. Careful reading of selected works of one or more philosophers, 1600 to 1750, such as Descartes, Hobbes, Spinoza, Leibniz, Locke, Berkeley, Hume, Reid, and Rousseau. Prerequisite: Phil 223 or 224 or 3 courses in philosophy or consent of the instructor.

424. Kant. 4 Hours. Intensive study of Kant’s metaphysics and theory of knowledge with main reading drawn from the Critique of Pure Reason. Prerequisite: Phil 223 or 224 or 3 courses in philosophy or consent of the instructor.

425. Studies in Nineteenth-Century Philosophy. 4 Hours. Careful reading of one or more post-Kantian philosophers such as Hegel, Schelling, Fichte, Schopenhauer, Marx, J.S. Mill, Kierkegaard, Nietzsche. Prerequisite: One 200-level course in philosophy or consent of the instructor.

426. Analysis and Logical Empiricism. 4 Hours. Developments in twentieth century philosophy with roots in the study of logic and language, such as logical atomism, logical empiricism, and contemporary analytic philosophy. Topics vary. Prerequisite: Phil 210 or 226 or consent of the instructor.

427. Continental Philosophy II: European Thought Since 1960. 4 Hours. European thought since 1960: Existential Marxism; critical theory, structuralism; post-structuralism and deconstruction. Prerequisite: Phil 227 or consent of the instructor.

429. Special Studies in the History of Philosophy. 4 Hours. May be repeated once for credit with the consent of the department. Advanced study of a historical school, period, or the development of a historical theme. Prerequisite: One 200-level course in the history of philosophy or consent of the instructor.

430. Ethics. 4 Hours. May be repeated once for credit with the approval of the department. Selected topics in ethics, such as normative ethics, value theory or meta-ethics. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

431. Social/Political Philosophy. 4 Hours. May be repeated once for credit with consent of the department. Selected topics in social and political philosophy. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

432. Topics in Ethics. 4 Hours. May be repeated once for credit with the approval of the department. Selected topics in ethics. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

433. Topics in Social/Political Philosophy. 4 Hours. May be repeated once for credit with the approval of the department. Selected topics in social and political philosophy. Prerequisite: One 200-level course in philosophy or consent of the instructor. Credit in a course in moral, social, or political philosophy is recommended.

441. Topics in Philosophy of Religion. 4 Hours. May be repeated once for credit with the approval of the department. Intensive study of one or more selected topics concerning the philosophical aspects of basic religious beliefs and concepts. Prerequisite: One 200-level course in philosophy (Phil 241 is recommended) or consent of the instructor.

500. Writing in Philosophy. 4 Hours. Required of all first-year Ph.D. students. Practice in philosophical writing including finding a thesis. Judicious choice of reading on the topic, outlining, and composing drafts as well as style, paragraphing, and making sentences. Prerequisite: Graduate standing in philosophy.

501. Seminar: Topics in Ancient Philosophy. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics in medieval philosophy.

504. Theoretical Approaches to Policy and Governance. 4 Hours. Same as PoIS 504. Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based.

505. Seminar in Modern Philosophy. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive analysis of the
work of one important philosopher or philosophical movement between 1600 and 1900.

508. Nineteenth-Century Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in nineteenth-century philosophy.

509. History of Analytic Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Students may register for more than one section per term when topics vary. Topics in late nineteenth- and early twentieth-century Anglo-American philosophy.

510. History of Ethics and Social/Political Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Topics in the history of ethics or social-political philosophy.

513. Topics in History of Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Philosophers, philosophical schools, or intellectual trends other than those of the ancient and modern periods.

520. Topics in Contemporary Philosophy. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive analysis of the work of one important philosopher or philosophical movement of the twentieth century.

522. Feminist Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in feminist philosophy.

524. Continental Philosophy. 4 Hours. May be repeated for credit with the approval of the department. Students may register for more than one section per term. Topics in continental philosophy.

526. Ethics. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

528. Social/Political Philosophy. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

530. Aesthetics. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics in aesthetics.

532. Metaphysics. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

534. Philosophy of Mind. 4 Hours. May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

536. Epistemology. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Selected topics in the contemporary theory of knowledge.

538. Philosophy of Language. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

540. Philosophy of Science. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

542. Philosophy of Special Sciences. 4 Hours. May be repeated for credit with the approval of the department. Two sections may be taken concurrently when topics vary. Intensive study of special topics in philosophy of physics, philosophy of biology, or other sciences.

544. Philosophy of Logic. 4 Hours. May be repeated for credit with the consent of the department. Two sections may be taken concurrently when topics vary. Intensive study of selected topics.

546. Philosophy of Mathematics. 4 Hours. May be repeated for credit with the approval of the department. Philosophical foundations of mathematics.

560. Recursion Theory I. 4 Hours. Same as Math 500. Primitive recursion, recursive and recursively enumerable sets, the arithmetic hierarchy, post’s problem and the finite injury priority method. Prerequisite: MCS 441.

562. Metamathematics I. 4 Hours. Same as Math 502. First order logic, completeness theorem and model theory. Prerequisite: Math 430 or consent of the instructor.

563. Metamathematics II. 4 Hours. Same as Math 503. Incompleteness theorems, elementary recursion theory and proof theory, first and second order arithmetic. Prerequisite: Phil 562.

565. Set Theory I. 4 Hours. Same as Math 504. Naive and axiomatic set theory. Independence of the continuum hypothesis and the axiom of choice. Prerequisite: Math 430 or Phil 562 or Math 502.


568. Model Theory II. 4 Hours. Same as Math 507. Intermediate stability theory: dependence, prime models, isolation, regular types, dimension, weight. Prerequisite: Phil 567 or Math 506.

569. Advanced Topics in Logic. 4 Hours. Same as Math 512. Students may register for more than one section per term. Advanced topics in modern logic: e.g., descriptive set theory, model theory of fields, theory of hierarchies, stable groups. Prerequisite: Approval of the department.

590. Research Seminar. 4 Hours. May be repeated for credit. S/U grade only. A work-in-progress seminar for graduate students at the topical, prospectus, or dissertation level. Prerequisite: Completion of 10 of the 14 required courses for the Ph.D. in Philosophy.

593. Independent Research. 2 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Topics and plan of study must be approved by the candidate’s advisor and by the staff member who directs the work.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Topics and plan of study must be approved by the candidate’s advisor and by the staff member who directs the work.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research for Ph.D. thesis.

Physical Therapy (PT)

501. Science of Physical Therapy Practice. 3 Hours. Concepts of evidenced-based physical therapy practice including practice theory, measurement, outcomes assessment and critical evaluation of bodies of literature in context of the health care system and health policy. Prerequisite: Consent of the instructor.

502. Measuring Motor Development and Function. 3 Hours. Psychometric characteristics of standardized tests of motor development and function. Survey of tests, test evaluation, interpretation of test scores, and application to clinical practice. Prerequisites: Consent of the instructor and a graduate-level course in statistics.

503. Analysis of Motor Development. 3 Hours. Sensorimotor development in children, relating changes to maturation, skill acquisition, motor learning, environmental influences and individual differences. Includes critical review of current literature. Prerequisite: Consent of the instructor. Recommended background: Prior experience in or knowledge of child development.

504. Assessment of Developmental Processes in Infancy. 2 Hours. Motor and behavioral competencies of the newborn, both term and preterm. Assessment of behavior and motor dysfunction in infants; analysis of the literature on intervention. Prerequisites: Consent of the instructor and credit or concurrent registration in a graduate-level course in statistics.

510. Control of Posture and Locomotion. 2 Hours. Review and analysis of normal and developmental aspects, assessment, disorders, and rehabilitation of balance and gait disorders. Prerequisites: PT 562 and consent of the instructor.
511. Therapeutic Intervention. 3 Hours. Provides clinicians with an approach to integrate research into practice. The goal is to acquire skills to evaluate therapeutic interventions in the literature and in practice. Prerequisite: Consent of the instructor.

520. Mechanics of Joint Dysfunction. 3 Hours. Principles of mechanics applied to pathology of joint components; mechanical and neurological implications of extremity and spinal joint dysfunction; critical review of pertinent literature. Prerequisite: PT 519.

521. Biomechanics of Locomotor Dysfunction. 3 Hours. Principles of mechanics applied to the study of walking pattern. Kinematic and kinetic analysis of normal and pathological deviations, and issues related to development from birth to adult and neuromuscular control. Prerequisite: Consent of the instructor.

562. Neural Plasticity and Pathophysiology. 3 Hours. Neurologic concepts underlining PNS/CNS injury process and neural plasticity (nervous system remodeling and reorganization). Neuropathology of conditions producing movement dysfunction. Prerequisite: Consent of the instructor.

563. Measurement in Physical Therapy. 3 Hours. Measurement theory and statistics underlying the development of standardized tests. Critique of physical therapy tests of strength, ROM, coordination, endurance, and activities of daily living. Prerequisites: Consent of the instructor and any graduate-level statistics course.

570. Planning and Evaluating Intervention Programs in Various Settings. 3 Hours. Planning, implementation, and evaluation of services for children with special needs. Emphasis on conceptual frameworks in human development and family systems. Program planning and evaluation. Prerequisite: Consent of the instructor. Recommended background: Prior experience or knowledge of child development.

571. Biomechanics of Normal and Abnormal Movement. 3 Hours. Same as MVSc 571. Principles of statics and dynamics exemplified by human movements. Examination of muscle mechanics, joint forces, stability. Redundancy and intersegmental interactions in multijoint movements. Prerequisite: Consent of the instructor.

572. Psychology of Motor Control and Learning. 3 Hours. Same as MVSc 572. Advanced principles of the control and acquisition of complex, voluntary skills. Prerequisites: MVSc 354 or consent of the instructor.

574. Instrumentation for Motor Control Research. 3 Hours. Same as MVSc 574. Introduction to oscilloscopes, amplifiers, filters, and transducers. Origin and processing of electromyograms. Motion capture and processing techniques. Prerequisite: PT 571.

594. Special Topics in Physical Therapy. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit if topics vary. Students may register for more than one section per term. Selected topics of interest within physical therapy specialty areas. Particular attention is given to topics of crosscutting importance to these professions, especially applications in teaching, consultation, and administration. Prerequisite: Consent of the instructor.

595. Seminar in Physical Therapy. 1 Hour. S/U grade only. Topics of current interest in physical therapy. Includes discussions of current research and important new developments in the specific disciplines. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. For graduate students who wish to pursue independent study not related to their project/thesis research. Prerequisite: Consent of the instructor.

598. Research in Physical Therapy. 0 to 16 Hours. S/U grade only. Independent research in one area of physical therapy directed by a faculty member. Prerequisites: Foundation courses in research methods and graduate-level statistics and consent of the instructor.

Physics (Phys)

401. Electromagnetism I. 4 Hours. Vector calculus; electrostatic fields in vacuum; solution of electrostatic boundary-value problems; electrostatic fields in material media; electromagnetic energy; electric currents. Prerequisites: Phys 142 and 215.

402. Electromagnetism II. 4 Hours. Magnetic fields of steady currents and magnetic materials; electromagnetic induction; magnetostatic equations; slowly-varying currents: a-c circuits; Maxwell’s equations; electromagnetic waves; bounded regions; special relativity. Prerequisite: Phys 401.

411. Quantum Mechanics I. 4 Hours. Wave particle duality; wave functions; Schroedinger equation; mathematical structure of quantum mechanics; operators and observables; matrix representation of operators; three-dimensional Schroedinger equation. Prerequisite: Phys 244.

412. Quantum Mechanics II. 4 Hours. Orbital angular momentum. Spin and vector addition of angular momenta; degenerate and nondegenerate perturbation theory; identical particles; time-dependent perturbation theory; scattering theory. Prerequisite: Phys 411.

421. Modern Physics: Atoms and Molecules. 4 Hours. Hydrogenic atoms, electron spin, external fields, multi-electron atoms, diatomic molecules, line widths, photons, radiation from atoms and other electromagnetic processes, positrons, positronium, elastic electron scattering. Prerequisite: Credit or concurrent registration in Phys 411.

425. Modern Optics. 5 Hours. Review of electromagnetic wave theory; advanced geometrical optics; Fourier transforms and optics; interference and diffraction; laser cavities and gain media; introduction to nonlinear and fiber optics. Prerequisite: Phys 244.

429. Plasma. 4 Hours. Same as ECE 429. Single particle motion, plasma as fluids, waves in plasma, diffusion, resistivity, equilibrium, stability, introduction to kinetic theory. Prerequisite: ECE 322.

431. Modern Physics: Condensed Matter. 4 Hours. Crystal structures; interatomic binding; lattice vibrations; thermal and magnetic properties; quantum statistical mechanics; free electron theory of metals; electronic band theory; semiconductors and insulators; superconductivity. Prerequisites: Phys 411 and 461; or consent of the instructor.

433. Theoretical Mechanics. 4 Hours. Variable motion, non-inertial frames, oscillations, rigid body motion, three-dimensional motion, angular momentum, torque, orbits, Lagrange’s equations. Prerequisites: Phys 142 and 215.

450. Molecular Biophysics of the Cell. 4 Hours. Same as Bio 450. Introduction to molecular length, time, force, energy scales; statistical thermodynamics of solutions; DNA, RNA and protein structure and function; experimental methods. Prerequisite: Phys 245 or the equivalent.

453. Modern Physics: Nuclei and Elementary Particles. 4 Hours. Accelerators, detectors, symmetries, conservation laws, leptons, weak interactions, electroweak theory, strong interactions, hadrons, nuclear forces, systematics and reactions, nuclear models, nuclear astrophysics, quarks, quantum chromodynamics. Prerequisite: Phys 411.

461. Thermal and Statistical Physics. 4 Hours. Thermal equilibrium (Zeroth Law); thermodynamic states (First Law); irreversibility; entropy (Second Law); thermodynamic potentials and properties; phase transitions; kinetic theory of gases; classical statistical mechanics. Prerequisite: Phys 245.

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

471. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Phys 470, and approval of the department.
481. Modern Experimental Physics I. 4 Hours. Theory and experimental use of linear circuits, semiconductor devices, amplifiers, oscillators. Techniques and experiments in atomic, molecular and solid-state physics. Prerequisite: Phys 244.


484. Special Topics in Physics Teaching. 2 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Seminar on various topics related to the teaching of physics. Supervised practice. Subjects are announced.

499. Survey of Physics Problems. 1 Hour. May be repeated once for credit. No graduation credit for graduate students. Problem-solving techniques applied to the variety of undergraduate physics topics. Prerequisites: Credit or concurrent registration in Phys 401, 411, 441, 461, and 481.


513. Quantum Field Theory I. 3 Hours. Lagrangian formulation of relativistic wave equations. Quantum electrodynamics: Feynman rules, trace theorems, lowest-order calculations for several processes, self-energy, renormalization, higher-order diagrams. Prerequisite: Phys 512.

514. Quantum Field Theory II. 3 Hours. Path integrals, gauge theories, Weinberg-Salam model, electroweak processes, quantum chromodynamics, non-perturbative methods, topological objects in field theories, instantons. Prerequisite: Phys 513.


521. Molecular Physics. 3 Hours. Rotational and vibrational energies of molecules, potential curves, electronic transitions, transition moments, intensity rules, thermodynamic properties. Applications. Prerequisites: Phys 411 and 421 or consent of the department.

522. Laser Physics/Quantum Electronics. 3 Hours. Laser physics; population inversion; quantum theoretical calculation; modern laser systems; coherence phenomena; applications of lasers. Prerequisite: Phys 521 or approval of the department.

524. Group Theory in Physics. 3 Hours. Applications of group theory and symmetry principles to problems in elementary particle, solid-state, atomic and molecular physics. Prerequisite: Phys 512 or consent of the department.


533. Theory of Solids: Magnetism and Superconductivity. 3 Hours. The main body problem; many-particle states; functional integrals; Green’s functions; Feynman diagrams; perturbation expansions; tree diagrams. Prerequisites: Phys 512 and 532.

534. Theory of Solids: Semiconductor Physics. 3 Hours. Spin systems; magnetism; equilibrium Green’s functions; Landau theory of fermi liquids; Hubbard model; Luttinger model; non-equilibrium Green’s functions; Keldysh; Kadanoff-Baym approach. Prerequisites: Phys 512 and 532.

540. Physics of Semiconductor Devices. 4 Hours. Same as ECE 540. Electrons in periodic lattice; equilibrium carrier distribution; energy band diagrams in junctions, in homogeneous semiconductors; recombination and generation; non-equilibrium processes, radiation and electric fields; diodes. Prerequisite: ECE 346 or the equivalent.

541. Theoretical Mechanics. 3 Hours. Variational principles; Lagrange and Hamilton equations; Hamilton-Jacobi theory; Poisson brackets, small oscillations; continuous systems and fields; dissipative systems; integrability. Prerequisite: Phys 442 or consent of the department.

545. Introduction to General Relativity. 3 Hours. Principle of equivalence, the metric field and geodesics, tensor analysis and differential geometry, Einstein’s equations and the action principle, gravitational fields and waves, black holes. Prerequisites: Phys 502 and 541, or consent of the department.


561. Statistical Mechanics. 3 Hours. Density matrix. Information theory; Boltzmann-Gibbs distributions; the n-vector model; renormalization group theory; cellular automata. Prerequisite: Phys 461 or consent of the department.

581. Advanced Experimental Physics. 2 Hours. Experimental techniques in atomic, molecular and solid- and solid-state physics. Prerequisite: Phys 431 or consent of the instructor.

594. Special Topics in Modern Physics. 1 to 4 Hours. Students may register for more than one section per term. Lectures on topics of current interest. Subjects are announced in the previous semester. Prerequisite: Phys 512.

595. Graduate Seminar. 1 Hour. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. S/U grade only. Seminars in areas of research activity within the department covering recent contributions to the literature and research in progress. Presentations by students, faculty and scientists from other institutions.

596. Individual Study. 2 to 4 Hours. S/U grade only. Students may register for more than one section per term. Special topics. Outside reading and a term paper are assigned by a special arrangement with the department and faculty. Prerequisite: Consent of the department.

598. Master’s Thesis Research. 0 to 16 Hours. S/U grade only. Student may elect to do thesis research to fulfill partial requirement for master’s degree. Prerequisite: Consent of the department.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Ph.D. thesis research. Prerequisite: Consent of the department.

Physiology and Biophysics (PhyB)

401. Human Physiology I. 5 Hours. Lectures and conferences in human physiology. Emphasis is on cellular, nerve-
muscle, cardiovascular, respiratory, and renal physiology. Prerequisites: Mathematics, undergraduate physics, and organic chemistry, and concurrent registration in graduate biochemistry, or consent of the instructor.

402. Human Physiology II. 5 Hours. Continuation of PhyB 401. Emphasizes gastrointestinal and physiology of the central nervous system, endocrine and reproductive systems. Prerequisite: A grade of C or better in PhyB 401 or consent of the instructor.

501. Endocrinology. 3 Hours. Review of the field of endocrinology will be followed by a systematic consideration of new concepts in endocrine gland and mechanisms of hormone actions. Attention will be paid to the most important areas of research being pursued at present. Prerequisite: PhyB 402 or consent of the instructor.

502. Physiology of Reproduction. 2 Hours. The purpose of this course is to enable students to acquire a detailed and up-to-date understanding of the biology of reproduction at both the physiological and molecular levels.

505. Receptors and Cell Signaling. 3 Hours. Same as Pocel 505. Lecture/discussions of theoretical and experimental aspects of cellular receptors and signaling processes. Topics include drug receptor theory and signal transduction mechanisms. Prerequisite: Behe 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: PhyB 402 or consent of the instructor.

516. Physiology and Biochemistry of Muscle Contraction. 2 Hours. Same as Behe 516. Structure and function of myosin, actin, tropomyosin, troponin, and the sarcoplasmic reticulum; control, energetics, and mechanism of muscle contraction; gene expression.

518. Molecular, Cellular and Integrative Cardiovascular Physiology. 3 Hours. Advanced study of the cardiovascular system from molecule to organism. Emphasis on recent developments at the molecular/cellular level and their relationship to overall function. Prerequisite: PhyB 401 or consent of the instructor.

523. Exercise Biology in Health and Disease. 3 Hours. Same as MvSc 523. Interrelationships between exercise and various pathological conditions. Current research focusing on molecular and cellular mechanisms in healthy and diseased states. Prerequisite: Consent of the instructor.

531. Molecular Biophysics. 2 Hours. Structural and dynamical studies of biomolecules by means of biophysical techniques. Prerequisites: One year each of college chemistry, physics, mathematics, and quantum mechanics, or consent of the instructor.

532. Nuclear Magnetic Resonance. 2 Hours. An introduction to the principles of analysis of structure and dynamic properties of biomolecules by means of nuclear magnetic resonance (NMR) spectroscopy. Fundamentals of NMR theory. Prerequisites: One year each of college chemistry, physics, mathematics, and quantum mechanics; or consent of the instructor.

533. Nuclear Magnetic Resonance in Biophysics. 2 Hours. Continuation of PhyB 532. Analysis of structure and dynamics of biomolecules in vitro and in vivo by means of nuclear magnetic resonance spectroscopy. Prerequisite: PhyB 532 or consent of the instructor.

540. Ion Channels: Structure, Function, Pharmacology and Pathology. 2 Hours. Same as Pocel 540. 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. Recommended background: One undergraduate course in biochemistry and one in physiology, or consent of the instructor.

569. Methods in Experimental Physiology. 3 Hours. Primarily for students in physiology. Registration limited to eight. A laboratory course designed to acquaint students with advanced techniques and methodology in physiologic investigations. Prerequisites: Enrollment in the M.S. or Ph.D. in Physiology and Biophysics program, and credit or concurrent registration in PhyB 401 or the equivalent, or consent of the instructor.

585. Cell Biology. 4 Hours. Same as Anat 585 and MIm 585. Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity.

586. Cell Physiology. 4 Hours. Advanced functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Prerequisite: PhyB 402 and 585 and Behe 460, or consent of the instructor.

591. Departmental Seminar. 1 Hour. May be repeated for credit. S/U grade only. Required of all physiology and biophysics students each fall and spring semester while enrolled in the graduate program. Weekly seminar by staff and invited speakers.

592. Tactics and Strategy of Research in Physiology. 2 Hours. Course presents an analysis concerning various approaches in solving current physiology problems. Emphasizes critical reading of the literature. Prerequisite: PhyB 401.

594. Special Topics in Physiology and Biophysics. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Topics may include bioengineering, endocrinology, membrane biology, ion transport and its regulation, muscle physiology, neurophysiology, molecular neurobiology and others of current significance in physiology and biophysics. Prerequisite: Consent of the instructor.

595. Journal Club and Seminar in Physiology. 1 Hour. S/U grade only. Student presentation and discussion of assigned topics of current importance in physiology and biophysics as well as related fields. Prerequisites: Consent of the instructor. Limited to degree candidates in physiology and biophysics.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Individual study guided by a faculty member. The format of the course, examination and grading to be established by the faculty member. Prerequisite: Consent of the instructor.

598. M.S. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under the supervision of a graduate advisor. Prerequisite: Graduate standing in Physiology and Biophysics.

599. Thesis Research. 0 to 16 Hours. S/U grade only. Thesis work under the supervision of a graduate advisor.

Policy Studies (PS)

406. Politics of Urban Education. 4 Hours. Same as PolS 440. Relations between school governance and urban politics. The role of educational interest groups, school boards, professional educators, and citizens in formulation and execution of educational policy.

453. Topics in Education Policy. 4 Hours. May be repeated for a maximum of 12 hours of credit. Workshop emphasis on issues related to school organization, control and community relations. Topics are announced at the time the class is scheduled.

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: Consent of the instructor.


510. Seminar in Urban Education. 4 Hours. S/U grade only. This required doctoral seminar will be taken in the first year of doctoral study. It introduces theoretical perspectives and research problems in both concentrations of the Ph.D program as well as relation between educational and social changes. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

512. The Nature and Interpretation of Evidence in Educational Policy Research. 4 Hours. This required course in educational research methodology provides students with basic research tools and skills in interpreting and representing quantitative and qualitative data. Students learn research design and
535. Leadership and Educational Supervision. 4 Hours. Same as CIE 551. Theory and practice of supervisory leadership in educational settings; effects of interactive factors on performance assessment and professional development. Field experience requirement. Prerequisite: Ed 430 or 431, or consent of the instructor.

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. Prerequisites: Consent of the instructor; admission to a degree program in the College of Education. Students in the Ed.D. in Urban School Leadership prerequisites also include PSS 550 and PS 552.

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: 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: Consent of the instructor.

555. 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 field work with system administrators. Prerequisite: Consent of the instructor.

556. Instructional Leadership. 4 Hours. Instructional improvement role of educational leaders of urban schools. Human resource development, parental/community support, supportive organizational contexts. Strategic planning, implementation, and evaluation. Prerequisite: Consent of the instructor.

559. Internship in Educational Leadership. 4 Hours. May be repeated for credit. May be repeated once for an additional 4 hours. Only 4 hours is required for the Illinois Type 75 certification. Additional hours may be needed for students to satisfy local school system administrator certification requirements (e.g., Chicago Public Schools’ 1019 requirement). 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. Prerequisites: Admission to a degree program in the College of Education and to the Type 75 General Administrative Certificate program; PS 550 and 552; concurrent registration in PS 553; and consent of the instructor.

566. Cultural Studies in Education. 4 Hours. This course will examine origins, evolutions, and current cultural studies frameworks, with a focus on educational policy and practice. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

567. Economics of Education and Public Policy: An Introduction. 4 Hours. Introduction to the economics of education. It relates education and income, studies and conditions for efficient production of education, teachers markets and school finance. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

568. Education and the Law. 4 Hours. Legal rights, responsibilities, and authority of students, parents, teachers, administrators, boards, and government units in relation to schools. Legal issues in education policy and practice. Prerequisite: Consent of the instructor.

570. Educational Policy: Historical and Philosophical Analysis. 4 Hours. The evolution of American educational thought and policy in the context of social and intellectual developments in the culture of the United States. Prerequisite: Consent of the instructor.

571. Education Policy: Formation, Implementation, Outcomes. 4 Hours. Examination of social forces outside the school that influence educational policy making, and the results of implementing policy decisions: legislatures, courts, government agencies, interest groups. Prerequisite: Consent of the instructor.

572. Sociology of Education. 4 Hours. Same as Soc 572. Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education, inequality and educational reform. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

573. Seminar in Administrative Practice. 4 Hours. May be repeated once for an additional 4 hours. Only 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 (e.g., Chicago Public Schools’ 1019 requirement). Administrative elements of educational leadership: 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. Prerequisites: Admission to a degree program in the College of Education and to the Type 75 General Administrative Certificate program; PS 550 and 552; concurrent registration in PS 559; and consent of the instructor.

574. The Impact of College on Students. 4 Hours. Same as PPA 574. Introduction to the research evidence on the impact of college on students. Emphasis is placed on methods of assessing impact and research on college effects. Prerequisite: Consent of the instructor.

575. Higher Education Organization and Administration. 4 Hours. Same as PPA 575. Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. Prerequisite: Admission to the Ph.D. in Public Policy Analysis program or consent of the instructor.

576. History of Higher Education. 4 Hours. Same as PPA 576. Key historical events that have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. Prerequisite: Admission to the Ph.D. in Public Policy Analysis program or consent of the instructor.

577. American Academic Profession. 4 Hours. Same as PPA 577. Historical and systemic foundations of the academic profession. Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. Prerequisites: Admission to the Ph.D. in Public Policy Analysis program and consent of the instructor.

578. Theoretical Frameworks of Educational Policy. 4 Hours. Basic concepts, hypotheses, research findings and theory development. Nature and function of theory in educational politics at the federal, state and local levels. Prerequisite: PS 406 or consent of the instructor.

579. Organization and Management in Education. 4 Hours. Models of decision making, organizational effectiveness, and organizational improvement in education. Topical problems in current educational management practice. Prerequisite: PS 550 or consent of the instructor.

581. Collective Bargaining Policy in Education. 4 Hours. Analysis of collective bargaining case studies and agreement with emphasis on implications for education policy formulation. Prerequisite: Consent of the instructor.

582. Cultural Pluralism and Education Policy. 4 Hours. Social philosophical analysis of the theory of cultural pluralism, emphasizing its relation to the liberal-experimentalist tradition in educational thought; selected equal educational opportunity policies; recent federal and state legislation on multicultural education. Prerequisite: Consent of the instructor.

583. Women in Education. 4 Hours. Same as GWS 583. An overview of girl’s and women’s educational experiences and placement within the academic structure (as students, professionals and intellectuals). The impact of gender on the realization of educational, economic and social opportunities. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

586. Methods of Institutional and Practitioner Research. 4 Hours. Methods of institutional and practitioner research for practicing educators in school and school system settings.
587. Topics in Documentary and Field Research in Education. 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Study and practice in documentary and field research methods of collecting, organizing and integrating educational data: interviewing, participant observation, ethnography, case study, historiography. Topics vary. Prerequisite: Consent of the instructor.

588. Critical Race Theory: Race and Racism in Education. 4 Hours. Examines theories of race and racism in education within the interdisciplinary construct of Critical Race Theory. Prerequisite: Consent of the instructor, or admission to the PhD in Policy Studies in Urban Education program.

589. Educational Administration Theory. 4 Hours. Overview of administrative theory including theory functions; theory-practice interface; administrative theory history; and relationships of administrative theory to educational administration and organizations. Prerequisite: PS 550 or consent of the instructor.

592. Professional Career Training in Education Policy. 4 Hours. May be repeated for a maximum of 16 hours of credit. Faculty-supervised training through university teaching, research or internship. Presentation relating experience to theory. Prerequisite: Consent of the instructor.

593. Ph.D. Research Project. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the Ph.D. in Education program.

594. Special Topics in Educational Policy. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Exploration of an area not covered in existing course offerings. Topics vary. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 4 Hours. May be repeated for up to 12 hours of credit. Students may register for more than one section per term. Students carry out independent study in policy studies under the direction of a faculty member. Prerequisites: Consent of the advisor and the area chairperson.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student’s dissertation. Prerequisite: Consent of the dissertation advisor.

Polish (Pol)

401. Polish Composition and Conversation III. 4 Hours. Development of oral and writing skills: expanding vocabulary and perfecting style. Prerequisite: Pol 302.

402. Polish Composition and Conversation IV. 4 Hours. Continues Pol 401. Prerequisite: Pol 401 or the equivalent.

410. Structure of Modern Polish. 4 Hours. A synchronic linguistic analysis of Polish substantives, pronouns, verbs, deverbal nouns, and minor parts of speech from a syntagmatic and paradigmatic point of view. Prerequisite: Pol 402 or the equivalent.

450. Studies in Polish Drama. 4 Hours. May be repeated for a maximum of 12 hours of credit. Main trends in Polish drama, leading playwrights, their aesthetics and philosophy in the context of European drama and from the Renaissance to the present.

460. Studies in Polish Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Literary trends in Polish literature within the European context.

499. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Graduate students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

510. History of the Polish Language. 4 Hours. Phonological and morphological development; emphasis on lexical, syntactical, and stylistic problems. Linguistic analysis of selected texts. Prerequisite: Pol 410 or the equivalent.

515. Topics in Contemporary Polish Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Variable content.

520. Topics in Historical Polish Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Variable content.

545. Studies in Polish Medieval, Renaissance and Baroque Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, genre, author or movement. Content varies.

550. Studies in Polish Enlightenment and Romanticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre or movement. Content varies.

560. Studies in Polish Positivism and Symbolism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre or movement. Content varies.

565. Studies in Twentieth-Century Polish Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of an author, topic, genre, or movement. Content varies.

570. Studies in Polish Literary Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Literary criticism in the major epochs of Polish literary history.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

Political Science (PolS)


405. The Problem of Justice. 4 Hours. Same as CrJ 405. Premodern and modern views of justice and their practical utility in analyzing legislative, executive, and judicial programs for enhancing or restricting justice. Prerequisites: CrJ 101 plus two 200-level courses in criminal justice or two 200-level courses in political science.

414. Formal Models of Politics. 4 Hours. Introduction to formal political theory, emphasizing spatial voting and collective action models, analytic techniques including game theory, decision theory, utility maximization, and difference equations.

420. Administrative Theory and Behavior I. 4 Hours. Theories of modern administrative behavior and organizational processes; major trends in research findings on organizational behavior and performance; comparison of governmental and nongovernmental organizations. Prerequisite: PolS 460 or consent of the instructor.

429. Policy Making and Implementation. 4 Hours. How political factors, institutional setting, procedures, and the prior experiences of government officials affect policy making and implementation. Prerequisite: PolS 460 or consent of the instructor.

435. Special Topics in Bureaucracy. 4 Hours. May be repeated for a maximum of 12 hours of credit. Consideration of timely or enduring issues in policy formation and bureaucracy not available in regularly offered courses. Prerequisites: PolS 460 and consent of the instructor.

440. Politics of Urban Education. 4 Hours. Same as PS 406. Relations between school governance and urban politics. The role of educational interest groups, school boards, professional educators, and citizens in formulation and execution of educational policy.

451. Law and Public Policy. 4 Hours. The role of law and legal institutions in the development and implementation of public policies.

460. The Structure and Processes of American Public Policy. 4 Hours. Integrated overview of American policy-making institutions and processes. Emphasis on organizational design-making and the impacts of various policy-making institutions. Prerequisite: Consent of the instructor.
465. **Topics in the Sociology of Politics. 4 Hours.** Same as Soc 465. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

467. **Public Opinion and Political Communication. 4 Hours.** Same as Comm 467. Nature of public opinion and political communication systems. Patterns of opinion distribution and its measurement. Forces shaping public opinion and its impact on public policy. Prerequisite: PolS 200 or the equivalent or consent of the instructor.

482. **Democratic Theory. 4 Hours.** Democracy as a procedure of government and value commitments associated with this form of government. Special attention paid to classical and modern democracies. Prerequisite: PolS 290 or 291, or consent of the instructor.

485. **Gender and Politics. 4 Hours.** Same as GW S 485. Impact of gender on basic categories of western political thought. Distinctions between reason and emotion, public and private, among others, examined from feminist perspective. Prerequisites: PolS 190 and one 200-level course in political theory, or consent of the instructor.

497. **Directed Readings in Political Science. 4 Hours.** May be repeated for credit with consent of the graduate director. Intensive readings on a topic not covered in the regular curriculum. Prerequisite: Consent of the instructor.

498. **Independent Research in Political Science. 2 to 6 Hours.** May be repeated for credit with consent of the graduate director. May not duplicate work done in PolS 598 or 599. Research on special problems not included in course offerings. Prerequisite: Consent of the instructor.

500. **Introduction to Policy and Governance. 4 Hours.** Same as PPA 500. Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored.

501. **Data Analysis II. 4 Hours.** Same as PPA 501. Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. Prerequisites: 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: PolS 402 or consent of the instructor.

503. **Structural Equation Modeling for Political Science. 4 Hours.** Systems of equations, structural models, maximum likelihood estimation, LISREL, matrix algebra, GAUSS. Prerequisite: PolS 402 or consent of the instructor.

504. **Theoretical Approaches to Policy and Governance. 4 Hours.** Same as Phil 504. Different theoretical approaches to the relationship between policy and governance and the philosophical foundations on which those approaches are based.

505. **Research Design and Methods. 4 Hours.** Overview of the methods and conduct of research in political science. Issues of inference, measurements, data collection, hypothesis testing and ethics.

506. **The Profession of Political Science. 2 Hours.** Introduces graduate students to the range of teaching, research and service possibilities in the political science profession. Students are encouraged to take this course during their first year of graduate study.

510. **Seminar on Teaching Political Science. 2 Hours.** S/U grade only. Seminar on ethics and responsibilities of teaching political science in various academic settings. Teaching methods and technology applicable to community colleges and four-year colleges are explored. This course complements the Preparing Future Faculty Program. The format will include guest speakers from area community and four-year colleges.

536. **Public Personnel Systems. 4 Hours.** Major problems and issues in the management of human resources in the public sector. Prerequisite: PolS 541 or consent of the instructor.

537. **The Legal Environment of Public Administration. 4 Hours.** Statutory framework for administrative action; rule-making and adjudicative powers of public agencies; judicial review of administrative action; liability of public officials. Prerequisite: PolS 541 or consent of the instructor.

541. **Policy Formation, Implementation and Evaluation. 4 Hours.** Same as PPA 541. Introduction to political science theories of how elections, interest groups and state structure affect the formulation of public solutions to societal problems.

542. **Distributive/Redistributive Public Policy. 4 Hours.** Seminar on the politics of enacting and maintaining distributive policies. Focus is on the parochial and community-wide efficiency of such policies.

544. **Regulatory Public Policies. 4 Hours.** Exploring the nature and determinants of public policymaking with respect to the regulation of the economy.

549. **Topics in Public Policy Analysis. 4 Hours.** A research seminar on some aspects of public policy analysis not otherwise covered in the regular curriculum.

551. **Introduction to Urban Politics. 4 Hours.** Explores relationships between private economy and public policies in American cities; causes of urban decline and uneven development; and urban redevelopment and human capital policies.

553. **Urban Public Policy. 4 Hours.** Explores the problems of poverty, race, education, transportation policy, and housing in America’s cities, with a special emphasis on Chicago.

556. **Neighborhood and Community Politics. 4 Hours.** The techniques and effects of community organizing. Major issues include the definition of community and how to encourage positive development. Prerequisite: PolS 551.

558. **Graduate Student Field Experience in Political Science. 1 to 8 Hours.** May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Graduate student intern experience. Placement with government agencies, community organizations, or civic organizations, in conjunction with a seminar class and directed readings. Prerequisites: PolS 402 and 500.

559. **Topics in State and Local Government. 4 Hours.** Case analysis and research in selected problems dealing with structure, functions and administrative processes of American state and local governments. Prerequisites: PolS 500 and 541.

560. **Proseminar in American Politics. 4 Hours.** Introduction to research literature on American policy-making institutions and processes Prerequisite: 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: PolS 541.

563. **Executive Process. 4 Hours.** Presidential elections; presidential decision-making; the powers of the president; presidential leadership; the distributive state; policy implementation; federalism and administration; the politics of budgeting. Prerequisite: Admission to the M.A. or PPA programs or consent of the instructor.

564. **Seminar in Judicial Process. 4 Hours.** The judicial process, as part of political and policy processes. Demands made by, and policy impacts on, individual and organizational litigants and other political actors. Prerequisite: PolS 460.

566. **Interest Groups. 4 Hours.** Pluralism: the distributive state; radical group theory, public-interest groups; collective actions; corporatism; statism; structural Marxism; social movements and interest groups.

567. **Topics in Political Communication. 4 Hours.** Same as Comm 567, PA 567. Intensive study of selected aspects; organizational communication in public institutions, urban political communication patterns, communication elites. Independent research using a variety of community research techniques. Prerequisite: Consent of the instructor.

569. **Topics in American Political Processes. 4 Hours.** A research seminar on some aspect of American political process. Topics vary. Prerequisites: PolS 402 and 500.
570. Comparative Politics and Public Policy. 4 Hours. Comparative analysis of how different political systems deal with a variety of public policy issues such as environmental protection, social welfare and crime control.

571. Seminar in International Relations. 4 Hours. Previously listed as: PolS 471. State-building and challenges to state authority, democratization and regime change, political economy, environment, war, regionalism and globalization, social movements and international governance.

572. International Political Economy. 4 Hours. Previously listed as: PolS 472. Exploration of competing perspectives on nation states and economic systems.

573. Transitions to Democracy. 4 Hours. Game-theoretic view of democracy. Process and outcomes of transitions to democracy in capitalist and in communist countries. Civil-military relations in the process of transition. Case studies.

579. Topics in Comparative Politics. 4 Hours. Advanced seminar on selected topics in comparative politics. Topic(s) will vary from semester to semester. Prerequisites: PolS 500 and 541.

582. The Philosophy of the Social Sciences. 4 Hours. The ontological and epistemological foundations of alternative approaches to the study of human beings. Naturalistic, hermeneutic, and critical approaches are addressed and assessed.

589. Topics in Political Theory. 4 Hours. Detailed analysis of a political theorist or type of political theory, especially designed to meet programmatic and graduate needs.

590. Advanced Public Policy Workshop. 4 Hours. Same as PPA 590. Interdisciplinary workshop on preparing a dissertation proposal for PPA students. Prerequisites: Advanced standing in the PPA program and completion of PPA core courses.

593. Independent Research for Master's Degree. 2 Hours. S/U grade only. 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. Prerequisites: PolS 401 and 505 and 506; and PolS 504 or 541 or 551 or 570 or 571. Open only to Master's degree students; and approval of the department.

596. Advanced Readings in Political Science. 1 to 4 Hours. May be repeated for credit with consent of the graduate director. Students may register for more than one section per term. Intensive readings on an advanced topic not covered in the regular curriculum. Prerequisites: PolS 401 and PolS 404 and consent of the instructor.

598. Thesis Research. 0 to 16 Hours. S/U grade only. Open only to degree candidates. Individual study required of all students pursuing advanced degree in political science under thesis option. Prerequisite: Consent of the instructor.

599. Dissertation Research. 0 to 16 Hours. S/U grade only. Open only to degree candidates. Individual study required of all students pursuing Ph.D. degree with specialization in political science. Prerequisite: Consent of the instructor.

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. Prerequisites: Rest 320, 321, 322, 323, and 330, or equivalent coursework, or matriculation into the Advanced Certificate in Advanced Prosthodontics program.

517. Advanced Occlusion/TMJ Disorders. 2 Hours. A lecture and seminar discussion of the advanced concepts of occlusion, articulation, occlusal analysis, diagnosis, and treatment of functional disturbances. Prerequisites: Matriculation into the Advanced Certificate in Advanced Prosthodontics program or the M.S. in Oral Sciences program and consent of the department head.

Psychiatric Nursing (NuPs)

400. Group Dynamics, Behavior and Intervention. 2 to 3 Hours. Master of Science degree-seeking students in the Mental Health Nursing Concentration must register for 3 hours of credit. Concepts, theories and research pertaining to group dynamics and to interventions carried out in groups. Analysis of videotaped group experience.

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: NuPs 527 or consent of the instructor.

516. Behavioral Health Care I. 3 Hours. Common mental health problems presented in primary and community care settings. Focus on psychopathology, assessment and brief counseling interventions; crisis intervention and triage; emergency care. Prerequisite: Consent of the instructor.

517. Behavioral Health Care II. 3 Hours. Complex mental health problems experienced in psychiatric populations. Focus on stabilization and management of psychotic illnesses, dual diagnosis treatment models, psychoeducational models and psychiatric rehabilitation. Prerequisite: NuPs 516.

518. Family Behavioral Health. 2 Hours. Theories of family development and behavior; functional and dysfunctional communication and behavioral patterns. Theories and strategies for family assessment and intervention. Prerequisite: Consent of the instructor.

521. Clinical Practicum in Behavioral Health I. 3 to 5 Hours. May be repeated for credit. Advanced nursing management of common mental health problems. Emphasis on primary care and community settings. Assessment, triage, case management, emergency care and brief interventions. Prerequisite: Credit or concurrent registration in NuPS 517.

522. Clinical Practicum in Behavioral Health II. 3 to 8 Hours. May be repeated for credit. Advanced psychiatric nursing with a selected caseload of clients with serious and complex problems. Emphasis on psychiatric rehabilitation, cognitive-behavioral methods, psychoeducation and dual diagnosis. Prerequisite: NuPS 521.

523. Clinical Practicum in Behavioral Health III. 2 to 5 Hours. May be repeated for credit. Development of mental health nurse practitioner role to deliver mental health services and impact policies affecting a selected population. Prerequisite: 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: Consent of the instructor.

Psychology (Psch)

411. Stereotyping, Prejudice, and Racism. 3 Hours. Psychological research and theory concerning stereotyping, prejudice, and racism. Historical conceptualization, development, causes, expression, and psychological consequences of prejudice, as well as theories of prejudice reduction. Prerequisite: Graduate standing in psychology or consent of the instructor.

415. 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.

417. Psychology and Law. 3 Hours. Application of psychological theories to the development, operation, and effects of law; evaluation of different and similar approaches of law and psychology. Prerequisite: Psch 312 or consent of the instructor.

420. Social Development of Urban Children. 4 Hours. Same as EPsy 420. General principles of social development and socialization during childhood and the factors common to urban children that illustrate and modify these principles. Prerequisite: Admission to the graduate program in education or psychology, or consent of the instructor.

422. Advanced Developmental Psychology and Educational Processes. 3 Hours. Same as Ed 422. Focuses on cognitive and social development from birth to adolescence. Examines relations between development, learning, and educational processes. Prerequisites: Psch 100 and any one from Ed 210, Psch 259, or 320, or consent of the instructor.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
423. Characteristics of Early Adolescence. 3 Hours. Same as EPsy 466. Physiological, social, emotional, and cognitive development of early adolescence. The relationship between these developmental characteristics and success in the middle grades. Prerequisites: Admission to the Ph.D. program in psychology or approval of the College of Education or consent of the instructor, and Ed 210 or 421 or 422 or Psch 422 or the equivalent.

429. Constructivist Approaches to Development: Piaget and Vygotsky. 4 Hours. Same as EPsy 429. Piaget’s and Vygotsky’s theories of development of knowledge. Empirical and logico-mathematical forms of knowledge. Thought and action. Thought and language. Prerequisite: Graduate standing in education and Psch 422 or Ed 422 or the equivalent 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: Psch 343.

452. Human Learning and Memory. 3 Hours. Survey of empirical research and theories concerning the human memory system and the encoding, retention, and retrieval of information in that system.

454. Psychology of Language. 3 Hours. Same as Ling 474 and Comm 454. Introductory survey of methods, theory and research, linguistic foundations, history, and present status of the field.

455. Psychology of Thinking. 3 Hours. Research and theory concerning higher mental processes, including problem solving, reasoning, judgment, and decision making.

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. Prerequisites: Previous knowledge of Cognitive Psychology with at least an undergraduate 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.

460. Advanced Learning. 3 Hours. Methods, results, and interpretation of experimental studies of basic learning processes in animal and human subjects.

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.

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.

466. Neural Basis of Motivation. 3 Hours. Review of empirical data and theories concerning the physiological basis of motivational processes in animals and humans.

467. Fundamentals of Neuroscience. 3 Hours. Basic principles of neurophysiology and neuropharmacology including logic bases of nerve action, chemistry of synapses, and actions of pharmacological agents.

481. Interviewing. 1 Hour. S/U grade only. Lecture on the theory and practice of clinical interviewing with supervised experience. Prerequisite: Graduate standing in psychology or consent of the instructor.

494. Special Topics in Psychology. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced treatment of an announced topic.

495. Seminar in Psychology. 1 to 3 Hours. May be repeated for a maximum of 9 hours of credit. Students may register for more than one section per term. S/U grade only. Seminar devoted to special topics in psychology.

504. Rating Scale and Questionnaire Design and Analysis. 4 Hours. Same as EPsy 504. Development and administration of rating scales and questionnaires, analysis of data, and reporting of results. The focus is on rating scales. Prerequisites: Ed 501 and EPsy 503 or the equivalents 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: Completion of Master’s thesis.

506. Item Response Theory/Rasch Measurement. 4 Hours. May be repeated for a maximum of 8 hours of credit. Same as EPsy 506. Statistical inference with item response theory models, useful to measure an individual’s performance on a test or questionnaire. Models include parametric, non-parametric, unidimensional, multidimensional, and cognitive. Extensive computer use required. Prerequisites: Ed 501 and EPsy 503 and EPsy 546 or the equivalent; appropriate score on the department placement test.

507. Emerging Research Issues. 1 Hour. May be repeated for a maximum of 2 hours of credit. S/U grade only. Weekly seminar that introduces PhD students in psychology to the current research of each faculty member in the department of psychology. Prerequisite: Consent of the instructor.

508. Colloquium on the Teaching of Psychology. 1 Hour. S/U grade only. Required training to prepare graduate students for contact teaching in the Department of Psychology. Prerequisite: Consent of the instructor.

512. Attitudes and Social Cognition. 3 Hours. Survey of theory and research in social psychology, including attitudes and social cognition. Prerequisite: Consent of the instructor.

513. Interpersonal Relations and Group Processes. 3 Hours. Survey of theory and research in social psychology, including interpersonal relations and group processes. Prerequisite: Consent of the instructor.

515. Theoretical Perspectives on Women and Gender. 3 Hours. Same as GWS 515. Critical examination of psychological theories and research on women and gender, including biohysical, psychoanalytic, socialization, power, and social constructionist perspectives. Prerequisite: 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. Prerequisites: Psch 512, 513, and 514, or consent of the instructor.

517. Social Psychology of Education. 4 Hours. Same as EPsy 502. Social psychological factors influencing academic and social outcomes in schools. Achievement motivation, peer relations, social values in relation to student characteristics and school practice. Prerequisite: Admission to the Ph.D. in Education program or the Ph.D. in Psychology program, or consent of the instructor.

518. Seminar in Social and Personality Psychology. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Critical discussion of selected topics, such as helping and altruism, social judgment, group processes, attitude formation and change. Content varies. Prerequisite: Consent of the instructor.

519. Current Topics in Social Psychology. 1 Hour. May be repeated for credit. S/U grade only. Discussion of recently published research and ongoing research by department faculty and graduate students. Prerequisite: Consent of the instructor.

520. Development in Infancy and Early Childhood. 4 Hours. Same as EPsy 526. Consideration of development in the preschool years. Stress on theory, research, individual child study, and educational implication. Prerequisite: Psch 422 or Ed 422 or the equivalent.

525. Achievement Motivation. 4 Hours. Same as EPsy 530. The psychology of achievement motivation will be explored from the perspectives of personality, social, and educational psychology. Prerequisite: Graduate standing in education or psychology or consent of the instructor.

526. Developmental Psychopathology. 3 Hours. Major sources and manifestations of maladjustment in childhood with an emphasis on emotional and intellectual handicaps. Prerequisite: Consent of the instructor.

527. Seminar in Moral Development. Character Formation, and Education. 4 Hours. Same as EPsy 527. Philosophical assumptions, psychology research, and theory underlying current approaches to moral and character education. Cultural and developmental factors in value formation. Prerequisite: Ed 422 or Psch 422 or the equivalent; or admission to the Ph.D.
program in Education, Ph.D. program in Psychology, or Ph.D. program in Social Work; or consent of the instructor.

529. Current Topics in Developmental Psychology. 1 Hour. May be repeated for credit. S/U grade only. Presentation of current research projects by faculty and students. Prerequisite: Consent of the instructor.

530. History and the Varied Epistemologies of Community Psychology. 3 Hours. Analysis of historical factors, including persons, contexts and policies, affecting the development of community research approaches. Implicit causal and value assumptions appraised of varied approaches. Prerequisite: Consent of the instructor.

531. Community Research. 3 Hours. 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. Same as DHD 532. Theory, research, practice and evaluation of community interventions; types and effectiveness of community intervention; role of the community intervenor. Prerequisite: Consent of the instructor.

533. Advanced Community and Prevention Research. 3 Hours. Overview of community psychology theory and intervention research in areas like prevention, empowerment, diversity, ecology, competence enhancement, and social change from historical and contemporary perspectives. Prerequisite: Graduate standing in psychology or consent of the instructor.

534. Prevention Research, Theory, and Practice. 3 Hours. This course emphasizes issues related to the conceptualization, design, implementation, and evaluation of prevention and competence-promotion programming. Prerequisite: Consent of the instructor.

536. Fatiguing Conditions and Disability. 2 Hours. Same as OT 536, Dis 536. Course covers 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. Recommended background: Health or behavioral sciences.

537. Seminar in Action Research. 3 Hours. May be repeated for credit. S/U grade only. Supervised action research in community settings including entry, data collection, ethics, feedback and report preparation. Prerequisite: Graduate standing in the Community and Prevention Research Specialization of the Ph.D. in Psychology or consent of the instructor.

538. Seminar in Community and Prevention Research. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Examination of a selected topic in community and prevention research. Prerequisite: Psch 530 or consent of the instructor.

539. Current Topics in Community and Prevention Research. 1 Hour. May be repeated for credit. S/U grade only. Ongoing seminar with faculty and graduate students to discuss contemporary issues in community and prevention research. Prerequisite: Consent of the instructor.

540. Research with Diverse Groups. 3 Hours. This course highlights some of the issues relevant to doing research with diverse groups, such as race/ethnicity, gender, social class, age, disability, etc.

541. Introduction to Computing in Psychology. 1 Hour. S/U grade only. An introduction to applications of computing in psychological research. Several projects are required. Prerequisite: Consent of the instructor.

543. Research Design and Analysis. 4 Hours. Experimental design, advanced analysis of variance (ANOVA) and statistical analyses for experimental and quasi-experimental designs, interpretation and writing results in APA style, SPSS. Prerequisite: Graduate standing in psychology or consent of the instructor.

544. Latent Variable Models. 3 Hours. Statistical methods and practical issues relevant to latent variable models with special emphasis on factor analysis and structural equation modeling. Prerequisite: Psch 545.

545. Multivariate Analysis. 3 Hours. The statistical analysis of functional relationships among two or more variables; multivariate regression, canonical correlation, discriminant analysis, multivariate analysis of variance, principal components, factor analysis, logistic regression, cluster analysis. Prerequisites: Psch 543 and graduate standing in psychology; or consent of the instructor.

546. Theory and Practice in Program Evaluation. 3 Hours. Introduction to theory, design and practice of program evaluation. Emphasis will be on theories of social programming, selecting appropriate methods, and politics of evaluation. Prerequisites: Psch 531 or the equivalent, 543, and 545; or consent of the instructor.

548. Seminar in Methods and Measurement. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Seminar on a preannounced topic in methodology, measurement or mathematical psychology. Prerequisite: Consent of the instructor.

549. Current Topics in Psychology and Law. 1 Hour. May be repeated for credit. S/U grade only. Discussion of recently published research and ongoing research in psychology and law by department faculty, graduate students and outside speakers. Prerequisite: Consent of the instructor.

550. Proseminar in Educational Psychology. 2 Hours. Same as EPsy 500. S/U grade only. Interdisciplinary colloquia on selected topics in educational psychology. Serves as introduction to faculty research foci. Prerequisite: Admission to the Ph.D. in Education or the Ph.D. in Psychology program, or consent of the instructor.

551. Cognition and Instruction. 4 Hours. Same as EPsy 501. Current research on relations among cognitive processes, learning, and instruction. Prerequisite: Admission to the Ph.D. in Education or the Ph.D. in Psychology program, or consent of the instructor.

552. Cognition and Instruction: Advanced Constructivist Approaches. 4 Hours. Same as EPsy 529. Piaget’s and Vygotsky’s theories of knowledge development. Emphasis on competing approaches concerning the relation of thought to action, to language, and to social relations. Prerequisites: Psch 429 or EPsy 429 or the equivalent, and admission to a Ph.D. program in the College of Education or Psychology or consent of the instructor.

558. Seminar in Cognitive Psychology. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Detailed critical review of selected topics in cognitive psychology: emphasis on current research and theoretical developments. Prerequisite: Consent of the instructor.

559. Current Topics in Cognitive Psychology. 1 Hour. May be repeated for credit. S/U grade only. Discussion of current research and theoretical issues in broad areas of cognitive psychology. Prerequisite: Consent of the instructor.

564. Clinical Psychopharmacology. 3 Hours. Behavioral, cognitive, and biological effects of psychotropic drugs in psychiatric populations. Theoretical, methodological and empirical issues related to the pharmacological treatment of psychopathology. Prerequisite: Consent of the instructor.

568. Seminar in Biopsychology. 1 to 4 Hours. May be repeated for credit. Current research issues and studies in biopsychology are discussed in terms of methodology and theory. Topic to be announced each semester. Prerequisite: Consent of the instructor.

569. Current Topics in Biopsychology. 1 Hour. May be repeated for credit. S/U grade only. Presentation of current research projects by staff and students. Prerequisite: Consent of the instructor.

570. Personality Psychology. 3 Hours. Contemporary research in personality psychology and a review of theoretical approaches to the study of personality structure and processes. Prerequisite: Consent of the instructor.

571. Psychopathology. 3 Hours. Detailed consideration of disorders of behavior including description, etiology, prognosis and experimental and clinical research; also consideration of development and functions of classification systems of abnormal behavior and their relation to clinical decision making. Prerequisites: Psch 570 and consent of the instructor.
572. Clinical Assessment and Decision Making. 3 Hours. Psychometric principles, research and theory with emphasis on clinical inference and decision making with structured personality test. Prerequisites: Psch 571 and consent of the instructor.

573. Cognitive and Behavioral Assessment. 3 Hours. Theory and research-based coverage of intellectual, neuropsychological, and behavioral assessment. Focus is on methods and interpretation of psychological testing including both objective and projective methods. Prerequisites: Psch 572 and consent of the instructor.

574. Techniques of Psychological Intervention. 3 Hours. May be repeated for credit. Students may register for more than one section per term. Intervention skills, modalities, concepts and techniques for different patient populations and presenting problems. Topics will vary each semester and include: cognitive-behavior therapy, psychodynamic therapy, group therapy and family therapy. Prerequisites: Psch 571 and consent of the instructor.

575. Psychotherapy Theory and Research. 3 Hours. Research methods and theory related to psychotherapy and behavior change, with an emphasis on design, evaluation, and results of empirically-based psychotherapy studies. Prerequisite: Psch 571 and consent of the instructor.

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: Graduate standing in psychology or consent of instructor.

578. Seminar in Clinical Psychology. 1 to 4 Hours. In-depth coverage of selected current topics in clinical psychology. Emphasis is on current research. Prerequisite: Consent of the instructor.

579. Current Topics in Clinical Psychology. 1 Hour. May be repeated for credit. S/U grade only. Research and case presentations in clinical psychology. Prerequisite: Consent of the instructor.

581. Practicum in Interviewing. 1 Hour. S/U grade only. Interviewing practicum through the Office of Applied Psychological Services. Students observe and conduct clinical interviews under supervision. Prerequisites: Psch 481 and consent of the instructor.

582. Practicum in Psychological Assessment. 4 Hours. May be repeated for credit. S/U grade only. Students may register for more than one section per term. Supervised practice in psychodiagnostic testing in various facilities associated with the graduate training program in clinical psychology. Prerequisites: Psch 573 and consent of the instructor.

583. Practicum in Clinical Intervention. 4 Hours. May be repeated for credit. S/U grade only. Students may register for more than one section per term. Instruction and supervision in the practice of psychological intervention, application of basic psychological principles to varied parent populations. Prerequisites: Psch 574 and consent of the instructor.

584. Practicum for Clinical Trainees on Assessment, Intervention and Research. 0 to 3 Hours. May be repeated for credit. S/U grade only. Presentation and discussion of trainee assessment, intervention, and research projects. Prerequisite: Acceptance into either a NIMH- or OAPS-sponsored training program.

587. Practicum in Instruction in Psychology. 0 to 9 Hours. May be repeated for a maximum of 12 hours of credit. S/U grade only. Students may register for more than one section per term. Seminar on course planning and supervised teaching of an undergraduate course. Prerequisite: Consent of the instructor.

591. Research Apprenticeship. 2 to 3 Hours. May be repeated for a maximum of 5 hours of credit. S/U grade only. Directed training in conducting research in specific areas of psychology, and in developing skills related to the research. Prerequisite: Consent of the instructor.

594. Advanced Special Topics in Psychology. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced treatment of an announced topic. Prerequisite: Consent of the instructor.

595. Methods and Measurement in Clinical Psychology. 2 Hours. May be repeated for credit. The purpose of this course is to provide students with an overview of research methods, process concerns, ethics, and issues that are relevant to the field of clinical psychology. Prerequisite: Consent of the instructor.

596. Independent Study. 1 to 12 Hours. May be repeated for credit. S/U grade only. Research on or study of topics not included in regular classes or thesis and dissertation research. Prerequisite: Consent of the instructor.

598. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 12 hours of credit. S/U grade only. Research on the topic of the master’s thesis. Prerequisite: Consent of the instructor.

599. Dissertation Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Research on the topic of the doctoral dissertation. Prerequisite: Consent of the instructor.

Public Administration (PA)

400. Public Administration Theory. 4 Hours. Development of public administration as a professional and scholarly area of knowledge and practice focusing on administrative reform and its intellectual roots. Politics versus administration, efficiency, effectiveness, representative bureaucracy, and market versus bureaucratic alternatives. Prerequisite: Admission to the MPA program or consent of the instructor.

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. Prerequisites: Appropriate score on the department placement test; or consent of the instructor. Admission to the MPA program or consent of the instructor.

410. Economics for Public Administration and Policy Decisions. 4 Hours. Basic economic tools and methods relevant to public administration and current policy: opportunity cost, supply and demand, rational choice, production costs, competition versus monopoly, economic efficiency versus equity, market failure, public goods, and externalities. Prerequisites: Admission to the MPA program or consent of the instructor.

415. Organization Theory and Public Management. 4 Hours. Theories and concepts of organizational behavior and public management from economics, sociology and political science. Organizational decision making, bureaucracy, organizational change and learning, public versus private organizations, leadership, and organizational culture. Prerequisite: Admission to the MPA Program or consent of the instructor.

460. Computers in Public Administration. 4 Hours. Database theory and constructing and managing databases relevant to the operation of government. Utilizes database software and allows students to gain practice with complex database programs and development of a database system. Prerequisite: Admission to the MPA Program or consent of the instructor.

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: 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: 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: Admission to the Ph.D. Program in PA 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: Admission to the Ph.D. program in PA or consent of the instructor.

490. Field Experience in Public Administration. 6 Hours. Students work in an organization such as a government agency, community group, or nonprofit organization. Students are required to submit written work and guide group discussions relevant to the experience learned.
to their experience and agency. Field work required. Prerequisite: Admission to the MPA Program or consent of the instructor.

494. Special Topics in Public Administration. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Consideration of timely or enduring issues in public administration not available in regularly offered courses. Prerequisite: Admission to the MPA program or consent of the instructor.

502. The Legal Context of Public Administration. 4 Hours. Legal basis and statutory framework for administrative agencies and actions in government. Relationship between courts and public agencies, rulemaking and adjudicative powers of public agencies, and impact of specific laws on government. Prerequisite: Admission to the MPA program or consent of the instructor.

503. Public Personnel Management. 4 Hours. History and current innovations in managing personnel and other areas of human resources. Compensation, classification, affirmative action, performance appraisal, labor relations, and unions. Statutory and court decisions affecting government personnel issues. Prerequisite: Admission to the MPA program or consent of the instructor.

504. Budgeting for Public Administration. 4 Hours. Processes and methods relevant to government finances and fiscal health: revenues, taxation, budget formulation, operating budgets, cost analysis, planning and performance, budget reforms, politics, capital budgeting, and role of budgeting in management. Prerequisites: Admission to the MPA program or consent of the instructor.

506. Policy Development and Analysis for Public Administrators. 4 Hours. This course 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: 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; inter-organizational relations; the organization-environment interface. Prerequisite: Admission to the Ph.D. program in Public Administration or approval of the instructor.

511. The History and Development of Public Administration Research & Theory. 4 Hours. The history and development of modern public administration, with emphasis on the U.S. model. Major scholarly movements; institutional developments; other factors shaping the present state of the discipline. Prerequisite: Admission to the Ph.D program in Public Administration or approval of the program director.

515. The Bureaucracy and Policy Process. 4 Hours. Theories and research issues concerning the role of administrators in policy formation. Case studies and research on federal, state, and local agencies. Prerequisite: Admission to the Ph.D. program in Public Administration 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: Admission to the MPA program or consent of the instructor.

522. Ethics and Accountability. 4 Hours. Better understanding of ethics and accountability. Effectiveness of boards of ethics, Inspector General, codes of ethics, and educational programs. History of ethics within the Western intellectual tradition. Prerequisite: 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: 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, etc. Prerequisite: Admission to the MPA program or consent of the instructor.

526. Public Decision Analysis. 4 Hours. This course 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: Admission to the MPA program or consent of the instructor.

527. Public Management Theory. 4 Hours. This course 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: Admission to the Ph.D. program in PA or consent of the instructor.

528. Program Evaluation. 4 Hours. Theory and procedures for evaluating the effectiveness of programs administered by public and non-profit organizations. Includes application of research design, quantitative, and qualitative methodologies. Prerequisites: PA 540 or equivalent or admission to the Ph.D. program in Public Administration 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: Admission to the MPA program or consent of the instructor.

530. 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, labor-management unions; civil service laws, collective bargaining, non-discrimination, and equal opportunity. Prerequisites: PA 503; 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 preference, and physical ability. Prerequisites: PA 503 or consent of the instructor. Admission to the MPA program or consent of the instructor.

534. Human Resource Development and Management in Public Administration. 4 Hours. A review of the literature of public personnel administration including recruitment, examination, selection, evaluation, promotion, and career development. Motivation theory, equal rights, and affirmative action issues. Prerequisite: PA 503 or equivalent or consent of the instructor.

540. Research Design for Public Administration. 4 Hours. Logic and methods of quantitative and non-quantitative research in public administration. Issues in measurement; causal inference; experimental and quasi-experimental designs; and methods of data collection. Prerequisite: Admission to the Ph.D. program in Public Administration or approval of the program director.

541. Advanced Data Analysis I. 4 Hours. Elements of matrix theory; introduction to the theory of estimation; hypothesis testing; logit and probit models; factor analysis; and principal components analysis. Application of techniques to public administration research. Prerequisite: PA 540 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: 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. Prerequisites: PA 540 or equivalent or consent of the instructor.

545. Research Topics in Public Administration I. 2 Hours. S/U grade only. This course will provide Ph.D. students with a better understanding of current research topics in PA. Students will read current working papers and published articles so as to develop the tools needed for critical analysis of current research. Prerequisites: Admission to the Ph.D. program in PA and advanced standing or approval of the instructor.

546. Research Topics in Public Administration II. 2 Hours. S/U grade only. This is a continuation of Research Topics in PA I. 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. Prerequisites: PA 545 and admission to the Ph.D. 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 admin and mgmt of govt’s financial affairs: govt accounting, purchasing, cash management, investment, risk management, pension and benefits administration, debt management and capital financing. Prerequisites: PA 504; 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. Prerequisites: PA 504; and admission to the MPA Program; or consent of the instructor.

552. Public Capital Budgeting and Finance. 4 Hours. This course 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. Prerequisites: PA 504 or consent of the instructor. 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 govs and public sector responses to market failures. Examines state and local revenue sources and discusses governmental provision of services. Prerequisites: 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. Prerequisites: PA 410 and PA 504 or equivalents; or consent of the instructor.

567. Topics in Political Communication. 4 Hours. Same as Comm 567, PolS 567. Intensive study of selected aspects; organizational communication in public institutions, urban political communication patterns, communication elites. Independent research using a variety community research techniques. Prerequisite: Consent of the instructor.

578. Surveys, Public Opinion, and Public Policy. 4 Hours. This course will address the nature of the relationship between public policy and public opinion and the role that surveys play in that relationship. Prerequisite: Admission to the MPA or PhD program in PA 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: Admission to the MPA or PhD program in PA or consent of the instructor.

580. Survey Nonresponse. 2 Hours. This course provides an overview of current problems in survey nonresponse and related questions of impact on data quality. Prerequisite: Admission to the MPA or PhD program in PA or consent of the instructor.

581. Cross-Cultural Survey Research Methods. 2 Hours. This course will provide 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 program in PA 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: Admission to the MPA or PhD program in PA or consent of the instructor.

583. The Psychology of Survey Measurement: Cognitive and Social Processes. 2 Hours. This course introduces students to one approach to survey methodology—the examination of the psychological processes through which survey respondents answer questions. Prerequisite: Admission to the MPA or PhD program in PA or consent of the instructor.

584. Internet Surveys. 2 Hours. This course 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: Admission to the MPA or PhD program in PA or consent of the instructor.

585. Survey Research Ethics. 2 Hours. Students will be exposed to survey research ethical issues. Prerequisite: Admission to the MPA or PhD program in PA or consent of the instructor.

586. The History of Survey Methodology. 2 Hours. This course examines the history of surveys and their development and change over time. Prerequisite: Admission to the MPA Program or PhD program in PA 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: Admission to the MPA or PhD program in PA or consent of the instructor.

588. Survey Data Reduction and Analysis. 2 Hours. This course will provide an in-depth overview of available procedures and standards for survey data reduction and data analysis activities. Prerequisite: Admission to the MPA or Ph.D. program in PA or consent of the instructor.

593. Independent Research in Public Administration. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the supervision of a faculty member. Prerequisites: Approval of the director of graduate studies and consent of the instructor.

594. Special Topics in Public Administration. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study of an announced topic. Prerequisite: Admission to the Ph.D. in Public Administration program or consent of the instructor.

596. Independent Study in Public Administration. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study of an announced topic. Prerequisite: Approval of the director of graduate studies and consent of the instructor.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual study and research. Prerequisite: Open only to degree candidates, upon approval of topic and by dissertation committee.

Public Health Nursing (NuPH)

400. Introduction to Occupational Health Nursing. 2 Hours. Theoretical bases for application of public health nursing practice to working population in occupational settings. Prerequisite: Consent of the instructor.

402. School Nursing Theory and Trends. 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: Consent of the instructor.

420. School Nursing Internship. 2 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. Prerequisite: 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: Credit or concurrent registration in NuPH 402.

504. School Nursing Internship. 2 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. Prerequisite: Consent of the instructor.

505. Nursing Systems Operations Management. 3 Hours. Same as NuAS 505. Addresses 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. Prerequisite: Consent of the instructor.

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. Prerequisites: Credit or concurrent registration in NuSc 525; and credit or concurrent registration in EpiD 400; 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. Prerequisites: NuSc 525 and 526; and NuPH 509. Requires concurrent registration in NuSc 527.

512. Healthcare Human Resources Management. 3 Hours.
Same as NuAS 512. 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. Prerequisite: NuPH 505 or NuAS 505.

517. Budget and Finance of Health and Nursing Services. 3 Hours.
Same as NuAS 517. Financial management techniques, supply and demand, cost behaviors, and revenue sources, provider reimbursement and public and private health insurance for health and nursing services will be analyzed. Prerequisite: NuAS 505 or NuPH 505.

518. Field Study in Health and Nursing Management. 3 Hours.
Same as NuAS 518. Field study emphasizing leadership within population-focused nursing management practice including organization and management concepts from public and private perspective. Prerequisite: NuAS 516 or NuAS 516; and NuPH 517 or NuAS 517; or consent of the instructor.

520. Internship in Advanced Nursing. 1 to 3 Hours.
May be repeated for credit. Same as NuAS 520. Intensive field study for advanced nursing practice with emphasis on integration of graduate course work. Prerequisite: Consent of the instructor.

524. Primary Care Nursing of Acute & Chronic Disorders I. 4 Hours.
Prepares nurse practitioners to assess, diagnose and manage stable chronic and acute episodic illnesses encountered in primary care settings. Prerequisite: NuPH 500.

525. Primary Care Nursing of Acute and Chronic Disorders II. 6 Hours.
Second of a two-course sequence to prepare nurse practitioners to assess, diagnose, and manage stable chronic and chronic episodic illnesses encountered in primary care settings. Prerequisite: NuPH 524.

528. Advanced Clinical Practice in Primary Care Nursing. 1 to 5 Hours.
S/U grade only. Health care issues, advanced clinical skills and supervised practicum experiences specific to students’ selected practice area or population groups in rural, urban or international settings. Prerequisites: 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. Prerequisites: NuPH 400; and credit or concurrent registration in EOHS 421 and EOHS 482 and EOHS 551.

560. Models/Frameworks of Health Service Delivery/Health Behavior. 2 Hours.
Critiques health services delivery and health promotion/disease prevention behavior models; examines cultural, community and organizational models and conceptual-, socially-, and psychologically-based health behavior models. Prerequisite: NuSc 505 or consent of the instructor.

561. Research in Health Services Delivery and Health Behavior. 2 to 4 Hours.
Analyzes culturally-, community-, and organizationally-based research on health delivery models; analyzes research reflecting cognitive and affective influences on health promotion/disease prevention behavior. Prerequisite: Consent of the instructor.

562. Measurement Issues/Health Service Delivery/ Promotion Behavior. 2 Hours.
Extends beyond overview courses. Critically examines those measurement concepts, techniques, and issues important to advanced research in health services delivery and health promotion behavior. Prerequisites: NuSc 515 or equivalent and consent of the instructor.

Public Policy Analysis (PPA)

401. Data Analysis I. 4 Hours.

500. Introduction to Policy and Governance. 4 Hours.
Same as PolS 500. Introduces the intellectual traditions and debates that have characterized the study of public policy and the social order. Society-centered and state-centered explanations for policy will be explored.

501. Data Analysis II. 4 Hours.
Same as PolS 501. Interpretation and application of multivariate methods of analysis in the social sciences. Regression specification and diagnostics, limited dependent variable models, measurement issues. Prerequisite: PPA 401 or PolS 401.

540. Economics for the Social Sciences. 4 Hours.
Same as Econ 540. Credit is not given for Econ/PPA 540 if the student has credit in Econ 501 or 520. Introduction to economics for graduate students in the social sciences. Economic cost, incentives, resource allocation and economic institutions. Supply and demand analysis. Economic behavior of consumers and households, business firms, government and non-profit institutions.

541. Policy Formulation, Implementation, Evaluation. 4 Hours.
Same as PolS 541. Introduction to political science theories of how elections, interest groups and state structure affect the formulation of public solutions to societal problems.

544. Research Design for Policy Analysis. 4 Hours.
Same as Ed 544. Alternative research design models and program evaluation methodologies; quantitative and qualitative approaches; ethnography and historiography; experimentation and quasiexperimentation; causal modeling. Prerequisites: Admission to the Ph.D. program in Public Policy Analysis and one graduate-level course in statistics.

574. The Impact of College on Students. 4 Hours.
Same as PS 574. Introduction to the research evidence on the impact of college on students. Emphasis is placed on methods of assessing impact and research on college effects. Prerequisite: Consent of the instructor.

575. Higher Education Organization and Administration. 4 Hours.
Same as PS 575. Perspectives on administration in higher education. Understandings from organization theory and research on postsecondary institutions applied to issues in higher education administration. Prerequisite: Admission to the Ph.D. program in Public Policy Analysis or consent of the instructor.

576. History of Higher Education. 4 Hours.
Same as PS 576. Key historical events that have enduring implications for colleges and universities. Emphasis on social, political, economic, intellectual, and legal forces shaping American higher education. Prerequisite: Admission to the Ph.D. program in Public Policy Analysis or consent of the instructor.

577. American Academic Profession. 4 Hours.
Same as PS 577. Historical and systemic foundations of the academic profession. Emphasis on institutional and disciplinary variation in the performance, evaluation, and reward of faculty activities. Prerequisites: Admission to the Ph.D. program in Public Policy Analysis or consent of the instructor.

584. Methods of Urban Policy Analysis. 4 Hours.
Same as UPP 584. Analytic, allocative and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. Prerequisite: Consent of the instructor.

590. Advanced Public Policy Workshop. 4 Hours.
Same as PolS 590. Interdisciplinary workshop on preparing a dissertation proposal for PPA students. Prerequisites: Advanced standing in the PPA program and completion of PPA core courses.

Religious Studies (RelS)

415. Milton. 4 Hours.
Same as Engl 415. Survey of Milton’s poetry and prose, with emphasis on Paradise Lost. Prerequisites: 6 hours of English from Engl 241, 242, 243, 300; or consent of the instructor.

446. Race, Ethnicity, and Gender in American Religion. 4 Hours.
Religious institutions in the U.S. as a crucible for racial, ethnic, and gender identities, group formation, and

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
intergroup relations; major world religions represented in the U.S. Same as Soc 446. Prerequisites: Soc 100 or consent of the instructor.

478. The Bible as Literature. 4 Hours. Same as Engl 478 and JSt 478. Literary analysis of the English Bible (including the Apocrypha) in its historical and religious contexts; study of the King James Version and successive revisions of it. Prerequisites: Grade of C or better in Engl 240; and grade of C or better in Engl 241, 242, or 243; or consent of the instructor.

479. Religion and Literature. 4 Hours. Literary works considered in the light of several religious traditions. Same as Engl 479. Prerequisites: 6 hours of English from Engl 241, Engl 242, Engl 243, Engl 300; or consent of the instructor.

495. Topics in Religious History. 4 Hours. Same as Hist 495. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of history or consent of the instructor.

**Russian (Russ)**

401. Russian Composition and Conversation III. 4 Hours. Oral presentations, compositions, conversation: daily life and current events. Problems of grammar and syntax. Improving pronunciation and intonation. Reading. Prerequisite: Russ 401 or the equivalent.

402. Russian Composition and Conversation IV. 4 Hours. Continuation of Russ 401. Prerequisite: Russ 401 or the equivalent.

410. Structure of Modern Russian. 4 Hours. A synchronic linguistic analysis of Russian substantives, adjectives, pronouns, verbs, deverbal nouns, and minor parts of speech from a syntagmatic and paradigmatic point of view. Prerequisite: At least 4 semester hours of Russian or the equivalent.

450. Studies in the Russian Novel. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a major novelist, movement, or special theme. Content varies. Prerequisite: 24 hours of Russian or consent of the instructor.

460. Studies in Russian Literature. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a major author, movement, or special topic. Content varies. Prerequisite: 36 hours of Russian or consent of the instructor.

499. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

510. History of the Russian Language. 4 Hours. Formation and development of standard Russian to the end of the eighteenth century. Analysis of selected texts. Prerequisite: Russ 410 or Slav 505 or the equivalent.

515. Topics in Contemporary Russian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Russ 410 or the equivalent.

520. Topics in Historical Russian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Specific topics are announced each term.

550. Studies in Russian Romanticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

555. Studies in Russian Realism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

560. Studies in Russian Neo-Realism and Modernism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author, or movement. Content varies.

565. Studies in Soviet Prose. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic or movement. Content varies.

570. Studies in Russian Literary Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a critical school or movement. Content varies.


596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

**Slavic (Slav)**

405. Problems in Slavic Grammars. 4 Hours. May be repeated for a maximum of 12 hours of credit. Systematic review of important topics in grammar and syntax. Content varies. Prerequisite: Russ 302 or Pol 302 or Slav 302, or the equivalent.

410. Structure of Modern Serbian. 4 Hours. A synchronic linguistic analysis of Serbian phonology and morphology, with fundamentals of syntax. Prerequisite: Slav 104 or the equivalent, or consent of the instructor.

433. Topics in Eastern European History. 4 Hours. Same as Hist 433. May be repeated for credit. Students may register for more than one section per term. Specific topics are announced each term. Prerequisite: 3 hours of European history or consent of the instructor.

460. Studies in East European Literatures and Culture. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a topic, author, genre, or movement. Prerequisite: 24 hours of Slavic or Baltic or consent of the instructor.

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

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

505. Old Church Slavonic. 4 Hours. Phonology, morphology, and basic elements of syntax. Readings in selected texts. Prerequisite: Three years of a Slavic language or consent of the instructor.

510. History of Serbian Language. 4 Hours. A diachronic linguistic analysis of Serbian phonology and morphology with fundamentals of syntax. Prerequisite: Slav 104 or the equivalent or consent of the instructor.

515. Topics in Contemporary Serbian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Slav 410.

520. Topics in Historical Serbian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Variable content. Prerequisite: Slav 505 or consent of the instructor.

525. Topics in Serbian Syntax. 4 Hours. May be repeated for a maximum of 12 hours of credit. Content varies.

530. Topics in Ukrainian Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Content varies.

535. Topics in Comparative Slavic Linguistics. 4 Hours. May be repeated for a maximum of 12 hours of credit. Comparative study of various linguistic aspects of the Slavic languages.
536. Topics in Comparative Slavic Literatures. 4 Hours. May be repeated for a maximum of 12 hours of credit. Comparative study of a literary topic or movement. Content varies.

542. Studies in Serbian Poetry. 4 Hours. May be repeated for a maximum of 12 hours of credit. Specific topics of the Serbian short story and novel are announced each term.

545. Studies in Serbian Prose I. 4 Hours. May be repeated for a maximum of 12 hours of credit. Specific topics of Serbian drama are announced each semester.

546. Topics in Serbian Prose II. 4 Hours. May be repeated for a maximum of 12 hours of credit. Specific topics of Serbian drama are announced each semester.

550. Studies in Yugoslav Literary Historiography and Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a period or movement in nineteenth-century and early twentieth-century Ukrainian poetry. Content varies.

560. Studies in Ukrainian Renaissance and Baroque Literature. 4 Hours. Ukrainian prose, poetry and drama of the sixteenth, seventeenth, and eighteenth centuries.

562. Studies in Ukrainian Romantic and Post-Romantic Poetry. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a period or movement in nineteenth-century and early twentieth-century Ukrainian poetry. Content varies.

563. Studies in Twentieth-Century Ukrainian Poetry. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a period or movement. Content varies.

565. Studies in Nineteenth-Century Ukrainian Prose. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of genre, topic, period, movement or author. Content varies.

566. Studies in Twentieth-Century Ukrainian Prose. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a period, topic, period, movement or author. Content varies.

568. Studies in Ukrainian Drama. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of a period, movement or author. Content varies.

570. Studies in Ukrainian Literary Historiography and Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Study of methodology, periods, schools and groups, individual literary historians and critics. Content varies.

575. Studies in Slavic Literary Theory. 4 Hours. May be repeated for a maximum of 12 hours of credit. Russian, Czech, Polish and Serbian contributions to literary theory: formalism, structuralism, semiotics, phenomenology. Taught in English.

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. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Investigation of special problems under the general direction of a faculty member. Prerequisite: Consent of the instructor and the head of the department.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Open only to Ph.D. degree candidates. Students engaged in research and writing theses will be assigned to this course at the discretion of the department. Independent research on a topic approved for a graduate thesis. Prerequisite: Consent of the department.

Social Work (SocW)

410. Human Behavior and the Social Environment. 3 Hours. No credit given if the student has credit in SocW 535. Human development through the life cycle including urban family, group, community, and organizational interactions with social, cultural, psychological factors. Prerequisite: Consent of the instructor, or admission to the MSW program.

411. Social Work in a Multicultural Society. 3 Hours. No credit given if the student has credit in SocW 537. Place of social work in a multicultural society; focus on racial and ethnic minority groups, particularly African-Americans, Latinos, Asian-Americans, and Native Americans. Prerequisite: Admission to the MSW program.

420. Policy I: Social Welfare Policy and Services. 3 Hours. No credit given if the student has credit in SocW 550. Social work history; structure and development policies; policy analysis and policy advocacy skills for social and economic justice. Prerequisite: Admission to the MSW program.

430. Practice I: Generalist Practice with Individuals, Families, and Groups. 3 Hours. No credit given if student has credit in SocW 501. Generalist practice principles applied to individuals, families, and groups including content on community context, racial and ethnic minorities, poor, oppressed, and other urban vulnerable communities. Prerequisite: Admission to the MSW program.

431. Practice II: Generalist Practice with Task Groups, Organizations, and Communities. 3 Hours. No credit given if student has credit in SocW 502. Generalist practice principles applied to task groups, organizations, and communities including focus on community context and the poor, oppressed and other urban vulnerable communities. Prerequisite: SocW 430.

460. Research I: Social Work Research. 3 Hours. No credit given if student has credit in SocW 560. Research methodology basics applied to social work: problem formulation, design, measurement, sampling, data analysis, computerization, ethics, qualitative and quantitative methodologies. Prerequisite: Admission to the MSW program.

480. Special Studies in School Social Work Practice. 3 Hours. Ecological and strengths-based interventions in urban school systems. Prerequisite: Admission to the post-MSW Type 73 program.

503. Family Practice in Urban Communities. 3 Hours. Empowering at-risk urban families using strengths-based intervention; brief treatment models; attention to diversity, community, poor, and other urban at-risk populations. Prerequisite: SocW 430.

504. Group Theory and Practice. 3 Hours. Theory and practice of social work with empower groups in both clinical and large system settings; diversity and equity issues. Prerequisite: SocW 430.

511. Practice with Children. 3 Hours. Direct treatment with urban at-risk children including situations involving homelessness, substance abuse, violence; treatment modalities emphasizing family, community, culture. Prerequisite: SocW 430.

513. Brief Individual Treatment in Managed Care. 3 Hours. Brief treatment interventions (cognitive behavioral, psycho dynamics, and solution focused) with adult clients in urban managed care settings; focus on strengths-based interventions and diversity. Prerequisite: SocW 430.

516. Practice with Couples. 3 Hours. Practice with urban couples with attention to diversity, poverty and other urban at-risk factors and problems including substance abuse, violence, mental disorders, and sexual problems. Prerequisite: SocW 430.

517. Practice with Family Violence, Neglect, and Abuse. 3 Hours. Ecological approach to family violence: physical, psychological and sexual abuse of children, women and elders at practice and policy levels; urban vulnerable population. Prerequisite: SocW 430 or consent of the instructor.

521. Aging Populations: Social Work Response. 3 Hours. Psychological, social, historical aging factors of individuals and families; emphasis on practice skills for community, long-term care and hospital-based services with urban emphases. Prerequisite: SocW 410 or consent of the instructor.

522. Crisis Intervention. 3 Hours. Nature of crises including suicide and large-scale disaster; strengths-based interventions in urban settings; medical and mental health facilities, schools, community centers, and neighborhoods. Prerequisites: SocW 430.

523. Drug and Alcohol Abuse and Social Work. 3 Hours. History and pharmacology of alcohol and other drugs; etiology of abuse and dependence; assessment and treatment models; practice in multi-disciplinary settings; emphasis on urban systems. Prerequisites: SocW 430.
525. Social Work with Women. 3 Hours. Same as GWS 525. Research, policy, and practice approaches to working with women in diverse urban settings; empowerment and diversity perspectives. Prerequisites: SocW 410; or consent of the instructor.

527. Topics in Social Services. 3 Hours. Critical review of selected areas of social work, social services, and social welfare. Prerequisites: Consent of the instructor, and admission to the MSW program.

530. Leadership and Professional Development. 3 Hours. Social work leadership and professional development including writing for publication, communication skills, personal leadership planning development, theory and practice of leadership at individual agency and community levels. Prerequisite: SocW 410.

532. Social Work in Corrections. 3 Hours. Policy and practice roles of social workers in correctional settings with emphasis on race, ethnicity, gender, sexual orientation and poverty factors. Prerequisite: SocW 410 or consent of the instructor.

533. Sexual Minority Communities. 3 Hours. Community and social justice framework applied to gay, lesbian, bisexual and transgendered populations; historical development of sexual minority communities; overview of social work response. Prerequisite: Admission to the MSW program or consent of the instructor.

534. Independent Study in Practice. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Independent study in practice area not covered by existing course offerings. Prerequisite: Consent of the instructor.

535. Human Behavior and the Social Environment. 3 Hours. Human development from prenatal through late adulthood: physiological, social, and cultural influences on development.

538. Human Sexuality: Social Work Applications. 2 Hours. Sexual development and understanding of normal and abnormal sexual behavior with focus on increasing professional skills and sensitivity to clients with sexual concerns. Prerequisite: SocW 410 or consent of the instructor.

539. Mental Health Issues with Children and Adolescents. 3 Hours. Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with children and adolescents. Prerequisite: SocW 410; or consent of the instructor.

540. Mental Health Issues with Adults. 3 Hours. Critical, strengths-based understanding of current classification and diagnostic systems for assessment and treatment planning with adults. Prerequisite: SocW 410; or consent of the instructor.

541. Psychopathology in Mental Health. 2 Hours. Psychopathology through the life cycle including clinical diagnosis, understanding of severe to mild mental disorders in adults, adolescents, and children and family interaction. Implications for social work practice in mental health settings. Prerequisite: SocW 535 or consent of the instructor.

542. Human Behavior and Health Care. 2 Hours. Interrelatedness of physical, social, and psychological factors of illness and implications for social functioning of patients and families; knowledge base required for hospital social workers, etc. Prerequisite: SocW 535 or consent of the instructor.

543. Organizational Theory in Social Welfare. 2 Hours. Examination of organization theory and analysis. Understanding organizational structures and processes within human service organizations. Critiques of models for organizational designs and research on human service organizations. Prerequisite: SocW 535 or consent of the instructor.

544. Community Violence. 3 Hours. Urban community violence; impact on individuals and society; policies and theories critically studied from race, class, and gender perspectives; social work implications. Prerequisite: SocW 410 or consent of the instructor.

545. HIV/AIDS: Social Work Challenges. 3 Hours. HIV prevention and intervention in urban setting; system and ecological understanding of impact of HIV on society and role of social work practice and policy. Prerequisite: SocW 410 or consent of the instructor.

549. Independent Study in Human Behavior and the Social Environment. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Independent study in human behavior and social environment areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

550. Social Welfare Policy and Services. 2 Hours. History, economic and social base, as well as the nature and scope of the United States social welfare system and its response to the needs and problems of its citizens. Current provisions and alternatives in social security and other social welfare programs and services.

551. Policy II: School Social Work Policy. 3 Hours. Critical analysis of federal, state, and local policies relevant to social work practice in urban school systems. Prerequisite: SocW 420.

552. Policy II: Child and Family Policy. 3 Hours. Critical analysis of policies affecting welfare of families and children; focus on child welfare, juvenile justice, adult criminal justice, mental health, and special education systems. Prerequisite: SocW 420.

553. Policy II: Health Care Systems and Policies. 3 Hours. Critical analysis of current health care programs and policies including policy change skills; content on urban poor and at-risk populations. Prerequisite: SocW 420.

554. Policy II: Mental Health Policy. 3 Hours. Critical analysis of policies and structures in mental health delivery system with focus on urban and chronically mentally ill populations.

555. Occupational Social Policy and Services. 2 Hours. Introduction to occupational social work and the provision of services in work settings. Theoretical framework for delivery of social services in work settings, values, issues, and corporate policy development relevant to occupational social work. Prerequisite: SocW 550 or consent of the instructor.

556. Policy II: Community and Administrative Practice. 3 Hours. Critical analysis of national, state, and local policies affecting urban community building and development. Prerequisite: SocW 420.

558. Social Work and the Law. 3 Hours. Social work input in legal system: family law, family violence, crime, delinquency, civil rights, education, health, mental health, social advocacy, social work practice regulation. Prerequisite: SocW 420 or consent of the instructor.

559. Independent Study in Social Welfare Policy and Services. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Independent study in social welfare policy and services areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.


565. Research Seminars: Social Service Issues. 3 Hours. Methodologies and results of research in selected fields of social services; special issues and problems in practice; relationship of research, theory, and practice; priorities for future research. Prerequisite: SocW 560 or consent of the instructor.

566. Research Project. 0 to 8 Hours. S/U grade only. May be repeated for credit. Application of research methods to social work problems in an individual or group project or library research project. Preparation of a formal report based on field study processes and findings. Prerequisites: SocW 560 or consent of the instructor, and approval of the college.

569. Independent Study in Research. 1 to 3 Hours. May be repeated for a maximum of 6 hours of credit. Independent study in research methodology or areas not covered by existing course offerings. Prerequisites: Consent of the instructor and approval of the college.

570. Field Instruction I. 5 Hours. S/U grade only. Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisite: Consent of the instructor.

571. Field Instruction II. 5 Hours. S/U grade only. Students are assigned to social agencies where, under the supervision of an
agency field instructor, they carry selected cases or groups for social work services. Prerequisites: SocW 570 and consent of the instructor.

572. Field Instruction III. 8 Hours. S/U grade only.
Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisites: SocW 571 and consent of the instructor.

573. Field Instruction IV. 8 Hours. S/U grade only.
Students are assigned to social agencies where, under the supervision of an agency field instructor, selected micro and macro system cases are carried for social work services. Prerequisites: SocW 572 and consent of the instructor.

574. Special Studies in Field Instruction I. 2 to 4 Hours. S/U grade only.
Practicum experiences in approved social agencies/organizations where students carry selected cases, applying knowledge to skill applications under the supervision of an agency field instructor. Prerequisite: Consent of the instructor.

575. Special Studies in Field Instruction II. 2 to 4 Hours. S/U grade only.
Practicum experiences in approved social agencies/organizations where students carry selected cases, applying knowledge to skill applications under the supervision of an agency field instructor. Prerequisite: Consent of the instructor.

577. Social Welfare History. 3 Hours.
Social work history in context of political, economic, and social developments; focus on gender, class, and race; critical application of theoretical models. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

579. Integrative Seminar. 2 Hours. May be repeated for a maximum of 4 hours of credit. Application of concepts of social work practice, policy, and research to selected fields of social service. Focus on appropriate service delivery models and intervention strategies. Prerequisites: Concurrent registration in SocW 575 and consent of the instructor.

580. Practice III: Community and Administrative Practice. 3 Hours.
Management of human service organizations; resource acquisition and management; planning; community relations; focus on urban, community-based agencies. Prerequisite: SocW 431.

581. Practice IV: Community and Administrative Practice. 3 Hours.
Advanced urban community building and developing; emphasis on poor, at-risk communities. Prerequisite: SocW 580.

582. Practice III: Practice with Children and Families. 3 Hours.
Ecological and strengths-based practice with urban children and families; special focus on child welfare. Prerequisite: SocW 431.

583. Practice IV: Practice with Children and Families. 3 Hours.
Advanced critical analysis and application of ecological and strengths-based practice emphasizing interactions of children and families with urban courts, schools, and child welfare systems. Prerequisite: SocW 582.

584. Practice III: Health Care. 3 Hours.
Theoretical basis and skills for health social work in diverse settings; biopsychological understanding of health and disease; emphasis on direct practice with urban clients and families. Prerequisite: SocW 431.

585. Practice IV: Health Care. 3 Hours.
Advanced knowledge and skills in health care settings; specific populations including urban poor and at-risk populations; emphasis on urban community and organizational levels. Prerequisite: SocW 584.

586. Practice III: Mental Health. 3 Hours.
Strengths-based assessment and treatment planning in urban settings; diversity issues; managed care settings; critical use of current mental health diagnostic and classification systems. Prerequisite: SocW 581.

587. Practice IV: Mental Health. 3 Hours.
Advanced urban mental health practice; diversity issues; focus on children and adolescents and their families; critical application of current mental health diagnosis and classification. Prerequisite: SocW 586.

588. Practice III: School Social Work. 3 Hours.
Ecological and strengths-based perspectives on development of basic competencies for urban school social work; diversity issues. Prerequisite: SocW 431.

589. Practice IV: School Social Work. 3 Hours.
Advanced interventions in urban school systems; use of groups, consultation, classroom interventions, family empowerment, conflict resolution and community interventions; diversity issues. Prerequisite: SocW 588.

590. Analysis of Social Work Practice Approaches. 3 Hours.
Historical and current developments in the conceptualization of social work practice. Implications of practice approaches for contributing to social justice. Values and ethics addressed. Extensive computer use required. Prerequisite: Admission to the Ph.D. in Social Work program or consent of the instructor.

591. Social Welfare Policy Analysis and Development. 3 Hours.
Analysis of social welfare policies with particular attention to issues of social and economic justice; conceptual models for analysis; application of models to selected problems. Prerequisite: Admission to the PhD in Social Work program or consent of the instructor.

592. Models of Social Work Scholarship and Knowledge Development. 3 Hours.
Functions of scholarship in social work, contributions of scholarship to social and economic justice, research methodologies and knowledge building processes for practice and policy analysis. Extensive computer use required. Prerequisite: Admission to the Ph.D. in Social Work program or consent of the instructor.

593. Quantitative Methods in Social Work Research. 3 Hours.
Selected statistical and analytical methods as applied to social issues. Use of computerized tools, sampling, hypothesis testing, descriptive and inferential procedure, introduction to multivariate analysis. Extensive computer use required. Prerequisite: Admission to Ph.D. in Social Work program or consent of the instructor.

594. Dissertation Proseminar in Social Work. 3 Hours.
Preparation in development of dissertation focus and planning of dissertation research. Readings are assigned and discussed in class. Emphasis on ideas for dissertation topic, its formulation, operationalization, and research design. Prerequisites: SocW 592 and 593.

595. Seminar in Social Work Education. 3 Hours.
Preparation for roles as social work educators. Historical development of social work education with special emphasis on relation between curriculum design and the accreditation process. Pedagogical issues such as selecting educational objectives, teaching methods, and evaluation of student performance. Student must participate in a teaching laboratory. Prerequisite: Admission to the Ph.D. in Social Work program.

596. Proseminar on Selected Topics and Issues in Social Work. 2 to 4 Hours. May be repeated for credit.
Review and critique of selected areas of social work content, theory, or practice. State of current knowledge and needed research stressed. Prerequisite: Admission to the Ph.D. in Social Work program.

599. Ph.D. Thesis Research. 0 to 16 Hours.
May be repeated for credit. S/U grade only. Individual research, under faculty direction, on social work doctoral dissertation. Prerequisite: Consent of the instructor.

Sociology (Soc)

400. Sociological Analysis. 4 Hours.
Procedures for analyzing original or secondary research data; writing literature reviews, proposals, data summaries, and research reports; computer-assisted data analysis and text preparation. Prerequisites: Soc 201 and 202 or 6 hours of upper-division courses in the social sciences including at least one course in introductory statistics and research methods, or consent of the instructor.

401. Sociological Statistics. 4 Hours.
Descriptive and inferential statistics for graduate and advanced undergraduate sociology majors and related fields. Tests of means, regression, correlation, analysis of variance, and related topics. Prerequisites: Soc 201 and 202; or consent of the instructor.

402. Intermediate Sociological Statistics. 4 Hours.

405. Writing in the Social Sciences. 4 Hours.
Leads to effective, clear writing for a social science audience. Teaches how to
organize ideas, avoid tiresome jargon and write with precision. Prerequisite: 6 hours of upper-division social science courses.

408. Fieldwork: Ethnographic and Qualitative Fieldwork Techniques. 4 Hours. Same as Anth 418. Practical introduction to the techniques of anthropologists and qualitative sociologists for research in natural social settings: participant observation/nonparticipant observation, interviewing, use of documentary sources. Prerequisite: Anth 213 or Soc 202 or consent of the instructor.

424. Sociology of Gender. 4 Hours. Same as GWS 425. Variety and change in gender roles; patterns and consequences of gender inequality; gender and sexuality; gender and social institutions such as family; economy. Prerequisite: 6 hours of upper-division sociology or gender and women’s studies courses or consent of the instructor.

425. Race and Ethnic Relations. 4 Hours. Critical examination of the conceptual frameworks and empirical findings in the study of race and ethnic relations. Prerequisite: 6 hours of upper-division sociology including Soc 225, or consent of the instructor.

426. Topics in Race and Ethnic Relations. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology including Soc 225, or consent of the instructor.

440. Topics in Organizations and Institutions. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

441. Social Stratification. 4 Hours. The nature of systems of differentiation and ranking in societies and their consequences; emphasis on class structure in the United States; prestige, status, power, and social mobility in the United States and other societies. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

444. Industrial Sociology. 4 Hours. Same as Mgmt 444. Analysis of industrial society and industrial institutions, the meaning of work and work relations, technology and economic change. Prerequisite: 6 hours of upper-division sociology or management, or consent of the instructor.

445. Sociology of the Family. 4 Hours. Variety and change in family patterns, family formation and break-up, parents’ and children’s effects on each other, influences of culture and political economy, consequences for other institutions. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

446. Race, Ethnicity, and Gender in American Religion. 4 Hours. 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. Prerequisite: Soc 100 or consent of the instructor.

447. Organizations. 4 Hours. Same as Mgmt 447. Characteristics of business, government, and not-for-profit organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisite: 6 hours of upper-division sociology, management, or political science, or consent of the instructor.

448. Sociology of Development. 4 Hours. Historical, economic, political, social, and geographic factors shaping national and international development experiences and outcomes. Prerequisite: 6 hours of upper-division social science courses or consent of the instructor.

451. Medical Sociology. 4 Hours. Survey of major topics in sociology of health and medicine including social definitions of health and illness, patient-practitioner interaction, the organization of health institutions and professions. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

455. Topics in Sociology of Politics. 4 Hours. Same as PolS 455. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

473. Cities and Regions. 4 Hours. Characteristics, conditions, and consequences of structure and change of cities and metropolitan regions. Spatial, political economy, cultural perspectives. Census, ecological, historical, comparative data for cities. Prerequisite: 6 hours of upper-division sociology including Soc 201, or consent of the instructor.

476. Topics in Urban Sociology. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive examination of a specialized topic announced when the class is scheduled. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

485. Classical Sociological Theory. 4 Hours. Survey and analysis of classical European and American social theory, such as Marx, Weber, Durkheim, Veblen, and Park. Prerequisite: 6 hours of upper-division sociology or consent of the instructor.

496. Independent Study or Research. 1 to 9 Hours. May be repeated for credit with the approval of the department. Students may register for more than one section per term. Extensive readings in specialized areas of sociology or empirical research. Prerequisites: 18 hours of sociology (excluding Soc 296 and 299), consent of the instructor, and approval of the department.

500. Sociological Research Methods I. 4 Hours. Introduction to research design, data gathering and data reduction; logic of problem formulation, units of analysis, measurement, data analysis.

501. Sociological Research Methods II. 4 Hours. Evaluating sociological research, data analysis and reporting; proposal writing and evaluation; professional issues including research ethics; student presentation of master’s research proposals. Prerequisite: Soc 500.

520. Seminar: Race, Ethnicity and Gender. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

528. Societal Analysis of Aging, Health and Health Care. 3 Hours. Same as CHSc 528. Analysis of aging, health and health care issues mainly from sociological and public health perspectives. Review and application of appropriate concepts, theories and methods. Prerequisite: CHSc 425 or consent of the instructor.

540. Seminar: Social Institutions. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

547. Seminar: Social Organization. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

548. Seminar: Comparative Societies. 1 to 7 Hours. May be repeated for credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

551. Seminar: Sociology of Health and Medicine. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics. Prerequisite: Consent of the instructor.

555. Seminar: Political Sociology. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

556. Seminar: Population and Human Ecology. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

572. Sociology of Education. 4 Hours. Same as PS 572. Education as a social institution in interaction with other institutions, such as the economy. Topics include the emergence of national systems of education, purposes of education, inequality and educational reform. Prerequisite: Consent of the instructor, or enrollment in the PhD in Policy Studies in Urban Education program.

585. Seminar: Sociological Theory. 1 to 7 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of specialized topics.

593. Colloquium on College Teaching of Sociology. 0 to 4 Hours. May be repeated for credit. Sociological analysis of contemporary university teaching; strategies and techniques for presentation of sociology at the college level.

595. Departmental Seminar. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Presentation and discussion of issues of professional concern to sociologists including current research, consulting, teaching and applied sociology.

596. Independent Study. 1 to 12 Hours. May be repeated for credit. Students may register for more than one section per term. Research on special problems not included in the graduate thesis. Prerequisites: Consent of the instructor and approval of the department.

597. Project Research. 0 to 16 Hours. S/U grade only. May be repeated for a maximum of 6 hours of credit. Supervised writing and research on topic of the master’s paper. Prerequisites: Soc 501 and consent of the instructor.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Research and writing of the Ph.D. thesis.

Spanish (Span)

400. History of the Spanish Language. 4 Hours. Origins and development of Spanish; phonological, morphological, syntactic development of the language; foreign influences; origin of dialects. Prerequisite: Span 205 or 300, or consent of the instructor.

402. Spanish Syntax. 4 Hours. Structure of the grammatical system of Spanish. Analysis of the most important syntactic phenomena with emphasis on the meaning and function of grammatical forms. Prerequisite: Span 305 or consent of the instructor.

403. Advanced Spanish Syntax. 4 Hours. Structure of the grammatical system of Spanish. In-depth analysis of selected syntactic phenomena. Prerequisite: Span 402 or the equivalent or consent of the instructor.

404. Spanish Phonology and Morphology. 4 Hours. Analysis of the phonological and morphological structure of Spanish. Emphasis on the production and mental representation of sounds. Prerequisite: Span 205 or the equivalent.

405. Advanced Spanish Phonology and Morphology. 4 Hours. Advanced and detailed study of the phonological and morphological structure of Spanish. Emphasis on current theories. Prerequisite: Span 404 or the equivalent or consent of the instructor.

406. Spanish Sociolinguistics. 4 Hours. Past and current theoretical and empirical sociolinguistics as applied to the study of variation within Spanish and U.S. Hispanic communities. Prerequisite: Span 402 or 404 or consent of the instructor.

408. Hispanic Dialectology. 4 Hours. Descriptive and historical analysis of the most salient linguistic phenomena of peninsular and American Spanish dialects. Prerequisite: Span 300 or 404 or the equivalent.

410. Spanish Medieval Literature. 4 Hours. Literary, social, and cultural developments in Medieval Spain, as reflected in Cantar de mio Cid, Libro de buen amor, El conde Lucanor and La Celestina. Prerequisite: Span 310.

412. Literary Forms in the Early Spanish Golden Age. 4 Hours. Renaissance and sixteenth-century lyric poetry: examples of picaresque, pastoral, and mystical prose. Prerequisite: Span 310.

413. Literary Forms in the Later Spanish Golden Age. 4 Hours. The comedy; culteranism and conceptismo; the prose of Quevedo and Gracian. Prerequisite: Span 310.

414. Don Quijote. 4 Hours. Detailed study of the text; novelistic techniques and influence on the development of the novel. Prerequisite: Span 310.

421. Modern Spanish Literature I: From Unamuno to Garcia Lorca. 4 Hours. Representative authors and tendencies from the end of the nineteenth century to the outbreak of the Civil War. Prerequisite: Span 311.

422. Contemporary Spanish Literature: From Cela to the Present. 4 Hours. The most important authors and tendencies in twentieth-century Spain. Prerequisite: Span 311.

427. Studies in Language Policy and Cultural Identity. 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 includes other countries and languages. Same as LALS 427. Taught in English. Prerequisite: Reading and writing knowledge of Spanish.

430. Spanish American Literature of the Colonial Period. 4 Hours. Conquest to independence. From the narrative of discovery, conquest and indigenous traditions, to Renaissance epic, Baroque poetry, and the literature of the Enlightenment. Prerequisite: Span 312.


432. Modern Spanish American Literature II. 4 Hours. Representative authors and movements from post-modernismo through Vanguardismo and the tendencies of the last twenty years. Emphasis on poetry. Prerequisite: Span 312.

433. Modern Spanish American Narrative. 4 Hours. The development of fiction in Spanish America from the Romantic era to the neo-realist novel and short story of the 1930’s. Prerequisite: Span 312.

434. Contemporary Spanish American Narrative. 4 Hours. Emergence of the New Fiction. Representative works of the 1940’s from South and Central America, Mexico, and the Caribbean, through contemporary developments of the “boom”. Prerequisite: Span 312.

435. Advanced Topics in Hispanic Literature. 4 Hours. Intensive study of a particular genre, theme, author or period within Spanish; Latin American or Latino literature with emphasis on literary analysis and critical writing. Prerequisites: Span 210, 211 and consent of the instructor.

436. Special Topics in the Teaching of Spanish. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each term in which course is given. Taught in English. Some semesters may be taught in Spanish. Prerequisite: Approval of the Department.

448. Foundations of Second Language Teaching. 4 Hours. Same as Fr 448 and Ger 448. Provides an introduction to second language acquisition research and its implications for communicative language teaching. Emphasis on creating activities to develop high school students’ communicative abilities in speaking and listening. Taught in English. Prerequisites: Three courses at the 200- and 300-levels; and consent of the instructor.

Note: Hours and prerequisites listed here apply to graduate students only. 500-level courses are restricted to graduate students.
449. Teaching Second Language Literacy and Cultural Awareness. 4 Hours. Same as Fr 449 and Ger 449. 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. Taught in English. Prerequisite: Consent of the instructor.

450. Foreign Language Teaching Methodology. 4 Hours. Same as Fr 481 and ItaL 460. Theories of second language learning. Evaluative procedures emphasizing oral proficiency testing, analysis of textbooks. Preparation and presentation of micro-lessons. Twenty hours of high school observation. Prerequisites: Three courses at the 200- and 300-levels.

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

452. Educational Practice with Seminar II. 6 Hours. Graduate credit only with approval of the department. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Prerequisites: Good academic standing in a teacher education program, completion of 100 clock hours of pre-student-teaching field experiences, credit or concurrent registration in Span 451, and approval of the department.


500. Research in Hispanic Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Basic concepts of linguistic and literary theory; introduction to areas of research in linguistics and literature. Prerequisite: Admission to the graduate program in Hispanic Studies or consent of the instructor.

502. Theoretical and Research Foundations of Communicative Language Teaching. 4 Hours. Same as Fr 502. No credit given if student has credit in Span 450 or Fr 450 or Ger 407. This course introduces students to contemporary theory and research on second language acquisition. Emphasis is on understanding the research and examining classroom practice. Taught in English. Prerequisite: Appointment as a teaching assistant. For students outside the department: consent of the instructor.

505. Seminar in Spanish Descriptive Linguistics. 4 Hours. May be repeated for a maximum of 8 hours of credit. Topics in phonology, morphology, syntax, semantics or pragmatics of Spanish. Prerequisites: One 400-level Spanish course and one from Spanish 402, 404, or 408, or consent of the instructor.

507. Seminar in Second Language Acquisition and Bilingualism. 4 Hours. May be repeated for a maximum of 8 hours of credit. Current theoretical and research directions of bilingualism and second language acquisition by non-natives. May include original empirical research projects.

510. Seminar in Spanish Medieval Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. An intensive study of relevant genres, periods, figures and movements of Spanish medieval literature.

512. Seminar in Golden Age Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Particular areas, genres, works or figures in sixteenth- and seventeenth-century Spanish literature.

520. Seminar in Modern Spanish Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Particular areas, genres, works or figures in modern Spanish literature.

530. Seminar in Spanish American Literature. 4 Hours. May be repeated for a maximum of 8 hours of credit. Intensive study of relevant genres, periods, figures and movements in Spanish-American literature.

535. Concepts and Methodologies in Hispanic Interdisciplinary Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Inception and development of Latin American society from interdisciplinary perspectives. Cultural evolution from the encounter of European values and indigenous cosmogony to New World syncretism.

540. Seminar on Language in Context. 4 Hours. Past and current theoretical and empirical directions as applied to the study of oral and written discourse and its social context. Prerequisites: One 400-level Spanish course, and two from Span 402, 404, 406, and 408.

556. Second Language Learning. 4 Hours. Same as Ling 556. An introduction to research findings and methods in second language learning. Prerequisite: Consent of the instructor.

557. Theories in Second Language Acquisition. 4 Hours. Review of current linguistic, cognitive, and socio-cultural 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. Same as Fr 570. This course may be repeated only with consent of the instructor and for a maximum of 8 hours of credit. Theories of literary production and reception; their application to the practice of literary criticism. Specific themes and topics vary. Taught in English.

594. Special Topics in Hispanic Studies. 4 Hours. May be repeated for a maximum of 8 hours of credit. Topics which involve multiple approaches to problems in linguistics and literature, or which cross the chronological and geographical boundaries established in the seminars.

596. Independent Study. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Provides for areas of study not regularly covered by departmental offerings. Study proposals must conform to departmental guidelines. Prerequisite: Consent of the instructor.

598. M.A. Thesis Research. 0 to 16 Hours. S/U grade only. Students involved in thesis research and writing are assigned to the course at the discretion of the graduate committee. Prerequisite: Consent of the graduate committee.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for a maximum of 24 hours of credit. S/U grade only. The writing of a Ph.D. thesis based on original research in the area of the candidate’s major specialization (literature, linguistics, or culture). Prerequisites: Admission to candidacy for the doctoral degree and consent of director of graduate studies.

Special Education (SpEd)

410. Survey of Characteristics of Learners with Disabilities. 3 Hours. Fulfills requirements for Illinois House Bill 150. Field experience required. Learning and personality characteristics of exceptional learners. Diagnostic processes and educational approaches are examined. Prerequisite: Ed 210 or 421, or graduate standing and consent of the instructor.

415. Characteristics of Exceptional Learners. 3 Hours. No graduation credit will be given for this course to students enrolled in Secondary Education and Social Work or any student currently enrolled in a graduate degree program. This course provides a foundation for the understanding of the exceptional learner in an inclusive environment. Extensive computer use required. Field work required. Prerequisite: 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: 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: SpEd 410 or the equivalent.

424. Assessment of Students with Special Needs. 4 Hours. Theoretical basis and practical application of standardized
and alternative testing of children with learning and behavior difficulties. Prerequisite: SpEd 410.

426. Curricular/Behavioral Considerations for Learners with Special Needs. 4 Hours. Instructional practices related to academics, classroom management, individualized and group instruction for students with special needs. Prerequisite: SpEd 424 or the equivalent or consent of the instructor.

427. Curricular and Behavioral Considerations for LEP Learners with Special Needs. 4 Hours. Exploration of best practice instruction and behavior management for limited English proficient students with learning disabilities, behavioral disabilities, and/or mild cognitive delays. Prerequisite: SpEd 410 or the equivalent or consent of the instructor.


444. Assistive Technology for Literacy, Learning and Participation in Pre-K through High School. 3 Hours. Same as DHD 444. Use of communication systems, computers, adapted equipment and strategies to foster participation and inclusion of students in grades preschool through high school.

448. Topics in Special Education. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Course or workshop on preannounced topic on the education of handicapped children, adolescents, or adults. Prerequisites: SpEd 410 and consent of the instructor.

461. Political and Socio-Cultural Perspectives on Special Education. 3 Hours. Same as Ed 461. Students will examine issues of access and equity through legislation, litigation, and socio-cultural perspectives and be introduced to major theoretical frameworks that influence special education programs. Field work required.

462. Assessment of Individuals with Disabilities. 3 Hours. To prepare students in the use of formal and informal assessment in making decisions regarding placement, instructional planning, and evaluation of students with disabilities. Field work required. Prerequisite: SpEd 461 or the equivalent or consent of the instructor.

463. Instructional Adaptations in Reading and Writing 1 3 Hours. Emphasizes the components of designing, implementing, and assessing reading and writing instruction for individuals with disabilities at the elementary level. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

465. Cognitive Development and Disabilities. 3 Hours. Same as EPsy 465. Theory and research on cognitive development in children with disabilities from infancy through adolescence, in the context of typical development. Models for cognitive assessment and intervention. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

466. Language Development, Diversity, and Disabilities. 3 Hours. Same as EPsy 466. Theory and research on language development in children with disabilities, in the context of typical development. Models for language assessment and intervention. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

467. Social and Emotional Development and Disabilities. 3 Hours. Same as EPsy 467. Exploration of the risk factors and different theoretical approaches associated with the social and emotional development of youth ages 5-21 with and without disabilities. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

471. Curricular Adaptations for Learners with Significant Disabilities. 3 Hours. This course is designed to address methods of instruction, assessment, planning for instruction, development and evaluation of learning environments, and instructional delivery for students with significant disabilities. Field work required. Prerequisites: SpEd 465 and 466 and 467; or consent of the instructor.

472. Promoting Academic and Prosocial Behavior I. 3 Hours. Same as Ed 472. Explores the importance of school-wide and classroom structure and climate in the educational process. Strategies to promote academic success and desired social behavior. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

473. Teaching Math and Science with Adaptations. 3 Hours. Same as Ed 473. Provides prospective teachers with assessment strategies and a range of adaptations, modifications, and interventions in math and science for students with disabilities. Field work required. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

480. Technology and Multimedia: Learning Tools in the Classroom. 4 Hours. New technologies to support teaching and learning in pre-college classrooms. Same as CIE 480.

481. Theoretical Foundations of Bilingual/ESL Special Education. 4 Hours. Overview of historical, political, pedagogical, and theoretical issues involved in the education of students with special learning needs and who are second language learners. Prerequisite: SpEd 410 or the equivalent or consent of the instructor.

500. Research Methods in Special Education. 4 Hours. Research strategies and statistical methods for the assessment of applied and theoretical research studies in special education. Prerequisite: SpEd 410 or consent of the instructor.

506. Characteristics 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. Field work 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: SpEd 506 or 511 or 513 or 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. Field Experience. Field work required. Prerequisite: Grade of B or better in SpEd 506 or consent of the instructor.


512. Instructional Methods for Students with Learning Disabilities. 3 Hours. Development and evaluation of individualized educational programs for learning disabled students, including instructional methods and materials. Field experience. Prerequisite: SpEd 511.

513. Characteristics of Mental Retardation. 3 Hours. The nature, characteristics and educational implications for the cognitive, social, and physical development of persons with mental retardation. Field experience. Prerequisite: SpEd 500.

514. Instructional Methods for Students with Mild Mental Retardation. 2 Hours. Instructional theory, methods, and techniques; and behavioral and academic objectives for students with mild mental retardation. Field experience. Prerequisites: SpEd 513 and concurrent registration in SpEd 515.

515. Instructional Methods for Students with Moderate to Profound Mental Retardation. 2 Hours. Instructional theory and techniques, instructional methods and materials, and behavioral and academic objectives for moderate, severe, and profound mental retardation. Field experience. Prerequisites: SpEd 513 and concurrent registration in SpEd 514.

516. Characteristics of Students with Emotional and Behavioral Disorders. 3 Hours. Exploration of the risk factors and different theoretical approaches associated with the development and prevention of serious emotional and behavioral disorders. Field experience. Prerequisites: SpEd 424 and 426.
517. Instructional Methods for Students with Emotional and Behavioral Disorders. 3 Hours. Instructional programming for the academic and social development of students with serious emotional and behavioral disorders. Strategies for effective classroom and behavioral management. Field experience. Prerequisite: SpEd 516.

522. Special Educator as Consultant. 4 Hours. Training for consultants in educational and employment settings: consultation models, observation, and coaching skills to use with educators, parents, employers, and community-agency personnel. Prerequisite: SpEd 410 or equivalent or consent of the instructor.

537. Special Education Practicum. 6 to 12 Hours. Practice teaching in the field of special education; focus on teaching students who are experiencing social and/or emotional disturbance, mental retardation, or learning disabilities. Prerequisites: Completion of 100 clock hours of pre-student-teaching field experiences; completion of a sequence in an area of special education; and consent of the advisor. Applications are due two semesters in advance.

538. Internship in Special Education. 1 to 9 Hours. May be repeated. Students may register for more than one section per term. Clinical, research or field-based internship experiences for Special Education majors. Prerequisites: SpEd 424 and 426 and 500; and consent of the instructor one semester prior to enrollment.

564. Proseminar in Special Education. 4 Hours. Various areas of special education research are reviewed. Topics include areas of faculty research. Prerequisites: SpEd 500 or consent of the instructor; and admission to Ph.D. program in Special Education.

573. Understanding Research in Special Education. 3 Hours. Overview of research methodology appropriate for teachers of special populations with emphasis on developing skills in critically reading research reports. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

576. Internship in Assessment. 3 Hours. Internship experiences in an assessment clinic for special education majors. Field work required. Prerequisite: SpEd 462 or the equivalent or consent of the instructor.

577. Field Teaching Internship Experience. 3 Hours. Field-based internship experiences for special education. Field work required. Prerequisite: Approval of the program faculty.

580. Student Teaching in Special Education. 6 Hours. Practice teaching in the field of special education. Field work required. Prerequisites: SpEd 463 and 471 and 473 and 572 and 573 and 576 and 577; and approval of the program faculty.

582. Forging Collaborations with Family and Community. 3 Hours. Same as EPSy 582. Develops skills necessary to work in partnership with the families of children with disabilities, and community members. Prerequisite: SpEd 461 or Ed 461 or the equivalent or consent of the instructor.

583. Instructional Adaptations in Reading and Writing II. 3 Hours. Students learn advanced strategies for design, implementing, and assessing reading and writing instruction for individuals with disabilities at the middle school and secondary level. Field work required. Prerequisites: SpEd 461 or Ed 461 and 463; consent of the instructor.

592. Seminar on Theory and Research in Special Education. 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Systematic in-depth review of theory and research on selected topics in special education. Prerequisites: SpEd 500 and consent of the instructor.

593. Ph.D. Research Project. 1 to 8 Hours. May be repeated for a maximum of 8 hours of credit. Students design, implement, and analyze results of a research problem in this area of specialization. Completed study is reviewed by faculty. Prerequisite: Admission to the Ph.D in Education program.

595. Seminar in Special Education. 4 Hours. S/U grade only. Discussion of current literature in the field of special education. Prerequisite: SpEd 564.

596. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Students independently study related topics not covered by courses, under faculty supervision. Prerequisites: SpEd 500 or the equivalent, and consent of the advisor and the instructor.

599. Thesis Research. 0 to 16 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research on the topic of the student’s dissertation. Prerequisite: Consent of the dissertation advisor.

Statistics (Stat)

401. Introduction to Probability. 4 Hours. Probability spaces, random variables and their distributions, conditional distribution and stochastic independence, special distributions, sampling distributions, limit theorems. Prerequisite: Grade of C or better in Math 210.

411. Statistical Theory. 4 Hours. Estimation, tests of statistical hypotheses, best tests, sufficient statistics, Rao-Cramer inequality, sequential probability ratio tests, the multivariate normal distribution, nonparametric methods. Prerequisite: Grade of C or better in Stat 401.

416. Nonparametric Statistical Methods. 4 Hours. Distribution-free tests for location and dispersion problems, one-way and two-way layouts, the independence problem, regression problems involving slopes, detecting broad alternatives, resampling methods. Prerequisite: Grade of C or better in Stat 381 or 411.

431. Introduction to Survey Sampling. 4 Hours. Simple random sampling, sampling proportions, estimation of sample size, stratified random sampling, ratio estimators, regression estimators, systematic and cluster sampling. Prerequisite: Grade of C or better in Stat 411 or 481.


462. Applied Probability Models II. 4 Hours. Renewal theory, regenerative processes, semi-Markov processes, queueing theory, exponential models, M/G/1 and G/M/1 systems, reliability, bounds on the reliability function, system life, Brownian motion, stationary processes. Prerequisite: Grade of C or better in Stat 461.

471. Linear and Non-Linear Programming. 4 Hours. Linear programming, simplex algorithm, degeneracy, duality theorem sensitivity analysis, convexity, network simplex methods, assignment problems. Constrained and unconstrained minima. Quasi-Newton methods. Ellipsoidal methods of Kachian. Prerequisite: Grade of C or better in Math 310.

473. Game Theory. 4 Hours. Games in extensive and normal form. Minimax theorem. Solving matrix games via linear programming. Nash equilibria for nonzero-sum games, Shapley value, bargaining models. Prerequisite: Grade of C or better in Math 310 or Stat 401.

477. Introduction to Reliability Theory. 4 Hours. Structural and probabilistic properties of coherent systems, notions of aging and classes of life distributions, preservation properties, dependent components, optimal allocation models. Prerequisite: Grade of C or better in Stat 401 or consent of the instructor.

481. Applied Statistical Methods II. 4 Hours. Linear regression, introduction to model building, analysis of variance, analysis of enumerative data, nonparametric statistics, product and system reliability, quality control. SAS and SPSSX applications. Prerequisite: Grade of C or better in Stat 381.
### 486. Statistical Consulting. 4 Hours.
Introduction to statistical consulting methods and techniques. Handling and transformation of raw data sets in CMS. Statistical analysis of data sets with SAS and SPSSX. Prerequisite: Grade of C or better in Stat 411 or 481.

### 494. Special Topics in Statistics, Probability, and Operations Research. 4 Hours.
May be repeated for credit. Students may register for more than one section per term. Course content is announced prior to each semester in which it is given. Topics drawn from areas such as distribution theory, Bayesian inference, discrete optimization, applied probability models, resampling techniques, biostatistics, environmental sampling. Prerequisite: Approval of the department.

### 496. Independent Study. 1 to 4 Hours.
May be repeated for credit. Students may register for more than one section per term. Reading course supervised by a faculty member. Prerequisites: Approval of the instructor and the department.

### 501. Probability Theory I. 4 Hours.
Abstract measure theory, probability measures, Kolmogorov extension theorem, sums of independent random variables, the strong and weak laws of large numbers, the central limit theorem, characteristic functions, law of iterated logarithm, infinitely divisible laws. Prerequisite: Math 534 or consent of the instructor.

### 502. Probability Theory II. 4 Hours.
Radon-Nikodym Theorem, conditional expectations, martingales, stationary processes, ergodic theorem, stationary Gaussian processes, Markov chains, introduction to stochastic processes, Brownian motions. Prerequisite: Stat 501.

### 511. Advanced Statistical Theory I. 4 Hours.
Statistical models, criteria of optimum estimation, large sample theory, optimum tests and confidence intervals, best unbiased tests in exponential families, invariance principle, likelihood ratio tests. Prerequisite: Stat 411.

### 512. Advanced Statistical Theory II. 4 Hours.
Basic concepts in decision theory, prior and posterior distributions, Bayesian decision theory, hierarchical models, robustness, minimax analysis, invariance principle, sequential analysis, completeness. Prerequisite: Stat 511.

### 521. Linear Statistical Inference. 4 Hours.
Estimation and testing in linear models, generalized inverses of matrices, n-dimensional normal distribution, quadratic forms, likelihood ratio tests, best invariant tests, analysis of variance. Prerequisite: Stat 411.

### 522. Multivariate Statistical Analysis. 4 Hours.
Multivariate normal distribution, estimation of mean vector and covariance matrix, T-square statistic, discriminant analysis, general linear hypothesis, principal components, canonical correlations, factor analysis. Prerequisite: Stat 521.

### 531. Sampling Theory I. 4 Hours.
Foundations of survey design and inference for finite populations; the Horvitz-Thompson estimator; simple random, cluster, systematic survey designs; auxiliary size measures in design and inference. Prerequisite: Stat 411.

### 532. Sampling Theory II. 4 Hours.
Uses of auxiliary size measures in survey sampling; cluster sampling; systematic sampling; stratified sampling; superpopulation methods; randomized response methods; resampling; nonresponse; small area estimations. Prerequisite: Stat 531.

### 535. Optimal Design Theory I. 4 Hours.
Gauss-Markov theorem, optimality criteria, optimal designs for 1-way, 2-way elimination of heterogeneity models, repeated measurements, treatment-control; Equivalence theorem, approximate designs for polynomial-regression. Prerequisite: Stat 521.

### 536. Optimal Design Theory II. 4 Hours.
Construction of optimal designs: BIB, Latin square and generalized Youden, repeated measurements, treatment-control studies; construction of factorial designs including orthogonal arrays. Prerequisite: Stat 535 or consent of the instructor.

### 571. Noncooperative Games. 4 Hours.

### 572. Cooperative Game Theory. 4 Hours.
Utility theory. Games with side payments, stable sets, core, bargaining sets, Shapley value, Nucleolus. Market games. NTU value. Multilinear extensions, non-atomic games. Prerequisite: Stat 571 or consent of the instructor.

### 575. Optimization Methods in Matrices. 4 Hours.

### 577. Reliability Theory. 4 Hours.
Coherent structures, paths and cuts, modules, shape and properties of reliability function, association, classes of life distributions based on aging, dependence, multivariate models. Prerequisite: Stat 461.

### 591. Advanced Topics in Statistics, Probability, and Operations Research. 4 Hours.
May be repeated for credit. Special topics. Topics drawn from areas such as: data analysis; Bayesian inference; nonlinear models; times series; computer-aided design; reliability models; game theory. Prerequisite: Approval of the department.

### 593. Graduate Student Seminar. 1 Hour.
May be repeated for credit. Students may register for more than one section per term. S/U grade only. For graduate students who wish to receive credit for participating in a learning seminar whose weekly time commitment is not sufficient for a reading course. This seminar must be sponsored by a faculty member. Prerequisite: Approval of the department.

### 595. Research Seminar. 1 Hour.
May be repeated for credit. Students may register for more than one section per term. S/U grade only. Current developments in research with presentations by faculty, students, and visitors. Researchers and practitioners from academia, industry and government will present talks on topics of current interest. Prerequisite: Approval of the department.

### 596. Independent Study. 1 to 4 Hours.
May be repeated for credit. Students may register for more than one section per term. Reading course sponsored by a faculty member. Prerequisites: Approval of the instructor and the department.

### 598. Master’s Thesis. 0 to 16 Hours.
S/U grade only. Research work under the supervision of a faculty member leading to the completion of a master’s thesis. Prerequisite: Approval of the department.

### 599. Thesis Research. 0 to 16 Hours.
May be repeated for credit. Students may register for more than one section per term. S/U grade only. Research work under supervision of a faculty member leading to the completion of a doctoral thesis. Prerequisite: Approval of the department.

### Surgery (Surg)

### 597. Project Research. 0 to 16 Hours.
S/U grade only. Research investigation of problems in surgery. Prerequisite: Consent of the instructor.

### 598. Master's Thesis Research. 0 to 16 Hours.
S/U grade only. Research investigation of problems in surgery. Prerequisite: Consent of the instructor.

### Theatre (Thtr)

### 410. Movement for Stage III. 4 Hours.
Specialized topics in movement-based performance skills, such as stage combat, circus techniques, and mask work. Prerequisite: Graduate standing in theatre.

### 423. Playwriting. 4 Hours.
Same as Engl 495. The development of scripts for stage performance. Prerequisites: Approval of the department and submission and approval of a playwriting sample or dialog-centered fiction prior to registration.

### 444. Drama in Its Cultural Context I. 4 Hours.
Drama in its social and cultural context, through the seventeenth century.

### 445. Drama in Its Cultural Context II. 4 Hours.
Drama in its social and cultural context, eighteenth to twentieth centuries.

### 452. Acting: Greeks and Shakespeare. 4 Hours.
Techniques of performing Greek and Shakespearean drama. Prerequisite: Graduate standing in theatre.

### 455. Acting: Comedy. 4 Hours.
Techniques of performing classic comedy. Emphasis on the “Commedia dell’arte” and improvisational comedy. Topics vary. Prerequisite: Graduate standing in theatre.
458. Acting: Ibsen and Chekhov. 4 Hours. Techniques of performing Ibsen, Chekhov, and their contemporaries. Prerequisite: Graduate standing in theatre.

462. Voice for Stage. 4 Hours. Advanced techniques in the integration of voice, speech, dialects, and other text-related vocal performance skills. Prerequisite: Graduate standing in theatre.

464. Special Projects in Theatrical Design. 4 Hours. May be repeated for a maximum of 12 hours of credit. Twentieth-century styles: design for the contemporary stage. Problems in conceptualization, realization, and execution. Prerequisite: Graduate standing in theatre.

465. Stage Direction. 4 Hours. Exploration of conceptual planning and implementation skills for the stage director ranging from script interpretation to rehearsal and performance. Performance projects required. Prerequisite: Graduate standing in theatre.

466. Special Projects in Performance Training. 4 Hours. May be repeated for a maximum of 12 hours of credit. Training in varying advanced techniques of performance. Prerequisite: Consent of the instructor.

470. Contemporary Performance Techniques. 4 Hours. May be repeated for a maximum of 8 hours of credit. The relationship of contemporary theory and performance techniques with attention to both text and non-text based forms. Topics vary. Performance projects required. Prerequisite: Graduate standing in theatre.

472. Investigative Collaboration. 4 Hours. May be repeated for a maximum of 8 hours of credit. Collaboration as the primary means for theatrical creation. Production teams assigned to joint-production projects. Topics vary. Prerequisite: Graduate standing in theatre.

474. Internship. 3 to 8 Hours. May be repeated for credit. Only 3 hours may be counted toward theatre major requirements. Students work in an approved professional setting. Individual projects developed through conferences with a faculty member and a field supervisor. Prerequisites: 12 hours of upper-division courses in theatre, with a 3.00 grade point average (A=4.00) in those courses; recommendation of two faculty members and approval of the department obtained in the semester prior to internship.

475. Audition Technique. 3 Hours. Selection and staging of audition pieces from both classical and modern drama.

491. Study Abroad in Theatre. 0 to 16 Hours. May be repeated for credit with the approval of the department. Study abroad within an approved foreign exchange program or department-sponsored program. Prerequisite: Approval of the department.

498. Independent Study. 1 to 4 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Individual investigation of special problems that may be student-initiated or related to faculty research. May also be used for special University-sponsored projects, such as interdisciplinary seminars. Prerequisite: Approval of the department.

502. Introduction to Research in Theatre. 4 Hours. Focuses on the research directors and scholars need to do to make informed choices.

502. Theories of Theatre. 4 Hours. May be repeated for a maximum of 12 hours of credit. Nature of the theatrical experience. Emphasis on topics varies, for example theory of comedy; semiotics of theatre; dada, surrealism, expressionism, futurism. Prerequisites: At least 3 of the following: Thtr 209, 245, 262, 284, 425; or consent of the instructor.

523. Special Topics in Dramatic Criticism. 4 Hours. May be repeated for a maximum of 12 hours of credit. Intensive analysis of an individual critic or school, or critical history of an important play.

596. Independent Research. 1 to 4 Hours. May be repeated for a maximum of 6 hours of credit. Students may register for more than one section per term. Department approved research projects not included in thesis research. Prerequisite: Consent of the director of graduate studies.

597. Thesis Production. 0 to 8 Hours. S/U grade only. Under guidance of an advisor and committee, the student creates a theatre or video production, together with a written explanation of the work’s intended significance. Prerequisite: Approval of the faculty thesis production committee.

598. Thesis Research. 0 to 16 Hours. S/U grade only. Students may register for more than one section per term. Under guidance of an advisor and committee, the student develops and conducts a research project addressing a theatre problem of a basic or applied nature. Prerequisite: Approval of the faculty thesis-research committee.

Urban Planning and Policy (UPP)


420. Great Cities: London & Chicago. 1 to 8 Hours. Comparative investigation of urban, economic, social, and political issues in the two global cities. Includes classes, study, and living in London. Field work required. Prerequisite: Selection by the Office of Study Abroad admission committee.

461. Urban and Regional Transportation Methods. 4 Hours. Same as CEMM 404. Methods and models for analyzing and forecasting transportation requirements, costs, and capacities. Prerequisite: Consent of the instructor.

470. Cohort Seminar for Urban Developers. 4 Hours. Application of the financial calculator, use of spreadsheets, and other tools commonly used in real estate-based urban development projects. Prerequisite: Consent of the instructor.

471. Housing and Community Development for Urban Developers. 4 Hours. Housing policy at federal, state and local levels affecting urban housing markets. Emphasis on assessment of market conditions affecting community development decisions. Prerequisite: UPP 470 or consent of the instructor.

472. Development Finance for Urban Developers. 4 Hours. Key financial principles of real estate development, particularly those related to the financing of affordable housing. How to develop a real estate pro forma. Prerequisite: Consent of the instructor.

473. Organizational Essentials for Urban Developers. 4 Hours. Theory and practice of management in public and non-profit settings. Focus on developing communication, leadership and legal skills for each step in development. Prerequisite: Consent of the instructor.

474. Community Development Process for Urban Developers. 4 Hours. Developing affordable housing: development team, acquisition strategy, legal issues, construction management and project sustainability, as it pertains to different types of housing developments. Prerequisite: Consent of the instructor.

475. Sustaining the Housing for Urban Developers. 4 Hours. Introduces students to a range of management issues: property management and maintenance, resident relations services, and financial/asset management as it relates to sustaining affordable housing. Prerequisite: Consent of the instructor.

502. History and Theory of Urban Planning. 4 Hours. Analysis of the development of the planning field and of the theories that have been developed for planning for change in the urban community.

501. Urban Space, Place and Institutions. 4 Hours. Political and economic approaches to urban structure and change. Includes intergovernmental relations, administrative organization and planning initiatives in urban space and institutions. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

502. Planning Skills: Computers, Methods and Communication. 4 Hours. Focus on the use of computers to learn methods and communication skills commonly used in planning practice. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

503. Data Analysis for Planning and Management I. 4 Hours. Basic introduction to data analysis techniques most commonly used in urban planning. Addresses issues of decision-making based on limited or imperfect information. Prerequisite: Consent of the instructor.
504. Economic Analysis for Planning and Management. 4 Hours. Basic micro, macro, and welfare economics theory; related analytical concepts including input-output, economic base, benefit cost. Economic forces which shape urban areas and affect public policy. Prerequisite: Consent of the instructor.

507. Computer Topics in Urban Planning. 4 Hours. Specialized computational abilities for various planning areas including data base, project scheduling, statistics, graphics, and simulations. Topics will vary each semester. Prerequisite: Graduate standing in the Urban Planning and Policy program.

508. Geographic Information Systems for Planning. 4 Hours. Same as Geography 589. Applications of Geographic Information Systems to urban planning and policy making. Prerequisite: Graduate standing in urban planning and policy or consent of the instructor.

511. Resource and Expenditure Planning. 4 Hours. Sources of governmental revenues with emphasis on local planning and administration. Legal and equity issues. Debt financing and management. Financial accounting. Pension fund management. Prerequisite: Graduate standing in the Master of Urban Planning and Policy program or consent of the instructor.

512. Evaluation Methods. 4 Hours. Methods used to evaluate policies and programs; quasi-experimental designs, valuation problems, and emerging evaluation methods. Prerequisite: Consent of the instructor.

513. Data Analysis for Planning and Management II. 4 Hours. Advanced topics in data analysis and model building including specific models used in urban planning. Prerequisite: UPP 503.

514. Issues of Class and Race in Planning. 4 Hours. Critically examines the significant role of race, class, ethnicity and gender as factors in planning public policy formation, implementation, and evaluation. Prerequisite: Consent of the instructor.

515. Regional and Metropolitan-Wide Planning. 4 Hours. History of regional planning. Prerequisite: UPP 500.

520. International Development I: Theory and Applications. 4 Hours. Overview of international development theories and their practical applications. Particular emphasis is placed on globalization. Urban versions and applications of these theories. Prerequisite: Consent of the instructor.

521. International Development II: Comparative Planning and Policies. 4 Hours. Policies and practice of public sector planning and development in three regional areas of the world: Europe, South America, and Asia. Prerequisite: UPP 520 or consent of the instructor.

525. International Development: Special Topics. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in international development planning. Prerequisite: Consent of the instructor.

530. Economic Development I: Analysis. 4 Hours. Theoretical perspectives, data, data sources and research techniques for analysis of regional, metropolitan and neighborhood economies. Prerequisite: UPP 504.

531. Economic Development II: Planning. 4 Hours. Overview of development strategies including financing, business development, industry retention and human resources; implementation and evaluation. Prerequisite: UPP 530.


535. Economic Development: Special Topics. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in economic development. Prerequisite: Consent of the instructor.

536. Urban Employment Planning. 4 Hours. The importance of employment as a focus in planning and policy making. History, theories and methodologies of urban markets; labor market analysis methodologies and emergent public policies. Prerequisite: UPP 504 or consent of the instructor.

537. Economic and Environmental Planning. 4 Hours. Analytical and economic methods for environmental planning and management. Applications to selected problems. Prerequisite: UPP 504 or 554.

540. Community Development I: Theory. 4 Hours. Critically examines community development as a field of practice, policy intervention, implementation and analysis; emphasis on community and social dynamics of disadvantaged groups. Prerequisite: Consent of the instructor.

541. Community Development II: Practice. 4 Hours. Examines the methods and techniques used or adapted in community development as a field of planning practice, analysis and evaluation; emphasis on community based settings, applications and foci. Prerequisite: Consent of the instructor.

542. Metropolitan Housing Planning. 4 Hours. Urban housing market structure and dynamics; impacts of government housing policy on market; development of local housing plans. Prerequisite: UPP 504 or consent of the instructor.

543. Planning for Community-Based Health and Human Services. 4 Hours. Investigates the needs of special populations such as the elderly or mentally ill, the role of the planner in serving these groups and community based strategies to meet needs.

545. Community Development: Special Topics. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in community development. Prerequisite: Consent of the instructor.

547. Community Organization Practice. 4 Hours. Critically examines the context, development, status, and problematics of organizing groups within communities of place, conditions and interest at various levels of analysis, relative to public formation, implementation and evaluation. Prerequisites: UPP 540 and 541; and consent of the advisor and the instructor.

550. Physical Planning I: Theoretical Foundations. 4 Hours. Physical form, economic characteristics, social qualities and government structure of cities, suburbs and regions; theories of urban spatial organization and planning. Prerequisite: Consent of the instructor.

551. Physical Planning II: Methods. 4 Hours. Fundamentals of construction and infrastructure of cities and regions, including site engineering and landscape architecture, natural environmental factors, utilities and infrastructure, cost/benefit analysis, and context of local government and planning process. Prerequisite: UPP 550.

552. Physical Planning III: Studio. 4 Hours. Analysis, evaluation, and development of land use and urban design plans for selected projects and clients. Prerequisite: UPP 551.

553. Land Use Law. 4 Hours. Legal constraints on land use control; constitutional and statutory principles and judicial review.

554. Environmental Planning. 4 Hours. The relationship of federal and state environmental policies and legislation to urban and regional planning efforts. Prerequisite: Consent of the instructor.

555. Physical Planning: Special Topics. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Special topics selected for intensive analysis in such areas as housing and urban design. Prerequisite: Consent of the instructor.

556. Urban Design 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: Consent of the instructor.

557. Site Planning. 4 Hours. Quantitative and qualitative tools for analysis and evaluation of site plans, including standards of site plans, spreadsheet computer models, elements of site design, landscape architecture, and red penciling site plans.

558. Land Use Planning. 4 Hours. Urban land use planning strategies and various land use control techniques which can be
employed to carry out development policies; social implications of land use policy and practice. Prerequisite: Consent of the instructor.

560. Urban Transportation I: Introduction. 4 Hours. Transportation planning and linkages between it and urban land use and regional economic development. Recent trends, traditional problems and emerging issues.

561. Urban Transportation II: Policy and Methods. 4 Hours. Formation and implementation of transportation policy at the national, regional and local levels. Students will prepare an in-depth study of a major policy issue. Prerequisite: UPP 560 or consent of the instructor.

562. Urban Transportation III: Laboratory. 4 Hours. Software packages for urban transportation planning, transportation GIS and air quality modeling. Heavy reliance on case studies. Prerequisite: UPP 561 or consent of the instructor.

563. Transportation Management. 4 Hours. Transit system planning, scheduling, pricing policy, and management; traffic control techniques and demand management; paratransit alternatives. Prerequisite: UPP 560.

565. Transportation: Special Topics. 1 to 4 Hours. May be repeated for a maximum of 8 hours of credit. Students may register for more than one section per term. Examination of specific and current problems in urban and regional transportation. Topics to be determined at the time the course is offered. Prerequisites: UPP 560 and consent of the instructor.

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 CEMM 580. Prerequisite: IE 201 or the equivalent or consent of the instructor. Recommended background: Familiarity with computer spreadsheets.

583. Advanced Planning Theory. 4 Hours. Study of theoretical ideas and debates about planning; the rational model and its competitors; critical review of planning methods and practice; composing alternative plans. Prerequisite: Consent of the instructor.

584. Methods of Policy Analysis. 4 Hours. Same as PPA 584. Analytic, allocative, and evaluative techniques in public policy analysis. Preparation of case studies in problem analysis and policy recommendation. Prerequisite: Consent of the instructor.

586. Topics in Urban Planning Research. 4 Hours. May be repeated for credit. Course highlights research activities and opportunities related to research centers.

587. Planning and Policy Research Practicum. 4 Hours. Open only to PhD degree students. PhD students work with faculty member on engaged research related to their discipline. The topic and scope is determined by mutual agreement. Prerequisites: UPP 586 and consent of the instructor.

591. Professional Practice Experience. 4 Hours. Reviews issues and problems in professional practice; analyzes prerequisites for rational, strategic and ethical planning; considers career options; and defines professional goals. Includes professional experience for students without professional planning experience. Prerequisite: Graduate standing in urban planning and policy and an approved internship agreement or waiver of the internship.

593. Independent Research in Urban Planning and Policy. 1 to 8 Hours. May be repeated for credit. Students may register for more than one section per term. S/U grade only. Advanced study and analysis of a topic selected by a student under the guidance of a faculty advisor. Prerequisite: Consent of the instructor.

594. Topics in Urban Planning and Policy. 1 to 4 Hours. May be repeated for a maximum of 12 hours of credit. Students may register for more than one section per term. Intensive analysis of selected planning problems or policy issues. Prerequisite: Consent of the instructor.

596. Independent Study in Urban Planning and Policy. 1 to 4 Hours. May be repeated for credit. Students may register for more than one section per term. Advanced study and analysis of topic selected by student under the guidance of the faculty advisor. Prerequisite: Consent of the instructor.

597. Master's Project Research. 0 to 4 Hours. S/U grade only. Preparation of plan, research report, or other document which demonstrates readiness for professional planning responsibility. Prerequisite: Open only to degree candidates, upon approval of student’s faculty advisor.

598. Master’s Thesis Research. 0 to 16 Hours. S/U grade only. Preparation of a major research paper under the guidance of a faculty committee. Prerequisite: Open only to degree candidates, upon consent of the director of graduate studies.

599. Ph.D. Thesis Research. 0 to 16 Hours. May be repeated for credit. S/U grade only. Individual study and research. Prerequisite: Open only to degree candidates, upon approval of topic by dissertation committee.

Women's Health Nursing (NuWH)

450. Women and Mental Health Nursing. 3 Hours. Same as GWS 450 and NuSc 450. Theories of female psychology; women’s daily lives and mental health; gender differences in mental illness; strategies for improving women’s mental health. Prerequisite: Consent of the instructor. Students enrolled in the College of Liberal Arts and Sciences must have credit in Pshc 100 and Pshc 270, Pshc 315, or GWS 315.

455. Women's Health: A Primary Health Care Approach. 3 Hours. Same as CHSE 456 and NuSc 455. Health promotion and disease prevention in women’s health. Includes community experience with community women. Primary health care approaches examined. Prerequisite: Consent of the instructor.

507. Biological Basis for Women's Health and Perinatal Nursing I. 2 Hours. Same as NuMC 507. Focuses on anatomy, physiology and endocrinology of reproduction, pregnancy, parturition, the puerperium and menopause as the biological basis for women’s health and perinatal nursing. Prerequisite: Consent of the instructor.

517. Health Care of Women I. 4 Hours. Same as NuMC 517. Health care of women through the lifespan with an emphasis on health promotion and disease prevention, fertility control and pregnancy care. Prerequisites: Credit or concurrent registration in NuMC 507 or NuWH 507; and credit or concurrent registration in NuSc 532; or consent of the instructor.

518. Health Care of Women II. 4 Hours. Same as NuMC 518. Health care of women through the lifespan with an emphasis on the parturition, the puerperium, and common health and pregnancy problems. Prerequisites: NuMC 508; and NuMC 517 or NuWH 517; or consent of the instructor.

519. Health Care of Women III. 4 Hours. Same as NuMC 519. Health care of women through the lifespan with an emphasis on gynecologic and primary care. Prerequisites: NuWH 518 or NuMC 518; and NuSc 531, 532, 535.

550. Issues for Research and Practice in Women’s Health. 3 Hours. Same as NuSc 550. Analysis of gender-related definitions of health and illness in theory issues and research evaluation criteria for women’s health care practice are developed as a basis for research. Prerequisite: Consent of the instructor.

555. Theories and Methods in Women's Health Nursing Research. 3 Hours. Same as NuSC 555. Critical analysis of theoretical and methodological approaches in women’s health nursing research. Emphasis on evaluation schema useful to researchers. Prerequisites: NuWH 550 or NuSc 550 and consent of the instructor.

565. Advanced Research in Women's Health. 1 to 2 Hours. Same as NuSc 565. Advanced seminar for doctoral students in graduate nursing concentration in women’s health. Faculty and students present and critique on-going and developing research. Prerequisite: Consent of the instructor.

570. International Dimensions in Women's Health. 3 Hours. Same as NuSc 570. Critical examination of the health of women from a global perspective. Emphasizes resources and strategies nurse researchers use to monitor women’s health across cultures and countries. Prerequisite: Consent of the instructor.

575. Minority Women's Health Nursing. 3 Hours. Same as NuSc 575. Theoretic and descriptive overview of the health concerns and health conditions of women from ethnic/racial minority backgrounds with implications for nursing research and practice. Prerequisite: Consent of the instructor.