

# UNIVERSITY COURSE DESCRIPTIONS

## ACCT - Accounting

### Department of Accounting (BUS)

#### ACCT 2000 SURVEY OF ACCOUNTING FOR NONBUSINESS MAJORS

[3 hours] A study of the principles of Financial and Managerial accounting, collection of accounting data, preparation and interpretation and analysis of basic financial statements, and the uses of accounting information. Prerequisite: Sophomore standing

#### ACCT 3000 FINANCIAL STATEMENT ANALYSIS

[3 hours] An elective dealing with financial statement information in decision making. Course requirements include both written and oral presentation of an in-depth analysis of the financial reports of a corporation. Prerequisite: BUAD 2050

#### ACCT 3010 COST ACCOUNTING FOR NONACCOUNTING MAJORS

[3 hours] Introduction to concepts and applications of cost accounting for manufacturing and service organizations. Covers cost management, activity costs, job costing, overhead analysis and uses of cost information in decision-making. Prerequisite: BUAD 2050

#### ACCT 3030 TAX ACCOUNTING FOR NONACCOUNTING MAJORS

[3 hours] An introduction to federal income taxes for individuals. This course covers the concepts of income, deductions, taxes and credits. Students gain practical experience in preparing form 1040 for individuals. Prerequisite: BUAD 2050

#### ACCT 3100 FINANCIAL ACCOUNTING AND SYSTEMS

[3 hours] This class focuses on the general purpose financial statements and the accounting information system that develops information included in those financial statements. Prerequisite: A higher education GPA of 2.5 or better and an average GPA of 2.5 or better in BUAD 2040 and 2050, and a C (2.0) or better in each

#### ACCT 3110 EXTERNAL FINANCIAL REPORTING I

[3 hours] This course covers accounting topics applicable to asset valuation, income measurement and financial statement disclosure. It concentrates on accounting for corporations and emphasizes the accounting cycle and the asset side of the balance sheet. Prerequisite: BUAD 2040 and 2050; junior standing; a higher education GPA of 2.5 or better and a 2.5 or higher GPA in BUAD 2040 and 2050, which must include a grade of C (2.0) or better in both BUAD 2040 and BUAD 2050

#### ACCT 3120 EXTERNAL FINANCIAL REPORTING II

[3 hours] This course concentrates on financial accounting for corporations and emphasizes the liability and stockholders' equity sections of the balance sheet, and related income statement issues. Prerequisite: ACCT 3110 with a grade of C (2.0) or better

#### ACCT 3210 INDIVIDUAL TAXATION

[3 hours] This class focuses on the concepts and principles applicable to the taxation of individuals. Prerequisite: ACCT 3100 with a grade of C (2.0) or better

#### ACCT 3310 ACCOUNTING INFORMATION SYSTEMS AND CONTROLS

[3 hours] This course provides an introduction to processing and reporting of accounting information. Major emphasis is placed on basic accounting information processing including accounting applications in an advanced information technology environment. Prerequisite: Higher education GPA of 2.5 or better and an average GPA of 2.5 or better in BUAD 2040 and 2050 with a grade of C (2.0) or better in each; permission of department required

#### ACCT 4130 EXTERNAL FINANCIAL REPORTING III

[3 hours] This is the third course in the external financial reporting sequence. This course covers topics such as foreign exchange, partnerships, business consolidations and mergers. Prerequisite: ACCT 3120 with a grade of C (2.0) or better

#### ACCT 4210 TAXES AND BUSINESS DECISIONS

[3 hours] This course provides an overview of income taxes. It emphasizes how taxes impact business decisions. Although various types of entities are compared, the course primarily covers corporate taxes. Prerequisite: ACCT 3110 with a grade of C (2.0) or better

#### ACCT 4220 ADVANCED TAX TOPICS

[3 hours] This course covers advanced topics in corporate taxation and income taxation of partnerships, estates and trusts, estate and gift taxation, and U.S. taxation of Foreign transactions. Prerequisite: ACCT 4210

#### ACCT 4310 INTERNAL REPORTING

[3 hours] Internal Reporting focuses on budgeting, product and service costing and the ability to recognize and provide management with relevant information for strategic cost management and performance evaluation. Prerequisite: ACCT 3110 with a grade of C (2.0) or better

#### ACCT 4410 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING

[3 hours] Principles, procedures and ethics of financial reporting for not-for-profit organizations, including state and local government. Includes the use of funds, budgets, appropriations and encumbrances as means of control. Prerequisite: ACCT 3120 with a grade of C (2.0) or better

#### ACCT 4420 AUDITING

[3 hours] Auditing integrates financial and cost accounting, ethics, accounting theory, information systems and control structure concepts into a systematic process of obtaining, evaluating and reporting on economic events and activities. Prerequisite: ACCT 3120 and 3310 with a grade of C (2.0) or better in each class

#### ACCT 4940 ACCOUNTING INTERNSHIP

[1-3 hours] The accounting internship allows superior accounting students to obtain practical training through a rigorous learning experience. This program enables students to secure a broad exposure to business operations and problems. Prerequisite: ACCT 3110; GPA of 2.8; Accounting GPA of 3.0; Approval of Internship Director

#### ACCT 4990 INDEPENDENT STUDY: READINGS AND RESEARCH

[1-3 hours] The student will write a research report on an accounting topic of interest to both student and faculty adviser. The topic must not be covered in another undergraduate accounting course. Prerequisite: ACCT 3120; senior standing; permission of chair; approval of faculty adviser

#### ACCT 5000 FINANCIAL AND MANAGERIAL ACCOUNTING

[3 hours] The study of the principles of Financial and Managerial accounting. The financial accounting segment of the course will focus on the preparation, interpretation and analysis of financial statements and the use of the financial information. The managerial accounting segment of the course will focus on an introduction to cost accounting, managerial accounting concepts and the use of accounting information in managerial decision-making. Prerequisite: Graduate standing

#### ACCT 5940 INTERNSHIP

[1-3 hours] A combination of practical experience at a business concern with discussion to be held at the University with others in the program. An oral and written report is required. Prerequisite: Approval of Internship Director

#### ACCT 6130 EXTERNAL FINANCIAL REPORTING III

[3 hours] This is the third course in the external financial reporting sequence. This course covers topics such as foreign exchange, partnerships, business consolidations and mergers. Prerequisite: ACCT 3120

#### ACCT 6150 INTERNATIONAL ACCOUNTING AND TAXATION

[3 hours] Analysis of accounting issues crucial to multinational companies. Issues to be addressed include: comparing accounting across countries, effects of harmonization of financial reporting requirements and the translation of foreign currency financial statements. Prerequisite: ACCT 6210

#### ACCT 6190 CONTEMPORARY ACCOUNTING PROBLEMS

[3 hours] An overview of current topics and issues concerning the profession. The course includes, but is not limited to, problems and opportunities related to the practice of public accounting. Prerequisite: ACCT 6210, 6130

#### ACCT 6210 RESEARCH IN ACCOUNTING AND TAXATION

[3 hours] Provides the methodology necessary for accountants to perform effective, efficient and ethical accounting and tax research and the means of communicating those results. Prerequisite: ACCT 3120 and 4210

## 302 Course Descriptions

### ACCT 6220 CORPORATE TAXATION

[3 hours] This course covers the taxation of corporations and their shareholders. Topics include the formation of a corporation, taxation of corporate income and the tax treatment of distributions. Corequisite: ACCT 6210

### ACCT 6230 FIDUCIARY AND ESTATE AND GIFT TAXATION

[3 hours] Introduces the study of income tax laws for fiduciaries and estate and gift taxation. Emphasis is placed on estate planning. Corequisite: ACCT 6210

### ACCT 6240 PARTNERSHIP AND S CORPORATION TAXATION

[3 hours] A study of partnerships and partners: and S corporations and S corporation shareholders. Corequisite: ACCT 6210

### ACCT 6290 TAX POLICY

[3 hours] A study and analysis of tax theories, principles and statutes that underlie tax policy throughout the world. The course will concentrate on current issues in federal tax policy. Prerequisite: ACCT 6210  
Corequisite: ACCT 6220, 6230, 6240

### ACCT 6310 ADVANCED MANAGERIAL ACCOUNTING

[3 hours] Use of accounting information in planning and controlling an organization, including case studies in cost-volume-profit, budgeting, transfer pricing and performance evaluation. Prerequisite: ACCT 4310

### ACCT 6320 COST ANALYSIS AND CONTROL

[3 hours] Criteria and techniques for designing and using cost systems. Theory and techniques of analyzing organizations and processes in manufacturing and service organizations. Uses case studies to evaluate cost management systems. Prerequisite: ACCT 4310

### ACCT 6410 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING

[3 hours] Principles, procedures and ethics of financial reporting for not-for-profit organizations, including state and local government. Includes the use of funds, budgets, appropriations and encumbrances as a means of control. Prerequisite: ACCT 3120

### ACCT 6420 AUDITING

[3 hours] Auditing integrates financial and cost accounting, ethics, accounting theory, information systems and control structure concepts into a systematic process of obtaining, evaluating and reporting on economic events and activities. Prerequisite: ACCT 3120 and 3310

### ACCT 6960 INDEPENDENT STUDY IN ACCOUNTING

[1-3 hours] Independent research report on an accounting topic of interest to both the student and the faculty member. Research related to a topic not covered in the listed graduate accounting courses.

## ACTG - Accounting

### Department of Business Technology (UNV)

### ACTG 1040 PRINCIPLES OF FINANCIAL ACCOUNTING

[3 hours] The course covers basic financial accounting principles for a business enterprise. Topics include transaction analysis, measurement, summarization, preparation, interpretation and use of financial reports.

### ACTG 1050 PRINCIPLES OF MANAGEMENT ACCOUNTING

[3 hours] Management uses of accounting data for analysis, decision making, financial planning and control. Topics include understanding cost behavior, activity-based costing, cost-volume-profit analysis and budgeting. Prerequisite: ACTG 1040

### ACTG 1060 TECHNICAL FINANCIAL ACCOUNTING FOR ACCOUNTING MAJORS

[2 hours] Extensive work on accounting cycle including preparation of financial statements, and development and use of account information in business application areas. Prerequisite: ACTG 1040

### ACTG 1200 ACCOUNTING SYSTEMS APPLICATIONS

[3 hours] A course designed to teach the student the application of accounting principles to a computerized accounting system. Prerequisite: ACTG 1040

### ACTG 1250 SPREADSHEET APPLICATIONS IN ACCOUNTING

[2 hours] Spreadsheet programs will be used in budgeting, financial management, preparation of financial statements, creation of business documents and other financial applications. Prerequisite: ACTG 1040, ACTG 1050, CMPT 1410

### ACTG 2100 INTERMEDIATE ACCOUNTING I

[3 hours] In-depth expansion of financial accounting principles and financial statement presentation. Emphasis on balance sheet accounts with particular attention applied to working capital (cash, receivables, inventory, current liabilities, also long-term assets). Prerequisite: ACTG 1040

### ACTG 2150 INTERMEDIATE ACCOUNTING II

[3 hours] Continuation of advanced financial accounting topics including valuation of long-term liabilities and investments, stockholders' equity and accounting for income taxes, leases, pensions, accounting changes/errors, statement of cash flow. Prerequisite: ACTG 2100

### ACTG 2300 COST ACCOUNTING

[3 hours] Practice of cost accounting especially applied to manufacturing business. Includes accounting for materials, labor and overhead under job order and process cost systems and standard costing. Prerequisite: ACTG 1040

### ACTG 2310 COST ACCOUNTING IN HEALTH CARE

[3 hours] Cost accounting has become an essential part of health care management. The spread of managed care has heightened this need. Traditional cost courses focus primarily on manufacturing. This course provides thorough coverage of the essentials of cost accounting from a health care perspective.

### ACTG 2350 MANAGERIAL ACCOUNTING

[3 hours] Emphasis on the use of accounting information internally for decision-making by managers of business entities. Prerequisite: ACTG 2300

### ACTG 2400 FUNDAMENTALS OF TAXATION

[3 hours] Consideration of the basic features of the federal income tax system. Emphasis is placed on the determination of taxable income of individuals and corporations. Also covered will be the preparation of the form 1040 both manually and using a commercial computer tax preparation package. Prerequisite: ACTG 1040

### ACTG 2450 ADVANCED TAX ACCOUNTING

[3 hours] A study of S corporations, C corporations, partnerships and estate and gift tax. Prerequisite: ACTG 1040

### ACTG 2500 AUDITING AND INTERNAL CONTROL

[3 hours] A study of auditing standards, concepts and procedures. This course includes examination of the auditor's approach to study and evaluation of the internal control structure as well as substantive testing of the revenue cycle. Prerequisite: ACTG 1060

### ACTG 2510 FORENSIC ACCOUNTING

[3 hours] Topics will cover gathering and presenting financial information that will be accepted by a court of jurisprudence against perpetrators of economic crime.

### ACTG 2610 PUBLIC ADMINISTRATION AND NON-PROFIT ACCOUNTING

[3 hours] This course is designed for students in the accounting program and employees of non-profit organizations. The course deals with the principles and applications of fund accounting as it relates to government, health care, colleges and universities and other non-profit organizations. It also includes budgeting and reporting.

### ACTG 2630 PAYROLL ACCOUNTING

[1 hour] This course will teach students the development and maintenance of appropriate reports, retention periods and tax filings.

### ACTG 2710 CERTIFIED BOOKKEEPER EXAM REVIEW

[3 hours] Will prepare students for National Certified Bookkeeper Exam. Course covers all five required skill areas: merchandise inventory, payroll, depreciation, correcting and adjusting entries.

### ACTG 2940 COOPERATIVE EDUCATION IN ACCOUNTING

[3 hours] Cooperative education in accounting is the integration of classroom theory with practical work experience in the related field. Work related jobs must be investigated and approved by the co-op instructor. Instructor permission required. Prerequisite: ACTG 1200 and permission of instructor

### ACTG 2980 SPECIAL TOPICS IN ACCOUNTING

[1-3 hours] Current developments in accounting research and theory and literature discussed in seminar manner. Topics selected from all areas of accounting. Prerequisite: ACTG 2100

**ACTG 2990 INDEPENDENT STUDY-ACCOUNTING**

[1-4 hours] Students will study an appropriate subject mutually agreed upon between the student and instructor. The format may include lecture, computer lab and/or practical experience. Prerequisite: Permission of instructor

## ADOT - Administrative Office Technology

### Department of Business Technology (UNV)

**ADOT 1010 PC KEYBOARDING I**

[3 hours] Provides a basic understanding of the personal computer, word processing software and the development of keyboarding skills. Learn to format business letters, memos, reports and tables.

**ADOT 1080 ADMINISTRATIVE OFFICE SKILLS**

[3 hours] This course develops the competence of students in applying proofreading, editing, telephone, filing and vocabulary skills to office situations to enhance their effectiveness as administrative support personnel. Prerequisite: ADOT 1010

**ADOT 1110 PC KEYBOARDING II**

[3 hours] Focuses on the improvement of typewriting production and speed building. Course coverage includes production work on professional reports, business correspondence, office forms and frequent special practice to develop maximum typing skills. Prerequisite: ADOT 1010

**ADOT 1200 SECRETARIAL OFFICE PROCEDURES**

[3 hours] This course explores the information processing and administrative support responsibilities and services necessary for the secretary to perform effectively at the operational level in the business office. Prerequisite: ADOT 1010

**ADOT 2140 MACHINE TRANSCRIPTION**

[3 hours] This course provides intensive practice in transcribing business correspondence from machine sources. The course will emphasize efficient use of equipment, preparation of quality correspondence, command of language skills and achieving an employable transcription rate. Prerequisite: ADOT 2180

**ADOT 2180 WORD PROCESSING**

[3 hours] This course emphasizes the mastery of basic and advanced word processing functions of WordPerfect for Windows to enable the student to function effectively and efficiently in a business environment. Prerequisite: ADOT 1010

**ADOT 2200 OFFICE MANAGEMENT**

[3 hours] Students study various organizational forms, the functions of business departments and relate past office situations to current office conditions in a effort to ensure future effectiveness in office operations. Prerequisite: ADOT 1200

**ADOT 2270 PC KEYBOARDING III**

[3 hours] Advanced instruction with emphasis on setting priorities, following directions, evaluating document formats and mailability, composing administrative business correspondence, demonstrating quality and efficiency in document production using industry standard word processing software. Prerequisite: ADOT 1110

**ADOT 2940 ADMINISTRATIVE OFFICE INTERNSHIP**

[3 hours] Students will work in an office environment in the local business community and demonstrate the technical and communication skills required for successful performance in an administrative support position. Prerequisite: ADOT 1080, 2180, 1200

**ADOT 2990 INDEPENDENT STUDY**

[1-3 hours] Students will study an appropriate subject mutually agreed upon between the student and instructor. The format may include lecture, computer lab and/or practical experience. Prerequisite: Permission of instructor

## AED - Art Education

### Department of Art (ARS)

**AED 2940 FIELD PLACEMENTS IN SPECIAL SETTINGS**

[1-4 hours] Independent field work which will allow the undergraduate student to develop a course of study. Optional placement in a school system or in programs for children and youth at The Toledo Museum of Art. Prerequisite: Admission to Art Education Program

**AED 3100 ART EDUCATION FOR THE PRE-PRIMARY AND PRIMARY CHILD**

[3 hours] Focuses on the supporting the young child's capacity to create, perceive and appreciate the visual arts. Orientation to materials and instructional techniques will be explored through studio and gallery instruction with a young child. Prerequisite: Admission to the College of Education

**AED 3130 MULTI-CULTURAL APPROACHES FOR ART APPRECIATION**

[3 hours] An investigation of innovative methods for teaching multi-cultural understanding through art history and art appreciation. The Toledo Museum of Art's collection will be the focus for the course. U.S. multicultural course

**AED 3300 CRAFTS IN ART**

[3 hours] This course is designed to investigate the philosophy and variety of craft processes used to make art. Topics that may be covered include fibers, metal crafts, ceramics, paper making. Humanities core course

**AED 3500 INNOVATIONS IN ART EDUCATION**

[3 hours] An introduction to new directions in secondary art education. Current views of philosophy and psychology are implemented as the rationale for contemporary curricula in art education. Field experience is to be arranged. Prerequisite: Admission to Art Education program

**AED 3940 ART FIELD PLACEMENTS IN THE ELEMENTARY SCHOOL**

[1-4 hours] Field placement in an elementary school setting allowing the undergraduate student, with art teacher approval, to develop a course of study that will satisfy the special needs of the student in art education. Prerequisite: Admission to Art Education program

**AED 4140 ART EDUCATION FOR THE SPECIAL CHILD**

[3 hours] This course introduces and surveys a wide variety of art strategies and instructional adaptations for use with the child with physical, emotional or mental differences.

**AED 4150 SETTING THE STAGE FOR EARLY CHILDHOOD LEARNING: INSPIRATIONS FROM REGGIO EMILIA**

[3 hours] This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.

**AED 4200 COMPUTER GRAPHICS IN ART EDUCATION**

[3 hours] This course examines the tools, technology and instructional applications of computer graphics in art settings. This course is especially appropriate for art educators interested in integrating art concepts using the Macintosh environment. Prerequisite: Admission to program in Art Education or permission of instructor

**AED 4230 INTEGRATING AESTHETIC EXPERIENCES**

[3 hours] This course will provide students in education an overview of the role of art and music in curriculum development. (Students may enroll in either art or music education sections.) Prerequisite: Admission to the College of Education

**AED 4240 ADAPTIVE METHODS IN THERAPEUTIC ART FOR CHILDREN**

[3 hours] This course is designed to study art media and methods that will enhance the development of the child with disabilities as it relates to their physical, emotional, intellectual and social well being. Prerequisite: AED 4560

**AED 4280 THERAPEUTIC ART FOR ADULT POPULATIONS**

[3 hours] This course is designed to provide understanding of how art experiences relate to special populations. Students will research and develop strategies and adaptations for use with special populations in therapeutic settings. Prerequisite: AED 4560

**AED 4300 MEDIA AND METHODS IN THERAPEUTIC ART**

[3 hours] An investigation into group and individual processes as they relate to art media and methods in therapeutic art will be presented. Experiences in art media will be explored. Prerequisite: AED 4560

**AED 4450 CURRICULUM IN ART EDUCATION**

[3 hours] An exploration of discipline-based art education (DBAE) philosophy in the schools. Field placement in the Toledo Museum of Art's Youth program and the area schools will be used to implement the theoretical base. Prerequisite: Admission to the program in Art Education

## 304 Course Descriptions

### **AED 4560 INTRODUCTION TO THERAPEUTIC ART**

[3 hours] This course will introduce students to therapeutic art through investigation of theories in art education and art therapy. Students will explore art media and methods in therapeutic art programming.

### **AED 4900 SEMINAR IN PROFESSIONAL DEVELOPMENT**

[2 hours] This seminar is designed to enhance the student teacher's final preparation for employment. Professional issues, ethical behavior, interview techniques and other processes and concerns involved in entry into the profession will be examined. Prerequisite: Admission to student teaching Corequisite: AED 4930

### **AED 4930 STUDENT TEACHING IN ART**

[6-12 hours] Planned field experiences in public school classrooms under the direction of experienced art teachers. Gradual acceptance of full responsibility by student teacher. A scheduled time will be included to facilitating professional practices. Prerequisite: Admission to the College of Education and completion of all major methods courses related content area and professional education

### **AED 4940 INTERNSHIP IN THERAPEUTIC ART**

[3 hours] This course will incorporate therapeutic art program development skills within an internship environment. Prerequisite: AED 4560, AED 4300

### **AED 4950 INNOVATIONS IN ART EDUCATION**

[3 hours] Students are introduced to a variety of activities and materials based upon children's interests and needs, available materials, and time allotted to art activities in the self-contained classroom.

### **AED 4990 INDIVIDUAL STUDY IN ART EDUCATION FOR THE UNDERGRADUATE STUDENT**

[1-4 hours] Individual study is designed to provide the student the opportunity to work individually on professional problems under the direction of the art education staff without formal class meetings. Prerequisite: Admission to the College of Education

### **AED 5000 RESEARCH IN ART EDUCATION**

[4 hours] This course will provide an overview of empirical and historical research structures, application of research to classroom activities and development of research for publication. Prerequisite: Graduate Admission in Art Education

### **AED 5140 ART EDUCATION FOR THE SPECIAL CHILD**

[3 hours] This course introduces and surveys a wide variety of art strategies and instructional adaptations for use with the child with physical, emotional or mental differences.

### **AED 5150 SETTING THE STAGE FOR EARLY CHILDHOOD LEARNING: INSPIRATIONS FROM REGGIO EMILIA**

[3 hours] This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.

### **AED 5200 COMPUTER GRAPHICS IN ART EDUCATION**

[3 hours] This course examines the tools, technology and instructional application of computer graphics education settings. The course is appropriate for art educators as well as others interested in using graphics and the microcomputer. Prerequisite: Graduate admission in Art Education or permission of instructor

### **AED 5220 ISSUES IN THERAPEUTIC ART**

[3 hours] The study of art processes that provide physical, emotional and intellectual development. Topics covered include art history, art appreciation, aesthetics, making art and art materials. Prerequisite: Graduate admission in Recreation and Leisure Education or Art Education

### **AED 5240 ADAPTIVE METHODS IN ART EDUCATION FOR SPECIAL POPULATIONS**

[3 hours] This course is designed to provide understanding of how art experiences relate to special populations. Students will research and develop strategies and instructional adaptations for use with special populations in a therapeutic or rehabilitative setting. Prerequisite: Graduate admission in Recreation and Leisure Education or Art Education; AED 5200

### **AED 5260 THERAPEUTIC ART FOR THE PRE-ADOLESCENT/ADOLESCENT**

[3 hours] Theory and Techniques of Therapeutic art with pre-adolescents/adolescents will be addressed. A survey of literature, case presentations and developmental stages will be discussed. Art assignments, papers and research will enhance a student's ability to work with this population. Prerequisite: Admission to the graduate program in Recreation and Leisure Education or Art Education; AED 5200

### **AED 5280 THERAPEUTIC ART FOR ADULT POPULATIONS**

[3 hours] This course is designed to study art methods and materials that will enhance the adult with special needs related to their emotional, intellectual and physical well-being. Prerequisite: Admission to the graduate program in Recreation and Leisure Education; AED 5220

### **AED 5300 MEDIA AND METHODS IN THERAPEUTIC ART**

[3 hours] An investigation into group and individual processes as they relate to art media and methods in therapeutic art will be presented. Experiences in art media will be explored. Prerequisite: Admission to the graduate program in Recreation and Leisure Education or Art Education; AED 5220

### **AED 5320 THE ART MUSEUM AND THE ART/HUMANITIES EDUCATOR**

[3 hours] This course will introduce the role of the museum for the art/humanities educator and will examine the installation and design of exhibitions and the implications for teaching. Life center issues, museum education, curriculum issues, interactive galleries and technology will be presented.

### **AED 5500 CONTEMPORARY TRENDS & ISSUES IN ART EDUCATION**

[4 hours] A review of research into current issues in art education related to methods of teaching, philosophy and psychology, this course also examines contemporary theoretical developments in art education. Prerequisite: Graduate admission in Art Education

### **AED 5930 ADVANCED SEMINAR IN PHILOSOPHY OF ART EDUCATION**

[1-4 hours] Guest lecturers from other institutions of higher learning are invited to The Toledo Museum of Art or The University of Toledo department of art to present seminars relevant to their endeavors. Prerequisite: Admission to the Graduate Program in Art Education

### **AED 5950 WORKSHOP IN ART EDUCATION FOR THE SELF-CONTAINED CLASSROOM**

[3 hours] Students are introduced to a variety of art activities and materials based on children's interests and needs, available materials, and time allotted to art activities in the self-contained classroom.

### **AED 5990 INDIVIDUAL STUDY OF ART FOR THE GRADUATE STUDENT**

[1-4 hours] Individual study is designed to provide a student with the opportunity to work independently on professional problems under the direction of the faculty in the Department of Art. Prerequisite: Admission to the Graduate Program in Art Education

### **AED 6920 MASTERS RESEARCH PROJECT IN ART EDUCATION**

[1-4 hours] This course is open to graduate students who elect the completion of a master's project in fulfilling the research requirement of the master's degree program. Prerequisite: Admission to the Graduate Program in Art Education

### **AED 6940 INTERNSHIP**

[1-4 hours] This course will incorporate advanced recreational therapy program concepts in therapeutic art within an internship environment using expressive techniques. 01: Creative Arts Therapy Psychiatric 02: Creative Arts Therapy Rehabilitation 03: Creative Arts Therapy Long Term Care 04: Creative Arts Therapy Mental Retardation Prerequisite: Admission to the Professional Sequence in Therapeutic Art; RCRT 4940

### **AED 6960 MASTER'S RESEARCH THESIS IN ART EDUCATION**

[1-4 hours] This course is open to graduate students who elect the completion of a master's thesis in fulfilling the research requirement of the master's degree program. Prerequisite: Admission to the Graduate Program in Art Education

## **AERO - Aerospace Studies**

### **Department of Military Science (HHS)**

#### **AERO 1110 AIR FORCE ORGANIZATION I**

[2 hours] Organization of the United States Air Force. Focus on missions involving airlift forces, strategic forces, tactical forces as well as overseas forces. Development and employment of weapon systems and logistic support functions. Leadership laboratory activities.

#### **AERO 1120 AIR FORCE ORGANIZATION II**

[2 hours] Organization of the United States Air Force. Focus on U.S. Defense policies, military balance between U.S. and eastern European forces as well as capabilities of Army, Navy and Reserve/Guard forces. Officership/Professionalism and introduction to flight.

**AERO 2110 AIR FORCE HISTORY I**

[2 hours] Development of air power from the first lighter-than-air vehicles through the establishment of the Department of the Air Force as an independent military force. Various concepts of employment of air power and factors which have prompted research and technological change. Examples of impact of air power on strategic thought. Leadership laboratory activities.

**AERO 2120 AIR FORCE HISTORY II**

[2 hours] Development of air power since the establishment of the independent Air Force to the present. Various concepts of employment of air power and factors which have prompted research and technological change. Examples of impact of air power on strategic thought. Leadership laboratory activities.

**AERO 3110 AIR FORCE MANAGEMENT I**

[3 hours] Integrated management course emphasizing individual as a leader in the Air Force. Human behavior, individual and in groups, historical development of management thought, discussion of classical leadership theory; oral and written communication, writing and briefing formats. Leadership laboratory activities.

**AERO 3120 AIR FORCE MANAGEMENT II**

[3 hours] Air Force leadership, planning, organizing, coordinating, directing and controlling functions of management with emphasis on Air Force application, concept of command and staff, junior as administrative leader, Air Force personnel system, management of environment. Leadership laboratory activities.

**AERO 4110 AMERICAN AND NATIONAL SECURITY**

[3 hours] Role of the President, the Congress and National Security Council in national security making policy; American defense strategy; alliance; regional security; arms control. Leadership laboratory activities.

**AERO 4120 AIR FORCE OFFICERSHIP**

[3 hours] Air Force officer as part of national security force; military law; laws of armed conflict; the military profession; transition to military life; relations with civilian community. Leadership laboratory activities.

**AERO 4910 AIR FORCE ISSUES**

[3 hours] On demand. In-depth study of selected topics. Offered to individuals in lecture, seminar or independent study depending on student needs and nature of material. May be repeated twice for up to 6 hours.

## AFST - Africana Studies

### Africana Studies Program (ARS)

**AFST 1100 INTRODUCTION TO AFRICANA STUDIES**

[3 hours] Introductory survey of basic theoretical concepts to analyze the Black experience, with special focus on the general historical process common to the African Diaspora (Africa, Caribbean and the Americas - South, Central and North, especially the USA.) U.S. multicultural course

**AFST 1110 AFRICAN CIVILIZATION**

[3 hours] General cultural and historical survey of Africa south of the Sahara from earliest times to the 20th century. Includes topics on art, literature, philosophy, religion and society. Humanities core course Non-western multicultural course

**AFST 1200 INTRODUCTION TO THE AFRICAN EXPERIENCE**

[3 hours] Introduction to the African experience through case studies of critical historical experiences: origin of humanity, origin of civilization, empire and traditional society. Non-western multicultural course  
AFST 2100 FOUNDATIONS OF BLACK

**INTELLECTUAL HISTORY**

[3 hours] An examination of slavery and colonialism in the intellectual history of the African Diaspora, especially in the work of W.E.B. Dubois, C.L.R. James and Kwame Nkrumah. Prerequisite: AFST 1100 or 1200 U.S. multicultural course

**AFST 2200 FOUNDATION OF CULTURE IN THE AFRICAN DIASPORA**

[3 hours] Examination of culture in the African Diaspora by focusing on continuities and discontinuities in music and dance, material culture, language and folklore and the cultural practices of everyday life. Prerequisite: AFST 1100 or 1200 Non-western multicultural course

**AFST 2220 HISTORY OF JAZZ**

[3 hours] A study of the development of jazz styles including listening skills and historical perspectives. Because the major innovations and stylistic interpretations of jazz are a result of African Americans, the course includes a study of how their culture influenced the development of jazz. Students may take P/N.C. Humanities core course U.S. multicultural course

**AFST 2300 BLACK COMMUNITY RESEARCH METHODS**

[3 hours] Survey of basic social research methods and studies focusing on the Black community. Class conducts research on Black community of Toledo. Offered as companion to AFST 2400. Topics change each year. Course can be taken twice. Prerequisite: AFST 1100 or 6 hours of any social science

**AFST 2400 SOCIAL POLICY AND THE BLACK COMMUNITY**

[3 hours] Examination of social policy and the Black community of Toledo with a special focus on one major topic. Offered as companion to AFST 2300. Topics change each year. The course can be taken twice. Prerequisite: AFST 1100 or 6 hours of any social science

**AFST 2660 POLITICS IN AFRICA**

[3 hours] The character and development of African political institutions and processes with a special emphasis on patterns in the post-independence period and prospects for the future. Non-western multicultural course

**AFST 3220 GEOGRAPHY OF AFRICA**

[3 hours] Course begins with a general overview of Africa's physical environment, its colonial history and its people and cultures. It then examines a variety of themes associated with development, population, urban and political geography. Non-western multicultural course

**AFST 3240 AFRICAN-AMERICAN POLITICS**

[3 hours] A study of the many ways blacks have involved themselves in American politics; examines African-Americans' participation in the political and governmental process. Prerequisite: PSC 1200

**AFST 3250 AFRICAN-AMERICAN HISTORY TO 1865**

[3 hours] An examination of the historical experiences of African-Americans in the United States from 1619 to 1865. U.S. multicultural course

**AFST 3260 AFRICAN-AMERICAN HISTORY FROM 1865**

[3 hours] An examination of the historical experiences of African-Americans in the United States since 1865. U.S. multicultural course

**AFST 3300 AFRICAN ART**

[3 hours] African Art is the study of the diversity of African art. The format of the course will be developed with emphasis upon region and style with emphasis upon the collections of African Art found in the Toledo Museum of Art. Non-western multicultural course

**AFST 3450 JAZZ HISTORY AND LITERATURE FOR MUSIC MAJORS**

[3 hours] A study of jazz styles, trends, performers and composers. Prerequisite: MUS 2410, 2420, 3410

**AFST 3490 ECONOMIC HISTORY OF THE AFRICAN AMERICAN COMMUNITY**

[3 hours] Development of the economic status, problems and role of the African American community from colonial times to the present. Special emphasis on economic writings of African American scholars. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor U.S. multicultural course

**AFST 4140 LANGUAGE IN THE AFRICAN AMERICAN COMMUNITY**

[3 hours] Focuses on the distinctive elements of African Vernacular English, its historical origins, its sociocultural development and its implications for pedagogy and language policy. U.S. multicultural course

**AFST 4420 SELECTED TOPICS IN AFRICAN-AMERICAN HISTORY**

[3 hours] Subject varies. Among those treated are slavery, racism, Black reconstruction, modes of protest, Black nationalism, key leaders and Black migration. U.S. multicultural course

**AFST 4430 SLAVERY IN AMERICA**

[3 hours] Stresses the African continuum among slaves within the context of variations in goals and policies of slaveowners, slave trade, slave economics, demographics, slave labor and formation of slave culture. U.S. multicultural course

**AFST 4530 CIVIL RIGHTS**

[3 hours] A study of judicial policy-making and administrative implementation of decisions affecting racial issues, freedom of expression, national security and criminal procedures. Prerequisite: PSC 1200

**AFST 4570 AFRICA TO 1800**

[3 hours] Africa south of the Sahara from antiquity to 1800. Topics include the peopling of the continent, growth of centralized political institutions, stateless societies, Islamic penetration, African slave trade. Non-western multicultural course

**AFST 4580 AFRICA SINCE 1800**

[3 hours] Africa south of the Sahara from 1800 to the present. Subjects include 19th century, colonial and independent Africa. Specific topics: the rise of South Africa, imperialism, African resistance and nationalism and independent African political, cultural and economic systems. Non-western multicultural course

## 306 Course Descriptions

### **AFST 4590 CULTURE AND HISTORY OF THE PEOPLE OF EASTERN AFRICA**

[3 hours] Study of the culture, history and society of the people of Eastern Africa. Each term different peoples will be considered. Areas include present-day Ethiopia, Kenya and the East Africa coast. Non-western multicultural course

### **AFST 4650 AFRICAN AMERICAN WRITERS BEFORE THE 20TH CENTURY**

[3 hours] A survey of African-American prose, poetry, drama and fiction from 1760 to 1915. Recommended: ENGL 2700, 2800, or 3790. U.S. multicultural course

### **AFST 4660 AFRICAN AMERICAN LITERATURE IN THE 20TH CENTURY**

[3 hours] Study of the literary achievement of major African-American writers beginning with DuBois and ending with Gwendolyn Brooks and Ed Bullins. Recommended: ENGL 2700, 2800, or 3790. U.S. multicultural course

### **AFST 4670 AFRICAN AMERICANS IN THE UNITED STATES**

[3 hours] Sociological study of African Americans in the United States, focusing on issues of ethnic identity, educational and economic achievement, continuing sources of discrimination and current movements for change. Prerequisite: 6 hrs of sociology or 9 hrs of social science U.S. multicultural course

### **AFST 4680 GOVERNMENT & POLITICAL INSTITUTIONS OF AFRICA**

[3 hours] An examination of political behavior in selected African states using a case method to examine alternative courses of action available to decision makers. Prerequisite: Prior social science or history course on Africa Non-western multicultural course

### **AFST 4700 INTERNATIONAL RELATIONS - AFRICA**

[3 hours] An examination of factors affecting foreign policy processes in Africa, emphasizing the relations between Africa, the Big Powers and the United Nations. Prerequisite: Two courses in political science

### **AFST 4800 DEVELOPMENT IN THIRD WORLD NATIONS**

[3 hours] The new emerging ideological, political, social and economic patterns which repeat themselves in and determine the Third World transition from a traditional to a new society. Prerequisite: 6 hrs of sociology or 9 hrs of social science Non-western multicultural course

### **AFST 4900 SENIOR SEMINAR**

[3 hours] General theoretical synthesis of the field focusing on a close reading of a recent biographical work of intellectual history, a recent work of cultural criticism and a recent work of social analysis. Prerequisite: 15 hours in Africana Studies or consent of Director of Africana Studies

### **AFST 4910 DIRECTED RESEARCH**

[1-6 hours] Student selected research topic under the supervision of faculty member and the director of Africana Studies. Permission to enroll is contingent on a written proposal by the student being accepted by the two sponsoring faculty. Prerequisite: Student proposal approved by two faculty

### **AFST 4920 DIRECTED READINGS**

[1-6 hours] For advanced students wishing to read a specialized literature in the field. Requires a written proposal approved by faculty and Director of the Program. Prerequisite: AFST 1100 or 1200 and total of 6 additional hours in Africana Studies

### **AFST 4960 HONORS THESIS**

[1-6 hours] Research and writing of original project in tutorial format. Maximum of 6 hours may be counted toward degree. Prerequisite: Senior standing and approval of Africana Studies honors committee, admitted by petition

### **AFST 4980 SPECIAL TOPICS IN AFRICANA STUDIES**

[3 hours] Discussion of a substantial issue in scholarly research or public discourse relative to the African Diaspora. May be repeated for different issues. Maximum number of hours for AFST 4980 should not exceed 9 semester hours. Prerequisite: AFST 1100 or 1200 or permission of instructor

## **ALS - Adult Liberal Studies**

### **Adult Liberal Studies Program (UNV)**

#### **ALS 1900 INTRO SEMINAR: ADULT LIBERAL STUDIES**

[2 hours] Introduction to liberal studies. Library use, writing of a documented paper and the development of critical thinking through classroom discussion. Students in Adult Liberal Studies only.

#### **ALS 3040 TOPICAL SEMINAR: SOCIAL SCIENCES**

[4 hours] Focus on topics of general interest to liberal arts students with particular reference to tools, concepts and analytical methods of social scientists. Students in Adult Liberal Studies only except by program director's permission.

#### **ALS 3050 TOPICAL SEMINAR: HUMANITIES**

[4 hours] Topics of general interest in humanities: writing and communication; religious, philosophical and ideological traditions; traditional and performing arts. Adult Liberal Studies students only except by program director's permission.

#### **ALS 3060 TOPICAL SEMINAR: NATURAL SCIENCES**

[4 hours] Topics of general interest that consider scientific problem solving in such areas as biology, chemistry, geology, astronomy, physics, mathematics and statistics. Adult Liberal Studies students only except by program director's permission.

#### **ALS 4910 SENIOR THESIS**

[4 hours] Under supervision of a selected instructor, student completes a capstone research thesis as part of the Liberal Studies program area of concentration. Open only to Liberal Studies seniors. Prerequisite: Senior status; completion of seminars

## **AMST - American Studies**

### **American Studies Program (ARS)**

#### **AMST 2700 INTRODUCTION TO AMERICAN STUDIES**

[3 hours] An interdisciplinary introduction to one or more American cultural myths such as that of the common man or the frontier which often underlie claims of a national character.

#### **AMST 3340 THE CHANGING AMERICAN POPULATION**

[3 hours] The course will outline the historical development of population trends in the U.S. and consider current dynamics, trends and tendencies.

#### **AMST 3730 FOLKLORE**

[3 hours] A survey of the field of folklore with an emphasis on folk narrative, folk music and material culture in America. Recommended: Permission of instructor and Composition II U.S. multicultural course

#### **AMST 4830 AMERICAN SOCIAL MOVEMENTS**

[3 hours] This course analyzes how and why social protest movements form and how and why they succeed or fail. Attention will be given to post World War II social movements, including current examples. Prerequisite: 6 hours of sociology or 9 hours of social science or permission of instructor

#### **AMST 4960 SENIOR THESIS, PARTS I & II**

[5 hours] Part I Research and initial organizational design of the senior thesis. Advanced American Studies majors work under an adviser's direction. Part II Completion of a preliminary and then final draft of the senior thesis. The American Studies Faculty Steering Committee administers an oral exam upon thesis completion.

#### **AMST 4980 SPECIAL TOPICS IN AMERICAN STUDIES**

[3 hours] Investigations of American Culture. Discovering patterns and interrelated phenomena in history, literature, sports, the arts, etc.

#### **AMST 4990 INDEPENDENT INVESTIGATION IN AMERICAN STUDIES**

[1-4 hours] Supervised independent study. Interdisciplinary topics within American culture. For majors only.

## **ANTH - Anthropology**

### **Department of Sociology and Anthropology (ARS)**

#### **ANTH 1020 INTRODUCTION TO ANTHROPOLOGY**

[3 hours] A survey of the varied aspects of anthropology, including cultural anthropology, prehistory, physical anthropology and linguistics. (not for major credit) Social Sciences core course

**ANTH 2020 INTRODUCTION TO ARCHAEOLOGY**

[3 hours] An introduction to the history, methods and techniques of archaeology and how the discipline of archaeology is related to anthropology, ethnohistory, history and geology. Social Sciences core course

**ANTH 2100 HUMAN SOCIETY THROUGH FILM**

[3 hours] An introduction through the use of ethnographic film to various aspects of non-western culture and the development of the use of film in anthropology. (not for major credit) Social Sciences core course Non-western multicultural course

**ANTH 2700 HUMAN EVOLUTION**

[3 hours] A survey of the human species in time, place and culture and the investigation of the factors underlying human biological variation.

**ANTH 2750 WORLD PREHISTORY**

[3 hours] A survey of the processes of cultural development from the lower Pleistocene to development of writing. Social Sciences core course

**ANTH 2800 CULTURAL ANTHROPOLOGY**

[3 hours] Introduction to culture patterns and processes and their relationship to human society and language. Social Sciences core course Non-western multicultural course

**ANTH 2900 AFRICAN AMERICAN CULTURE**

[3 hours] A survey of the socio-historical and cultural factors of African Americans in the U.S. Cross-listed as SOC 2900 Social Sciences core course U.S. multicultural course

**ANTH 2980 TOPICS IN ARCHAEOLOGY**

[3 hours] Examination of a special topic in archaeology. May be repeated on different topics. Prerequisite: ANTH 1020 or 2020

**ANTH 3020 OHIO PREHISTORY**

[3 hours] A study of the prehistoric peoples in Ohio from the end of the Ice Age to the arrival of the Europeans. Prerequisite: Permission of instructor

**ANTH 3330 FOOD, HEALTH, SOCIETY**

[3 hours] An examination of the historical, social, political and economic factors that influence the production, distribution and consumption of food and the effects on world health and development.

**ANTH 3510 FIELD METHODS IN ARCHAEOLOGY**

[1-6 hours] Methods of excavation and recovery of archaeological data. Field school conducted during excavation of a prehistoric site in the Toledo area. Prerequisite: Permission of instructor

**ANTH 3850 PEOPLES OF WORLD: AN EVOLUTIONARY APPROACH**

[3 hours] An introduction to the socioeconomic activities in societies of varying sociocultural complexity. Prerequisite: 6 hours of anthropology Non-western multicultural course

**ANTH 3920 INDIANS OF NORTH AMERICA**

[3 hours] A survey of North America Indians from prehistoric times to the present. Prerequisite: ANTH 2800 U.S. multicultural course

**ANTH 3940 PEOPLES OF SUBSAHARAN AFRICA**

[3 hours] The cultures and societies of the Sub-Saharan peoples of Africa. Prerequisite: ANTH 2800 Non-western multicultural course

**ANTH 4520 LABORATORY METHODS IN ARCHAEOLOGY**

[3 hours] Instruction in the methods and techniques employed by the archaeologist to analyze cultural material recovered in the field. Prerequisite: Permission of instructor

**ANTH 4560 FIELDWORK IN ETHNOLOGY**

[1-6 hours] Consists of field work involving the student in meaningful research problems at the community level. Introduces the student to the methods and problems of participant research. Prerequisite: Permission of instructor

**ANTH 4730 BIOCULTURAL ECOLOGY**

[3 hours] A study of the functional interrelationships of humans and their biophysical environment in cross cultural perspective, with special emphasis on non-western cultures. Prerequisite: ANTH 2800, 2850 Non-western multicultural course

**ANTH 4760 MEDICAL ANTHROPOLOGY**

[3 hours] An examination of the biocultural nature of health and illness, with special emphasis on changing patterns of disease in non-western societies. Prerequisite: 6 hours of social science, anthropology Non-western multicultural course

**ANTH 4820 ANTHROPOLOGY OF RELIGION**

[3 hours] A cross-cultural approach to the description and analyses of magical and religious beliefs and practices in Asia, Africa, Latin America and Indigenous North America. Prerequisite: ANTH 2800 Non-western multicultural course

**ANTH 4860 THE IRISH-AMERICAN EXPERIENCE**

[3 hours] A survey of the sociohistorical and cultural factors related to the immigration and adaptation of the Irish in America. Prerequisite: 6 hours of social science U.S. multicultural course

**ANTH 4890 PEASANT SOCIETY**

[3 hours] Consideration of the economic and cultural forms of peasant society on a worldwide basis and comparison of these forms to other contemporary communities. Prerequisite: ANTH 2800 Non-western multicultural course

**ANTH 4910 INDEPENDENT RESEARCH IN ANTHROPOLOGY**

[1-3 hours] Supervised independent research in anthropology. Prerequisite: 6 hours of anthropology; permission of instructor

**ANTH 4920 DIRECTED READINGS IN ANTHROPOLOGY**

[1-3 hours] Designed for those wishing to continue course work in greater depth or seeking contact with unlisted subject areas. Written proposal and consent required. Prerequisite: 6 hours of anthropology; permission of instructor

**ANTH 4950 SENIOR RESEARCH PROJECT**

[3-6 hours] Supervised opportunity for senior majors to apply the anthropological approach to a theoretical or applied cultural historical/biocultural problem through individual research, an internship, professional participation or a public education experience. Prerequisite: Senior standing; permission of instructor

**ANTH 4960 HONORS THESIS**

[3-6 hours] The student completes a thesis under the direction and guidance of their faculty adviser. Prerequisite: Senior standing; approval of honors adviser

**ANTH 4980 PROBLEMS IN ANTHROPOLOGY**

[3 hours] Courses on varied anthropological specialties. May be repeated in different specialty areas such as religion, ethnohistory, ethnic conflict and area courses. Prerequisite: Permission of instructor

**ANTH 5520 LABORATORY METHODS IN ARCHAEOLOGY**

[3 hours] Instruction in the methods and techniques employed by the archaeologist to analyze cultural material recovered in the field. Prerequisite: Permission of instructor

**ANTH 5560 FIELDWORK IN ANTHROPOLOGY**

[1-6 hours] Consists of field work involving the student in meaningful research problems at the community level. Introduces the student to the methods and problems of participant research. Prerequisite: Permission of instructor

**ANTH 5730 BIOCULTURAL ECOLOGY**

[3 hours] A study of the functional interrelationships of humans and their biophysical environment. Prerequisite: ANTH 2800 or permission of instructor

**ANTH 5740 NUTRITIONAL ANTHROPOLOGY**

[3 hours] An examination of the historical, social, political and economic factors that influence the production, distribution and consumption of food and the effects on world health and development.

**ANTH 5760 MEDICAL ANTHROPOLOGY**

[3 hours] An examination of the biocultural nature of health and illness. Prerequisite: 6 hours of social science, anthropology

**ANTH 5820 ANTHROPOLOGY OF RELIGION**

[3 hours] A cross-cultural approach to the description and analyses of magical and religious beliefs and practices.

**ANTH 5860 THE IRISH-AMERICAN EXPERIENCE**

[3 hours] A survey of the sociohistorical and cultural factors related to the immigration and adaptation of the Irish in America. Prerequisite: 6 hours of social science

**ANTH 5890 PEASANT SOCIETY**

[3 hours] Consideration of the economic and cultural forms of peasant society on a worldwide basis. Prerequisite: ANTH 2800

**ANTH 5920 DIRECTED READINGS IN ANTHROPOLOGY**

[1-3 hours] Designed for those wishing to continue course work in greater depth or seeking contact with unlisted subject areas. Written proposal and consent required. Prerequisite: 6 hours of anthropology; permission of instructor

**ANTH 5980 PROBLEMS IN ANTHROPOLOGY**

[3 hours] Courses on varied anthropological specialties. May be repeated in different specialty areas such as religion, ethnohistory, ethnic conflict and area courses. Prerequisite: permission of instructor

## 308 Course Descriptions

**ANTH 6960 THESIS IN ANTHROPOLOGY**  
[3-6 hours] Individually constructed. Prerequisite: permission of instructor

**ANTH 6990 INDEPENDENT RESEARCH IN ANTHROPOLOGY**  
[1-3 hours] Supervised independent research in anthropology. Prerequisite: Permission of instructor, 6 hours of anthropology

### ARBC - Arabic Language

#### Department of Foreign Languages (ARS)

**ARBC 1110 ELEMENTARY ARABIC I**  
[4 hours] An introduction to Arabic Language and culture through listening, speaking, reading and writing. Laboratory practice required.

**ARBC 1120 ELEMENTARY ARABIC II**  
[4 hours] An introduction to Arabic language and culture through listening, speaking, reading and writing. Laboratory practice required. Prerequisite: ARBC-1110 or satisfactory score on placement test Humanities core course

**ARBC 2140 INTERMEDIATE ARABIC I**  
[3 hours] Further practice of the four language skills with grammar building and readings of a literary-cultural nature. Prerequisite: ARBC-1120 or satisfactory score on placement test Humanities core course

**ARBC 2150 INTERMEDIATE ARABIC II**  
[3 hours] Further practice of the four language skills with grammar building and readings of a literary-cultural nature. Prerequisite: ARBC-2140 or satisfactory grade on placement test Humanities core course

### ARCT - Architectural Technology

#### Department of Engineering Technology (ENG)

**ARCT 1200 ARCHITECTURAL CADD**  
[4 hours] Computer Aided Design and Drafting (CADD) terminologies, concepts, strategies for three-dimensional drawings and presentations. Hands-on computer activities and experiences. Prerequisite: CET 1100

**ARCT 1250 BUILDING CODES**  
[3 hours] An introduction to various codes regulating the construction of a building, code history, their purpose and how organized zoning and other codes are studied. Prerequisite: CET 1100, 1150

**ARCT 1260 CONSTRUCTION ESTIMATING**  
[3 hours] Fundamentals, concepts and strategies used in the process of construction cost estimating. Organization of materials, labor and construction methods are experienced; other information is collected, organized and utilized. Prerequisite: CET 1100, 1150

**ARCT 2100 ADVANCED ARCHITECTURAL DOCUMENTS**  
[4 hours] Strategies, planning, preparation of working drawings of a construction project. Research and organization required to produce complete contract documents. Code searching, preliminary construction specifications and cost estimating; drafting board methods and CADD techniques are available for graphic presentations. Prerequisite: CET 1100, 1150 Corequisite: ARCT 2160, 1250

**ARCT 2160 CONTRACTS AND SPECIFICATIONS**  
[3 hours] Fundamentals of construction contract documents, relationship of drawings, specifications, critical path planning, scheduling and contracts. Composition of construction specifications. Prerequisite: CET 1100, 1150

**ARCT 2210 ADVANCED CADD**  
[4 hours] Fundamental computer concepts and operating systems, applications of computer generated graphics, Computer Aided Design and Drafting (CADD) systems, CADD terminologies, concepts, strategies for two-dimensional drawings, hands-on computer activities and experiences. Prerequisite: ARCT 1200

**ARCT 2220 ARCHITECTURAL DESIGN TECHNIQUES**  
[4 hours] The techniques employed in the development of the design and presentation phases of architectural projects, client involvement, including project programs, space requirements and relationships, drafting board and CADD techniques are available.

**ARCT 2250 BUILDING SYSTEMS**  
[3 hours] An introduction to building systems and equipment technologies and their capabilities. Fundamentals of designing and sizing the building systems. Prerequisite: CET 1100; PHYS 2010 Corequisite: ARCT 2160

**ARCT 2980 SPECIAL TOPICS**  
[1-4 hours] Student performs work on a specialized project of an advanced nature under the supervision of an Architectural Technology faculty member.

### ARS - Arts And Science

#### College of Arts & Sciences (ARS)

**ARS 1000 ORIENTATION**  
[1 hour] Course will introduce new students to the University and college, provide information on requirements, regulations, campus resources and career exploration and help students develop academic skills.

### ART - Art

#### Department of Art (ARS)

**ART 1080 FOUNDATIONS DRAWING I**  
[3 hours] Various approaches to drawing and disciplines intended to develop skills, perception, visual acuity and awareness. Introduction to a broad range of objective subject matter and a variety of graphic media. Humanities core course

**ART 2050 FOUNDATIONS 2D DESIGN**  
[3 hours] This course develops the understanding of basic studio art principles, critiquing skills and media manipulation. Topics addressed include color theory and formal and conceptual elements of manipulating two dimensional space. May be taken concurrently with ART 2060. Humanities core course

**ART 2060 FOUNDATIONS 3D DESIGN**  
[3 hours] This course develops the understanding of basic studio art principles, critiquing skills and media manipulation in the context of studying the formal and conceptual elements of manipulating three dimensional space. May be taken concurrently with ART 2050. Humanities core course

**ART 2080 DRAWING II**  
[3 hours] Dimensional, perspective and volumetric drawing applied to natural, man-made forms, environment and the figure. Emphasis on rendering techniques, skills and exploration of media integrated with design elements and formal compositional. Prerequisite: ART 1080

**ART 2150 DIGITAL ART I: PRINT MEDIA**  
[3 hours] This course covers basic computer operations in an art context, utilizing bitmap, vector and page layout programs. Prerequisite: ART 2050, 2060

**ART 2160 ART II: INTERACTIVE MEDIA**  
[3 hours] Survey of interactive computer operations in an art context utilizing web, 2D animation and sound applications. Prerequisite: ART 2150

**ART 2230 ASPECTS OF PRINTMAKING**  
[3 hours] Study of basic print materials and media, including relief, monoprint, Planographic and intaglio process and development of sound general print shop skills and safe practices. This course will impart an understanding of the language of the prints as a basis for further exploration. Prerequisite: ART 1080, 2050, 2080

**ART 2330 OIL PAINTING**  
[3 hours] Introduction to painting materials and their functions, emphasis oil color. The construction and design of paintings and investigations into the character and actions of paint upon a variety of surfaces. Prerequisite: ART 2050, 2060, 2080

**ART 2430 FOUNDATIONS OF SCULPTURE**  
[3 hours] An exploration of the application of traditional methods of sculpture making to additive, subtractive, Constructive and replicative processes with clay, plaster, wood, stone and metal. Formal and expressive content addressed. Prerequisite: ART 2050, 2060, 2080

**ART 2530 CERAMICS I**  
[3 hours] Basic ceramic techniques explored. Introduction to hand-building, simple mold techniques and the potter's wheel. Basic glaze and clay body formulation and firing procedures. Prerequisite: ART 2050, 2060

**ART 2730 METALSMITHING I**  
[3 hours] Introduction to basic metalsmithing with emphasis on the technique of fabrication, soldering, casting and simple raising and the use of appropriate tools. Prerequisite: ART 2050, 2060

**ART 2810 ART PHOTOGRAPHY**  
[3 hours] An introduction to photography as a fine art medium; includes camera operations, the use and handling of color films, film processing, printing, presentation techniques, historic and contemporary photographers. Prerequisite: ART 2050, 2060



**ART 3060 INSTALLATION: ART OF PLACE**  
[3 hours] Study of altering a defined physical and psychological space as an art medium. Includes a study of the history of installations. Prerequisite: ART 1080, 2050, 2060, 2080, ARTH 2080

**ART 3070 MIXED MEDIA**  
[3 hours] Traditional mixed media approaches as well as experimental and environmental art forms, light and motion, happenings and events. Prerequisite: ART 1080, 2050, 2060

**ART 3080 DRAWING III: LIFE DRAWING/ ANATOMY**  
[4 hours] Intensive study of the undraped human figure with emphasis on internal anatomical structure, dynamics and design; form rendering in linear media interpretation of old master and contemporary figurative drawing. Prerequisite: ART 2050, 2060, 2080

**ART 3090 DRAWING IV: LIFE DRAWING**  
[3 hours] Continued study of the structural human figure integrated into situational light and environment. Instrumentation of varied media; construction and articulation of form with emphasis on space, pictorial elements and design. Prerequisite: ART 3080

**ART 3150 DIGITAL PHOTOGRAPHY**  
[3 hours] Exploration of digitally created and manipulated photographic imagery from conception to print. Prerequisite: ART 2150, 2810

**ART 3160 DIGITAL DRAWING**  
[3 hours] Advanced studies in drawing and painting on the computer and the exploration of traditional and experimental out put methods. Prerequisite: ART 1080, 2150

**ART 3170 WEB-BASED ART**  
[3 hours] The creation of web pages as artworks. In addition to conceptual development and building a visual vocabulary, students learn technical skills, including HTML, JavaScript and the use of web authoring software. Prerequisite: ART 2160

**ART 3260 ETCHING**  
[3 hours] Approaches to an understanding of etching and intaglio processes. Study a wide range of materials and methods, including color printing. Critiques of content and technical skills will be essential. Prerequisite: ART 1080, 2050, 2080, 2230

**ART 3270 LITHOGRAPHY**  
[3 hours] Study of lithography and Planographic processes as they relate to fine art. Study of stone, plate and photo-lithography. Critiques of content and technical skills will be essential. Prerequisite: ART 1080, 2050, 2080, 2230

**ART 3380 ACRYLIC PAINTING**  
[3 hours] Introduction to painting materials and their functions, emphasis acrylic color. The construction and design of paintings and investigations into character and actions of paint in a variety of pictorial problems. Prerequisite: ART 2050, 2060, 2080

**ART 3460 ADDITIVE SCULPTURE**  
[3 hours] The application of additive processes using clay, plaster, wax to manipulate form and space using human, natural and built form as reference. Formal and expressive content addressed in historical context. Prerequisite: ART 1080, 2060, 2430

**ART 3470 SUBTRACTIVE SCULPTURE**  
[3 hours] The application of subtractive processes using natural and laminated wood and cast and natural stone to manipulate form and space. Formal and expressive content in historical context is addressed. Prerequisite: ART 1080, 2060, 2430

**ART 3570 CERAMICS II**  
[3 hours] Discipline problems relating to the wheel and handbuilding techniques. Individual responsibility involving the whole ceramic process. Introduction to ceramic materials and how they function in glazes and clay. Suggested readings. Prerequisite: ART 1080, 2530

**ART 3710 VISUAL LANGUAGE**  
[3 hours] WAC studio/lecture course utilizing The Toledo Museum of Art collection. Emphasizes aspects of visual language, writing origins, letterforms, artists' books, medieval manuscripts, collaborations, journals, sketchbooks, writing about visual art, concrete poetry.

**ART 3760 METALSMITHING II**  
[3 hours] Continued exploration of basic techniques and new problems in forging. (ferrous and non-ferrous metals), fabrication and surface decoration to advance technical skills and creative problem solving. Prerequisite: ART 1080, 2730

**ART 3770 METALSMITHING III**  
[3 hours] Introduction to basic iron working, making tools, building forges and unit construction for larger pieces, techniques in enameling/continued study with alternative techniques and materials. Prerequisite: ART 3760

**ART 3830 ISSUES IN VISUAL CONSTRUCTION OF GENDER**  
[1 hour] Optional discussion section with limited enrollment for Studio Art Majors only. Must be taken simultaneously with ART 3820 - Visual Construction of Gender.

**ART 3860 INTERMEDIATE PHOTOGRAPHY**  
[3 hours] Black and white photography for fine art applications, intermediate camera and darkroom techniques, exposure and lighting for b&w, film processing and printing, historic and contemporary photographers. Prerequisite: ART 1080, 2810

**ART 3870 ADVANCED PHOTOGRAPHY**  
[3 hours] Use of large format cameras, studio lighting and advanced darkroom techniques for fine art applications. Prerequisite: ART 3860

**ART 4080 DRAWING V**  
[3 hours] Interpretive and analytical drawing. Experimentation with a broad range of materials and techniques and in reconceptualizing form and composition. Assimilated form, abstraction, fantasy and memory drawing encouraged. Prerequisite: ART 3080

**ART 4090 DRAWING VI**  
[3 hours] Advanced drawing, emphasizing interpretive and conceptual approaches. Refinement of discoveries and transformation into more personal imagery. Further expansion of visual vocabulary, cumulative skills and control of media. Prerequisite: ART 4080

**ART 4240 SCREENPRINTING**  
[3 hours] Study of screenprinting (serigraphy) as a fine arts process, including digital imaging. Critiques of content and technical skills will be essential. Prerequisite: ART 1080, 2050, 2080, 2150

**ART 4310 3D RENDERING AND MODELING**  
[3 hours] Creation and animation of 3D imagery on the computer. Prerequisite: ART 1080, 2150, 2160

**ART 4320 INTERACTIVE MULTI-MEDIA**  
[3 hours] Study of combining still imagery, animation, video and sound in an interactive computer format. Prerequisite: ART 2160, 3150

**ART 4330 INTERMEDIATE PAINTING**  
[3 hours] Continued focus on the development of technical skills and the solution of pictorial problems, with attention to individual creative solutions. Prerequisite: ART 2330, 3380

**ART 4340 TIME-BASED DIGITAL MEDIA**  
[3 hours] Creating digital motion components, utilizing digital video, still imagery and time-based compositing for integration in interactive multimedia and web-based artworks. Labor intensive, designed for highly motivated, self-disciplined students. Prerequisite: ART 2160, 3150

**ART 4350 MIXED MEDIA**  
[3 hours] Contemporary painting approaches, emphasis on guided experimentation with a wide range of mixed materials. Advancing from technical proficiency toward the development of individual conceptual goals relative to painting. Prerequisite: ART 2330, 3380

**ART 4410 ADVANCED TOPICS IN DIGITAL ART**  
[3 hours] Special topics in Cyber art. May be repeated when topic varies. Prerequisite: ART 3150, 3170, 4320 or 4310

**ART 4430 SCULPTURE CASTING & FABRICATION**  
[3 hours] An exploration of the application of metal casting and welding producing traditional and non-traditional sculpture. Formal and expressive content in sculpture is addressed. Prerequisite: ART 2050, 2060, 1080, 2430

**ART 4540 CERAMICS III**  
[3 hours] Student concentration into special studio problems. Development of style and direction. Goals set by the instructor and student. Active student involvement in all phases of studio function and operation. Prerequisite: ART 3570

**ART 4550 CERAMICS IV**  
[3 hours] 3 hours each semester. Student concentration into special studio problems. Development of style and direction. Goals set by the instructor and student. Active student involvement in all phases of studio function and operation. Prerequisite: ART 4540

**ART 4730 METALSMITHING IV**  
[3 hours] Problems with advanced hollowware, Masonite die process and T Stake raising. Fabrication of hollowware surface treatment, i.e., sandblasting, reticulation, coloring. Prerequisite: ART 3770

**ART 4810 PHOTO TOPICS**  
[3 hours] Varying studio topics in fine art photography including documentary photography, alternative processes, advanced projects, the body and the lens, studio lighting. May be repeated under differing course titles. Advanced Projects may be repeated. Prerequisite: ART 3860

## 310 Course Descriptions

### ART 4850 PROFESSIONAL PRACTICES

[3 hours] Professional skills course for advanced art. Topics include portfolios, resumes, taxes, contracts shipping, documenting artwork, artists' statements, exhibitions/competitions, galleries, artists' talks and more. Prerequisite: Junior standing

### ART 4910 INDEPENDENT STUDY

[1-6 hours] Individual study into special studio problems. Weekly critiques. Every semester. Time arranged. Prerequisite: Permission of instructor

### ART 4920 INDEPENDENT STUDY II

[1-6 hours] Individual study into special studio problems. Weekly critiques. Every semester. Time arranged. Prerequisite: Permission of instructor

### ART 4930 INDEPENDENT STUDY III

[1-6 hours] Individual study into special studio problems. Weekly critiques. Every semester. Time arranged. Prerequisite: Permission of instructor

### ART 4940 INTERNSHIP

[1-4 hours] Student works in professional venue related to a diversity of art fields or endeavors. May be repeated for a maximum of 8 credit hours. Prerequisite: Permission of instructor

### ART 4990 SPECIAL STUDIES

[1-6 hours] Group study in studio topics by various instructors. May be repeated when the topic varies. Prerequisite: Permission of instructor

## ARTH - Art History

### Department of Art (ARS)

### ARTH 1500 ART IN HISTORY

[3 hours] Introduction to the esthetic, cultural and social interpretation of works of art and architecture, and to the historical relationships of artists, patrons and audiences in the production and purpose of works of art. Humanities core course

### ARTH 1510 ISSUES IN ART HISTORY

[1 hour] Optional discussion section with limited and voluntary enrollment; focus on the Museum collections. Corequisite: ARTH 1500

### ARTH 2000 ASPECTS OF ANCIENT ART

[3 hours] Study of art and architecture from prehistoric Europe through the Roman Empire; emphasis on the interpretation of representative works from Egypt, Greece and Rome. Humanities core course

### ARTH 2010 ISSUES IN ANCIENT ART

[1 hour] Optional discussion section with limited and voluntary enrollment; focus on the Museum collections in ancient art. Must be taken simultaneously with ARTH 2000. Corequisite: ARTH 2000

### ARTH 2020 ASPECTS OF MEDIEVAL ART

[3 hours] Study of art and architecture from the late Roman Empire through the age of the Gothic Cathedral; emphasis on representative examples of Late Antique, Early Medieval, Romanesque and Gothic art.

### ARTH 2030 ISSUES IN MEDIEVAL ART

[1 hour] Optional discussion section with limited and voluntary enrollment; focus on the Museum collections in medieval art. Corequisite: ARTH 2020

### ARTH 2040 HISTORY OF RENAISSANCE AND BAROQUE ART

[3 hours] An introductory survey emphasizing European painting and sculpture from circa 1300 to 1700. Humanities core course

### ARTH 2080 HISTORY OF MODERN ART

[3 hours] European and American art after 1700, from the Rococo through Impressionism, Expressionism, Cubism and Surrealism to the present. Humanities core course

### ARTH 2090 ISSUES IN MODERN ART

[1 hour] Optional discussion section with limited voluntary enrollment focusing on the collections of The Toledo Museum of Art. Must be taken simultaneously with ARTH 2080, History of Modern Art. Corequisite: ARTH 2080

### ARTH 2100 ASIAN ART

[3 hours] An introduction to the architecture, painting and sculpture of India, China and Japan and their relationship to the major religions and philosophies of each culture. Non-western multicultural course

### ARTH 2200 ETHNOGRAPHIC ART

[3 hours] Contextual exploration of traditional art forms in the principle cultures of the Americas, Africa and Oceania. Non-western multicultural course

### ARTH 2300 INTRODUCTION TO ARCHITECTURE

[3 hours] Study of architectural design (function, materials, structure, aesthetics and symbolism), with focus on significant historical examples from antiquity through the late 20th century. Humanities core course

### ARTH 2980 SPECIAL TOPICS

[1-5 hours] Topics in art history selected by instructor; may be repeated when topic varies.

### ARTH 3110 TOPICS IN ANCIENT ART

[3 hours] Special topics in the history of the art or architecture of the ancient world; may be repeated when topic varies. Prerequisite: ARTH 1500, 2000 or permission of instructor

### ARTH 3130 TOPICS IN MEDIEVAL ART

[3 hours] Special topics in the history of western art or architecture from 200 to 1500 A.D.; may be repeated when topic varies. Prerequisite: ARTH 1500, 2020 or permission of instructor

### ARTH 3150 TOPICS IN RENAISSANCE ART

[3 hours] Special topics in the history of Renaissance art or architecture; may be repeated when topic varies. Prerequisite: ARTH 1500, 2040, or permission of instructor

### ARTH 3170 TOPICS IN BAROQUE ART

[3 hours] Special topics in the history of Baroque art or architecture; may be repeated when topic varies. Prerequisite: ARTH 1500, 2040, or permission of instructor

### ARTH 3190 TOPICS IN 19TH-CENTURY ART

[3 hours] Special topics in the history of 19th-Century art. May be repeated when topic varies. Prerequisite: ARTH 1500, 2080, or permission of instructor

### ARTH 3210 TOPICS IN 20TH-CENTURY ART

[3 hours] Special topics in the history of 20th-Century art. May be repeated when topic varies. Prerequisite: ARTH 1500, 2080, or permission of instructor

### ARTH 3230 TOPICS IN AMERICAN ART

[3 hours] Special topics in the history of American art and architecture. May be repeated when topic varies. Prerequisite: ARTH 1500, 2080, or permission of instructor

### ARTH 3250 TOPICS IN ASIAN ART

[3 hours] Special topics in the history of Asian art or architecture; may be repeated when topic varies. Prerequisite: ARTH 1500, 2100, or permission of instructor

### ARTH 3270 TOPICS IN ETHNOGRAPHIC ART

[3 hours] Special topics in the history of ethnographic art of Africa, Oceania or the Americas; may be repeated when topic varies. Non-western multicultural course

### ARTH 3290 TOPICS IN ARCHITECTURE

[3 hours] Special topics in the history of architecture; may be repeated when topic varies. Prerequisite: ARTH 1500, 2300, or permission of instructor

### ARTH 3300 AFRICAN ART

[3 hours] Study of the diversity of African art. The course will emphasize region and style with focus upon the collections of African Art in the Toledo Museum of Art. Non-western multicultural course

### ARTH 3350 ANCIENT ART OF THE AMERICAS

[3 hours] Ancient Art of the Americas is a course which will focus on the artifacts produced by the indigenous populations of the Americas before the arrival of Columbus in the New World. Non-western multicultural course

### ARTH 3500 HISTORY OF 20TH-CENTURY PHOTOGRAPHY

[3 hours] An in-depth study of the history of 20th-Century Photography. Prerequisite: ARTH 1500, ART 2050, or permission of instructor

### ARTH 3600 HISTORY OF NEW MEDIA

[3 hours] This course explores the development of technology as an art medium with a focus on significant historical examples from the 19th through the 21st centuries. Prerequisite: ARTH 1500

### ARTH 3820 VISUAL CONSTRUCTION OF GENDER

[3 hours] WAC course. This course focuses on how images reflect and shape our understanding of gender. Students learn to analyze visual material to identify and articulate their cultural significance in relation to gender. Prerequisite: English Composition II or HON 1020 Humanities core course U.S. multicultural course

### ARTH 3980 SPECIAL STUDIES

[3-5 hours] Topics in Art History selected by the instructor. May be repeated when topic varies. (Check course schedules for specific subjects.) Prerequisite: Permission of instructor

### ARTH 4910 SENIOR THESIS I

[2 hours] Directed research in the history of art for the Senior Thesis. May only be taken with permission of instructor; see department for application form. Must be taken consecutively with ARTH 4920, Senior Thesis II. Prerequisite: Permission of instructor

### ARTH 4920 SENIOR THESIS II

[2 hours] Writing the Senior Thesis. May only be taken after successful completion of ARTH 4910, Senior Thesis I and with instructor's consent. See department for application form. Prerequisite: ARTH 4910 and permission of instructor

**ARTH 4940 INTERNSHIP**

[1-4 hours] Student works in professional venue related to a diversity of art fields or endeavors. May be repeated for a maximum of 8 credit hours. Prerequisite: Permission of instructor

**ARTH 4980 SPECIAL TOPICS**

[1-5 hours] Topics in Art History selected by instructor; may be repeated when topic varies. Prerequisite: Permission of instructor

**ARTH 4990 INDEPENDENT STUDY IN ART HISTORY**

[1-4 hours] Independent Study in special problems of art history. May be repeated when topic varies. Prerequisite: Permission of instructor

## ASTR - Astronomy

### Department of Physics and Astronomy (ARS)

**ASTR 1010 SURVEY OF ASTRONOMY**

[3 hours] Not for major credit; not open to science majors; no credit after 2010, 2020. General astronomy, including appearance of the sky and nature and evolution of the Earth, Moon, solar system, stars, galaxies and the Universe. Natural Sciences core course

**ASTR 2010 SOLAR SYSTEM ASTRONOMY**

[3 hours] A quantitative introduction to the contents, origin and evolution of the solar system, as revealed by recent advances in space exploration. High school mathematics at the level of graphs, algebra and elementary logarithms is required. Natural Sciences core course

**ASTR 2020 STARS, GALAXIES, AND THE UNIVERSE**

[3 hours] A quantitative introduction to the nature and evolution of stars, galaxies and the universe, as revealed by observation and physical theory. High school mathematics at the level of graphs, algebra and elementary logarithms is required. Natural Sciences core course

**ASTR 2050 ELEMENTARY ASTRONOMY LABORATORY**

[1 hour] Laboratory exercises and observational measurements in elementary astronomy. Two hours laboratory per week. (not for major credit) Corequisite: ASTR 1010, 2010 or 2020 Natural Sciences core course

**ASTR 2310 MARS**

[3 hours] The history of observations of Mars, information gathered during the space program, potential for human exploration and colonization and related contemporary science fiction. High school algebra and graphs will be used. Prerequisite: ASTR 1010 or 2010

**ASTR 2320 LIFE IN THE UNIVERSE**

[3 hours] The astronomical factors involved in the emergence of life in the universe, the search for extraterrestrial intelligence and the likelihood of advanced civilizations in the Galaxy. May be offered as writing intensive. Prerequisite: ASTR 1010 or 2010 and 2020

**ASTR 2330 BLACK HOLES, GENERAL RELATIVITY AND THE BIG BANG THEORY**

[3 hours] Descriptive discussion of the theory of general relativity, the final states of stellar evolution, black holes and history of the universe from the big bang through the formation of the solar system. May be offered as writing intensive. Prerequisite: ASTR 1010 or 2020

**ASTR 2340 NEW FRONTIERS IN ASTRONOMY**

[3 hours] Descriptive treatment of recent developments in astronomy from spacecraft, such as the Hubble Space Telescope, or from the newest, very large ground based telescopes. May be offered as a writing intensive. Prerequisite: ASTR 1010 or 2010 or 2020

**ASTR 4800 ASTRONOMY IN THE PLANETARIUM**

[3 hours] Theory and practice of astronomical outreach programming. Sky and calendar, mythology, constellations, astrophysics, buying and using small telescopes, operating and maintaining planetarium projectors, sky simulation software, projects and program production. Prerequisite: ASTR 1010 or 2010 or 2020

**ASTR 4810 ASTRONOMY FOR SCIENCE MAJORS I**

[3 hours] Spherical coordinate systems, astronomical time, celestial mechanics, the solar system and planetary physics, photometry, radiative transfer, stellar spectra and classification, binary stars and stellar masses. Prerequisite: PHYS 3070 or 3320

**ASTR 4820 ASTRONOMY FOR SCIENCE MAJORS II**

[3 hours] Stellar structure and evolution, close binaries, origin of the elements, the sun, variable stars, star clusters, the interstellar medium, the Milky Way Galaxy, stellar statistics, galaxy structure and evolution, cosmology. Prerequisite: ASTR 4810

**ASTR 4880 ASTROPHYSICAL MEASUREMENTS**

[3 hours] Astronomical, optical and electronic principles of operation of a modern astronomical observatory. Observing with the 1 meter telescope of Ritter Observatory, introduction to reduction, analysis and interpretation of astrophysical data. Six hours laboratory per week. May be offered as writing intensive. Prerequisite: ASTR 2010, 2020 and PHYS 2080 or 2140 Corequisite: ASTR 4810

## BANS - Business Analysis

### Department of Finance and Business Economics (BUS)

**BANS 3060 MANAGERIAL ECONOMICS**

[3 hours] Applications of economic concepts and analytical techniques to business decisions and operations, including pricing and product management, market segmentation, technological development and the regulatory environment. Prerequisite: ECON 1150, 1200; Junior standing

**BANS 3070 BUSINESS FLUCTUATIONS AND OUTLOOKS**

[3 hours] Course focuses on the dynamics of business cycles and economic processes, and how they relate to business. Economic outlooks are examined through key indicators, cases, statistical analyses, and computer applications. Prerequisite: ECON 1150, 1200; Junior standing

**BANS 5210 ECONOMICS FOR BUSINESS DECISIONS**

[3 hours] An examination of the basic economic concepts and techniques used in business decision-making. The course covers micro- and macro-economic theories, history and evolution of economic institutions, ethical questions, and economic applications to business decisions in a global environment. Prerequisite: Graduate standing; Ph.D. status

**BANS 6050 HEALTH CARE ECONOMICS**

[3 hours] Health care national policy, third party payment systems, capital formation, delivery systems, health care budgeting and macro economic health issues are examined. Prerequisite: ACCT 5000; BANS 5210

**BANS 6310 BUSINESS FORECASTING**

[3 hours] Study and use of forecasting models, managing and monitoring the forecasting function and communicating forecasts to management. Prerequisite: BANS 5210, OPMT 5510

**BANS 6520 MANAGERIAL ECONOMICS**

[3 hours] Economic concepts and technique applied to company-level decision making. Focus on demand analysis, applied regression analysis and the interface between economics and human resource management, production, marketing and finance. Prerequisite: BANS 5210, OPMT 5510

**BANS 6740 BUSINESS CONDITIONS ANALYSIS**

[3 hours] Course develops a framework for measuring, tracking and forecasting national, regional and international business conditions. Focus is on how external economic conditions in the world economy influence business decisions. Prerequisite: BANS 5210, OPMT 5510

**BANS 7210 ECONOMICS FOR BUSINESS DECISIONS**

[3 hours] An examination of the basic economic concepts and techniques used in business decision-making. The course covers micro- and macro-economic theories, history and evolution of economic institutions, ethical questions and economic applications to business decisions in a global environment. Prerequisite: Graduate standing; Ph.D. status

## BIOE - Bioengineering

### Department of Bioengineering (ENG)

**BIOE 1000 ORIENTATION AND INTRODUCTION TO BIOENGINEERING**

[2 hours] Orientation to The University of Toledo, the College of Engineering and the department of bioengineering. Topics also include a general introduction to the field of bioengineering and a survey of engineering computing resources. Prerequisite: Acceptance into Bioengineering

**BIOE 1010 PROFESSIONAL DEVELOPMENT**

[1 hour] Preparation for co-op and full-time employment in industry. Topics include resume writing, interviewing skills, compensation and benefits, social protocol and corporate ethics, biomedical ethics, design and quality control processes and governmental regulation. Prerequisite: BIOE 1000

## 312 Course Descriptions

### **BIOE 1200 COMPUTER PROGRAMMING FOR BIOENGINEERING**

[3 hours] Introduction and application of computer programming, with emphasis on the C++ programming language. Includes concept and properties of an algorithm, analysis of computational problems, flow diagrams and applications to numerical problem solving methods. Prerequisite: Acceptance into Bioengineering

### **BIOE 2100 BIOENGINEERING THERMODYNAMICS**

[3 hours] Principles of thermodynamics and conservation of mass applied to living systems, biomedical devices and bioprocesses. Prerequisite: PHYS 2130; MATH 2850 or 2950

### **BIOE 2200 BIOMATERIALS**

[3 hours] Physical and chemical properties of materials commonly used in medicine. Inflammatory, immunogenic, carcinogenic and toxicologic responses within host tissues. Testing and evaluation strategies for effective use of materials in medicine and biology. Prerequisite: PHYS 2130; MATH 1860 or 1930; CHEM 1240 Corequisite: BIOL 2150

### **BIOE 3110 INTRODUCTION TO BIOMECHANICS**

[3 hours] Mechanics of the human musculoskeletal system and its joints. Basic concepts for deformable body mechanics, including stress and strain analysis, viscoelasticity, and applications to common problems in orthopedic biomechanics. Prerequisite: CIVE 1150; BIOL 2170; BIOE 2200

### **BIOE 3200 PHYSIOLOGY FOR BIOENGINEERS**

[3 hours] Review of general physiological principles followed by a comprehensive study of the human circulatory, respiratory, digestive and excretory systems. An emphasis will be placed on homeostatic mechanisms. Prerequisite:

### **BIOE 3300 BIOMEDICAL ELECTRONICS**

[4 hours] Measurement circuits, signal analysis, and computer design in biological systems and medicine. Electronic devices, digital devices, amplifier design and instrumentation safety. Laboratory applies lecture topics to acquisition of biological signals. Prerequisite: EECS 2300

### **BIOE 3400 BIOTRANSPORT PHENOMENA**

[3 hours] The quantitative description of momentum transport (viscous flow) and mass transport (convection and diffusion) in living systems. Application of engineering methods to model and quantify aspects of bioengineering systems. Prerequisite: BIOE 2100; MATH 3860

### **BIOE 3500 BIOPROCESSING LABORATORY**

[3 hours] Introduction to processing techniques used in biotechnology industries. The entire process of product development will be covered, including the creation and culture of recombinant organisms to synthesize a protein product, and the extraction, purification, immobilization and assay of the final product. Prerequisite: Junior standing in BIOE

### **BIOE 3940 CO-OP EXPERIENCE**

[1 hour] Approved co-op experience. Course may be repeated. Prerequisite: BIOE 1200

### **BIOE 4110 ADVANCED BIOMECHANICS**

[3 hours] Three-dimensional analysis and measurements of human body motions. Applications include gait analysis, physical therapies, and impact analysis. Joint Replacement and Fixation Devices, total hip and total knee replacements, elbow, shoulder, wrist and finger arthroplasty; bone plates, hip fracture fixation devices and external fixators. Prerequisite: BIOE 3110; MIME 2300

### **BIOE 4120 BIOSIGNAL PROCESSING**

[3 hours] Design and application of analog and digital signal processors to biomedical signals. Covered topics include the Laplace transform, analog filter design, continuous and discrete Fourier transform, and FIR/IIR digital filter design. Prerequisite: BIOE 3300, MATH 3860

### **BIOE 4200 BIOSYSTEMS AND CONTROL**

[3 hours] Formulating, implementing and simulating mathematical models of biological and bioengineering systems. Linear feedback control systems are emphasized; other models are introduced. Prerequisite: BIOE 3200; MATH 3860

### **BIOE 4300 ANALYSIS OF BIOENGINEERING SYSTEMS**

[3 hours] Application of modern computing methods to the numerical and statistical analysis of bioengineering systems. Prerequisite: BIOL 2170; MATH 3860

### **BIOE 4350 BIOMEDICAL OPTICS**

[3 hours] This course introduces the theory and design of optical biomedical instrumentation. Topics covered will include geometrical optics, electromagnetic theory, instrumentation and optical principles applied to biomedical optics. Prerequisite: BIOE3300

### **BIOE 4410 BIOENGINEERING DESIGN PROJECT I**

[3 hours] This course integrates the engineering and life science backgrounds of senior bioengineering students through the presentation of design principles for problems in biomechanical, bioelectrical, biochemical and biological systems. Oral and written communication, ethics, engineering economics and business plans are reviewed. Prerequisite: BIOE 3300, 3500, senior standing

### **BIOE 4420 BIOENGINEERING DESIGN PROJECT II**

[3 hours] A continuation of BIOE 4410. Teams of senior bioengineering students solve problems in biomechanical, bioelectrical, biochemical and biological systems through a design project. Testing and evaluation of designs, progress reports, oral presentations and a written final report are required. Prerequisite: BIOE 4410, senior standing

### **BIOE 4610 ARTIFICIAL ORGANS**

[3 hours] The application of engineering principles to the design and analysis of artificial organs and their clinical application. Prerequisite: Senior standing

### **BIOE 4630 BIOSEPARATIONS**

[3 hours] Practical and theoretical aspects of processes required to separate and purify cells, proteins and other biological compounds. Prerequisite: Senior standing

### **BIOE 4640 MEDICAL IMAGING**

[3 hours] An introduction to the physical principles, design and function of medical diagnostic imaging systems. Prerequisite: Senior standing; BIOE 3300

### **BIOE 4650 INTELLIGENT MEDICAL DECISION MAKING**

[3 hours] Introduction to expert systems and their characteristics, knowledge representation, inference techniques, dealing with uncertain information in knowledge-based systems and machine learning techniques for rule extraction. Prerequisite: Senior standing

### **BIOE 4660 OBJECT-ORIENTED MODELS IN BIOE**

[3 hours] Object-oriented modeling is an important tool in computational life science. This course utilizes the C++ programming language and the Unified Modeling Language (UML) to develop mechanistic biological models. Prerequisite: BIOE 1200, MATH 3860

### **BIOE 4670 ULTRASOUND PRINCIPLES AND MEDICAL APPLICATIONS**

[3 hours] The basic principles and physics of ultrasound will be covered. Students will learn various medical applications of ultrasound and will be exposed to the latest developments in ultrasound technology. Prerequisite: MATH 3860, PHYS 2140

### **BIOE 4710 BIOMECHANICS OF SOFT AND HARD TISSUES**

[3 hours] Composite and hierarchical models bones; models of bone remodeling. Soft tissues models: linear and nonlinear viscoelasticity, Fung's quasilinear viscoelastic theory. Biphasic and triphasic models and mechano-ionic interactions. Prerequisite: BIOE 3110

### **BIOE 4720 CELLULAR ELECTROPHYSIOLOGY**

[3 hours] The physiology of electrically excitable tissues, including nerve, muscle and secretory tissues. Action potential generation, neurotransmission and modulatory mechanisms. Methods for constructing and using computational models of excitable membranes. Prerequisite: EECS 2300; BIOE 3200

### **BIOE 4730 COMPUTATIONAL ORTHOPEDIC BIOMECHANICS**

[3 hours] Introduction to and utilization of computational packages in orthopedic biomechanics. Computer aided design of implants, shape-optimization, finite element analysis of implants performance and failure of musculoskeletal organs, tissues and cells. Prerequisite: BIOE 3110

### **BIOE 4740 TISSUE ENGINEERING**

[3 hours] Application of principles from engineering and the life sciences toward the development of biological substitutes that restore, maintain or improve tissue function. Prerequisite: BIOE 2200, 3200

### **BIOE 4750 EXPERIMENTAL METHODS IN ORTHOPEDIC BIOMECHANICS**

[3 hours] The theory and implementation of techniques used for the measurement of forces and motion within the musculoskeletal system at the system, organ and tissue levels. Prerequisite: BIOE 3110 or CIVE 1160

### **BIOE 4810 INTRODUCTION TO NANOTECHNOLOGY**

[3 hours] Introduction treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals, semiconductors and various models of BJT's, FET's and MOSFET's and application to bioinstruments. Prerequisite: EECS2300

**BIOE 4820 NANOTECHNOLOGY AND MICROFABRICATION**

[3 hours] A comprehensive treatment of the theory and techniques associated with Semiconductor nanotechnology and microfabrication of biomedical devices, sensors, MENS and microsystems. Prerequisite: BIOE3300

**BIOE 4910 BIOENGINEERING HONORS THESIS**

[1-3 hours] Thesis research. The student completes and defends a written thesis under the direction and guidance of their faculty research adviser. Prerequisite: Senior standing in Bioengineering

**BIOE 4980 BIOENGINEERING SPECIAL TOPICS**

[1-3 hours] Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor. Prerequisite: Permission of instructor

**BIOE 4990 BIOENGINEERING INDEPENDENT STUDY**

[1-3 hours] The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their research. Prerequisite: Permission of instructor

**BIOE 5110 BIOENGINEERING PRINCIPLES**

[3 hours] This course provides new bioengineering graduate students with the knowledge base needed to apply engineering concepts to the field of bioengineering. This course will also provide the necessary background needed for additional study in the life sciences and bioengineering.

**BIOE 5120 BIOENGINEERING LABORATORY**

[1 hour] A laboratory course providing the bioengineering graduate student the opportunity to explore and experience fundamental concepts and to use laboratory research tools and equipment. Prerequisite: Graduate standing Corequisite: BIOE 5110

**BIOE 5200 PHYSIOLOGY AND ANATOMY FOR BIOENGINEERS**

[3 hours] Review and study of general physiological principles and bioengineering perspectives of the human circulatory, respiratory, digestive, immune, nervous, muscular and excretory systems.

**BIOE 5260 MEDICAL IMAGING SYSTEMS I**

[3 hours] An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems. Prerequisite: EECS 3200 or permission of instructor

**BIOE 5610 NONLINEAR DYNAMICS IN PHYSIOLOGY AND BIOLOGY**

[3 hours] Properties and applications of systems of nonlinear differential equations. Fixed points, stability analysis, bifurcations, phase plane analysis, limit cycles, attractors and chaos. Applications to physiological and other biological systems are discussed. Prerequisite: Permission of instructor

**BIOE 5620 IONIC CHANNELS IN EXCITABLE MEMBRANES**

[3 hours] The generation of electrical impulses by ion channels in excitable tissues. Models of ion channel gating include the Hodgkin-Huxley equations and Markov models. Principles of electrodiffusion applied to ionic flow through open channels. Prerequisite: Permission of instructor

**BIOE 5630 SINGLE NEURON MODELS**

[3 hours] Mathematic modeling of neurons. Cable theory applied to passive neurons. Compartmental modeling and computer simulations to incorporate ion channels. Obtaining experimental data to for creating realistic models of neurons. Prerequisite: Permission of instructor

**BIOE 5720 INTRODUCTION TO BIOMATERIALS**

[3 hours] This course will address chemical, mechanical and immunological properties of biomaterials and strategies for their effective use in the fields of medicine and dentistry as well as in cell culturing and processing operations. Biomaterials applications in artificial organs, bone/joint replacement, plastic surgery, immunoisolation and controlled drug delivery will be addressed. The continued development and fabrication of biocompatible materials is critical for these areas. Prerequisite: Permission of instructor

**BIOE 5930 BIOENGINEERING SEMINAR**

[1 hour] Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students. Prerequisite: Graduate standing

**BIOE 5950 BIOENGINEERING SEMINAR**

[1 hour] Presentation of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students. Prerequisite: Must have taken and successfully completed 2 semester hours of BIOE 5930/7930

**BIOE 5980 SPECIAL TOPICS IN BIOENGINEERING**

[1-5 hours] Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.

**BIOE 5990 INDEPENDENT STUDY IN BIOENGINEERING**

[1-6 hours] The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research. Prerequisite: Graduate standing, permission of faculty adviser Corequisite: BIOE 5110

**BIOE 6210 OPTICAL INSTRUMENTATION FOR BIOENGINEERING**

[3 hours] Introduction to the theory and design of topical instruments for bioengineers. Instruments using geometrical, physical and quantum optical principles will be discussed. Prerequisite: Graduate standing

**BIOE 6220 SEMICONDUCTOR BIOSENSORS**

[3 hours] Introduction to the theory and design of semiconductor sensors for measuring biological parameters. All major aspects of fabrication and characterization will be discussed. Prerequisite: Graduate standing

**BIOE 6230 BIOELECTRICAL INSTRUMENTATION**

[3 hours] This course is intended to give students in bioengineering a basic understanding of bioelectrical instrumentation and physiological measurements. Prerequisite: Graduate standing

**BIOE 6240 BIOELECTRICAL INSTRUMENTATION LABORATORY**

[1 hour] Laboratory introduction to measurement of bioelectrical potentials and use of instruments.

**BIOE 6250 ADVANCED BIOELECTRICAL INSTRUMENTATION**

[3 hours] Advanced discussion of the theory and design of bioelectrical instrumentation. Computer analysis of data, data conversion and complex sensor systems will be considered. Prerequisite: Graduate standing

**BIOE 6270 MEDICAL IMAGING SYSTEMS II**

[3 hours] An introduction to the physical principles, design and function of ultrasonic, nuclear medicine and magnetic resonance imaging (MRI) diagnostic imaging systems. Prerequisite: EECS 3200 or permission of instructor

**BIOE 6280 ADVANCED IMAGING TECHNIQUES**

[3 hours] Contemporary techniques for producing and processing images and image data, including remote sensing, industrial inspection and medical diagnosis. Modeling and analysis of spatially invariant image sequences. Image reconstruction from projections. Prerequisite: Prior imaging course

**BIOE 6290 BIOSIGNAL PROCESSING**

[3 hours] Analog and discrete-data bioelectrical and bioengineering signals and their characteristics, bioengineering signal classification, signal processing and analysis techniques and decision making. Prerequisite: Signal & System Analysis

**BIOE 6310 BIOCHEMICAL ENGINEERING PRINCIPLES**

[3 hours] The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.

**BIOE 6340 BIOSEPARATIONS**

[3 hours] Practical and theoretical aspects of various processes required to separate and purify cells, proteins and other biological compounds. Topics covered include various types of chromatography, liquid/liquid separations, solid/liquid separations, membrane processing, flow cytometry and field-enhanced separations. This course will focus on new and non-traditional methods. Prerequisite: BIOE 6310 or permission of instructor

**BIOE 6410 BIOLOGICAL AND ARTIFICIAL NEURAL NETWORKS**

[3 hours] Introduction to biological neural networks and cognitive science. Discriminant functions, training methods, TLUs, perceptrons and adalines. Backpropagation and statistical methods. Kohonen networks. Hopfield network. Associative memories. Radial Basis Functions. Ontogenic neural networks. Neuro-fuzzy networks. Prerequisite: MATH- Linear Algebra; MATH-Prob. Theory; Data Structures

## 314 Course Descriptions

### **BIOE 6420 MEDICAL DATA MINING**

[3 hours] Fuzzy sets, the extension principle, fuzzy relations, fuzzy logic. Approximate operations on sets, lower and upper approximation, dependency and reduction of attributes. Populations of objects, fitness function, mutation, crossover. Prerequisite: MATH Linear Algebra; MATH Prob. Theory; Data Structures

### **BIOE 6430 INTELLIGENT MEDICAL DIAGNOSTIC SYSTEMS**

[3 hours] Knowledge representation, dealing with uncertainty in knowledge-based systems. Machine learning techniques for rule extraction. Prerequisite: BIOE 5420

### **BIOE 6440 WAVELETS & THEIR APPLICATIONS**

[3 hours] Fundamentals of series expansion using wavelets, continuous wavelets and frames, and signal compression. Applications of wavelets in signal processing, signal reconstruction, compression and analysis for biomedical applications. Background in signal processing is desired.

### **BIOE 6510 OCCUPATIONAL BIOMECHANICS**

[3 hours] Occupational biomechanics deals with the mechanical behavior of musculoskeletal tissues during performance of physical work. It combines knowledge of mechanics and physiology together with industrial work specifications and practice and provides an understanding of the physics of manual industrial activities. Prerequisite: Undergraduate mechanics & statics courses

### **BIOE 6520 ORTHOPAEDIC BIOMECHANICS**

[3 hours] The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.

### **BIOE 6700 ARTIFICIAL ORGANS**

[3 hours] This course is concerned with the application of engineering principles to the design and analysis of artificial organs and their clinical application.

### **BIOE 6710 TISSUE ENGINEERING**

[3 hours] Tissue engineering combines engineering, materials science and cellular biology knowledge to solve the critical problems of tissue loss and organ failure. This course aims to not only teach aspects of engineering and cellular biology in the same course, but also to present them in such a way that the student learns the cellular phenomena involved in tissue development and growth and gains an appreciation of the role of biochemical and mechanical environment in regenerating tissues.

### **BIOE 6730 BIOLOGICAL TRANSPORT PHENOMENA**

[3 hours] Application of transport phenomena and reaction engineering in the understanding of signaling, growth processes and the flow of biological fluids in mammalian vessels in living systems. Prerequisite: Permission of instructor

### **BIOE 6810 SOLID STATE ELECTRONICS WITH BIOENGINEERING APPLICATIONS**

[3 hours] A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors, various models of BJT's and FET's and applications to biochemical and biomechanical sensing will be considered. Prerequisite: Graduate standing

### **BIOE 6820 MICROELECTRONIC AND MICROMECHANICAL FABRICATION**

[3 hours] A comprehensive treatment of the theory, principles and techniques associated with microfabrication of electronic circuits and biosensors. Prerequisite: Graduate standing

### **BIOE 6830 COMPUTATIONAL METHODS OF NEURAL FUNCTIONS**

[3 hours] The course focuses on the development and analysis of mathematical models of biological processes. Students will use advanced mathematics and computers to implement models from the literature. Prerequisite: Graduate standing

### **BIOE 6920 BIOENGINEERING PROJECT**

[1-4 hours] The student performs a special project of an advanced nature in bioengineering. A written report is required. Prerequisite: Graduate standing; permission of instructor

### **BIOE 6960 BIOENGINEERING RESEARCH AND THESIS - MASTER'S**

[1-6 hours] Graduate thesis research. The student completes and defends a written thesis under the direction and guidance of their faculty research adviser. Prerequisite: Permission of instructor

### **BIOE 7120 BIOENGINEERING LABORATORY**

[1 hour] A laboratory course providing the bioengineering graduate student the opportunity to explore and experience fundamental concepts and to use laboratory research tools and equipment. Prerequisite: Graduate standing Corequisite: BIOE 5110

### **BIOE 7260 MEDICAL IMAGING SYSTEMS I**

[3 hours] An introduction to the physical principles, design and function of x-ray based diagnostic imaging systems, including radiographic, fluoroscopic and computer tomography (CT) systems. Prerequisite: EECS 3200 or permission of instructor

### **BIOE 7610 NONLINEAR DYNAMICS IN PHYSIOLOGY AND BIOLOGY**

[3 hours] Properties and applications of systems of nonlinear differential equations. Fixed points, stability analysis, bifurcations, phase plane analysis, limit cycles, attractors and chaos. Applications to physiological and other biological systems are discussed. Prerequisite: Permission of instructor

### **BIOE 7620 IONIC CHANNELS IN EXCITABLE MEMBRANES**

[3 hours] The generation of electrical impulses by ion channels in excitable tissues. Models of ion channel gating include the Hodgkin-Huxley equations and Markov models. Principles of electrodiffusion applied to ionic flow through open channels. Prerequisite: Permission of instructor

### **BIOE 7630 SINGLE NEURON MODELS**

[3 hours] Mathematic modeling of neurons. Cable theory applied to passive neurons. Compartmental modeling and computer simulations to incorporate ion channels. Obtaining experimental data to for creating realistic models of neurons. Prerequisite: Permission of instructor

### **BIOE 7720 INTRODUCTION TO BIOMATERIALS**

[3 hours] This course will address chemical, mechanical and immunological properties of biomaterials and strategies for their effective use in the fields of medicine and dentistry as well as in cell culturing and processing operations. Biomaterials applications in artificial organs, bone/joint replacement, plastic surgery, immunoisolation and controlled drug delivery will be addressed. The continued development and fabrication of biocompatible materials is critical for these areas. Prerequisite: Permission of instructor

### **BIOE 7930 BIOENGINEERING SEMINAR**

[1 hour] Presentations of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students. Prerequisite: Graduate standing

### **BIOE 7950 BIOENGINEERING SEMINAR**

[1 hour] Presentation of ongoing research in the field of bioengineering. Includes presentations by guest speakers, faculty and graduate students. Prerequisite: Must have taken and successfully completed 2 semester hours of BIOE 5930/7930

### **BIOE 7980 SPECIAL TOPICS IN BIOENGINEERING**

[1-5 hours] Selected subjects in the field of bioengineering with intensive investigation of the recent literature in a few areas of special interest to the class and the professor.

### **BIOE 7990 INDEPENDENT STUDY IN BIOENGINEERING**

[1-6 hours] The student, under the guidance of their research adviser, explores in-depth specific areas or topics related to their thesis or dissertation research. Prerequisite: Graduate standing, permission of faculty adviser Corequisite: BIOE 5110

### **BIOE 8210 OPTICAL INSTRUMENTATION FOR BIOENGINEERING**

[3 hours] Introduction to the theory and design of topical instruments for bioengineers. Instruments using geometrical, physical and quantum optical principles will be discussed. Prerequisite: Graduate standing

### **BIOE 8220 SEMICONDUCTOR BIOSENSORS**

[3 hours] Introduction to the theory and design of semiconductor sensors for measuring biological parameters. All major aspects of fabrication and characterization will be discussed. Prerequisite: Graduate standing

### **BIOE 8230 BIOELECTRICAL INSTRUMENTATION**

[3 hours] This course is intended to give students in bioengineering a basic understanding of bioelectrical instrumentation and physiological measurements. Prerequisite: Graduate standing

### **BIOE 8240 BIOELECTRICAL INSTRUMENTATION LABORATORY**

[1 hour] Laboratory introduction to measurement of bioelectrical potentials and use of instruments.

### **BIOE 8250 ADVANCED BIOELECTRICAL INSTRUMENTATION**

[3 hours] Advanced discussion of the theory and design of bioelectrical instrumentation. Computer analysis of data, data conversion and complex sensor systems will be considered. Prerequisite: Graduate standing

**BIOE 8270 MEDICAL IMAGING SYSTEMS II**

[3 hours] An introduction to the physical principles, design and function of ultrasonic, nuclear medicine and magnetic resonance imaging (MRI) diagnostic imaging systems. Prerequisite: EECS 3200 or permission of instructor

**BIOE 8280 ADVANCED IMAGING TECHNIQUES**

[3 hours] Contemporary techniques for producing and processing images and image data, including remote sensing, industrial inspection and medical diagnosis. Modeling and analysis of spatially invariant image sequences. Image reconstruction from projections. Prerequisite: Prior imaging course

**BIOE 8290 BIOSIGNAL PROCESSING**

[3 hours] Analog and discrete-data bioelectrical and bioengineering signals and their characteristics, bioengineering signal classification, signal processing and analysis techniques and decision making. Prerequisite: Signal & System Analysis

**BIOE 8310 BIOCHEMICAL ENGINEERING PRINCIPLES**

[3 hours] The application of engineering principles to the design and analysis of biological processes that employ living organisms or biochemicals.

**BIOE 8340 BIOSEPARATIONS**

[3 hours] Practical and theoretical aspects of various processes required to separate and purify cells, proteins and other biological compounds. Topics covered include various types of chromatography, liquid/liquid separations, solid/liquid separations, membrane processing, flow cytometry and field-enhanced separations. This course will focus on new and non-traditional methods. Prerequisite: BIOE 6310 or permission of instructor

**BIOE 8410 BIOLOGICAL AND ARTIFICIAL NEURAL NETWORKS**

[3 hours] Introduction to biological neural networks and cognitive science. Discriminant functions, training methods, TLUs, perceptrons and adalines. Backpropagation and statistical methods. Kohonen networks. Hopfield network. Associative memories, Radial Basis Functions. Ontogenic neural networks. Neuro-fuzzy networks. Prerequisite: MATH- Linear Algebra; MATH-Prob. Theory; Data Structures

**BIOE 8420 MEDICAL DATA MINING**

[3 hours] Fuzzy sets, the extension principle, fuzzy relations, fuzzy logic. Approximate operations on sets, lower and upper approximation, dependency and reduction of attributes. Populations of objects, fitness function, mutation, crossover. Prerequisite: MATH Linear Algebra; MATH Prob. Theory; Data Structures

**BIOE 8430 INTELLIGENT MEDICAL DIAGNOSTIC SYSTEMS**

[3 hours] Knowledge representation, dealing with uncertainty in knowledge-based systems. Machine learning techniques for rule extraction. Prerequisite: BIOE 5420

**BIOE 8440 WAVELETS & THEIR APPLICATIONS**

[3 hours] Fundamentals of series expansion using wavelets, continuous wavelets and frames and signal compression. Applications of wavelets in signal processing, signal reconstruction, compression and analysis for biomedical applications. Background in signal processing is desired.

**BIOE 8510 OCCUPATIONAL BIOMECHANICS**

[3 hours] Occupational biomechanics deals with the mechanical behavior of musculoskeletal tissues during performance of physical work. It combines knowledge of mechanics and physiology together with industrial work specifications and practice and provides an understanding of the physics of manual industrial activities. Prerequisite: Undergraduate mechanics & statics courses

**BIOE 8520 ORTHOPAEDIC BIOMECHANICS**

[3 hours] The course of orthopaedic biomechanics has been designed to fuse the biological and physiological problems with the science and technology of engineering. It focuses on a brief review of the physiology and biology of the human body, introduces the physics of manual industrial activities.

**BIOE 8700 ARTIFICIAL ORGANS**

[3 hours] This course is concerned with the application of engineering principles to the design and analysis of artificial organs and their clinical application.

**BIOE 8710 TISSUE ENGINEERING**

[3 hours] Tissue engineering combines engineering, materials science and cellular biology knowledge to solve the critical problems of tissue loss and organ failure. This course aims to not only teach aspects of engineering and cellular biology in the same course, but also to present them in such a way that the student learns the cellular phenomena involved in tissue development and growth and gains an appreciation of the role of biochemical and mechanical environment in regenerating tissues.

**BIOE 8730 BIOLOGICAL TRANSPORT PHENOMENA**

[3 hours] Application of transport phenomena and reaction engineering in the understanding of signaling, growth processes and the flow of biological fluids in mammalian vessels in living systems. Prerequisite: Permission of instructor

**BIOE 8960 BIOENGINEERING DISSERTATION**

[1-16 hours] Original investigations of significant bioengineering problems at the graduate level under the guidance of a member of the faculty. Prerequisite: Permission of department

## BIOL - Biology

### Department of Biology (ARS)

**BIOL 1120 SURVEY OF BIOLOGY**

[3 hours] A survey of major biological principles and phenomena in various plants and animals with emphasis on man. (not for major credit). Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher Natural Sciences core course

**BIOL 1140 BIOLOGICAL ASPECTS OF HUMAN CONSCIOUSNESS**

[3 hours] Lectures integrating developmental, genetic, neurophysiological, psychological, sociological and philosophical aspects of human consciousness in terms a lay person can understand. (not for major credit) Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher Natural Sciences core course

**BIOL 1150 HUMAN INHERITANCE: CONCEPTS AND APPLICATIONS**

[3 hours] Basic principles of human inheritance. Includes a comprehensive treatment of modern genetic technologies and their social, ethical, political and economic implications. (not for major credit) Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher Natural Sciences core course

**BIOL 1220 SURVEY OF BIOLOGY LABORATORY**

[1 hour] (Not for major credit) A series of laboratory exercises that supplement the material discussed in BIOL 1120. Corequisite: BIOL 1120 and signature of instructor.

**BIOL 1340 THE NATURE OF SCIENCE**

[3 hours] An interdisciplinary course that discusses major scientific discoveries, the role of hypothesis testing in science, the use of mathematics in science, data presentation and moral and ethical issues that stem from science. Natural Sciences core course

**BIOL 2010 MAJOR CONCEPTS IN BIOLOGY**

[3 hours] This course will discuss and analyze classical experiments which underlie major concepts in biology, such as evolution, the gene, the cell, homeostasis and epigenesis. (not for major credit) Prerequisite: ENGL 1100 or 1110; MATH 1180 Natural Sciences core course

**BIOL 2020 MAMMALIAN FORM AND FUNCTION**

[4 hours] Structure and operation of organ systems. Lecture and laboratory emphasizing how shapes and properties within tissues and organs enable the whole organism to maintain a living balance. (not for major credit) Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher

**BIOL 2100 BASIC MICROBIOLOGY**

[4 hours] Emphasizes the principles of microbiology that are important to the environmental, life science, nursing and health-related fields. (not for major credit)

**BIOL 2150 FUNDAMENTALS OF LIFE SCIENCE I: DIVERSITY OF LIFE, EVOLUTION AND ADAPTATION**

[4 hours] An introduction to the diversity of multicellular life on earth, evolution and physiological adaptations. Natural Sciences core course

**BIOL 2160 FUNDAMENTALS OF LIFE SCIENCE LABORATORY I**

[1 hour] A series of laboratory exercises which supplement the material discussed in BIOL 2150. Corequisite: BIOL 2150 Natural Sciences core course

**BIOL 2170 FUNDAMENTALS OF LIFE SCIENCE II: CELLS, INHERITANCE AND DEVELOPMENT**

[4 hours] A general introduction to cell structure and function, energy processing in plants and animals, basic genetics, molecular biology and development. Prerequisite: CHEM 1090 or CHEM placement score of 20 or BIOL 2150 Natural Sciences core course

**BIOL 2180 FUNDAMENTALS OF LIFE SCIENCE LABORATORY II**

[1 hour] A series of laboratory exercises which supplement the material discussed in BIOL 2170. Corequisite: BIOL 2170 Natural Sciences core course

## 316 Course Descriptions

### **BIOL 2910 BIOLOGICAL RESEARCH**

[1 hour] A discussion/demonstration of opportunities for undergraduate research in biology at The University of Toledo and elsewhere. Prerequisite: GPA of 2.5

### **BIOL 2980 TOPICS IN THE LIFE SCIENCES**

[3-4 hours] Selected topics in Biology for the non-major. Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher

### **BIOL 3010 MOLECULAR GENETICS**

[3 hours] The principles of heredity at the molecular level, covering gene and chromosome structure, replication and repair, recombination, control of gene expression, control of cell division. Prerequisite: BIOL 2170; CHEM 1220 or 1240

### **BIOL 3020 MOLECULAR GENETICS LABORATORY**

[2 hours] A laboratory course in experimental molecular biology involving gene cloning, analysis of cloned product and other techniques of modern molecular genetics. Corequisite: BIOL 3010

### **BIOL 3030 CELL BIOLOGY**

[3 hours] A study of the internal organization of the eukaryotic cell, organelle and membrane function, cell-cell signaling, cell movement, cell adhesion, the extracellular matrix. Prerequisite: BIOL 2170 and CHEM 1240

### **BIOL 3040 CELL BIOLOGY LABORATORY**

[2 hours] Laboratory exercises involving cell culturing, protein analysis, protein localization and other techniques of modern cell biology. Corequisite: BIOL 3030

### **BIOL 3070 HUMAN PHYSIOLOGY**

[3 hours] Detailed structural and functional analysis of the human endocrine, nervous, reproductive, circulatory, respiratory, digestive and excretory systems. An emphasis will be placed on system-system interactions and homeostatic mechanisms. Prerequisite: BIOL 3030

### **BIOL 3090 DEVELOPMENTAL BIOLOGY**

[3 hours] Lectures on molecular and cellular interactions in animal and plant embryogenesis and development. Prerequisite: BIOL 3030

### **BIOL 3100 DEVELOPMENTAL BIOLOGY LABORATORY**

[1 hour] An analysis of development by biochemical and biological methods using live materials. Prerequisite: BIOL 3090 (may also be taken concurrently)

### **BIOL 3210 HUMAN NUTRITION**

[3 hours] Lectures covering nutrition and transport in humans, role of nutrition in growth and development, nutritional diseases. Prerequisite: BIOL 3070

### **BIOL 3410 PLANT PHYSIOLOGY**

[3 hours] Lectures on the basic concepts of plant physiology. Included will be a review of plant organization, transport systems and biochemistry. Prerequisite: BIOL 3030

### **BIOL 3420 DOMESTICATED PLANTS**

[3 hours] A discussion of plants which are important to humans from household, garden, landscape, agronomic and other perspectives. Laboratory exercises will concern culture techniques. Prerequisite: BIOL 2150, 2160, 2170, 2180

### **BIOL 3510 COMPARATIVE VERTEBRATE ANATOMY**

[4 hours] A comparative treatment of the evolutionary and developmental history of the major vertebrate organ systems. Prerequisite: BIOL 2150, 2160, 2170, 2180

### **BIOL 4010 MOLECULAR BIOLOGY**

[3 hours] Analysis of the regulatory mechanisms for nucleic acid and protein synthesis; genome structure; recombination; genetic damage and repair. Prerequisite: BIOL 3030

### **BIOL 4030 MICROBIOLOGY**

[3 hours] Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated. Prerequisite: BIOL 3030; CHEM 2420 Corequisite: BIOL 4040

### **BIOL 4040 MICROBIOLOGY LABORATORY**

[1 hour] Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes. Corequisite: BIOL 4030

### **BIOL 4050 IMMUNOLOGY**

[3 hours] Lectures on the chemical, genetic and cellular basis of the immune response. Prerequisite: BIOL 3030

### **BIOL 4060 IMMUNOLOGY LABORATORY**

[1 hour] Laboratory studies of the immune response. Corequisite: BIOL 4050

### **BIOL 4110 HUMAN GENETICS**

[3 hours] A systematic survey of genetic variation in man with emphasis on modern research methodology. Prerequisite: BIOL 3030

### **BIOL 4130 CYTOGENETICS**

[3 hours] Lectures pertaining to chromosome architecture and mechanisms controlling variation in chromosome structures and changes in chromosome number. Prerequisite: BIOL 3030

### **BIOL 4170 DEVELOPMENTAL GENETICS**

[3 hours] Survey of animal and plant developmental genetics. Basic principles and methods of genetic analysis, model systems, genetic basis of tissue patterning, evolutionary implications and applications in tissue and plant engineering. Prerequisite: BIOL 3010

### **BIOL 4200 REGULATION OF INTERNAL MAMMALIAN ENVIRONMENT**

[3 hours] Mechanisms regulating gas exchange, water balance and electrolyte concentrations in plasma and interstitial fluid in the mammalian body; normal function of cardiovascular, gas exchange and renal systems including neuroendocrine control. Prerequisite: BIOL 3070

### **BIOL 4230 COMPARATIVE ANIMAL PHYSIOLOGY**

[3 hours] Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation, excretion and osmotic regulation. Prerequisite: BIOL 3030, 3070

### **BIOL 4300 FIELD BOTANY**

[3 hours] Introduction to the principles and methodology of plant taxonomy with particular attention to the native plant species. Prerequisite: BIOL 2150 or EEES 2150 or permission of instructor

### **BIOL 4310 INVERTEBRATE ZOOLOGY**

[3 hours] Survey of the invertebrates from unicellular protista to protostomes and deuterostomes. Emphasis on adaptations to aquatic, terrestrial, or parasitic habitats. Prerequisite: BIOL 3030 or permission of instructor

### **BIOL 4320 INVERTEBRATE ZOOLOGY LABORATORY**

[1 hour] Laboratory exercises and field trips involving observation, collection and dissection of representative invertebrates. Corequisite: BIOL 4310

### **BIOL 4330 PARASITOLOGY**

[3 hours] A study of the host-parasite interaction including aspects of parasite morphology, taxonomy, development and ecology. Prerequisite: BIOL 2150, 2170

### **BIOL 4700 BIOLOGICAL LITERATURE AND COMMUNICATION**

[3 hours] A writing intensive course that focuses on reading original literature in biology in a variety of formats. Required of all biology majors. Prerequisite: BIOL 3030 and 3070 (or 3410) Corequisite: Senior standing

### **BIOL 4790 BIOLOGY FIELD TRIP**

[2-4 hours] Faculty directed course that incorporates extensive field experience and individual projects. Prerequisite: Permission of instructor

### **BIOL 4910 UNDERGRADUATE RESEARCH**

[1-3 hours] Faculty directed research. Both oral and written reports of results required. Prerequisite: Permission of instructor

### **BIOL 4940 EXTRAMURAL RESEARCH**

[1-4 hours] Prior consent of both the department and the proposed supervisor. Scientist-supervised study of research done in an extramural research institute or scientific laboratory. Written and oral reports to the department required. Maximum of 6 hours may count toward BIOL electives. Prerequisite: BIOL 2150, 2170; permission of chair

### **BIOL 4950 INTERNSHIP IN BIOLOGY**

[1-12 hours] Supervised practical experience in the field of biology. Maximum of 6 hours may be used as biology elective credit for BS degree. Prerequisite: Permission of adviser and department chair

### **BIOL 4980 ADVANCED TOPICS IN BIOLOGY**

[1-3 hours] An advanced course for Biology majors in an important area of biology. May be repeated for credit under different specialty numbers (topics). Topic must be approved in advance by Undergraduate Committee and chair. Prerequisite: Permission of instructor

### **BIOL 4990 INDEPENDENT STUDY IN BIOLOGY**

[1-3 hours] Faculty directed readings or projects in a specific area of biology. Prerequisite: Permission of instructor



**BIOL 5030 ADVANCED MICROBIOLOGY**

[3 hours] Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated. Prerequisite: BIOL 3030 or equivalent; CHEM 2420 Corequisite: BIOL 5040

**BIOL 5040 ADVANCED MICROBIOLOGY LABORATORY**

[1 hour] Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes. Corequisite: BIOL 5030

**BIOL 5050 ADVANCED IMMUNOLOGY**

[3 hours] The development, genetics and physiology of the immune response. Prerequisite: BIOL 3030 or equivalent

**BIOL 5060 ADVANCED IMMUNOLOGY LABORATORY**

[1 hour] Laboratory studies of the immune response. Corequisite: BIOL 5050

**BIOL 5110 ADVANCED HUMAN GENETICS**

[3 hours] A systematic survey of genetic variation in man with emphasis on modern research methodology. Prerequisite: BIOL 3030 or equivalent

**BIOL 5130 ADVANCED CYTOGENETICS**

[3 hours] Lectures pertaining to chromosome architecture and mechanisms controlling variation in chromosome structures and changes in chromosome number. Prerequisite: BIOL 3030 or equivalent

**BIOL 5170 ADVANCED DEVELOPMENTAL GENETICS**

[3 hours] Survey of animal and plant developmental genetics. Model systems, genetic basis of tissue patterning, evolutionary implications and applications in tissue and plant engineering. Analysis of primary literature. Prerequisite: Graduate standing

**BIOL 5230 ADVANCED COMPARATIVE ANIMAL PHYSIOLOGY**

[3 hours] Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation. Prerequisite: BIOL 3030, 3070 or equivalents

**BIOL 5310 SURVEY OF THE INVERTEBRATES**

[3 hours] Survey of invertebrates from unicellular protista and protostomes and deuterostomes. Emphasis on adaptations to aquatic, terrestrial or parasitic habitats. Prerequisite: BIOL 2150 or equivalent; BIOL 2170 or equivalent

**BIOL 5320 INVERTEBRATE ZOOLOGY LABORATORY**

[1 hour] Laboratory exercises and field trips involving observation, collection and dissection of representative invertebrates. Corequisite: BIOL 5310

**BIOL 5330 ADVANCED PARASITOLOGY**

[3 hours] A study of the host-parasite interaction including aspects of parasite morphology, taxonomy, development and ecology. Prerequisite: BIOL 2150 or equivalent; BIOL 2170 or equivalent

**BIOL 5980 ADVANCED TOPICS IN THE BIOLOGICAL SCIENCES FOR SCIENCE EDUCATORS**

[1-3 hours] Lecture, seminar or distance learning course on current topics or problems in the biological sciences that are relevant for science educators.

**BIOL 6000 INTRODUCTION TO SCIENTIFIC THOUGHT AND EXPRESSION**

[3 hours] A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.

**BIOL 6010 ADVANCED MOLECULAR BIOLOGY**

[4 hours] Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.

**BIOL 6020 ADVANCED MOLECULAR BIOLOGY LABORATORY**

[3 hours] Library screening and sequencing of selected clones.

**BIOL 6090 ADVANCED CELL BIOLOGY**

[4 hours] An advanced course that stresses the experimental basis for current concepts of cell structure and function.

**BIOL 6100 RESEARCH METHODOLOGY: CELL AND MOLECULAR BIOLOGY**

[3 hours] An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.

**BIOL 6510 PROTEIN CHEMISTRY**

[4 hours] See CHEM 6510.

**BIOL 6520 ENZYMOLOGY**

[4 hours] See CHEM 6520.

**BIOL 6530 NUCLEIC ACID CHEMISTRY**

[4 hours] See CHEM 6530.

**BIOL 6920 SPECIAL PROJECTS IN BIOLOGY**

[2-4 hours] Introduction to research on a selected problem under the direction of an individual faculty member.

**BIOL 6930 SEMINAR IN BIOLOGY**

[1 hour] Presentation on research or current literature by graduate students, faculty, or guest speakers.

**BIOL 6940 EXTRAMURAL STUDIES IN BIOLOGY**

[2-4 hours] Prior consent of both the department and the proposed supervisor. Scientist-supervised study of research done in an extramural research institute or scientific laboratory. Written and oral reports to the department required. Prerequisite: Permission of instructor

**BIOL 6960 MASTERS THESIS RESEARCH**

[1-15 hours] Research that normally contributes to the fulfillment of the M.S. thesis requirement.

**BIOL 6980 ADVANCED TOPICS IN BIOLOGY**

[2-4 hours] Seminar/discussion of significant current topics or problems in biology.

**BIOL 6990 ADVANCED READINGS IN BIOLOGY**

[2-4 hours] Faculty directed readings or projects in a specific area of Biology. Prerequisite: Permission of instructor

**BIOL 7030 ADVANCED MICROBIOLOGY**

[3 hours] Lectures on the principles of modern microbiology and virology, including metabolism, growth, cellular morphology, genetics and host parasite relationships. Bacterial and viral diseases will be illustrated. Prerequisite: BIOL 3030 or equivalent; CHEM 2420 Corequisite: BIOL 7040

**BIOL 7040 ADVANCED MICROBIOLOGY LABORATORY**

[1 hour] Laboratories utilizing basic microbiological techniques and illustrating principles of growth, identification and genetics of microbes. Corequisite: BIOL 7030

**BIOL 7050 ADVANCED IMMUNOLOGY**

[3 hours] The development, genetics and physiology of the immune response. Prerequisite: BIOL 3030 or equivalent

**BIOL 7060 ADVANCED IMMUNOLOGY LABORATORY**

[1 hour] Laboratory studies of the immune response. Corequisite: BIOL 7050

**BIOL 7110 ADVANCED HUMAN GENETICS**

[3 hours] A systematic survey of genetic variation in man with emphasis on modern research methodology. Prerequisite: BIOL 3030 or equivalent

**BIOL 7130 ADVANCED CYTOGENETICS**

[3 hours] Lectures pertaining to chromosome architecture and mechanisms controlling variation in chromosome structures and changes in chromosome number. Prerequisite: BIOL 3030 or equivalent

**BIOL 7230 ADVANCED COMPARATIVE ANIMAL PHYSIOLOGY**

[3 hours] Lectures on the comparative and environmental physiology of vertebrates and invertebrates including metabolism, temperature regulation, respiration, circulation excretion and osmotic regulation. Prerequisite: BIOL 3030, 3070 or equivalents

**BIOL 7310 SURVEY OF THE INVERTEBRATES**

[3 hours] Survey of invertebrates from unicellular protista and protostomes and deuterostomes. Emphasis on adaptations to aquatic, terrestrial or parasitic habitats. Prerequisite: BIOL 2150 or equivalent; BIOL 2170 or equivalent

**BIOL 7320 INVERTEBRATE ZOOLOGY LABORATORY**

[1 hour] Laboratory exercises and field trips involving observation, collection and dissection of representative invertebrates. Corequisite: BIOL 7310

**BIOL 7330 ADVANCED PARASITOLOGY**

[3 hours] A study of the host-parasite interaction including aspects of parasite morphology, taxonomy, development and ecology. Prerequisite: BIOL 2150 or equivalent; BIOL 2170 or equivalent

**BIOL 7980 ADVANCED TOPICS IN THE BIOLOGICAL SCIENCES FOR SCIENCE EDUCATORS**

[1-3 hours] Lecture, seminar or distance learning course on current topics or problems in the biological sciences that are relevant for science educators.

**BIOL 8000 INTRODUCTION TO SCIENTIFIC THOUGHT AND EXPRESSION**

[3 hours] A writing intensive course for new graduate students that focuses on scientific hypothesis testing and reading the original literature in biology.

## 318 Course Descriptions

### **BIOL 8010 ADVANCED MOLECULAR BIOLOGY**

[4 hours] Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.

### **BIOL 8020 ADVANCED MOLECULAR BIOLOGY LABORATORY**

[3 hours] Library screening and sequencing of selected clones.

### **BIOL 8090 ADVANCED CELL BIOLOGY**

[4 hours] An advanced course that stresses the experimental basis for current concepts of cell structure and function.

### **BIOL 8100 RESEARCH METHODOLOGY: CELL AND MOLECULAR BIOLOGY**

[3 hours] An in-depth discussion of techniques used in the study of cell and molecular biology. Examples include chromatography and fractionation, electrophoresis cell and molecular cloning.

### **BIOL 8510 PROTEIN CHEMISTRY**

[4 hours] See CHEM 8510.

### **BIOL 8520 ENZYMOLOGY**

[4 hours] See CHEM 8520.

### **BIOL 8530 NUCLEIC ACID CHEMISTRY**

[4 hours] See CHEM 8530.

### **BIOL 8920 SPECIAL PROJECTS IN BIOLOGY**

[2-4 hours] Introduction to research on a selected problem under the direction of an individual faculty member.

### **BIOL 8930 SEMINAR IN BIOLOGY**

[1 hour] Presentation on research or current literature by graduate students, faculty, or guest speakers.

### **BIOL 8940 EXTRAMURAL STUDIES IN BIOLOGY**

[2-4 hours] Prior consent of both the department and the proposed supervisor. Scientist-supervised study of research done in an extramural research institute or scientific laboratory. Written and oral reports to the department required.  
Prerequisite: Permission of instructor

### **BIOL 8960 DOCTORAL DISSERTATION RESEARCH**

[1-15 hours] Research normally leading to the fulfillment of the Ph.D. dissertation requirement.

### **BIOL 8980 ADVANCED TOPICS IN BIOLOGY**

[2-4 hours] Seminar/discussion of significant current topics or problems in biology.

### **BIOL 8990 ADVANCED READINGS IN BIOLOGY**

[2-4 hours] Faculty directed readings or projects in a specific area of Biology. Prerequisite: Permission of instructor

## **BLAW - Business Law**

### **Department of Management (BUS)**

#### **BLAW 3550 LEGAL AND SAFETY COMPLIANCE ISSUES IN HUMAN RESOURCE MANAGEMENT**

[3 hours] Introduction of the issues and challenges facing human resource specialists, generalists and managers in organizations. Legal, social and political aspects of human resource management, as well as compliance requirements for OSHA and other safety laws, are discussed. Prerequisite: BUAD 3030

#### **BLAW 3570 THE LAWS OF STRUCTURING AND OPERATING A BUSINESS**

[3 hours] The role of law in structuring and operating business choices of sole proprietorship, agency, partnership, limited partnership, close private corporation, large public corporation, limited liability corporation and negotiable instruments law. Prerequisite: Junior standing

#### **BLAW 3670 INTERNATIONAL BUSINESS LAW**

[3 hours] The role of laws and organizations governing business done in the global arena. Study of the legal environment of international business; international sales, credits and the commercial transaction; international trade law and the regulation of the international marketplace. Prerequisite: BUAD 3030; Senior standing

#### **BLAW 4570 LEGAL AND ETHICAL ASPECTS OF MANAGING INNOVATION AND TECHNOLOGY**

[3 hours] This course examines intellectual property systems and presents management options for the protection of intellectual property. Technology's legal and ethical aspects are covered, including case studies on specific technological innovations and products. Prerequisite: BUAD 3030, MGMT 3470

#### **BLAW 5150 DYNAMICS OF LEGAL ENVIRONMENT OF BUSINESS**

[3 hours] Emphasis will be placed on the law in those areas which would assist the student to have a better understanding of those ethical and social problems in our increasingly more complicated legal environment.

#### **BLAW 6040 HEALTH LAW**

[3 hours] Provides an analytical framework for the understanding of the legal climate within which the health care institution operates. Emphasis on the legal concepts which bear upon current health care problems and operation and planning decisions.

#### **BLAW 6100 BUSINESS, GOVERNMENT AND SOCIETY**

[3 hours] Discussion of social criticisms of business and of responses which may improve its social performance. Topics include consumerism, ecology, market power, market organization, social responsibility and ethics regulation and public policy, social performance measurement.

#### **BLAW 7150 DYNAMICS OF LEGAL ENVIRONMENT OF BUSINESS**

[3 hours] Emphasis will be placed on the law in those areas that would assist the student to have a better understanding of those ethical and social problems in our increasingly more complicated legal environment. Prerequisite: Ph.D. student status

## **BMGT - Business Management Technology**

### **Department of Business Technology (UNV)**

#### **BMGT 1000 BUSINESS TECHNOLOGIES/ COLLEGE ORIENTATION**

[1 hour] Acquaints the new student with the services, policies, procedures and layout of the university, college and department. Establishes relationships among new students, full-time professors and peer mentors during this time of adjustment. Corequisite: Must be taken during first semester of enrollment.

#### **BMGT 1010 BUSINESS PRINCIPLES**

[3 hours] An introduction to the world of business focusing on an overview of business operations with special emphasis on management, marketing, computers, accounting and finance.

#### **BMGT 1500 WORKPLACE COMMUNICATION AND PRESENTATIONS**

[3 hours] Covers all aspects of communicating in the workplace including oral, written and group communications. Specific subjects covered include composing agendas, conducting interviews and organizing meetings. Students will learn a computer graphics program and prepare a presentation.

#### **BMGT 1540 ORGANIZATIONAL BEHAVIOR**

[3 hours] This course will address the impact of individual and group behavior on organizations. Topics covered include downsizing, stakeholder management, network organizations, participative management approaches and the quality movement.

#### **BMGT 1800 PRINCIPLES OF OPERATIONS MANAGEMENT**

[3 hours] The study of planning and controlling the operations that an organization uses to produce goods and provide services and the decision making tradeoffs that occur.

#### **BMGT 1850 PRINCIPLES OF TOTAL QUALITY MANAGEMENT**

[3 hours] An introduction to the basic philosophies, concepts and tools of Quality Management. Continuous improvement, customer focus and appropriate measurement of quality are covered. Prerequisite: BMGT 1800

#### **BMGT 2010 WORKPLACE MANAGEMENT**

[3 hours] Covers issues dealing with managing a company in a predominantly service-oriented marketplace. Topics include training employees to deal with customers/clients, creating a customer-friendly business environment, problem-solving and strategic planning.

#### **BMGT 2020 HUMAN RESOURCE DEVELOPMENT**

[3 hours] Explores the functions of Human Resource Management including acquiring and developing human resources with special emphasis on improving the quality of work life.

#### **BMGT 2030 SUPERVISION**

[3 hours] Explores the role of first-line managers in organizations with special emphasis on the responsibilities of supervisors. These responsibilities include delegation, communication, problem-solving, training and leading.

**BMGT 2050 SMALL BUSINESS MANAGEMENT**

[3 hours] Examines entrepreneurship with a special emphasis on formulating, developing and operating a small business.

**BMGT 2110 MANAGING IN A GLOBAL ECONOMY**

[3 hours] Students will examine one particular industry and learn the various economic factors associated with operating a business in an international setting.

**BMGT 2120 CONSUMER FINANCE**

[3 hours] Course is designed to assist students in understanding personal and consumer finance issues as well as sound financial planning measures.

**BMGT 2310 LEGAL ENVIRONMENT OF BUSINESS**

[3 hours] Carefully documents treatment of the legal framework of business. Emphasis on the international aspect of business law. Topics covered include contracts, bailments, agency relationships, legal forms of ownership and negotiable instruments.

**BMGT 2700 MANAGING DIVERSITY IN THE WORKPLACE**

[3 hours] This course offers a conceptual framework for understanding diversity and its effects on organizational behavior. It will also provide action tools for effective management of diversity in organizations. U.S. multicultural course

**BMGT 2720 DIVERSITY TRAINING AND BIAS-FREE WORK PRACTICES**

[3 hours] Students discover how to be a diversity trainer and explore bias-free practices that create more inclusive diverse work environments free from discrimination, contributing to enhanced organizational effectiveness. Prerequisite: BMGT 2700

**BMGT 2750 CULTURAL COMMUNICATIONS IN THE WORKPLACE**

[3 hours] Strategies taught to increase communication effectiveness among employees from differing cultural backgrounds. Students will also learn market-specific tips and taboos and develop strategies for negotiating across cultures. U.S. multicultural course

**BMGT 2800 DOCUMENTATION AND IMPLEMENTATION OF ISO/OS 9000 QUALITY ASSURANCE STANDARDS**

[3 hours] Gain an understanding of the ISO 9000 and QS 9000 quality standards requirements and the actions and decisions necessary to successfully gain ISO/OS 9000 registration. Prerequisite: BMGT 1850

**BMGT 2990 INDEPENDENT STUDY**

[1-3 hours] Students will study a management-related subject mutually agreed upon between the student and instructor. The format may include lecture, computer lab and/or practical experience. Prerequisite: Permission of instructor

## BUAD - Business Administration

### College of Business Administration (BUS)

**BUAD 1000 ORIENTATION FOR BUSINESS STUDENTS**

[1 hour] Introduction to the University community. Strategies for successful college transition are explored. (Not available for credit to sophomores, juniors or seniors)

**BUAD 1010 INTRODUCTION TO BUSINESS**

[3 hours] Introduction to the various functional areas of business, the critical role business plays in the economy, the impact of globalization and the performance of business functions.

**BUAD 1020 MICRO-COMPUTER APPLICATIONS IN BUSINESS**

[3 hours] Course provides an overview of the role of micro-computers and information systems in business applications. It provides good training in word processing and spreadsheets for problem solving.

**BUAD 2000 CAREER DEVELOPMENT I**

[1 hour] This course will assist students with self-assessment, exploring career options and developing a resume. Skills in communicating, listening, organizing and supervising are some of the areas required for long-term career success that are covered. (Open to Business students only. Graded A-C/no credit.) Prerequisite: BUAD 1000 and business major

**BUAD 2030 LEADERSHIP AND ORGANIZATIONAL SURVIVAL SKILLS**

[3 hours] Skills-based course equips the student to effectively lead and work in teams. Continuous improvement, problem solving, decision making, synergy and teamwork are explored in hands-on learning experience. Prerequisite: Sophomore standing

**BUAD 2040 FINANCIAL ACCOUNTING INFORMATION**

[3 hours] This course is an introduction to financial accounting from the perspective of a financial statement user. Where appropriate, it provides a small and mid-sized company's perspective. Prerequisite: Completion of 30 hours

**BUAD 2050 ACCOUNTING FOR BUSINESS DECISION-MAKING**

[3 hours] This course is an introduction to management accounting, including the use and limitations of cost-volume-profit analysis for fundamental decisions concerning products, services and activities. Prerequisite: BUAD 2040

**BUAD 2060 DATA ANALYSIS FOR BUSINESS**

[3 hours] Business data analysis using interactive tools such as spreadsheets. Course will cover the application of statistical concepts, the collection and analysis of data for business decision-making using cases where appropriate. Prerequisite: MATH 1260 and 1270, or MATH 1760, or MATH 1850 or MATH 1920, and basic business computing proficiency

**BUAD 2070 APPLICATION OF STATISTICS IN BUSINESS DECISION MAKING**

[3 hours] A study of application of statistics in business using cases and spreadsheets. Course will cover hypothesis testing, regression analysis and correlation analysis, process control, time series, forecasting and index numbers. Prerequisite: BUAD 2060 or MATH 2600 or MATH 2630

**BUAD 2080 GLOBAL ENVIRONMENT OF BUSINESS**

[3 hours] This course covers the global competitive challenges impacting businesses. Topics include globalization forces, country differences in political economy and culture, cross-border trade and investment, regional economic integration, and monetary systems. Prerequisite: Sophomore standing

**BUAD 3000 CAREER DEVELOPMENT II**

[1 hour] This course will assist students in developing job search skills necessary to obtain an internship and full-time position. Skills covered include resume enhancement, cover letter design, networking, informational interviewing, interview preparation and professional dress. (Open to Business students only. Graded A-C/no credit.) Prerequisite: BUAD 1000, 2000 and business major

**BUAD 3010 PRINCIPLES OF MARKETING**

[3 hours] A practical approach to the planning and utilization of the marketing function. Topics include product development, pricing, promotion and distribution within a domestic and international framework. Prerequisite: ECON 1150 and 1200 or MIME 2600, and junior standing

**BUAD 3020 PRINCIPLES OF MANUFACTURING AND SERVICE SYSTEMS**

[3 hours] This course provides an overview of the functions, problems, solution techniques and decision making processes within the manufacturing and service environment. Topics include production planning, JIT, TQM and materials management. Prerequisite: BUAD 2070, basic business computing proficiency and junior standing

**BUAD 3030 MANAGERIAL AND BEHAVIORAL PROCESSES IN ORGANIZATIONS**

[3 hours] Introduction to managerial and organizational concepts designed to develop knowledge, attitudes, techniques and skills in creating and managing innovative, adaptive organizations. Interactive exercises, videos, cases, discussions and lectures will be used. Prerequisite: Junior standing

**BUAD 3040 PRINCIPLES OF FINANCIAL MANAGEMENT**

[3 hours] Course emphasizes integrated financial decision making tools, techniques and theory. Content stresses acquisition and management of short and long-term capital, short and long-term investments, corporate securities and, financial markets. Prerequisite: BUAD 2040 or ACTG 1040, and junior standing Corequisite: BUAD 2050 and 2060

**BUAD 3050 INFORMATION TECHNOLOGY MANAGEMENT**

[3 hours] The role of computers and information systems in business decision-making will be carefully examined. The student is expected to develop computer-based applications for business decision making and problem solving through the use of state of the art software, including advanced spreadsheets, database and web design tools. Prerequisite: Computing proficiency; junior standing

## 320 Course Descriptions

### **BUAD 3470 THE LEGAL AND ETHICAL ENVIRONMENT OF BUSINESS**

[3 hours] The nature of the law and the formation and application of Legal Principles; the Legal and Ethical Environment in which business operates; regulation of commerce and competition through Contracts, Torts and the Uniform Commercial Code. Prerequisite: Junior standing

### **BUAD 4010 INTEGRATIVE CAPSTONE EXPERIENCE**

[3 hours] Course is designed to be integrative and to provide a top-down focus in order to enhance overall understanding of key business concepts and processes. Students select from five options: The Dynamics of Family Business; Staying in Business: Value Based Management; Developing Global Business Plan for Small and Mid-Sized Firms; Integrative Management Game; and Honors Integrative Research Project. Prerequisite: Senior standing in Business Administration and completion of all 3000-level business core courses

### **BUAD 4020 SENIOR BUSINESS POLICY FORUM**

[3 hours] This course integrates functional business knowledge learned in the core and stresses their interconnectedness and interrelationships. Students will develop and implement strategies in response to changes in the external environment. Prerequisite: Senior standing in Business Administration and successful completion of BUAD 3010, 3020, 3030 and 3040

### **BUAD 6010 ASSESSING EMERGING BUSINESS OPPORTUNITIES**

[3 hours] A contemporary view of entrepreneurship strategies in organizations is presented. This course deals with opportunity driven analysis and strategy. It will expose students to the role of the entrepreneurs in an organization and the skills and attitudes required to succeed in planning and managing entrepreneurial organizations. This integrated course covers a substantial body of knowledge, concepts and tools that entrepreneurs/intrapreneurs need prior to and while starting their new ventures. Prerequisite: Completion of predominance of 5000-level MBA core Corequisite: Other courses in the 6000-level core.

### **BUAD 6030 DESIGNING PRODUCTS AND OPERATIONS**

[3 hours] Involves customer and market-driven issues and how they affect product/service/operations development. This integrated course examines marketing, operating and engineering in product development. Prerequisite: Completion of predominance of 5000-level MBA core Corequisite: Other courses in the 6000-level core.

### **BUAD 6100 ACCOUNTING FOR DECISION MAKING**

[3 hours] This course develops an appreciation for financial statements and their usefulness in making decisions. The nature of costs, opportunity costs, responsibility accounting, budgeting, cost allocations, absorption cost systems, activity based costing and standard costs are included. Prerequisite: BUAD 5000 or BUAD 2040 and BUAD 2050

### **BUAD 6200 FINANCE & BUSINESS ECONOMICS**

[3 hours] This class uses cases and projects to develop skills necessary to integrate financial and nonfinancial considerations into the managerial process. Topics: (1) Assessing entrepreneurial opportunities; (2) Forecasting for strategic financial decision making; (3) Capital acquisition; and (4) Acquiring an existing business. Prerequisite: FINA 5310 or equivalent

### **BUAD 6300 STRATEGIC MARKETING AND ANALYSIS**

[3 hours] This course covers the application of marketing concepts, models, technology and techniques to marketing problems, emphasizing strategic thinking and analysis in a global environment. Also covered are market research and information usage, and data-driven, ethical strategic marketing decision making. Prerequisite: MKTG 5410 or equivalent

### **BUAD 6400 RESULTS-BASED MANAGEMENT**

[3 hours] An integrated approach to management. The focal point is organizational strategies, group and individual adaptation to environmental forces. Prerequisite: MGMT 5110 or equivalent Corequisite: Other courses in the

### **BUAD 6500 INTERNATIONAL BUSINESS**

[3 hours] This course presents an understanding of the underlying theories and strategic challenges that must be encountered when firms "go global" or operate in the global context. Prerequisite: 5000-level MBA courses

### **BUAD 6600 SUPPLY CHAIN MANAGEMENT**

[3 hours] This course presents an integrated approach to value chain management and analyzes key challenges, practices and trends concerning primary business functions and processes. The course also examines the strategic ramifications for the supply chain in an emerging digital economy. Prerequisite: All 5000-level MBA prerequisite courses

### **BUAD 6800 INFORMATION TECHNOLOGY AND E-BUSINESS**

[3 hours] This course covers the strategic role of information technology resources, e-commerce initiatives and e-business transformation for competitive advantage, managerial decision support, business process streamlining and inter-firm collaboration. Also covered are analysis of business models, exposure to data analysis tools, evaluation of information system architecture and resource requirements.

### **BUAD 6900 STRATEGIC MANAGEMENT CAPSTONE**

[3 hours] This capstone course integrates business functions toward the strategic management of organizations or subunits thereof. Course pedagogy includes lectures, guest speakers, cases, experiential exercises field projects and simulations. Strongly recommended to be taken in the student's final MBA semester Prerequisite: Completion of 5000-level MBA core courses; BUAD 6200; and BUAD 6300

### **BUAD 6980 SPECIAL TOPICS IN BUSINESS ADMINISTRATION**

[1 hour] Independent study to be arranged with the director, M.B.A. program. Prerequisite: Only students in final semester of the M.B.A. program are eligible for BUAD 6980. Permission of the M.B.A. director required.

## **CARD - Cardiovascular Technology**

### **Department of Health Professions (HHS)**

#### **CARD 1180 CARDIAC DYSRHYTHMIAS**

[4 hours] Study of cardiac electrophysiology and the process of rhythm analysis, along with heart sounds and ambulatory monitoring techniques. Corequisite: CARD 1190

#### **CARD 1190 CARDIAC DYSRHYTHMIAS LABORATORY**

[1 hour] Twelve-lead EKG analysis and troubleshooting. Patient preparation and instruction for ambulatory monitoring. Corequisite: CARD 1180

#### **CARD 1280 12-LEAD EKG INTERPRETATION**

[4 hours] Twelve-lead EKG analysis which includes bundle branch blocks, hypertrophics, infarction patterns, pediatric EKG interpretation and stress test procedures. Prerequisite: CARD 1180, 1190 Corequisite: CARD 1290

#### **CARD 1290 12-LEAD EKG INTERPRETATION LABORATORY**

[1 hour] Analysis of abnormal twelve-lead EKGs and procedures for stress testing. Prerequisite: CARD 1180, 1190 Corequisite: CARD 1280

#### **CARD 1390 12-LEAD EKG INTERPRETATION CLINICAL**

[4 hours] Clinical experiences are provided in acute care and outpatient settings for EKG, ambulatory monitoring and stress testing. Prerequisite: CARD 1280, 1290; current CPR certification

#### **CARD 2080 ECHOCARDIOGRAPHY**

[4 hours] Study of the procedures and principles in M-mode, 2-D and Doppler echocardiography. Emphasis on views and pathology. Prerequisite: CARD 1390 Corequisite: CARD 2090 and 2370

#### **CARD 2090 ECHOCARDIOGRAPHY LAB/CLINICAL I**

[3 hours] Introduction to echocardiography views utilized for M-mode, 2-D and Doppler measurements. Laboratory and clinical experience are provided to support the didactic curriculum. Prerequisite: CARD 1390 Corequisite: CARD 2080, 2380

#### **CARD 2090 ECHOCARDIOGRAPHY LAB/CLINICAL I**

[4 hours] Introduction to echocardiography views utilized for M-mode, 2-D and Doppler measurements. Laboratory and clinical experience are provided to support the didactic curriculum. Prerequisite: CARD 1390 Corequisite: CARD 2080, 2380

#### **CARD 2180 ADVANCED ECHOCARDIOGRAPHY**

[2 hours] Advanced pathophysiology, including stress echo, transesophageal and congenital anomalies. Prerequisite: CARD 2080 and 2090 Corequisite: CARD 2190 and 2380

#### **CARD 2190 ECHOCARDIOGRAPHY LABORATORY/CLINICAL II**

[4 hours] Advanced echocardiography studies, with Doppler interpretation. Clinical practice will be held off campus. Prerequisite: CARD 2080, 2090 Corequisite: CARD 2180 and 2380

**CARD 2370 ULTRASOUND INSTRUMENT MECHANICS AND WAVE PHYSICS**

[1 hour] A study of ultrasound instrumentation mechanics and ultrasound wave physics. Introduction to knobology of the imaging system in noninvasive cardiology studies. Prerequisite: MATH 1320 Corequisite: CARD 2080 and CARD 2090 or CARD 2400 and CARD 2410

**CARD 2380 ULTRASOUND PHYSICS AND INSTRUMENTATION**

[4 hours] The physical principles of ultrasound image generation and the image interpretation skills will be discussed. Assessment of cardiac and peripheral vascular diseases will be covered. Prerequisite: MATH 1320 Corequisite: CARD 2080, 2090 or 2400, 2410

**CARD 2400 PERIPHERAL VASCULAR - VENOUS DISORDERS**

[4 hours] Study of the procedures and principles involved in recording and performing an analysis of non-invasive PV data. The use of quantitative and qualitative methods of detecting venous diseases are covered. Prerequisite: CARD 1390 Corequisite: CARD 2370 and 2410

**CARD 2410 PERIPHERAL VASCULAR LABORATORY/CLINICAL I**

[3 hours] Performance of non-invasive peripheral vascular procedures related to venous diseases. Laboratory and clinical experience are provided to support the didactic curriculum. Clinical rotations are held off campus. Prerequisite: CARD 1390 Corequisite: CARD 2400, 2380

**CARD 2410 PERIPHERAL VASCULAR LABORATORY/CLINICAL I**

[4 hours] Performance of non-invasive peripheral vascular procedures related to venous diseases. Laboratory and clinical experience are provided to support the didactic curriculum. Clinical rotations are held off campus. Prerequisite: CARD 1390 Corequisite: CARD 2370 and 2400

**CARD 2420 PERIPHERAL VASCULAR - ARTERIAL DISORDERS**

[2 hours] A study of the procedures and principles involved in recording and performing analysis of non-invasive peripheral vascular data. The use of quantitative and qualitative methods of assessing arterial diseases are provided. Prerequisite: CARD 2400, 2410 Corequisite: CARD 2380 and 2430

**CARD 2430 PERIPHERAL VASCULAR LABORATORY/CLINICAL II**

[4 hours] Performance of non-invasive peripheral vascular procedures related to arterial diseases. Laboratory and clinical experience are provided to support the didactic curriculum. Clinicals are held off campus. Prerequisite: CARD 2400, 2410 Corequisite: CARD 2420

**CARD 2500 CARDIOVASCULAR CLINICAL**

[3 hours] Clinical rotation which allows the student to perform non-invasive echocardiography or peripheral vascular exams under the direct supervision of a qualified technologist. Prerequisite: CARD 2180, 2190 OR CARD 2420, 2430

**CARD 2990 INDEPENDENT STUDY**

[1-3 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

## CET - Construction Engineering Technology

### Department of Engineering Technology (ENG)

**CET 1100 ARCHITECTURAL DRAFTING**

[3 hours] Fundamentals of construction drafting techniques (hand and computer-aided) will be covered in this course. Drafting of plan sheets for foundations, wall cross-sections, floor plans and architectural detail will be covered in the laboratory portion of this course. Prerequisite: MATH 1340 Corequisite: ENGT 1050

**CET 1150 CONSTRUCTION MATERIALS AND CODES**

[3 hours] Terminologies and properties of construction materials and construction techniques. Sources and organization of manufacturer's material information will be discussed. An introduction to the various building codes and these organizations will be examined as related to new and existing buildings.

**CET 1200 ENGINEERING MECHANICS**

[4 hours] Analysis of the laws of statics and strength of materials. Application to the properties of common construction materials including stress, strain, compression, shear, moments and deflection with respect to columns and beams. The design of wood beams, columns, joints and other structural elements will also be examined. Prerequisite: PHYS 2010, MATH 1320 and 1330, ENGT 1050

**CET 1210 SURVEYING**

[3 hours] Study of construction and land surveying techniques, including the use of a steel tape, level, transit and total station. Laboratory will stress surveying measurement and layout techniques. Laboratory exercises will also introduce "AUTOCAD" and associated third party software applications to surveying. Prerequisite: ENGT 1050, MATH 1320

**CET 2030 CONSTRUCTION GRAPHICS**

[3 hours] Computer drafting as related to construction engineering projects such as highways, streets, sanitary and storm sewers, and building sites. The computer drafting portion will use Microstation and associated third party support (e.g., Geopak). Prerequisite: ENGT 1050, CET 1100

**CET 2110 MATERIALS TESTING**

[3 hours] Design of portland and asphalt cement concrete mixes and associated quality control tests of mortar, aggregates, asphalt cements, portland and asphaltic concrete. Prerequisite: ENGT 1050

**CET 2220 SOIL MECHANICS**

[3 hours] Theory and application of soil properties as related to foundation design, including pressure distribution, bearing capacity, compressibility, consolidation, shear and stress analysis. Laboratory will cover quality control tests. Prerequisite: ENGT 1050, CET 1200

**CET 2250 STRUCTURAL DESIGN**

[4 hours] Principles of statics and strength of materials as applied to structural design of steel, reinforced concrete and wood, using applicable codes. Prerequisite: ENGT 1050, CET 1200

**CET 2980 SPECIAL TOPICS**

[1-4 hours] Student performs work on a specialized project of an advanced nature under the supervision of a Construction Engineering Technology faculty member.

**CET 3120 ADVANCED CONSTRUCTION MATERIALS**

[3 hours] Engineering design and problems of soils, aggregates, asphaltic and portland cement concretes, brick and block masonry construction. Emphasis will be upon earth-based quality construction. Prerequisite: CET 1100, CET 2110

**CET 3210 SURVEYING APPLICATIONS**

[3 hours] Study of land surveying concepts as related to land subdivision - construction, boundary and engineering surveys. Laboratory exercises will be field surveying problems and computer laboratory problems using "AUTOCAD" and associated computer surveying software packages.

**CET 3220 HYDROLOGY AND HYDRAULICS**

[3 hours] Surface and ground-water hydrology/hydraulic concepts as related to rainfall/runoff and surface and ground-water drainage. Open and closed channel hydraulics will be studied. Prerequisite: ENGT 1050

**CET 4250 ADVANCED STRUCTURAL DESIGN**

[4 hours] Advanced studies of steel, wood, concrete and masonry structural design, examination of temporary construction structures and problems, demolition of structures. Prerequisite: CET 2250

**CET 4350 SOILS, FOUNDATIONS AND EARTH STRUCTURES**

[4 hours] Temporary and permanent earth structures (foundations and retaining walls), tunneling, trenching, cofferdams and dewatering. Prerequisite: CET 2250, EEES 3250

**CET 4460 CONSTRUCTION MANAGEMENT AND SCHEDULING**

[3 hours] Topics include job startup, scheduling (pre-construction operations), CPM and PERT, disputes, work stoppages, job closeout, liens and client, contract, architect-engineer relationship. Supervision and inspection of various building elements (concrete, asphalt, steel, anchor bolts) will be discussed as related to OSHA and general ethics. Prerequisite: CET

## CHEE - Chemical & Environmental Engineering

### Department of Chemical & Environmental Engineering (ENG)

**CHEE 1000 ORIENTATION AND COMPUTING FOR CHEMICAL ENGINEERS**

[3 hours] An introduction to the UT campus, campus resources, the College of Engineering and the department of chemical and environmental engineering. Primary emphasis is on engineering computing, data analysis and basic chemical engineering calculations.

**CHEE 1010 PROFESSIONAL DEVELOPMENT**

[1 hour] Social protocol and ethics in industry. Resume writing and interview skills are presented in preparation for the Co-op experience. Review of resource materials for technical and non-technical individual learning. Oral and written presentation techniques are emphasized.

## 322 Course Descriptions

**CHEE 2010 MASS AND ENERGY BALANCES**  
[3 hours] Introduction to the principles and techniques used in chemical engineering. Basic concepts of mathematics, physics and chemistry are applied to solving problems involving stoichiometry, material balances and energy balances. Prerequisite: CHEE 1000 Corequisite: MATH 1850

**CHEE 2110 PROCESS FLUID MECHANICS**  
[3 hours] A comprehensive introduction to process fluid mechanics. Topics include: hydrostatics, characteristics of laminar and turbulent flow, mechanical energy balance, flow through packed beds and fluidization of solids, design of pumping systems and piping networks and metering of fluids. Prerequisite: CHEE 2010

**CHEE 2230 CHEMICAL ENGINEERING THERMODYNAMICS I**  
[3 hours] The principles of thermodynamics and their application to chemical engineering. Topics include states and properties of matter, the first and second law of thermodynamics and thermo-chemical effects. Prerequisite: CHEE 2010

**CHEE 2330 CHEMICAL ENGINEERING THERMODYNAMICS II**  
[3 hours] Topics include properties of fluid mixtures, phase equilibria, chemical equilibria, power generation and refrigeration processes. Prerequisite: CHEE 2230

**CHEE 2980 SPECIAL TOPICS IN CHEMICAL ENGINEERING**  
[1-4 hours] Special topics of interest to chemical engineers - lower division.

**CHEE 2990 INDEPENDENT STUDIES IN CHEMICAL ENGINEERING**  
[1-4 hours] Independent studies in chemical engineering - lower division. Selected subjects in chemical engineering of special interest to the professor and the student.

**CHEE 3030 SEPARATION PROCESSES**  
[3 hours] An introduction to equilibrium-based separation processes. Topics include distillation, extraction, leaching, drying and membrane separations. Preliminary equipment design calculations. Prerequisite: CHEE 2230

**CHEE 3110 PROCESS HEAT TRANSFER**  
[2 hours] Fundamental equations of heat transfer. Fourier's law. Steady and unsteady thermal conduction. Heat transfer coefficients. Heat exchangers. Condensation and boiling. Forced and natural convection. Radiation, Kirchoff's law and view factors. Prerequisite: CHEE 2110

**CHEE 3120 MASS TRANSFER**  
[3 hours] Mass transfer and its application in chemical engineering separations. Diffusivity, mass transfer coefficients and Fick's Law. Applications in continuous and stagewise processes, including absorption, extraction and distillation. Prerequisite: CHEE 2110, prerequisite or corequisite 3030

**CHEE 3300 REACTOR ENGINEERING AND DESIGN**  
[3 hours] Fundamentals of chemical reaction engineering. Rate laws, kinetics and mechanisms of homogeneous and heterogeneous reactions. Analysis of reaction rate data. Design of industrial reactors. Prerequisite: CHEE 2230

**CHEE 3400 PROCESS DYNAMICS AND CONTROL**  
[3 hours] An introduction to designing control systems for chemical engineering processes. Process stability and controller design and selection. Application of Laplace transforms, frequency response techniques and simulation software for open-loop and closed-loop analysis. Prerequisite: CHEE 3300 or CHEE 3120; MATH 3860

**CHEE 3940 CO-OP WORK EXPERIENCE**  
[1 hour] Approved co-op work experience. Course may be repeated. Prerequisite: CHEE 2010

**CHEE 4100 ENVIRONMENTAL CHEMODYNAMICS**  
[3 hours] A study of the transport and fate of chemicals in the environment. This course makes use of the principles of thermodynamics, material balances and transport concepts to concentrate on the mechanisms and rates of movement of chemicals in natural environments. Prerequisite: CHEE 3110 and 3120 or permission of instructor

**CHEE 4110 POLLUTION PREVENTION**  
[3 hours] Legal aspects of pollution prevention. Process integration. Pinch analysis. Intelligent process design and control. Mass exchange networks. Environmentally conscious selection of raw materials.

**CHEE 4150 ENVIRONMENTAL REACTION ENGINEERING**  
[3 hours] The study of chemical reaction engineering as applied to environmental systems. Engineering reactor design considerations for environmental applications are covered.

**CHEE 4160 INDUSTRIAL WASTE TREATMENT**  
[3 hours] Discussion of and solution to the environmental problems of the chemical industry. Equal periods of time will be devoted to water, air and solid and hazardous waste control. Prerequisite: Junior standing

**CHEE 4180 HAZARDOUS MATERIAL SPILLS**  
[3 hours] All aspects of oil and hazardous material spills. Causes of spills, safe responses to them, mitigation of spills, impact, cleanup, prevention, disposal of residues, transportation of chemicals. Air pollution problems from volatile chemicals. Safety laws. Prerequisite: CHEE 3110 and 3120 or permission of instructor

**CHEE 4270 ESTIMATION OF PHYSICAL PROPERTIES**  
[3 hours] Estimation of Physical Properties, especially thermodynamic properties of gases and liquids. Prerequisite: CHE 2330

**CHEE 4410 NEW SEPARATIONS**  
[3 hours] Introduction to and analysis of new separation techniques relevant to downstream processing of bioreactor products. Topics include new extraction and adsorption methods, chromatography techniques, ultrafiltration and electrokinetic methods such as electrophoresis and isoelectric focusing. Prerequisite: CHEE 3110, 3120, 3030

**CHEE 4480 MEMBRANE SCIENCE AND ENGINEERING**  
[3 hours] An introduction to formulating and solving engineering problems involving the use of both dense and porous membranes for gas separation, pervaporation, dialysis, filtration and reverse osmosis applications. Prerequisite: Senior standing

**CHEE 4500 CHEMICAL ENGINEERING LABORATORY I**  
[2 hours] An experimental study of the design and performance of selected chemical engineering processes and equipment. Analysis of data, design of experiments and laboratory reports are emphasized. Prerequisite: CHEE 2110, 3030, 3300

**CHEE 4510 TRANSPORT PHENOMENA**  
[3 hours] An introductory analysis of the equations of change governing the phenomena of momentum, heat and mass transfer in single and multicomponent systems from a continuum viewpoint. The analogies between the three phenomena will be stressed. The ability to obtain a realistic mathematical model of chemical engineering processes will be developed. Prerequisite: CHEE 3110, 3120; MATH 3860

**CHEE 4520 CHEMICAL PROCESS ECONOMICS AND DESIGN**  
[3 hours] Chemical equipment and process design. Introduction to simulation and flow-sheeting techniques and software. Topics include plant safety and pollution prevention, market analysis, cost estimating, decision making and cash flow analysis. Prerequisite: CHEE 2110, 2330, 3300

**CHEE 4540 CHEMICAL PROCESS SIMULATION AND DESIGN**  
[3 hours] Application of chemical engineering fundamentals and the use of process simulators in the synthesis of chemical processes. Use of cost factors and environmental considerations in process decisions. The solution of a comprehensive case study and the preparation of a formal report are required. Prerequisite: CHEE 3110, 3120, 4520

**CHEE 4550 CHEMICAL ENGINEERING LABORATORY II**  
[2 hours] An experimental study of the design and performance of selected chemical engineering process equipment, focusing on heat and mass transfer and process control. Design of experiments, analysis of data and presentation techniques are emphasized. Prerequisite: CHEE 3110, 3120, 3400, 4500

**CHEE 4600 FRACTALS IN ENGINEERING**  
[3 hours] The course will help students develop a working knowledge of the mathematical tools developed to describe seemingly random or chaotic behavior and the ability to apply these tools to problems of interest to engineers.

**CHEE 4800 POLYMER SCIENCE AND ENGINEERING**  
[3 hours] Polymerization processes, characterization, structure and properties of polymers, processing and engineering applications of the major polymer types. Prerequisite: Junior standing

**CHEE 4820 COLLOID AND SURFACE PHENOMENA**  
[3 hours] Introduction to the physico-chemical principles and engineering of dispersions, emulsions and colloids relevant to chemical/biochemical, pharmaceutical and environmental areas. Topics include surface tension, adsorption, charge effects at interfaces, colloid stability and emulsions. Prerequisite: MATH 3860

**CHEE 4850 PROPERTIES OF POLYMER SYSTEMS**

[3 hours] A quantitative treatment of the mechanical behavior of polymer systems emphasizing rubber elasticity, linear viscoelasticity, yield and failure, non-Newtonian flow of polymer melts, and viscometry. Application of stress-strain relationships to processing and design are considered. Prerequisite: CHEE 2330, 2110

**CHEE 4960 SENIOR HONORS THESIS**

[3 hours] Independent research under the guidance of a faculty member, requiring an oral report and a written thesis upon completion of work. Prerequisite: Senior standing; Honors student

**CHEE 4980 SPECIAL TOPICS IN CHEMICAL ENGINEERING**

[1-4 hours] Special topics of interest to chemical engineers - upper division.

**CHEE 4990 INDEPENDENT STUDIES IN CHEMICAL ENGINEERING**

[1-4 hours] Independent studies in chemical engineering - upper division.

**CHEE 5100 ENVIRONMENTAL CHEMO-DYNAMICS**

[3 hours] A study of the transport and fate of chemicals in the environment. This course makes use of the principles of thermodynamics, material balances and transport concepts to concentrate on the mechanisms and rates of movement of chemicals in natural environments.

**CHEE 5150 ENVIRONMENTAL REACTION ENGINEERING**

[3 hours] The study of chemical reaction engineering as applied to environmental systems. Engineering reactor design considerations for environmental applications are covered.

**CHEE 5160 INDUSTRIAL WASTE TREATMENT**

[3 hours] Discussion of and solution to the environmental problems of the chemical industry. Equal periods of time will be devoted to water, air and solid and hazardous waste control.

**CHEE 5180 HAZARDOUS MATERIAL SPILLS**

[3 hours] All aspects of oil and hazardous material spills. Causes of spills, safe responses to them, mitigation of spills, impact, cleanup, prevention, disposal of residues, transportation of chemicals. Air pollution problems from volatile chemicals. Safety laws.

**CHEE 5270 ESTIMATION OF PHYSICAL PROPERTIES**

[3 hours] Estimation of physical properties, especially thermodynamic and transport properties of gases and liquids.

Prerequisite: Graduate standing

**CHEE 5410 NEW SEPARATIONS**

[3 hours] Introduction to and analysis of new separation techniques relevant to downstream processing of bioreactor products. Topics include new extraction and adsorption methods, chromatography techniques, ultrafiltration and electrokinetic methods such as electrophoresis and isoelectric focusing.

**CHEE 5480 MEMBRANE SCIENCE AND ENGINEERING**

[3 hours] Students learn how to formulate and solve engineering problems involving the use of both dense and porous membranes for gas separation, pervaporation, dialysis, filtration and reverse osmosis applications.

**CHEE 5600 FRACTALS IN ENGINEERING**

[3 hours] The course will help students develop a working knowledge of the mathematical tools developed to describe seemingly random or chaotic behavior and the ability to apply these tools to problems of interest to engineers.

**CHEE 5800 POLYMER SCIENCE AND ENGINEERING**

[3 hours] Polymerization processes, characterization, structure and properties of polymers, processing and engineering applications of the major polymer types.

**CHEE 5820 COLLOID AND SURFACE PHENOMENA**

[3 hours] Introduction to the physico-chemical principles and engineering of dispersions, emulsions and colloids relevant to chemical/biochemical, pharmaceutical and environmental areas. Topics include surface tension, adsorption, charge effects at interfaces, colloid stability and emulsions.

**CHEE 5850 PROPERTIES OF POLYMER SYSTEMS**

[3 hours] A quantitative treatment of the mechanical behavior of polymer systems emphasizing rubber elasticity, linear viscoelasticity, yield and failure, non-Newtonian flow of polymer melts, and viscometry. Application of stress-strain relationships to processing and design are considered.

**CHEE 5930 SEMINARS IN CHEMICAL ENGINEERING**

[1 hour] Research topics of current interest to chemical engineers will be presented by internal and external speakers in a research seminar format.

**CHEE 6100 ENGINEERING MATERIALS SCIENCE AND APPLICATIONS**

[3 hours] Study of engineering materials science and applications relevant for industry and manufacturing. Course content emphasizes the relation of structure and processing to design and applications of metallic, semiconductor, ceramic polymeric and composite materials.

**CHEE 6500 ADVANCED CHEMICAL REACTION ENGINEERING**

[3 hours] Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization.

**CHEE 6510 ADVANCED CHEMICAL ENGINEERING THERMODYNAMICS**

[3 hours] Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.

**CHEE 6550 TRANSPORT PHENOMENA I**

[3 hours] Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena. Prerequisite: Graduate standing

**CHEE 6560 TRANSPORT PHENOMENA II**

[3 hours] Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection. Prerequisite: CHEE 6550/8550

**CHEE 6600 APPLIED TENSOR ANALYSIS**

[3 hours] The study of tensor algebra and calculus. Use of covariant, contravariant and mixed tensor algebra and calculus. Tests for tensor character. Christoffel symbols and derivative operations in curvilinear coordinates.

**CHEE 6700 MANAGEMENT OF PROJECTS AND TECHNOLOGICAL INNOVATION**

[3 hours] Theory and practice of management technology applied to project management, engineering project development and major technological innovation to address new business needs and opportunities. Topics covered include schedule, budgets, performance, technology assessment and management of time and costs. Prerequisite: Graduate standing

**CHEE 6810 PHYSICAL CHEMISTRY OF POLYMERS**

[3 hours] The physical and chemical principles of polymer systems. Topics covered include: configuration and conformation, thermodynamics and statistical mechanics of polymer solutions, hydrodynamics, scattering, rubber elasticity, birefringence, glass phenomena, crystallization thermodynamics and kinetics. Prerequisite: CHEE 5800/7800

**CHEE 6830 TRANSPORT IN PLASTICS**

[3 hours] A study of the transport properties of polymers including permeation of gases, vapors and liquids and movement of electrical charge. Topics include mathematics of diffusion, polymer-per meant interactions, effects of polymer structure, packaging and dielectric properties and electrical conduction of polymers.

**CHEE 6840 POLYMER PROCESSING**

[3 hours] A study of the concepts and principles of basic thermoplastic processing methods with the emphasis of their application to selected topics of current interest in the industry.

**CHEE 6860 POLYMER LABORATORY METHODS**

[3 hours] Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.

**CHEE 6870 ADVANCED ENGINEERING MATERIALS**

[3 hours] An advanced course on the structure and bonding, theory, properties and materials processing of metallic, semiconductor, ceramic, macromolecular, composite and biological materials, emphasizing the relations between composition and structure, crystal growth and processing kinetics and properties and applications. Prerequisite: Graduate standing

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### **CHEE 6880 THERMODYNAMICS OF SEMICONDUCTOR AND BIOLOGICAL MATERIALS**

[3 hours] Application of chemical thermodynamics and phase equilibria in materials science. Basic principles of chemical thermodynamics will be introduced and then applied to metal alloy and semiconductor systems and to biological systems. Prerequisite: Graduate standing, CHEE 6870

### **CHEE 6890 ADVANCED CHARACTERIZATION OF ENGINEERING MATERIALS**

[3 hours] An advanced course for students interested in multidisciplinary engineering materials science research, of the concepts, theory and techniques for advanced characterization of crystalline, amorphous and macromolecular materials at various length scales by optical, magnetic, electrical, X-ray microscopy, chemical, physical and probe techniques. Prerequisite: Graduate standing, CHEE 6870

### **CHEE 6960 MASTER'S GRADUATE RESEARCH AND THESIS**

[1-15 hours] Graduate research towards the completion of a master's degree. Prerequisite: Permission of instructor

### **CHEE 6980 SPECIAL TOPICS IN CHEMICAL ENGINEERING**

[1-6 hours] Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.

### **CHEE 8500 ADVANCED CHEMICAL REACTION ENGINEERING**

[3 hours] Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization.

### **CHEE 8510 ADVANCED CHEMICAL ENGINEERING THERMODYNAMICS**

[3 hours] Advanced treatment of fundamental principles of thermodynamics, especially as related to calculation of phase equilibria. Topics include intermolecular potentials, excess functions, theories of solutions, high-pressure equilibria and introductory statistical mechanics.

### **CHEE 8550 TRANSPORT PHENOMENA I**

[3 hours] Students learn how to formulate and solve engineering problems involving momentum transfer from the microscopic view. Topics include vector/tensor analysis, approximation methods, computational solutions and non-Newtonian fluid phenomena. Prerequisite: Graduate standing

### **CHEE 8560 TRANSPORT PHENOMENA II**

[3 hours] Students learn how to formulate and solve engineering problems involving simultaneous momentum, heat and mass transfer from the microscopic view. Topics include conduction, radiation, diffusion, forced convection and free convection. Prerequisite: CHEE 6550/8550

### **CHEE 8600 APPLIED TENSOR ANALYSIS**

[3 hours] The study of tensor algebra and calculus. Use of covariant, contravariant and mixed tensor algebra and calculus. Tests for tensor character. Christoffel symbols and derivative operations in curvilinear coordinates.

### **CHEE 8810 PHYSICAL CHEMISTRY OF POLYMERS**

[3 hours] The physical and chemical principles of polymer systems. Topics covered include: configuration and conformation, thermodynamics and statistical mechanics of polymer solutions, hydrodynamics, scattering, rubber elasticity, birefringence, glass phenomena, crystallization thermodynamics and kinetics. Prerequisite: CHEE 5800/7800

### **CHEE 8830 TRANSPORT IN PLASTICS**

[3 hours] A study of the transport properties of polymers including permeation of gases, vapors and liquids and movement of electrical charge. Topics include mathematics of diffusion, polymer-per meant interactions, effects of polymer structure, packaging and dielectric properties and electrical conduction of polymers.

### **CHEE 8840 POLYMER PROCESSING**

[3 hours] A study of the concepts and principles of basic thermoplastic processing methods with the emphasis of their application to selected topics of current interest in the industry.

### **CHEE 8860 POLYMER LABORATORY METHODS**

[3 hours] Characterization of polymers by physical testing (tensile, creep and rheological), physicochemical methods (viscosity, gel permeation chromatography), thermal analysis, spectroscopy, light microscopy, permeation, density, light scattering and processing.

### **CHEE 8960 DOCTORAL GRADUATE RESEARCH AND DISSERTATION**

[1-15 hours] Graduate research towards the completion of a doctoral degree. Prerequisite: Permission of instructor

### **CHEE 9980 SPECIAL TOPICS IN CHEMICAL ENGINEERING**

[1-6 hours] Selected topics from current chemical engineering research with intensive investigation into the recent literature in an area of mutual interest to the student and the instructor.

## **CHEM - Chemistry**

### **Department of Chemistry (ARS)**

### **CHEM 1090 ELEMENTARY CHEMISTRY**

[3 hours] For students who major in science, engineering or other fields which require chemistry as a prerequisite subject who have not had a previous course in chemistry and whose preparation is not sufficient to begin General Chemistry (CHEM 1230) or Chemistry for Health Sciences (CHEM 1210). Prerequisite: One of the following: ACT Math score of 19 or higher; high school GPA or 3.0 or higher; College Algebra Test score of 8 or higher; passing grade in MATH 1320 or

### **CHEM 1100 CONCEPTS IN CHEMISTRY**

[3 hours] Introduction to basic principles and theories of chemistry; molecular structure and energy relations. For majors in humanities, social sciences, elementary education and business; not for credit toward a chemistry major. Natural Sciences core course

### **CHEM 1120 CHEMISTRY FOR HEALTH SCIENCES**

[4 hours] The study of chemistry for students majoring in nursing and other health-related fields. This course includes general, organic and biochemical topics in condensed form. The impact of chemistry in health fields will be emphasized. Prerequisite: CHEM 1090 or chemistry placement score of 19, and math placement score

### **CHEM 1150 CONCEPTS IN CHEMISTRY LABORATORY**

[1 hour] Laboratory introduction to the concepts of chemistry to accompany CHEM 1100. Demonstrations by laboratory experiments of lessons developed in the accompanying lecture course. Natural Sciences core course

### **CHEM 1200 PROBLEM SOLVING IN GENERAL CHEMISTRY**

[1 hour] Problem solving and skill development for students enrolled in CHEM 1230 who obtained a satisfactory score on the chemistry placement test but need additional assistance in selected topics. May be taken only as P/NC. Prerequisite: Satisfactory score on the chemistry placement test

### **CHEM 1210 CHEMISTRY FOR THE LIFE SCIENCES I**

[3 hours] A series of elementary courses oriented toward the life processes in plants and animals. Recommended for students in the allied health professions. Prerequisite: High school chemistry; permission of instructor; pass placement exam Natural Sciences core course

### **CHEM 1220 CHEMISTRY FOR THE LIFE SCIENCES II**

[3 hours] A series of elementary courses oriented toward the life processes in plants and animals. Recommended for students in the allied health professions. Prerequisite: CHEM 1210 or permission of instructor Natural Sciences core

### **CHEM 1230 GENERAL CHEMISTRY I**

[4 hours] An introduction to atomic structure, chemical bonding, kinetic-molecular theory, energy relationships and structural concepts. This sequence is for students who major in science, engineering or other fields which require chemistry as a prerequisite subject. Three hours lecture and one hour discussion per week. Prerequisite: CHEM 1090 or pass placement exam Natural Sciences core course

### **CHEM 1240 GENERAL CHEMISTRY II**

[4 hours] An introduction to solutions, equilibrium, acid-base theory, energy relationships and structural concepts. This sequence is for students who major in science, engineering or other fields which require chemistry as a prerequisite subject. Three hours lecture and one hour discussion per week. Prerequisite: CHEM 1230 Natural Sciences core

### **CHEM 1260 CHEMISTRY FOR THE LIFE SCIENCES LABORATORY I**

[1 hour] Beginning laboratories directed toward a chemical study of the life processes in plants and animals. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: Permission of instructor Corequisite: CHEM 1210 Natural Sciences core



**CHEM 1270 CHEMISTRY FOR THE LIFE SCIENCES LABORATORY II**

[1 hour] Beginning laboratories directed toward a chemical study of the life processes in plants and animals. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 1210 or permission of instructor Corequisite: CHEM 1220 Natural Sciences core course

**CHEM 1280 GENERAL CHEMISTRY LAB I**

[1 hour] Experiments over topics covered in CHEM 1230 lectures. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Corequisite: CHEM 1230 Natural Sciences core course

**CHEM 1290 GENERAL CHEMISTRY LAB II**

[1 hour] Experiments over topics covered in CHEM 1240 lectures. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 1280 Corequisite: CHEM 1240 Natural Sciences core course

**CHEM 1910 SURVEY OF RESEARCH**

[1 hour] Survey of current research areas at the frontiers of chemistry, including topics that cross the boundaries with other disciplines. May be taken only as P/NC. Prerequisite: Permission of department

**CHEM 2410 ORGANIC CHEMISTRY I**

[3 hours] Study of structure and reactions of organic compounds. Three hours lecture per week. Prerequisite: CHEM 1240

**CHEM 2420 ORGANIC CHEMISTRY II**

[3 hours] Study of structure and reactions of organic compounds. Three hours lecture per week. Prerequisite: CHEM 2410

**CHEM 2460 ORGANIC CHEMISTRY LABORATORY I**

[1 hour] Practice of organic laboratory techniques. Four hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 1240, 1290 Corequisite: CHEM 2410

**CHEM 2470 ORGANIC CHEMISTRY LABORATORY II**

[1 hour] Practice of organic laboratory techniques. Four hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 2460 Corequisite: CHEM 2420

**CHEM 2480 ORGANIC SEPARATIONS AND ELEMENTARY SYNTHESIS**

[2 hours] Introduction to theory and laboratory practice in modern methods of physical separation techniques, synthesis and microscale manipulations. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 1290 Corequisite: CHEM 2410

**CHEM 2490 SYNTHESIS AND IDENTIFICATION OF ORGANIC COMPOUNDS**

[2 hours] Application of synthetic methods to elementary organic synthesis with special emphasis on instrumental approaches to problem solving in organic chemistry. Approved chemistry safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 2410, 2480 Corequisite: CHEM 2420

**CHEM 2500 INSTRUMENTAL METHODS FOR ORGANIC CHEMISTRY**

[2 hours] A bridge course for students wishing to major in chemistry at the B.S. level after taking CHEM 2460 or CHEM 2460 and 2470. The application of instrumental methods to organic synthesis. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 2410, 2460

**CHEM 2910 UNDERGRADUATE RESEARCH**

[1-3 hours] An introduction to research under the guidance of a faculty member. May be repeated. A maximum accumulated credit of 4 hours in 2910 and total of 10 hours in 2910, 3910, 4910 may be applied toward a degree. May be taken only as P/NC. Prerequisite: GPA (overall and in chemistry courses) above 2.5; permission of department Corequisite: CHEM 1240

**CHEM 2920 READINGS IN CHEMISTRY**

[1-2 hours] Readings from the literature of chemistry. May be taken only as P/NC. Prerequisite: Permission of instructor; sophomore status

**CHEM 3310 ANALYTICAL CHEMISTRY**

[2 hours] Theory and applications of chemical equilibria to gravimetric, volumetric and separation techniques. Emphasis on the quantitative aspects of analytical chemistry. Two hours lecture per week. Prerequisite: CHEM 1240

**CHEM 3360 ANALYTICAL CHEMISTRY LABORATORY**

[2 hours] Practice of quantitative analytical methods of analysis. Six hours laboratory per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 3310, 1290

**CHEM 3510 BIOCHEMISTRY I**

[3 hours] Chemical structure and molecular transformation in biological systems. Prerequisite: CHEM 2420

**CHEM 3520 BIOCHEMISTRY II**

[3 hours] Chemical structure and molecular transformation in biological systems. Prerequisite: CHEM 3510

**CHEM 3610 INORGANIC CHEMISTRY I**

[3 hours] The application of modern theories to the elements and their inorganic compounds. Physical chemical principles are used throughout. Prerequisite: CHEM 3710 or 3730 Corequisite: CHEM 3720 or 3740

**CHEM 3710 PHYSICAL CHEMISTRY FOR THE BIOSCIENCES I**

[3 hours] Physical and mathematical laws applied to chemistry with examples from biologically important processes. No credit given if Chemistry 3730-3740 are taken. Prerequisite: CHEM 2420, 2470; MATH 1860; PHYS 2070, 2080, 2130 or 2140

**CHEM 3720 PHYSICAL CHEMISTRY FOR THE BIOSCIENCES II**

[3 hours] Physical and mathematical laws applied to chemistry with examples from biologically important processes. No credit given if CHEM 3730-3740 are taken. Prerequisite: CHEM 3710

**CHEM 3730 PHYSICAL CHEMISTRY I**

[3 hours] Fundamental theories and basic laws of chemistry with emphasis on their mathematical development. Thermodynamics, equilibrium, electrochemistry, classical chemical kinetics. Prerequisite: CHEM 2420 and 2470 or 2490; MATH 2850; PHYS 2130-2140

**CHEM 3740 PHYSICAL CHEMISTRY II**

[3 hours] Fundamental theories and basic laws of chemistry with emphasis on their mathematical development. Structure of matter, statistical and quantum mechanics, reaction dynamics, spectroscopy. Prerequisite: CHEM 3730

**CHEM 3860 ADVANCED LABORATORY I**

[2 hours] Laboratory experiments and techniques relating to subjects developed in 3710/3720, 3730/3740. Three hours laboratory and one hour discussion per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 2420 and 2470 or 2490 Corequisite: CHEM 3710 or 3730

**CHEM 3870 ADVANCED LABORATORY II**

[2 hours] Laboratory experiments and techniques relating to subjects developed in 3710/3720, 3730/3740. Three hours laboratory and one hour discussion per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 3860 Corequisite: CHEM 3720 or 3740

**CHEM 3910 UNDERGRADUATE RESEARCH II**

[1-3 hours] Research under the guidance of a faculty member. May be repeated. A maximum accumulated credit of 10 hours in 2910, 3910, 4910 may be applied toward a degree. May be taken only as P/NC. Prerequisite: GPA (overall and in chemistry courses) above 2.5; permission of department Corequisite: CHEM 2420

**CHEM 3920 READINGS IN CHEMISTRY II**

[1-2 hours] Readings from the literature of chemistry. May be taken only as P/NC. Prerequisite: Permission of instructor; junior status

**CHEM 4300 INSTRUMENTAL ANALYSIS**

[2 hours] An introduction to modern chemical instrumentation and applications to chemical analysis. Topics include electrical, magnetic, nuclear and spectroscopic instrumentation. Prerequisite: CHEM 3310, 3360 Corequisite: CHEM 3710 or 3730

**CHEM 4620 INORGANIC CHEMISTRY II**

[3 hours] The application of modern theories to the elements and their inorganic compounds-advanced topics. Physical chemical principles are used throughout. Prerequisite: CHEM 3610

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### **CHEM 4880 ADVANCED LABORATORY III**

[2 hours] Laboratory experiments and techniques relating to subjects developed in 4300, 3610 and 3510. Six hours of laboratory per week. Approved chemical safety goggles meeting the American National Standard Z87.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: CHEM 3610, 3870 Corequisite: CHEM 4300

### **CHEM 4910 UNDERGRADUATE RESEARCH III**

[1-3 hours] Thesis level research under the guidance of a faculty member. May be repeated. A minimum of three hours and an acceptable thesis required for credit toward the B.S. major. A maximum accumulated credit of 10 hours in 2910, 3910, 4910 may be applied toward a degree. A written report is required to receive credit. May be taken only as P/NC. Prerequisite: GPA (overall and in chemistry courses) above 2.5; permission of department Corequisite: CHEM 3740

### **CHEM 4920 READINGS IN CHEMISTRY III**

[1-2 hours] Readings from the literature of chemistry. May be taken only as P/NC. Prerequisite: Permission of instructor; senior status

### **CHEM 4980 SPECIAL TOPICS IN CHEMISTRY**

[2-4 hours] An advanced course for chemistry majors in an important area of chemistry. Consult the undergraduate adviser for details. Course may be repeated for credit under different specialty numbers (topics). Prerequisite: CHEM 2420, CHEM 3740

### **CHEM 5300 PRINCIPLES OF ANALYTICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in analytical chemistry. Prerequisite: Permission of the department

### **CHEM 5400 PRINCIPLES OF ORGANIC CHEMISTRY**

[1-4 hours] Tutorial in selected topics in organic chemistry. S/U grading only. Prerequisite: Permission of department

### **CHEM 5500 PRINCIPLES OF BIOLOGICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in biological chemistry. Prerequisite: Permission of department

### **CHEM 5600 PRINCIPLES OF INORGANIC AND**

### **ORGANOMETALLIC CHEMISTRY**

[1-4 hours] Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only. Prerequisite: Permission of department

### **CHEM 5700 PRINCIPLES OF PHYSICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in physical chemistry. S/U grading only. Prerequisite: Permission of department

### **CHEM 5800 PRINCIPLES OF MATERIALS CHEMISTRY**

[1-4 hours] Tutorial in selected topics in materials chemistry. Prerequisite: Permission of department

### **CHEM 6300 ADVANCED ANALYTICAL CHEMISTRY**

[2-4 hours] Section 1 (2 hours): New techniques in characterization/compositional analysis of materials in the condensed state, i.e. organic, polymeric, inorganic and composites. Section 2 (2 hours): Principles of techniques described. Includes surface characterization, rheology and electrochemical properties. Section 3 (4 hours): Material covered in both sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6310 SEPARATION METHODS**

[2-4 hours] Section 1 (2 hours): The theory and design of separation methods. Section 2 (2 hours): Application of separation methods. Section 3 (4 hours.): Material covered in both sections 1 and 2. Topics include extraction techniques, gas, liquid and supercritical fluid chromatography, affinity and chiral separation and capillary electrophoresis. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: Permission of department

### **CHEM 6320 CHARACTERIZATION OF CONDENSED PHASES AND SURFACES**

[2-4 hours] Modular study of the theory, instrumentation and methods of analysis for the characterization and analysis of liquid, solution and solid phases. Section 1 (2 hrs.): A fundamental study of electrochemical concepts, methods, instrumentation and applications. Section 2 (2 hrs.): A study of surface analysis and colloid and interfacial chemistry. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6330 SPECTROSCOPIC METHODS AND ANALYSIS OF SPECTRA**

[2-4 hours] Section 1 (2 hrs): A comprehensive study of theory and instrumentation. Section 2 (2 hrs): Applications of spectroscopic methods including spectral interpretation. Section 3 (4 hrs): Material covered in Sections 1 and 2. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry and related subjects. Prerequisite: Permission of department

### **CHEM 6400 ADVANCED ORGANIC CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): Basic heterocyclic synthesis and methodology. Section 2 (2 hrs): Reducing reagents and new carbon-carbon bond forming processes. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6410 ORGANIC SYNTHESIS**

[2-4 hours] Section 1 (2 hrs): Important methodology in organic synthesis. Section 2 (2 hrs): Disconnection and retroanalysis. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6420 PHYSICAL ORGANIC CHEMISTRY & REACTION MECHANISMS**

[2-4 hours] Section 1 (2 hrs): Physical basis of organic chemistry. Section 2 (2 hrs): Molecular orbital theory, mechanistic chemistry and reactive intermediates. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6430 MEDICINAL CHEMISTRY**

[4 hours] Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined. Prerequisite: Permission of department

### **CHEM 6500 ADVANCED BIOLOGICAL CHEMISTRY**

[2-4 hours] The chemistry of cellular and molecular transformations in biochemical systems. Section 1 (2 hrs): Molecular structure of proteins, nucleic acids and membranes. Section 2 (2 hrs): Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6510 PROTEIN CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): A detailed analysis of the structure and function of proteins. Section 2 (2 hrs): Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: CHEM 6500 or 8500

### **CHEM 6520 ENZYMOLOGY**

[2-4 hours] The principles of chemical catalysis applied to molecular enzymology. Section 1 (2 hrs): Catalysis: kinetics, steady state vs. numerical integration, the proton in chemistry, coenzymes, metal ions; Enzyme mechanism; Allosterism; Conformational effects. Section 2 (2 hrs): Methodology: site-directed mutagenesis, affinity labeling, monoclonal and antipeptide antibodies, isotope effects; Catalytic antibodies. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 6530 NUCLEIC ACID CHEMISTRY**

[2-4 hours] The chemical basis for the storage and transmission of genetic information. Section 1 (2 hrs): Nucleic acid structure, DNA/RNA: sequence and conformation analysis, 3D solution and solid state structures, complexes, proteins, ribosomes, nucleosomes, networks, chromosomes. Section 2 (2 hrs): Biological Consequences: mutagenesis, carcinogenesis, chemotherapeutic strategies; Properties and chemistry: hybridization and higher order complexes, interactions with small molecules, cleavage reactions, mismatch, damage, repair. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: CHEM 6500 or 8500

### **CHEM 6540 MACROMOLECULAR CRYSTALLOGRAPHY**

[2 hours] Fundamental theory and practical application of X-ray diffraction to macromolecular structure determination, including protein crystallization and manipulation, data collection and reduction, phase solution, electron density interpretation, structural refinement and validation. Prerequisite: CHEM 6850 or permission of instructor

### **CHEM 6550 PRACTICAL PROTEIN CRYSTALLOGRAPHY**

[2 hours] Hands-on training in protein crystallography. Laboratory projects include: protein crystallization, crystal manipulation and mounting, X-ray diffraction data collection, data reduction, structure solution, electron density interpretation, refinement and cultural validation. Prerequisite: CHEM 6850 or permission of instructor Corequisite: CHEM 6540

**CHEM 6560 TOPICS IN PROTEIN CRYSTALLOGRAPHY**

[2 hours] An advanced course on the theoretical aspects of modern methods in macromolecular structure determination. Topics include: sample preparation, crystallization, data collection, phasing, electron density map interpretation and structural refinement. Prerequisite: CHEM 6540 or permission of instructor

**CHEM 6600 ADVANCED INORGANIC AND ORGANOMETALLIC CHEMISTRY**

[2-4 hours] Section 1 (2 hrs.): The inorganic chemistry of the main group elements, transition metals, lanthanides and actinides is described. Section 2 (2 hrs.): Bonding, structure and reactivity are considered and appropriate concepts applied. Section 3: (4 hrs.) Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6610 INORGANIC AND ORGANOMETALLIC CHEMISTRY OF TRANSITION AND POST-TRANSITION ELEMENTS**

[2-4 hours] Section 1 (2 hrs.): The inorganic and organometallic chemistry of the transition metals, lanthanides and actinides is described. Bonding, structure and reactivity are considered. Section 2 (2 hrs.): Applications in areas such as bioinorganic chemistry, catalytic synthesis and materials chemistry are discussed. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6700 ADVANCED PHYSICAL CHEMISTRY**

[2-4 hours] Section 1 (2 hrs.): Classical chemical thermodynamics and kinetic rate laws and mechanisms. Section 2 (2 hrs.): Energetic considerations in electrochemistry. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6710 MOLECULAR STRUCTURE AND DYNAMICS**

[2-4 hours] Section 1 (2 hrs.): Introduction to electronic structures of molecules. Section 2 (2 hrs.): Chemical dynamics and statistical mechanics. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6720 PHYSICAL CHEMISTRY OF MATERIAL TRANSFORMATIONS**

[2-4 hours] Section 1 (2 hrs.): An exploration of the laws relating to physical and chemical transformations of matter between the solid, liquid and gas phases. Section 2 (2 hrs.): Reactants and products at equilibrium conditions and rates of change when removed from equilibrium. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6800 ADVANCED MATERIALS CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): Advanced topics in phase equilibria and phase diagrams, materials, structure and transformations. Section 2 (2 hrs): Modern methods of materials preparation and manufacture. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6810 MATERIALS SCIENCE I**

[4 hours] A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state. Prerequisite: Permission of department

**CHEM 6820 MATERIALS SCIENCE II**

[4 hours] A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics. Prerequisite: Permission of department

**CHEM 6850 X-RAY CRYSTALLOGRAPHY**

[2-4 hours] Theory and practice of molecular structure determination by X-ray diffraction. Section 1 (2 hrs): Small molecule crystallography. Section 2 (2 hrs): Macromolecular crystallography. Section 3 (4 hrs): Material in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 6920 CHEMISTRY COLLOQUIUM**

[1-4 hours] Presentations on research or current literature. Prerequisite: Permission of department

**CHEM 6930 CHEMISTRY SEMINAR**

[1-2 hours] Seminars conducted by individual members of the department. Prerequisite: Permission of department Corequisite: CHEM 6960 or 8960

**CHEM 6960 THESIS RESEARCH**

[1-15 hours] Original investigations of significant chemical problems at the master's level under the guidance of a member of the faculty. Prerequisite: Permission of department

**CHEM 6980 SPECIAL TOPICS IN CHEMISTRY**

[2-4 hours] Discussions of newly developing areas in chemistry research.

**CHEM 7300 PRINCIPLES OF ANALYTICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in analytical chemistry. Prerequisite: Permission of department

**CHEM 7400 PRINCIPLES OF ORGANIC CHEMISTRY**

[1-4 hours] Tutorial in selected topics in organic chemistry. S/U grading only. Prerequisite: Permission of department

**CHEM 7500 PRINCIPLES OF BIOLOGICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in biological chemistry. Prerequisite: Permission of department

**CHEM 7600 PRINCIPLES OF INORGANIC AND ORGANOMETALLIC CHEMISTRY**

[1-4 hours] Tutorial in selected topics in inorganic and organometallic chemistry. S/U grading only. Prerequisite: Permission of department

**CHEM 7700 PRINCIPLES OF PHYSICAL CHEMISTRY**

[1-4 hours] Tutorial in selected topics in physical chemistry. S/U grading only. Prerequisite: Permission of department

**CHEM 7800 PRINCIPLES OF MATERIALS CHEMISTRY**

[1-4 hours] Tutorial in selected topics in materials chemistry. Prerequisite: Permission of department

**CHEM 8300 ADVANCED ANALYTICAL CHEMISTRY**

[2-4 hours] Section 1 (2 hrs.): New techniques in characterization/compositional analysis of materials in the condensed state, i.e. organic, polymeric, inorganic and composites. Section 2 (2 hrs.): Principles of techniques described. Includes surface characterization, rheology and electrochemical properties. Section 3 (4 hrs): Material covered in both sections 1 and 2. Prerequisite: Permission of department

**CHEM 8310 SEPARATION METHODS**

[2-4 hours] Section 1 (2 hrs.): The theory and design of separation methods. Section 2 (2 hrs.): Application of separation methods. Section 3 (4 hrs.): Material covered in both sections 1 and 2. Topics include extraction techniques, gas, liquid and supercritical fluid chromatography, affinity and chiral separation and capillary electrophoresis. Approved chemical safety goggles meeting the American National Standard 287.1-1968 must be worn by every student during every laboratory class meeting. Prerequisite: Permission of department

**CHEM 8320 CHARACTERIZATION OF CONDENSED PHASES AND SURFACES**

[2-4 hours] Modular study of the theory, instrumentation and methods of analysis for the characterization and analysis of liquid, solution and solid phases. Section 1 (2 hrs.): A fundamental study of electrochemical concepts, methods, instrumentation and applications. Section 2 (2 hrs.): A study of surface analysis and colloid and interfacial chemistry. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 8330 SPECTROSCOPIC METHODS AND ANALYSIS OF SPECTRA**

[2-4 hours] Section 1 (2 hrs): A comprehensive study of theory and instrumentation. Section 2 (2 hrs): Applications of spectroscopic methods including spectral interpretation. Section 3 (4 hrs): Material covered in Sections 1 and 2. Topics include a study of absorption, emission, Raman, NMR, ESR, mass spectrometry and related subjects. Prerequisite: Permission of department

**CHEM 8400 ADVANCED ORGANIC CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): Basic heterocyclic synthesis and methodology. Section 2 (2 hrs): Reducing reagents and new carbon-carbon bond forming processes. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 8410 ORGANIC SYNTHESIS**

[2-4 hours] Section 1 (2 hrs): Important methodology in organic synthesis. Section 2 (2 hrs): Disconnection and retroanalysis. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 8420 PHYSICAL ORGANIC CHEMISTRY & REACTION MECHANISMS**

[2-4 hours] Section 1 (2 hrs): Physical basis of organic chemistry. Section 2 (2 hrs): Molecular orbital theory, mechanistic chemistry and reactive intermediates. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

**CHEM 8430 MEDICINAL CHEMISTRY**

[4 hours] Qualitative and quantitative aspects of the design of new therapeutic agents are discussed. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids will be examined. Prerequisite: Permission of department

## 328 Course Descriptions

### **CHEM 8500 ADVANCED BIOLOGICAL CHEMISTRY**

[2-4 hours] The chemistry of cellular and molecular transformations in biochemical systems. Section 1 (2 hrs): Molecular structure of proteins, nucleic acids and membranes. Section 2 (2 hrs): Metabolism and biosynthesis of carbohydrates, amino acids and lipids; gene regulation and replication. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8510 PROTEIN CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): A detailed analysis of the structure and function of proteins. Section 2 (2 hrs): Current methodology for the analysis of structure, the basis for molecular associations and relationships between structure and biological function. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: CHEM 6500 or 8500

### **CHEM 8520 ENZYMOLOGY**

[2-4 hours] The principles of chemical catalysis applied to molecular enzymology. Section 1 (2 hrs): Catalysis: kinetics, steady state vs. numerical integration, the proton in chemistry, coenzymes, metal ions; Enzyme mechanism; Allosterism; Conformational effects. Section 2 (2 hrs): Methodology: site-directed mutagenesis, affinity labeling, monoclonal and antipeptide antibodies, isotope effects; Catalytic antibodies. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8530 NUCLEIC ACID CHEMISTRY**

[2-4 hours] The chemical basis for the storage and transmission of genetic information. Section 1 (2 hrs): Nucleic acid structure, DNA/RNA: sequence and conformation analysis, 3D solution and solid state structures, complexes, proteins, ribosomes, nucleosomes, networks, chromosomes. Section 2 (2 hrs): Biological Consequences: mutagenesis, carcinogenesis, chemotherapeutic strategies; Properties and chemistry: hybridization and higher order complexes, interactions with small molecules, cleavage reactions, mismatch, damage, repair. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: CHEM 6500 or 8500

### **CHEM 8540 MACROMOLECULAR CRYSTALLOGRAPHY**

[2 hours] Fundamental theory and practical application of X-ray diffraction to macromolecular structure determination, including protein crystallization and manipulation, data collection and reduction, phase solution, electron density interpretation, structural refinement and validation. Prerequisite: CHEM 8850 or permission of instructor

### **CHEM 8550 PRACTICAL PROTEIN CRYSTALLOGRAPHY**

[2 hours] Hands-on training in protein crystallography. Laboratory projects include: protein crystallization, crystal manipulation and mounting, X-ray diffraction data collection, data reduction, structure solution, electron density interpretation, refinement and structural validation. Prerequisite: CHEM 8850 or permission of instructor Corequisite: CHEM 8540

### **CHEM 8560 TOPICS IN PROTEIN CRYSTALLOGRAPHY**

[2 hours] An advanced course on the theoretical aspects of modern methods in macromolecular structure determination. Topics include: sample preparation, crystallization, data collection, phasing, electron density map interpretation and structural refinement. Prerequisite: CHEM 8540 or permission of instructor

### **CHEM 8600 ADVANCED INORGANIC AND ORGANOMETALLIC CHEMISTRY**

[2-4 hours] Section 1 (2 hrs.): The inorganic chemistry of the main group elements, transition metals, lanthanides and actinides is described. Section 2 (2 hrs.): Bonding, structure and reactivity are considered and appropriate concepts applied. Section 3: (4 hrs.) Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8610 INORGANIC AND ORGANOMETALLIC CHEMISTRY OF TRANSITION AND POST-TRANSITION ELEMENTS**

[2-4 hours] Section 1 (2 hrs.): The inorganic and organometallic chemistry of the transition metals, lanthanides and actinides is described. Bonding, structure and reactivity are considered. Section 2 (2 hrs.): Applications in areas such as bioinorganic chemistry, catalytic synthesis and materials chemistry are discussed. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8700 ADVANCED PHYSICAL CHEMISTRY**

[2-4 hours] Section 1 (2 hrs.): Classical chemical thermodynamics and kinetic rate laws and mechanisms. Section 2 (2 hrs.): Energetic considerations in electrochemistry. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8710 MOLECULAR STRUCTURE AND DYNAMICS**

[2-4 hours] Section 1 (2 hrs.): Introduction to electronic structures of molecules. Section 2 (2 hrs.): Chemical dynamics and statistical mechanics. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8720 PHYSICAL CHEMISTRY OF MATERIAL TRANSFORMATIONS**

[2-4 hours] Section 1 (2 hrs.): An exploration of the laws relating to physical and chemical transformations of matter between the solid, liquid and gas phases. Section 2 (2 hrs.): Reactants and products at equilibrium conditions and rates of change when removed from equilibrium. Section 3 (4 hrs.): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8800 ADVANCED MATERIALS CHEMISTRY**

[2-4 hours] Section 1 (2 hrs): Advanced topics in phase equilibria and phase diagrams, materials, structure and transformations. Section 2 (2 hrs): Modern methods of materials preparation and manufacture. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8810 MATERIALS SCIENCE I**

[4 hours] A generic materials science approach to the study of crystalline structure and defects (point, line and planar) in crystalline materials. The mechanisms and kinetics of diffusion in the condensed state. Prerequisite: Permission of department

### **CHEM 8820 MATERIALS SCIENCE II**

[4 hours] A materials science approach to the thermodynamics of condensed state equilibria. Phase transformation kinetics. Prerequisite: Permission of department

### **CHEM 8850 X-RAY CRYSTALLOGRAPHY**

[2-4 hours] Theory and practice of molecular structure determination by X-ray diffraction. Section 1 (2 hrs): Small molecule crystallography. Section 2 (2 hrs): Macromolecular crystallography. Section 3 (4 hrs): Material in Sections 1 and 2. Prerequisite: Permission of department

### **CHEM 8920 CHEMISTRY COLLOQUIUM**

[1-4 hours] Presentations on research or current literature. Prerequisite: Permission of department

### **CHEM 8930 CHEMISTRY SEMINAR**

[1-2 hours] Seminars conducted by individual members of the Department. Prerequisite: Permission of department Corequisite: CHEM 6960 or 8960

### **CHEM 8960 DISSERTATION RESEARCH**

[1-15 hours] Original investigations of significant chemical problems at the Doctoral level under the guidance of a member of the faculty. Prerequisite: Permission of department

### **CHEM 8980 SPECIAL TOPICS IN CHEMISTRY**

[2-4 hours] Discussions of newly developing areas in chemistry research. Section 1 (2 hrs): Selected areas in Chemistry. Section 2 (2 hrs): Developing areas in Chemistry. Section 3 (4 hrs): Material covered in Sections 1 and 2. Prerequisite: Permission of department

## CHIN - Chinese

### Department of Foreign Languages (ARS)

#### **CHIN 1110 ELEMENTARY CHINESE I**

[4 hours] An introduction to Chinese language and culture through listening, speaking, reading and writing. Laboratory practice required.

#### **CHIN 1120 ELEMENTARY CHINESE II**

[4 hours] An introduction to Chinese language and culture through listening, speaking, reading and writing. Laboratory practice required. Prerequisite: CHIN 1110 or satisfactory score on placement test Humanities core course

#### **CHIN 2140 INTERMEDIATE CHINESE I**

[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. Prerequisite: CHIN 1120 or satisfactory score on placement test Humanities core course

#### **CHIN 2150 INTERMEDIATE CHINESE II**

[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. Prerequisite: CHIN 2140 or satisfactory score on placement test Humanities core course

## CI - Curriculum & Instruction

### Department of Curriculum & Instruction (EDU)

#### CI 1900 INTRODUCTION TO MIDDLE GRADES EDUCATION LINKING SEMINAR

[1 hour] This course introduces students to the world of middle grades education. The students will explore the nature of middle grades education, its philosophy, history, students, curriculum and teaching. Prerequisite: EAP 1000

#### CI 1910 COMMUNICATION SKILLS IN THE DISCIPLINE

[1 hour] A seminar which focuses on the relationship among the skills learned in English composition classes, the art of explaining and communicating and the specific disciplines. Students will be encouraged to see language skills in the wider context of enabling the understanding of and explaining in their own academic major. They will be encouraged to use various means of communication (including electronic) to interpret concepts in their major area and consider ways in which a secondary teacher would need to implement these same experiences in the classroom. Prerequisite: ENGL 1110 plus a Composition II course

#### CI 1920 INTRODUCTION TO FOREIGN LANGUAGE EDUCATION: LINKING SEMINAR I

[1 hour] This course introduces students to the world of foreign language education. Students will explore the nature of foreign language education, its philosophy, history, types of schools, students, curriculum and teaching.

#### CI 1900 DIVERSITY AND BOOKS LINKING SEMINAR

[1 hour] Students will learn about various forms of cultural diversity as presented in books appropriate for middle childhood learners. Prerequisite: CI 2200

#### CI 1910 STUDY TOUR LINKING SEMINAR

[1 hour] This course will allow students to explore education-related issues within the context of society in general. Structured field trips, coupled with pre- and post-seminars are planned.

#### CI 1920 CASE STUDIES LINKING SEMINAR

[1 hour] Students will learn about cognitive, physical, emotional and social characteristics of pre- and young adolescents through participant observation in study and recreational settings and they will prepare a case study. Prerequisite: CI 2200

#### CI 1930 ARTS AND SCIENCE LINKING SEMINAR IN MATHEMATICS

[1 hour] Students will examine current reform efforts in mathematics education and the impact on the teaching and learning of mathematics at all levels - PreK-college. Students must join a professional mathematics education organization. Prerequisite: CI 2200

#### CI 1940 ARTS AND SCIENCE LINKING SEMINAR IN SCIENCE

[1 hour] Students will examine current reform efforts in science education and the impact on the teaching and learning of science at all levels - PreK-college. Students must join a professional science education organization. Prerequisite: CI 2200

#### CI 1950 ARTS AND SCIENCE LINKING SEMINAR IN SOCIAL STUDIES

[1 hour] Students will examine current reform efforts in social studies education and the impact on the teaching and learning of social studies at all levels - PreK-college. Students must join a professional social studies education organization. Prerequisite: CI 2200

#### CI 1960 ARTS AND SCIENCE LINKING SEMINAR IN READING/LANGUAGE ARTS

[1 hour] Students will examine current reform efforts in reading/language arts education and the impact on the teaching and learning of reading/language arts at all levels - PreK-college. Students must join a professional reading/language arts education organization. Prerequisite: CI 2200

#### CI 1970 AN ORIENTATION TO THE SCHOOL ENVIRONMENT AND DEVELOPING A PERSONAL PHILOSOPHY OF TEACHING

[1 hour] This course will help the student explore school context including the sociology and culture of high schools. The goal of this course is to help students apply theory and explore the ways of supporting the wide diversity of backgrounds and abilities of students in today's high schools. Students will be helped to see the necessity of and begin the development of a personal philosophy and set of beliefs with respect to the educational processes in which they will participate. Prerequisite: Sophomore standing

#### CI 1980 INTRODUCTION TO FOREIGN LANGUAGE EDUCATION: LINKING SEMINAR II

[1 hour] Students will understand salient factors relating to the effective teaching of foreign languages in elementary, middle-junior and high school. Specifically, students will assist foreign language teachers in teaching their students. Prerequisite: CI 1500

#### CI 1990 TEACHING ELEMENTARY READING, LANGUAGE ARTS AND SOCIAL STUDIES

[7 hours] Integration of instruction in listening, talking, writing and reading skills with purposes, scope and sequence of Social Studies. Ways to help children grow and develop in these areas. Preparation of an integrated unit. Prerequisite: Advanced professional standing; EDP 3210 Corequisite: CI 3020

#### CI 1990 INTEGRATED ELEMENTARY FIELD EXPERIENCE

[3 hours] Prepare and teach integrated language arts/social studies unit and teach reading/language arts in an elementary, or middle school classroom. Corequisite: CI 3010

#### CI 1990 EFFECTIVE SECONDARY SCHOOL TEACHING METHODS

[3 hours] Introduction to theory and research supporting effective curriculum development and instruction. Students acquire knowledge and skills necessary to create effective classroom environments. Prerequisite: EDP 3220; advanced professional standing Corequisite: CI 3110

#### CI 1990 SECONDARY FIELD EXPERIENCE I

[1-2 hours] Students will implement and apply skills of instructional design, content area reading and classroom management within selected secondary school settings. Corequisite: CI 3100

#### CI 1990 OFFICE PRODUCTION

[2 hours] Development of understanding and judgment relating to the production of documents and statistical reports. Introduction to Cortez Peters method of teaching keyboarding. Prerequisite: GSCT 2270

#### CI 1990 OFFICE PROCEDURES

[3 hours] Analysis of the activities of today's office professionals. Includes office technology, management, communication procedures (oral and written) and office procedures.

#### CI 1990 INFORMATION PROCESSING FOR BUSINESS EDUCATION

[3 hours] Hands-on experience in the operation of information processing equipment used in today's modern offices. Prerequisite: CI 3210

#### CI 1990 BEST PRACTICES IN MIDDLE LEVEL TEACHING

[3 hours] This course will provide a comprehensive study of effective teaching in the middle level schools. Students will study historical, philosophical and psychological factors, transcendent instructional strategies, discipline, classroom management and evaluation. Prerequisite: CI 2200

#### CI 1990 LITERACY ISSUES

[3 hours] An introduction to literacy and the acquisition of reading and writing skills/proficiency. Presents a study of language development, language diversity, the process of reading and writing and their development.

#### CI 1990 PHONICS AND WORD IDENTIFICATION FOR EARLY CHILDHOOD EDUCATION

[3 hours] Phoneme-grapheme relationships using age appropriate techniques with young children, teaching phonics and word recognition, phonological and morphological underpinnings of English spelling, reading disabilities, sound awareness in spoken language. Prerequisite: Admission to Professional Education Corequisite: CI 3460

#### CI 1990 PHONICS AND WORD IDENTIFICATION FOR MIDDLE CHILDHOOD EDUCATION

[3 hours] Students learn methods for using phonics and word identification skills with pre- and early adolescent learners, focusing on strategies to help with reading, writing and spelling in the content areas.

#### CI 1990 LITERACY AND READING DEVELOPMENT FOR YOUNG CHILDREN

[3 hours] Professional standards for reading/language arts with specific attention to diverse learners. PreK through grade 3. Developmentally-appropriate classroom design and methods. Understanding of print. Use of computer software. Prerequisite: Admission to Professional Education Corequisite: CI 3430

#### CI 1990 INTERNSHIP SEMINAR: RELATING COLLEGE LEVEL CONTENT TO THE SECONDARY SCHOOL CURRICULUM

[1 hour] The course will consider the content of the college courses taken in a student's major area and relate it to specific courses in the secondary school curriculum. Examples will be developed of the ways in which concepts of university level courses are related to the curriculum of the content area courses at the secondary school level. Students will be encouraged to develop materials and applications of the college level content to a conceptual level appropriate to the secondary student. Students will be expected to use computer technology in several ways. Prerequisite: Admission to Professional Education Corequisite: CI 3240 or 4150/4160/4170 or 4180

## 330 Course Descriptions

### CI 4000 PRINCIPLES OF CURRICULUM INTEGRATION

[3 hours] A course designed to introduce students to major curriculum trends and issues. Focus will be placed on theory and practical issues related to curriculum integration and team teaching. Prerequisite: CI 4250; CI 4240, 4260, 4270 or 4280 (select 2) Corequisite: CI 4090, SPED 4020, CI 4200 and CMHS 4580

### CI 4010 MIDDLE GRADES FIELD EXPERIENCE FOR CURRICULUM INTEGRATION

[1 hour] A field experience for regular education and special education students. Teaching experiences to demonstrate knowledge and pedagogical skill in a team taught integrated unit. Prerequisite: CI 4250, 4260, 4270 or 4280 (select two) Corequisite: CI 4000

### CI 4030 TEACHING SCIENCE IN THE MIDDLE GRADES

[4 hours] Introduction to the purposes, scope and sequence, resources, curriculum, instruction and evaluation in middle grades science. Methods and materials for teaching science concepts. Prerequisite: Advanced professional standing; CI 3010, 3020

### CI 4040 TEACHING SCIENCE IN THE PRIMARY GRADES

[4 hours] Introduction to the purposes, scope and sequence, resources, curriculum, instruction and evaluation in primary science. Relationships to DAP and science concept development. Prerequisite: Advanced professional standing; CI 3010, 3020

### CI 4050 SCIENCE FIELD EXPERIENCE

[1 hour] Prepare and teach a science unit of instruction in the elementary classroom. Corequisite: CI 4030 or 4040

### CI 4060 TEACHING ELEMENTARY SCHOOL MATHEMATICS

[4 hours] Focus on the mathematics education of children in early childhood through the middle grades with emphasis on mathematics learning process, mathematics content, effective teaching strategies, instructional materials and assessment techniques. Prerequisite: Advanced professional standing; CI 4030 or 4040 Corequisite: CI 4070, 4930

### CI 4070 TEACHING ELEMENTARY SCHOOL MATHEMATICS - FIELD

[1 hour] Teach a mathematics unit in an early childhood, elementary, or middle grade classroom. Corequisite: CI 4060

### CI 4080 INTEGRATED ELEMENTARY TEACHING METHODS I

[5 hours] Methods for teaching and integrating language arts in diverse classrooms. Emphasis on understanding the reading and writing process from emergent literacy through middle school. For Special Education Majors only. Prerequisite: Advanced professional standing; EDP 3210 or 3220

### CI 4090 INTEGRATED ELEMENTARY TEACHING METHODS II

[5 hours] Integrated approach to teaching mathematics and science. Emphasis on the learning process, mathematics and science content, effective teaching strategies, instructional materials and assessment techniques. For Special Education Majors Only. Prerequisite: Advanced professional standing; EDP 3210

### CI 4130 TEACHING IN URBAN COMMUNITIES

[3 hours] Focus on student learning in urban settings. Students will examine urban demographic and school achievement data, develop a profile of urban students and develop appropriate school activities. Prerequisite: CI 3100; advanced professional standing Corequisite: CI 4190 and 4150, 4160, 4170 or 4180

### CI 4140 TEACHING METHODS FOR FOREIGN LANGUAGES

[3 hours] Consideration of current theory and practice in teaching foreign languages in elementary and secondary schools. Focus on planning instruction, materials selection and methods for teaching communication skills and culture. Prerequisite: CI 3100; Advanced professional standing

### CI 4150 TEACHING METHODS FOR SECONDARY ENGLISH

[3 hours] Language immersion techniques, mastery-based teaching and reliance on reading/writing-to-learn activities. Develop proficiency in methodologies that reflect current research and effective instructional practices in secondary English and Communications. Prerequisite: CI 3100; Advanced professional standing Corequisite: CI 4130, 4190

### CI 4160 TEACHING METHODS FOR SECONDARY MATHEMATICS

[3 hours] Preparation for teaching in the secondary mathematics classroom. Techniques for motivating students, using questioning and critical thinking strategies and integrating technology are developed. Prerequisite: CI 3100; Advanced professional standing Corequisite: CI 4130, 4190

### CI 4170 TEACHING METHODS FOR SECONDARY SCIENCE

[3 hours] In-depth study of the methods and materials for teaching secondary science. Apply knowledge in a secondary classroom. Prerequisite: CI 3100; Advanced professional standing Corequisite: CI 4190, 4130

### CI 4180 TEACHING METHODS FOR SECONDARY SOCIAL STUDIES METHODS

[3 hours] In-depth study of methods and materials for teaching social studies. Implementation of secondary curriculum within the context of current technology and the development of critical thinking skills. Prerequisite: CI 3100; advanced professional standing Corequisite: CI 4190, 4130

### CI 4190 SECONDARY FIELD EXPERIENCE II

[3 hours] Students will develop and implement a unit plan in the content area integrating teaching of content, thinking skills and adjusting the unit to a special needs population. Prerequisite: CI 3100; advanced professional standing Corequisite: CI 4130 and 4150, 4160, 4170 or 4180

### CI 4210 ADMINISTRATIVE OFFICE MANAGEMENT

[3 hours] Office functions as part of business administration, including physical facility planning, office systems, procedures and services, control of office work and administrative/supervision of office staff. Prerequisite: Junior standing

### CI 4220 INFORMATION MANAGEMENT FOR BUSINESS EDUCATION

[3 hours] Hands-on experience in a current word processing package. Also provides an overview of word processing methodologies, concepts and techniques needed to teach a secondary course. Prerequisite: CI 3220

### CI 4230 BUSINESS TEACHING METHODS I

[3 hours] Development and application of appropriate materials and methods in teaching general business, accounting and computer technology. Prerequisite: CI 3100; advanced professional standing

### CI 4240 BUSINESS TECHNOLOGY METHODS II

[3 hours] Development and application of appropriate materials and methods in teaching keyboarding, business communication/English, vocational education and computer applications. Course required for vocational certification. Prerequisite: Advanced professional standing; CI 3210

### CI 4250 METHODS FOR MIDDLE GRADES MATHEMATICS LICENSURE

[4 hours] A course for preservice middle grade teachers seeking licensure in mathematics. The course will focus on curriculum, scope and sequence, resources, learning activities, teaching strategies, technology use and assessment following NCTM Standards and the Ohio Mathematics Model. Prerequisite: Admission to professional standing; CI 3240 Corequisite: CI 4290, EDP 3240, HEAL 4400

### CI 4260 METHODS FOR MIDDLE GRADES SCIENCE LICENSURE

[4 hours] Designed for middle grade teachers seeking licensure in science. The course covers standards, curriculum, learning activities, teaching strategies, use of technology and assessment techniques in a middle school setting. Prerequisite: Admission to professional standing and CI 3240 Corequisite: CI 4290:01, EDP 3240, HEAL 4400

### CI 4270 METHODS FOR MIDDLE GRADES SOCIAL STUDIES LICENSURE

[4 hours] This course will focus upon the social studies education of middle grades students with an emphasis on standards, scope and sequence, resources, learning activities, teaching strategies, technology evaluation techniques. Prerequisite: Admission to professional standing and CI 3240 Corequisite: CI 4290, EDP 3240, HEAL 4400

### CI 4280 METHODS FOR MIDDLE GRADES READING/LANGUAGE ARTS LICENSURE

[4 hours] A course for preservice middle grades teachers seeking licensure in reading/language arts. This course will focus upon the literary education of children in the middle grades. Standards, curriculum, scope and sequence, resources, learning activities, teaching strategies, technology use and assessment will be addressed following NCTE standards and the Ohio Language Arts Model. Prerequisite: Admission to professional standing and CI 3240 Corequisite: CI 4290, EDP 3240, HEAL 4400

### CI 4290 MIDDLE GRADES METHODS FIELD EXPERIENCE

[2 hours] Field experience to demonstrate knowledge and pedagogical skills as students teach in two licensure areas. Instructional practice, assessment strategies and technology use will be integrated in two units from a student's licensure areas. Prerequisite: Admission to professional standing Corequisite: EDP 3240, HEAL 4400 and two of the following: CI 4280, CI 4260, CI 4270 or CI 4250

**CI 4300 LITERATURE FOR CHILDREN**

[3 hours] Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, biography and other information books, particularly for the preschool and primary student. Prerequisite: Junior standing

**CI 4310 LITERATURE FOR MIDDLE GRADERS**

[3 hours] Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, biography and other information books. Geared for the middle school student. Prerequisite: Junior standing

**CI 4320 LITERATURE FOR YOUNG ADULTS**

[3 hours] Survey of literature materials written for the junior and senior high school student. Emphasis is placed on all genres, literary elements and the use of literature across the curriculum. Prerequisite: Junior standing

**CI 4360 MULTICULTURAL LITERATURE**

[3 hours] Picture books, fiction, biography and poetry appropriate for elementary and middle school students that interpret and reflect honestly the lives of persons of color will be studied and evaluated. U.S. multicultural course

**CI 4390 SANDBERG CHILDREN'S LITERATURE INSTITUTE**

[3 hours] To broaden students' knowledge of current professionals in children's literature, nationally-known authors, illustrators and editors presentations.

**CI 4400 READING IN MIDDLE GRADES**

[3 hours] Using various genres of literature, students focus on instructional strategies across the curriculum for teaching, assessing, diagnosing and remediating reading and reading difficulties. Evaluation of learning through writing emphasized. Prerequisite: CI 3240 Corequisite: SPED 4280, CMHS 4580, CI 4000, CI 4010

**CI 4430 ISSUES IN SECOND LANGUAGE TEACHING**

[3 hours] A critical study of teaching foreign languages and English as a second language in secondary schools including current curriculum, materials, teaching strategies and evaluation. Prerequisite: CI 4140 Corequisite: CI 4900:03, 4930:03

**CI 4440 ISSUES IN LINGUISTICS, WRITING, AND GRAMMAR**

[3 hours] Examine the research on structural and generative grammars and oral language acquisition. Analyze process writing research, teaching-learning principles, and practices that employ process writing techniques. Prerequisite: CI 4150 Corequisite: CI 4930:03, 4900:03

**CI 4450 CREATIVITY AND LANGUAGE ARTS**

[3 hours] Practical techniques for guiding children into effective oral and written expression of ideas and feelings will be presented. Develop lesson plans. :01 Creative Drama; :02 Creative Writing; :03 Storytelling Prerequisite: Junior standing

**CI 4470 READING ASSESSMENT AND DIAGNOSIS**

[3 hours] Focus on the knowledge and skill needed to assess the reading and writing of students and to plan appropriate instruction.

**CI 4480 READING ASSESSMENT AND REMEDIATION PRACTICUM**

[3 hours] Focus on diagnostic assessment that represents differences in learners and emphasizes meeting student needs through a variety of instructional strategies to remediate problems in phonics, word recognition, fluency, comprehension and writing.

**CI 4490 CONTENT AREA READING FOR ADOLESCENT YOUNG ADULT, MULTI-AGE, AND CAREER AND TECHNICAL EDUCATION TEACHERS**

[3 hours] Study of the integration of reading comprehension, writing, oral language and word skill development in content reading. Attention will be given to instructional methods as well as assessment practices.

**CI 4510 MATHEMATICS FOR THE YOUNG CHILD**

[3 hours] Development of mathematical understanding in young children, appropriate learning and assessment experiences and analysis of curriculum. Mathematical focus on place value, number sense, geometry, measurement, algebra, data analysis and probability. Prerequisite: Junior standing

**CI 4520 MATHEMATICS FOR THE MIDDLE SCHOOL**

[3 hours] Conceptualization of mathematics curriculum and its implementation in the classroom. The inductive approach will be emphasized. Examination of middle school math concepts. Prerequisite: Junior standing

**CI 4530 TEACHING GEOMETRY IN GRADES K-12**

[3 hours] Examination of the development of mathematics concepts and skills across the K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice. (:01-Geometry, :02 Algebra) Prerequisite: Junior standing

**CI 4540 TEACHING ALGEBRA IN GRADES K-12**

[3 hours] Examination of the development of mathematics concepts and skills across K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice. (:01 Geometry, :02 Algebra) Prerequisite: Junior standing

**CI 4550 TEACHING PROBLEM SOLVING IN MATHEMATICS**

[3 hours] Focuses on the art of problem solving and its implementation in the classroom. Basic problem solving strategies are developed; materials and methods for their integration in mathematics teaching are provided. :01 K-8; :02 7-12 Prerequisite: Junior standing

**CI 4570 CURRICULUM ISSUES IN MATHEMATICS**

[3 hours] Focuses on the content of the 7-12 mathematics curriculum and its delivery in secondary schools. Consideration is given to the role of technology, proficiency testing, conceptualizations of mathematics and resulting implications. Prerequisite: CI 4160; advanced professional standing Corequisite: CI 4930, 4900:03

**CI 4640 ENVIRONMENTAL EDUCATION**

[3 hours] Issues, methods and materials related to teaching Environmental Science in grades PreK-12. Field trips to areas of environmental interest will be part of the course.

**CI 4670 SCIENCE IN MIDDLE SCHOOL CURRICULUM**

[3 hours] Nature, scope and role of science experiences in learning development of middle school age children; integration and application of current developments; theory and research in middle school science education. Prerequisite: Advanced professional standing

**CI 4680 ISSUES IN SCIENCE EDUCATION**

[3 hours] This course focuses on theoretical issues related to teaching science in grades pre K-12 and is designed for preservice teachers. Prerequisite: CI 4170; Advanced professional standing Corequisite: CI 4900, 4930:03

**CI 4710 TEACHING STRATEGIES IN MULTICULTURE EDUCATION**

[3 hours] Examines multicultural curriculum and teaching strategies. Reviews ethnicity, culturally pluralistic curricula, selection of instructional materials, grouping practices, assessment of learning and multi-ethnic schools, with an emphasis on improving instruction.

**CI 4720 ISSUES IN SOCIAL STUDIES**

[3 hours] Examines current issues of content and pedagogy in secondary social studies. Prerequisite: Advanced professional standing; CI 4180 Corequisite: CI 4900; CI 4930

**CI 4740 MODELS OF VALUING**

[3 hours] Reviews the rationale, research and strategies for character education, values clarification, moral developments as well as programs designed to promote self concept.

**CI 4760 TEACHING LOCAL HISTORY**

[3 hours] Rationale, strategies and resources for teaching local history including demonstrations of teaching oral history and utilization of community resources.

**CI 4790 USING NEWS MEDIA IN THE CLASSROOM**

[3 hours] Rationale and strategies for using newspapers as classroom resource for teaching across curriculum. Participants will explore classroom applications after interviewing reporters, photographers, cartoonists as well as Newspaper in Education classroom teachers.

**CI 4900 STUDENT TEACHING SEMINAR**

[2-4 hours] Focuses reflectivity on common experiences in Student Teaching. Attention to resume preparation, portfolio use, job interviews. Corequisite: CI 4930

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### **CI 4910 INTERNSHIP SEMINAR: REFORMS, RESEARCH AND CRITICAL LITERACY IN THE CONTENT AREAS**

[3 hours] A professional teaching and reflection seminar that places internship experience in the context of reforms, research and critical literacy in the content areas. This will include a study of reports, studies and resulting recommendations of the societies as well as those at the state, national and international levels. Critical literacy will be examined within the framework of necessary knowledge for an informed citizenry. Outcomes of this seminar may be integrated in the professional portfolio presentation. Coursework will be creatively scheduled to dovetail with the internship

### **CI 4930 INTERNSHIP/STUDENT TEACHING**

[6-12 hours] Full-time supervised classroom teaching for 8-15 weeks. :01 Early Childhood Education, :02 Elementary education, :03 Secondary Education, :04 Middle Childhood Education, :05 Adolescent & Young Adult Education, :06 MultiAge: Foreign Languages Education Prerequisite: 100 semester hours; advanced professional standing; 90% major/core; all professional courses; 2.5 GPA Corequisite: CIEC 4910 and CI 4900, or TSOC 4000 and CI 4900, or CI

### **CI 4950 WORKSHOP IN CURRICULUM AND INSTRUCTION**

[1-5 hours] Workshops developed around topics of interest and concern for pre-service and in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.

### **CI 4980 SPECIAL TOPICS IN CURRICULUM AND INSTRUCTION**

[1-5 hours] Topics of interest and concern to preservice, inservice and non-degree teachers within school districts and community agencies. The course may be included in an undergraduate degree program.

### **CI 4990 UNDERGRADUATE INDEPENDENT STUDY IN CURRICULUM AND INSTRUCTION**

[1-5 hours] Provides student the opportunity to work individually on professional problems under the direction of the staff of the department of curriculum and instruction. This course is open to seniors with the consent of the adviser and permission of the instructor.

### **CI 5150 TEACHING METHODS FOR SECONDARY ENGLISH**

[3 hours] Language immersion techniques, mastery-based teaching and reliance on reading/writing-to-learn activities. Develop proficiencies in methodologies that reflect current research and best practice. Alternative preservice methods. Prerequisite: CI 5190

### **CI 5160 TEACHING METHODS FOR SECONDARY MATHEMATICS**

[3 hours] Preparation for teaching in the secondary mathematics classroom. Techniques for motivating students, using questioning and critical thinking strategies and integrating technology are developed. Prerequisite: EDP 5220, CI 5190, 8510

### **CI 5170 TEACHING METHODS FOR SECONDARY SCIENCE**

[3 hours] In-depth study of the methods and materials for teaching secondary science. Apply knowledge in a secondary classroom. Prerequisite: EDP 5220, CI 5190, 8510

### **CI 5180 TEACHING METHODS FOR SECONDARY SOCIAL STUDIES METHODS**

[3 hours] In-depth study of methods and materials for teaching social studies. Implementation of secondary curriculum within the context of current technology and the development of critical thinking skills. Prerequisite: EDP 5220, CI 5190, 8510

### **CI 5190 SECONDARY FIELD EXPERIENCE II**

[3 hours] Field experience for alternative 712 certification. Classroom observations and reports Teach series of lessons or unit of study in secondary classroom. Students will develop and implement a unit plan in the content area integrating teaching of content, thinking skills and adjusting the unit to a special needs population. Prerequisite: EDP 3220

### **CI 5210 ADMINISTRATIVE OFFICE MANAGEMENT**

[3 hours] Office functions as part of business administration, including physical facility planning, office systems, procedures and services, control of office work and administration/supervision of office staff.

### **CI 5220 INFORMATION MANAGEMENT FOR BUSINESS EDUCATION**

[3 hours] Hands-on experience in a current word processing package. Also provides an overview of word processing methodologies, concepts and techniques needed to teach a secondary course.

### **CI 5250 METHODS FOR MIDDLE GRADES MATHEMATICS LICENSURE**

[4 hours] A course for preservice middle grade teachers seeking licensure in mathematics. The course will focus on curriculum, scope and sequence, resources, learning activities, teaching strategies, technology use and assessment following NCTM standards and the Ohio Mathematics Model. Prerequisite: EDP 5220

### **CI 5260 METHODS FOR MIDDLE GRADES SCIENCE LICENSURE**

[4 hours] Designed for middle grades teachers seeking licensure in science. The course covers standards, curriculum, learning activities, teaching strategies, use of technology and assessment techniques in a middle school setting. Prerequisite: EDP 5220

### **CI 5270 METHODS FOR MIDDLE GRADES SOCIAL STUDIES LICENSURE**

[4 hours] This course will focus upon the social studies education of middle grades students with an emphasis on standards, scope and sequence, resources, learning activities, teaching strategies, technology evaluation techniques. Prerequisite: EDP 5220

### **CI 5280 METHODS FOR MIDDLE GRADES READING/LANGUAGE LICENSURE**

[4 hours] A course for preservice middle grades teachers seeking licensure in reading/language arts. This course will focus upon the literary education of children in the middle grades. Standards, curriculum, scope and sequence, resources, learning activities, teaching strategies, technology use and assessment will be addressed following NCTE standards and the Ohio Language Arts Model. Prerequisite: EDP 5220

### **CI 5300 LITERATURE FOR CHILDREN**

[3 hours] Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, biography and other information books, particularly for the preschool and primary student.

### **CI 5310 LITERATURE FOR MIDDLE GRADERS**

[3 hours] Emphasis on all genres of literature for children, including poetry, traditional literature, fantasy, realistic fiction, both historical and contemporary, biography and other informational books. Geared for the middle school student.

### **CI 5320 LITERATURE FOR YOUNG ADULTS**

[3 hours] Survey of literature materials written for the junior and senior high school student. Emphasis is placed on all genres, literary elements and uses of literature across the curriculum.

### **CI 5360 MULTICULTURAL LITERATURE**

[3 hours] Picture books, fiction, biography and poetry appropriate for elementary and middle school students that interpret and reflect honestly the lives of persons of color will be studied and evaluated.

### **CI 5390 SANDBERG CHILDREN'S LITERATURE INSTITUTE**

[3 hours] To broaden students' knowledge of current professionals in children's literature, nationally-known authors, illustrators or editors presentations.

### **CI 5430 ISSUES IN SECOND LANGUAGE INSTRUCTION**

[3 hours] A critical study of teaching foreign languages and English as a second language in secondary schools including current curriculum, materials, teaching strategies and evaluation.

### **CI 5450 CREATIVITY AND LANGUAGE ARTS**

[3 hours] Practical techniques for guiding children into effective oral and written expression of ideas and feelings will be presented. Develop lesson plans. :01 Creative Drama, :02 Creative Writing, :03 Storytelling

### **CI 5460 THEORY & PRACTICE IN LANGUAGE ARTS**

[3 hours] Advanced methods for teaching and integrating language arts in diverse classrooms. Emphasis is on understanding the reading and writing process from emergent literacy through middle school.

### **CI 5470 READING ASSESSMENT AND DIAGNOSIS**

[3 hours] Focus on knowledge and skill needed to assess reading and writing of students and to plan appropriate instruction. Prerequisite: CI 6400

### **CI 5480 READING ASSESSMENT AND REMEDIATION PRACTICUM**

[3 hours] Focus on diagnostic assessment that represents differences in learners and emphasizes meeting student needs through a variety of instructional strategies to remediate problems in phonics, word recognition, fluency, comprehension and writing.



**CI 5490 CONTENT AREA READING FOR ADOLESCENT YOUNG ADULT, MULTI-AGE, AND CAREER AND TECHNICAL EDUCATION TEACHERS**

[3 hours] Study of the integration of reading comprehension, writing, oral language and word skill development in content reading. Attention will be given to instructional methods as well as assessment practices.

**CI 5510 MATHEMATICS FOR THE YOUNG CHILD**

[3 hours] Development of mathematical understanding in young children, appropriate learning and assessment experiences and analysis of curriculum. Mathematics focus on place value, number sense, geometry, measurement, algebra, data analysis and probability.

**CI 5520 MATHEMATICS FOR THE MIDDLE SCHOOL**

[3 hours] Conceptualization of mathematics curriculum and its implementation in the classroom. The inductive approach will be emphasized. Examination of middle school math concepts.

**CI 5530 TEACHING GEOMETRY IN GRADES K-12**

[3 hours] Examination of the development of mathematics concepts and skills across the K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice.

**CI 5540 TEACHING ALGEBRA IN GRADES K-12**

[3 hours] Examination of the development of mathematics concepts and skills across the K-12 curriculum. Discussion of mathematics content, teaching methods, instructional materials, assessment techniques and applications to classroom practice.

**CI 5550 TEACHING PROBLEM SOLVING IN MATHEMATICS**

[3 hours] Focuses on the art of problem solving and methods and materials for classroom implementation. Consideration given to current trends and related resource regarding use of problem solving in mathematics teaching. :01 grades K-8; :02 grades 7-12

**CI 5570 CURRICULUM ISSUES IN MATHEMATICS**

[3 hours] Focuses on the content of the 7-12 mathematics curriculum and its delivery in secondary schools. Consideration is given to the role of technology, proficiency testing, conceptualizations of mathematics and resulting implications. Prerequisite: CI 5160

**CI 5640 ENVIRONMENTAL EDUCATION**

[3 hours] Issues, methods and materials related to teaching environmental science in grades PreK-12. Field trips to areas of environmental interest will be part of the course.

**CI 5670 SCIENCE IN THE MIDDLE SCHOOL CURRICULUM**

[3 hours] Nature, scope and role of science experiences in learning and development of middle school age children; integration and application of current developments; theory and research in middle school science education.

**CI 5680 ISSUES IN SCIENCE EDUCATION**

[3 hours] This course focuses on theoretical issues related to teaching science in grades preK-12 and is designed for preservice teachers. Prerequisite: CI 5170; advanced professional standing

**CI 5690 PROJECT-BASED SCIENCE**

[3 hours] Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.

**CI 5710 TEACHING STRATEGIES IN MULTICULTURAL EDUCATION**

[3 hours] Examines multicultural curriculum and instructional issues. Reviews diversity issues. Reviews diversity issues, pluralistic curricula, selection and development of instructional materials, grouping practices, assessment of learning and multi-ethnic schools. Emphasis on improving instruction.

**CI 5720 ISSUES IN SOCIAL STUDIES**

[3 hours] Examines current issues of content and pedagogy in secondary social studies. Prerequisite: CI 5180

**CI 5740 MODELS OF VALUING**

[3 hours] Rationale, research and strategies for character education, values clarification, moral development and self concept programs. Students will do a critical review of programs in values education.

**CI 5760 TEACHING LOCAL HISTORY**

[3 hours] Rationale, strategies and resources for teaching local history including demonstrations of teaching oral history and utilization of community resources.

**CI 5790 USING NEWS MEDIA IN THE CLASSROOM**

[3 hours] Rationale and strategies for using newspapers as classroom resource for teaching across curriculum. Explore classroom applications after interviewing reporters, photographers, cartoonists as well as Newspaper in Education classroom teachers.

**CI 5810 INSTRUCTIONAL STRATEGIES**

[3 hours] Purposes of classroom instruction and role of the teacher. Investigation and characteristics of mediated instruction, lecture-recitation, inductive discussion and inquiry and cooperative learning models. Modeling activities.

**CI 5820 ANALYSIS OF SCHOOL CURRICULUM & TEACHING**

[3 hours] Introduction to curriculum and teaching for initial 1-8 certification at the graduate level. Analysis of classroom management, curriculum and instructional planning and evaluation strategies. Unit and lesson preparations.

**CI 5830 TEACHING IN THE MIDDLE AND JUNIOR HIGH**

[3 hours] An exploration of quality teaching in middle grades schools (5-9) including historical and philosophical foundations, developmental traits of students, current curriculum, teaching strategies, discipline and classroom management and evaluation.

**CI 5860 MIDDLE-JUNIOR HIGH CURRICULUM**

[3 hours] An exploration of the junior high and middle school curriculum including philosophical, psychological and historical bases, current organization and design and principles of curriculum development. Designing developmentally-appropriate curriculum is stressed.

**CI 5870 SECONDARY SCHOOL CURRICULUM**

[3 hours] Exploration of senior high school curriculum. Social, psychological, historical and philosophical foundations. Curriculum organization and design. Sources of curriculum.

**CI 5880 THINKING WORKS: COMPREHENSIVE CONTENT READING**

[3 hours] This course explores innovative research-based instructional strategies that show students how to teach comprehension as a constructive process in all curricula areas. It explores alternative methods for addressing the needs of less advanced students and multicultural populations.

**CI 5950 WORKSHOP IN CURRICULUM & INSTRUCTION**

[1-5 hours] Workshops developed around topics of interest and concern to inservice teachers. Practical application of workshop topics will be emphasized. Students may include several workshops in their master's or specialist degree programs.

**CI 5980 SPECIAL TOPICS IN CURRICULUM & INSTRUCTION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers within school districts and agencies. Stresses solution and resolution of education problems occurring within the district.

**CI 5990 GRADUATE INDEPENDENT STUDY IN CURRICULUM AND INSTRUCTION**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty of the Department of Curriculum and Instruction.

**CI 6370 FUNDAMENTALS OF GRANT WRITING**

[3 hours] This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.

**CI 6400 TRENDS IN LITERACY ACQUISITION**

[3 hours] Study of the theories and problems of literacy instruction. Factors affecting literacy development including organizations and climate of the classroom texts and instructional methods will be considered.

**CI 6410 CONTENT AREA LITERACY**

[3 hours] Study of the integration of reading and writing in the content areas. Attention will be given to instructional methods as well as assessment practices. Prerequisite: CI 6400

**CI 6420 CONTENT AREA LITERACY FOR SECONDARY TEACHERS**

[3 hours] Study of the integration of reading and writing in the content areas. Attention will be given to instructional methods as well as assessment practices.

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### **CI 6430 DIAGNOSIS OF READING DISABILITY**

[3 hours] Teachers acquire the knowledge and skill needed to assess the reading and writing of students and to plan appropriate instruction. Prerequisite: CI 6400

### **CI 6440 REMEDIATION PRACTICUM**

[3 hours] Focus on comprehension, vocabulary and word identification strategies for supporting disabled readers in the regular classroom in learning to read independently. Prerequisite: CI 6400, 6430

### **CI 6460 WRITING PROCESS**

[3 hours] Understanding and implementation of writing process in elementary classrooms, focusing on helping students write more effectively in three genre-fiction, nonfiction and poetry, as well as on evaluating student writing.

### **CI 6470 INTEGRATING LANGUAGE ARTS ACROSS THE CURRICULUM**

[3 hours] Addresses the philosophical underpinnings of integrated instruction as well as practical aspects of its implementation. Students incorporate literature and instructional strategies in thematic units.

### **CI 6490 THEORY AND RESEARCH IN LITERACY**

[3 hours] Extensive examination of current research in literacy instruction. The influence of scientific studies on teaching procedures, materials and contexts of learning will be considered. Prerequisite: :01 Reading: CI 6400, 6430, 6440, and 6410 or 6420, :02 English Education: None

### **CI 6590 THEORY AND RESEARCH IN MATHEMATICS EDUCATION**

[3 hours] Analysis of the latest research in mathematics curriculum of the elementary school. A critical appraisal is made of current issues in mathematics instruction.

### **CI 6690 THEORY AND RESEARCH IN SCIENCE EDUCATION**

[3 hours] Critical appraisal of current issues and trends in science education research. Emphasis on research investigations concerning concepts and issues in science learning theory, curriculum development and assessment.

### **CI 6750 CHILDREN OF SUBSTANCE ABUSE-STRATEGIES AND CURRICULUM MATERIALS**

[3 hours] Examination of family substance abuse and dysfunction. Hidden learning, roles and patterns of behavior among COSAs. Strategies and materials for elementary, middle school, junior high COSAs.

### **CI 6790 THEORY AND RESEARCH IN SOCIAL STUDIES**

[3 hours] Intensive study of contemporary developments in social studies including national standards, current research and major publications.

### **CI 6800 FOUNDATIONS OF CURRICULUM & INSTRUCTION**

[3 hours] Consideration is given to major conceptualizations (models) of curriculum and instruction - classical, technological, personalized and interactional. Stress is placed upon the philosophical, psychological and historical determinants of these curricular models.

### **CI 6810 CURRICULUM DEVELOPMENT: K-12**

[3 hours] Study of essential structural components of curriculum. Role of the educator in making defensible curriculum decisions. Issues related to curricular aims, content, designs and evaluation are examined with the assistance of curriculum theory.

### **CI 6820 PROGRAM DEVELOPMENT FOR NON-SCHOOL SETTINGS**

[3 hours] Program development for community agency personnel training and staff development. Principles of curriculum design applied to non-school programs. Model for design; evaluation.

### **CI 6830 CURRICULUM TRENDS AND ISSUES**

[3 hours] Analysis of current curriculum developments in public school education such as the major curriculum reform projects, individualization of programs, compensatory programs, ITU and programmed instructional packages and related developments.

### **CI 6840 CURRICULUM FOR EDUCATIONAL LEADERS**

[3 hours] Study of initiating and implementing curriculum change in the school setting. Students will build upon a review and examine key theories of educational leadership concerned with curriculum development.

### **CI 6900 MASTERS RESEARCH SEMINAR IN CURRICULUM AND INSTRUCTION**

[2-3 hours] Examination of research and current issues in curriculum and instruction. Emphasis on theory and research and evaluation models. Preparation and submission of article manuscript. Prerequisite: CI 6490, 6590, 6690, 6790 or CIEC 6950

### **CI 6920 MASTERS RESEARCH PROJECT IN CURRICULUM AND INSTRUCTION**

[1-3 hours] Students will complete an individual research project under the direction of a committee of at least two faculty members in Curriculum and Instruction, ordinarily including the faculty adviser.

### **CI 6940 INTERNSHIP IN CURRICULUM AND INSTRUCTION**

[1-3 hours] Placement of a masters student in an appropriate school district setting under direction of a CI instructor.

### **CI 6960 MASTERS THESIS IN CURRICULUM AND INSTRUCTION**

[1-3 hours] Students will complete a thesis under the direction of committee of at least two faculty members from Curriculum and Instruction, ordinarily including the faculty adviser.

### **CI 7460 THEORY & PRACTICE IN LANGUAGE ARTS**

[3 hours] Advanced methods for teaching and integrating language arts in diverse classrooms. Emphasis is on understanding the reading and writing process from emergent literacy through middle school.

### **CI 7690 PROJECT-BASED SCIENCE**

[3 hours] Advanced methods for teaching science to engage learners in extended inquiry as they investigate real-world questions. Emphasis on innovative instructional strategies, research and theoretical perspectives to promote deep understanding of fundamental concepts.

### **CI 7810 INSTRUCTIONAL STRATEGIES**

[3 hours] Purposes of classroom instruction and role of the teacher. Investigation and characteristics of mediated instruction, lecture-recitation, inductive discussion and inquiry and cooperative learning models. Modeling activities.

### **CI 7830 TEACHING IN THE MIDDLE AND JUNIOR HIGH**

[3 hours] An exploration of quality teaching in middle grades schools (5-9) including historical and philosophical foundations, developmental traits of students, current curriculum, teaching strategies, discipline and classroom management and evaluation.

### **CI 7860 MIDDLE-JUNIOR HIGH CURRICULUM**

[3 hours] An exploration of the junior high and middle school curriculum including philosophical, psychological and historical bases, current organization and design and principles of curriculum development. Designing developmentally-appropriate curriculum is stressed.

### **CI 7870 SECONDARY SCHOOL CURRICULUM**

[3 hours] Exploration of senior high school curriculum. Social, psychological, historical and philosophical foundations. Curriculum organization and design. Sources of curriculum.

### **CI 7880 THINKING WORKS: COMPREHENSIVE CONTENT READING**

[3 hours] This course explores innovative research-based instructional strategies that show students how to teach comprehension as a constructive process in all curricula areas. It explores alternative methods for addressing the needs of less advanced students and multicultural populations.

### **CI 7940 SPECIALIST PRACTICUM IN CURRICULUM AND INSTRUCTION**

[1-3 hours] Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.

### **CI 7980 SPECIAL TOPICS IN CURRICULUM & INSTRUCTION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers within school districts and agencies. Stresses solution and resolution of education problems occurring within the district.

### **CI 8370 FUNDAMENTALS OF GRANT WRITING**

[3 hours] This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.

### **CI 8400 TRENDS IN LITERACY ACQUISITION**

[3 hours] Study of the theories and problems of literacy instruction. Factors affecting literacy development including organizations and climate of the classroom texts and instructional methods will be considered.

### **CI 8410 CONTENT AREA LITERACY**

[3 hours] Study of the integration of reading and writing in the content areas. Attention will be given to instructional methods as well as assessment practices. Prerequisite: CI 6400

**CI 8420 CONTENT AREA LITERACY FOR SECONDARY TEACHERS**

[3 hours] Study of the integration of reading and writing in the content areas. Attention will be given to instructional methods as well as assessment practices.

**CI 8430 DIAGNOSIS OF READING DISABILITY**

[3 hours] Teachers acquire the knowledge and skill needed to assess the reading and writing of students and to plan appropriate instruction. Prerequisite: CI 6400

**CI 8440 REMEDIATION PRACTICUM**

[3 hours] Focus on comprehension, vocabulary and word identification strategies for supporting disabled readers in the regular classroom in learning to read independently. Prerequisite: CI 6400, 6430

**CI 8460 WRITING PROCESS**

[3 hours] Understanding and implementation of writing process in elementary classrooms, focusing on helping students write more effectively in three genre-fiction, nonfiction and poetry, as well as on evaluating student writing.

**CI 8470 INTEGRATING LANGUAGE ARTS ACROSS THE CURRICULUM**

[3 hours] Addresses the philosophical underpinnings of integrated instruction as well as practical aspects of its implementation. Students incorporate literature and instructional strategies in thematic units.

**CI 8490 THEORY AND RESEARCH IN LITERACY**

[3 hours] Extensive examination of current research in literacy instruction. The influence of scientific studies on teaching procedures, materials and contexts of learning will be considered. Prerequisite: :01 Reading, CI 6400, 6430, 6440, and 6410 or 6420, :02 English Education, None

**CI 8590 THEORY AND RESEARCH IN MATHEMATICS EDUCATION**

[3 hours] Analysis of the latest research in mathematics curriculum of the elementary school. A critical appraisal is made of current issues in mathematics instruction.

**CI 8690 THEORY AND RESEARCH IN SCIENCE EDUCATION**

[3 hours] Critical appraisal of current issues and trends in science education research. Emphasis on research investigations concerning concepts and issues in science learning theory, curriculum development and assessment.

**CI 8750 CHILDREN OF SUBSTANCE ABUSE-STRATEGIES AND CURRICULUM MATERIALS**

[3 hours] Examination of family substance abuse and dysfunction. Hidden learning, roles and patterns of behavior among COSAs. Strategies and materials for elementary, middle school, junior high COSAs.

**CI 8790 THEORY AND RESEARCH IN SOCIAL STUDIES**

[3 hours] Intensive study of contemporary developments in social studies including national standards, current research and major publications.

**CI 8800 FOUNDATIONS OF CURRICULUM & INSTRUCTION**

[3 hours] Consideration is given to major conceptualizations (models) of curriculum and instruction - classical, technological, personalized and interactional. Stress is placed upon the philosophical, psychological and historical determinants of these curricular models.

**CI 8810 CURRICULUM DEVELOPMENT: K-12**

[3 hours] Study of essential structural components of curriculum. Role of the educator in making defensible curriculum decisions. Issues related to curricular aims, content, designs and evaluation are examined with the assistance of curriculum theory.

**CI 8820 PROGRAM DEVELOPMENT FOR NON-SCHOOL SETTINGS**

[3 hours] Program development for community agency personnel training and staff development. Principles of curriculum design applied to non-school programs. Model for design; evaluation.

**CI 8830 CURRICULUM TRENDS AND ISSUES**

[3 hours] Analysis of current curriculum developments in public school education such as the major curriculum reform projects, individualization of programs, compensatory programs, ITU and programmed instructional packages and related developments.

**CI 8840 CURRICULUM FOR EDUCATIONAL LEADERS**

[3 hours] Study of initiating and implementing curriculum change in the school setting. Students will build upon a review and examine key theories of educational leadership concerned with curriculum development.

**CI 8860 ADVANCED CURRICULUM THEORY**

[3 hours] Problems of conducting systematic inquiry in the curriculum field. Students will discuss ideas and research of curriculum scholars. Requires the ability to analyze and evaluate current programs and scholarly writing.

**CI 8870 CURRICULUM CRITICISM**

[3 hours] An in-depth investigation of the foundations of curriculum inquiry with specific emphasis on the application of contemporary philosophy, curricular criticism and possibility in the design of educational programs.

**CI 8900 DOCTORAL SEMINAR IN CURRICULUM AND INSTRUCTION**

[2-4 hours] This seminar will consider problems and provide advanced study for doctoral students in Curriculum and Instruction.

**CI 8930 INDEPENDENT RESEARCH IN CURRICULUM AND INSTRUCTION**

[1-5 hours] Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of CI faculty.

**CI 8940 DOCTORAL INTERNSHIP IN CURRICULUM AND INSTRUCTION**

[1-3 hours] Placement of doctoral students in appropriate school, school district, or other professional setting under direction of joint placement personnel and CI faculty.

**CI 8960 DISSERTATION IN CURRICULUM AND INSTRUCTION**

[1-10 hours] Original research in an area of curriculum and instruction.

## CIEC - Curriculum & Instruction: Early Childhood Education

### Department of Early Childhood, Physical and Special (EDU)

**CIEC 1900 ECE LINKING SEMINAR I**

[1 hour] A reading and discussion seminar which provides an opportunity to broaden a student's intellectual and cultural perspective by understanding key concepts and tools of inquiry associated with the content of the Humanities, Sciences and Social Sciences that inform and influence Early Childhood curriculum. Prerequisite: Second semester freshman standing Corequisite: Enrolled in a Humanities, Science or Social Science course

**CIEC 2900 ECE LINKING SEMINAR II**

[1 hour] A reading and discussion seminar that continues and intensifies the activities of CIEC 1900. In addition, students will engage internet resources to explore the content of the Humanities, Sciences and Social Sciences that inform and influence Early Childhood curriculum. Prerequisite: Sophomore standing and CIEC 1900 Corequisite: enrolled in a Humanities, Science or Social Science course

**CIEC 3200 EARLY CHILDHOOD EDUCATION: PHILOSOPHY AND PRACTICE**

[3 hours] The course emphasizes the role, attitude and characteristics of the effective teacher of young children. Prerequisite: TSOC 1500

**CIEC 3250 PUBLIC POLICY AND ADVOCACY ISSUES IN EARLY CHILDHOOD**

[2 hours] Designed to heighten an awareness about the effect of public policy on young children, their educational opportunities and their parents and sensitize students to advocacy and its many manifestations. Prerequisite: Jr. standing

**CIEC 3310 CURRICULUM AND METHODS FOR PRESCHOOL EDUCATION**

[4 hours] In-depth study of curriculum development, designing learning environments and anti-bias procedures for preschool children. Students will plan and implement learning activities in field placement. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand

**CIEC 3320 PLAY AND LEARNING**

[3 hours] A study of the young child's play and its relationship to learning. Students will design activities and a socio-dramatic play kit to facilitate play in assigned early childhood settings. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Standing

**CIEC 3350 CHILD, FAMILY & PUBLIC POLICY IN EARLY CHILDHOOD**

[3 hours] This course is designed to establish awareness of public policy issues and advocacy techniques, knowledge of family systems, effective home/school communication and collaborative procedures. Prerequisite: Admission to professional standing; Corequisite: CIEC/SPED 3380, CIEC/SPED 3390, TSOC 3000

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### **CIEC 3380 FIELD EXPERIENCE: SOCIO-CULTURAL DIMENSIONS OF EDUCATION**

[2 hours] This course is designed to explore the socio-cultural context of the school, family and community as important influences in learning. Students will be assigned to work with a family, gather data and information about their field sites and attend IEP and IFSP conferences. Prerequisite: Admission to professional standing Corequisite: CIEC/SPED 3350, CIEC/SPED 3390, TSOC 3000

### **CIEC 3390 INTEGRATIVE SEMINAR: SOCIO-CULTURAL DIMENSIONS OF EDUCATION**

[2 hours] Seminar will provide opportunity for students and faculty to share, discuss and explore the socio-cultural context of the schools in which they are doing their field experiences. Students will collect, analyze and report data related to the setting where they are working. Prerequisite: Admission to professional standing Corequisite: CIEC 3350, CIEC 3380, TSOC 3000

### **CIEC 3900 ECE LINKING SEMINAR III**

[1 hour] A culminating reading and discussion seminar that continues and intensifies the activities of earlier seminars (CIEC 1900 and 2900). Emphasis will be on transforming the content of the Humanities, Sciences and Social Sciences into appropriate Early Childhood curriculum. Prerequisite: Junior standing, completion of CIEC 1900 and 2900 Corequisite: enrolled in a Humanities, Science or Social Science course

### **CIEC 4070 EFFECTIVE TEACHING PRACTICES, PRE-K TO 3RD GRADE**

[5 hours] This course is designed to apply characteristics of best practice to curriculum development and implementation with adherence to the national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs. Prerequisite: Admission to professional standing, TSOC 3000, CIEC 3350, CIEC 3430, CIEC 3390, CI 4510, CI 3430, CI 3460 Corequisite: SPED 4080, CI 3460, CIEC 4490

### **CIEC 4150 SETTING THE STAGE FOR EARLY CHILDHOOD LEARNING: INSPIRATIONS FROM REGGIO EMILIA**

[3 hours] This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.

### **CIEC 4340 INFANT/TODDLER CURRICULUM**

[3 hours] Sequential development of the young child from birth to 3 years. Taken in conjunction with placement in early childhood setting, permitting opportunities to participate in the caregiving of infants/toddlers. Prerequisite: EDP 3210, SPED 3220, CIEC 3200, admission to professional education

### **CIEC 4350 INFANT/TODDLER CURRICULUM**

[3 hours] Sequential development of the young child from birth to 3 years. Taken in conjunction with placement in early childhood setting, permitting opportunities to participate in the caregiving of infants/toddlers. Prerequisite: EDP 2970; CIEC 3200; Adv Prof Stand

### **CIEC 4380 PRACTICUM: PRESCHOOL**

[1-2 hours] Practicum experience in preschool settings where students will observe, plan, implement and evaluate activities. Students will spend two half days per week in their field placements. Prerequisite: CIEC 3200, 3310, 3320; EDP 2970 Corequisite: CIEC 4390

### **CIEC 4390 PRESCHOOL SEMINAR**

[2 hours] Planning, teacher made materials and managing classrooms will be covered. Prerequisite: EDP 2970; CIEC 3310, 3320; Adv Prof Stand Corequisite: CIEC 4380

### **CIEC 4480 INTEGRATIVE FIELD EXPERIENCE: BEST PRACTICES**

[5 hours] A five half day a week field experience in an inclusive Pre-K or primary classroom with focus on the implementation of content and skill based curriculum using the best practice methods and the integration of appropriate technology. Prerequisite: Admission to professional standing, TSOC 3000, CIEC/SPED 3350, CIEC/SPED 3380, CIEC 3390, CI 4510, CI 3430, CI 3460 Corequisite: SPED 4080, CIEC/SPED 4490, CIEC 4070

### **CIEC 4490 INTEGRATIVE SEMINAR: BEST PRACTICES**

[2 hours] A seminar designed to provide a forum for group sharing and reflection about curricular design and implementation in the inclusive Pre-K and kindergarten-grade 3 field settings. Prerequisite: Admission to professional standing, TSOC 3000, CIEC/SPED 3350, CIEC/SPED 3380, CIEC 3390, CI 4510, CI 3430, CI 3460 Corequisite: SPED 4080, CIEC 4480, CIEC 4070

### **CIEC 4510 LANGUAGE AND LITERACY**

[3 hours] A study of the language, literacy and concept development of the young child with emphasis on the factors that influence this development and classroom practice which fosters their development.

### **CIEC 4520 MULTISENSORY EXPERIENCES**

[3 hours] Developmental, sensory and neurological principles underlying the planning and implementation of developmentally appropriate learning activities for young children. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand

### **CIEC 4530 AFFECTIVE EXPERIENCES**

[3 hours] Emphasizes the rationale and methods for providing a wholesome affective environment for young children in preschool and primary settings. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand

### **CIEC 4540 PRE-KINDERGARTEN PROGRAMS**

[3 hours] Provides early childhood educators with skills and knowledge related to the successful operation of an early childhood center, school, or program. Standards and regulations as set forth by State licensing agencies as well as accreditation by NAEYC will be covered. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand

### **CIEC 4580 PRACTICUM: INFANT/TODDLER**

[1 hour] Practicum experience in infant/toddler settings where students will observe, plan, implement and evaluate activities. Prerequisite: CIEC 4350; EDP 2970 Corequisite: CIEC 4590

### **CIEC 4590 INFANT/TODDLER SEMINAR**

[2 hours] Planning, teacher made materials and the environment for infant and toddlers will be covered. Prerequisite: CIEC 3200, 4350; EDP 2970 Corequisite: CIEC 4580

### **CIEC 4750 DEVELOPMENTAL ASSESSMENT IN EARLY CHILDHOOD**

[3 hours] This course focuses on methods of assessment in early childhood classrooms. Issues covered include methods of observation, interpreting formal assessment results and using information gained from assessment to plan curriculum. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand Corequisite: CIEC 4760

### **CIEC 4760 PRINCIPLES OF DEVELOPMENTALLY APPROPRIATE CURRICULUM**

[4 hours] A study of the principles and knowledge base for designing developmentally appropriate curriculum and classroom environments. Principles of anti-bias education are also addressed. Students make observations in four K to grade 3 classrooms. Prerequisite: CIEC 3200; EDP 2970; Adv Prof Stand Corequisite: CIEC 4750

### **CIEC 4770 PRACTICUM: KINDERGARTEN**

[2 hours] Practicum experience in kindergarten settings where students will observe, plan, implement and evaluate activities. Prerequisite: CIEC 4750, 4760; Adv Prof Stand Corequisite: CIEC 4790

### **CIEC 4790 KINDERGARTEN SEMINAR**

[2 hours] Planning, research, teacher made materials appropriate for environments for kindergarten children will be covered. Prerequisite: CIEC 4750, 4760 Corequisite: CIEC 4770

### **CIEC 4900 INTERNSHIP/STUDENT TEACHING SEMINAR**

[2 hours] A seminar designed to reflect on the student teaching experience and to enhance the student teacher's final preparation for employment. Professional issues, ethical behavior, resume and interview techniques and other processes and professional entry concerns. For early childhood student teachers. Corequisite: CIEC 4930

### **CIEC 4910 ECE SENIOR RESEARCH PROJECT**

[2 hours] The internship senior will complete an action research study or related topic about student learning. In addition to a completed paper, the student will give a multi-media presentation that clearly articulates the research question/problem, methods used in the study and the results of the study. Prerequisite: Admission to professional standing Corequisite: CI 3430

### **CIEC 4930 INTERNSHIP/STUDENT TEACHING**

[8-16 hours] Planned experience in public school classrooms under direction of University supervisor. Observation of teaching of experienced teacher; gradual acceptance of full responsibility by student teacher for planning, instruction, evaluation and related duties. Prerequisite: 100 semester hours, Adv Prof Standing, 90% major/core, All Prof Courses, 2.5 GPA Corequisite: CIEC 4900, CI 4060 and 4070

### **CIEC 4950 WORKSHOP I EARLY CHILDHOOD EDUCATION**

[1-5 hours] Workshop developed around topics of interest and concern for pre-service and in-service teachers and other education personnel. Practical application of workshop topics will be emphasized.

### **CIEC 4980 SPECIAL TOPICS IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] Topics of interest and concern to preservice, inservice and non-degree teachers within districts and community agencies served by the Center for Educational Development. May be included in an undergraduate degree program.

**CIEC 4990 UNDERGRADUATE INDEPENDENT STUDY IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the Early Childhood faculty.

**CIEC 5000 ECE: PHILOSOPHY AND PRACTICE**

[3 hours] A comprehensive introduction to the profession of early childhood education by examining relevant issues as they relate to overall development of children ages birth to eight years.

**CIEC 5070 EFFECTIVE TEACHING PRACTICES: PRE-K TO 3RD GRADE**

[3 hours] Applies characteristics of best practice to curriculum development and implementation with adherence to national and state curriculum standards as they apply to children, age 3 to 8, with diverse educational needs. Prerequisite: CIEC 5000, EDP 5210, SPED 5010 Corequisite: SPED 6070, CIEC 4490, CIEC 4480

**CIEC 5150 SETTING THE STAGE FOR EARLY CHILDHOOD LEARNING: INSPIRATIONS FROM REGGIO EMILIA**

[3 hours] This course will explore Reggio's philosophy of early childhood education and the numerous ways that children explore the "hundred languages." Reggio uses these languages (art, clay, wire, sculpture, light, shadow, etc.) as a way to help children represent their world and what they know about it.

**CIEC 5340 INFANT/TODDLER CURRICULUM**

[3 hours] Introduction to the sequential development of the young child from birth to 3 years. Students will engage in field hours in infant-toddler settings, design learning materials and critique research in topics related to infant/toddler curriculum.

**CIEC 5380 PRACTICUM: PRESCHOOL**

[1-2 hours] Practicum experience in pre-kindergarten settings where students will observe, plan, implement and evaluate activities. Students will spend two half-days per week in their field placements. Prerequisite: CIEC 6/8310; Child Development Course; CIEC 6/8320 Corequisite: CIEC 5390

**CIEC 5390 PRESCHOOL SEMINAR**

[2 hours] Planning, teacher made materials and managing classrooms will be covered. Prerequisite: CIEC 6/8310; Child Development Course Corequisite: CIEC 5380

**CIEC 5520 MULTISENSORY EXPERIENCES**

[3 hours] Development and sensory principles underlying the planning and implementation of developmentally appropriate learning activities for young children. Technical content will include the physical and neurological bases for learning.

**CIEC 5530 AFFECTIVE EXPERIENCES**

[3 hours] This course focuses on teacher planning and activities that support the socio-emotional development of young children.

**CIEC 5540 PREKINDERGARTEN PROGRAMS**

[3 hours] Focuses on the successful operations of an early childhood program. Covers topics such as licensing and certification standards, staff development selection and purchase of equipment and proper food and health services.

**CIEC 5580 PRACTICUM: INFANT/TODDLER**

[1 hour] Practicum experience in infant/toddler settings where students will observe, plan, implement and evaluate activities. Prerequisite: CIEC 5350; Child Development Course Corequisite: CIEC 5590

**CIEC 5590 INFANT TODDLER/SEMINAR**

[2 hours] Planning, research, teacher-made materials appropriate for environments for infants and toddlers will be covered. Prerequisite: Child Development; CIEC 5350 Corequisite: CIEC 5580

**CIEC 5770 PRACTICUM: KINDERGARTEN**

[2 hours] Practicum experience in kindergarten settings where students will observe, plan, implement and evaluate activities. Prerequisite: CIEC 6/8310; Child Development Course, CIEC 6/8320 Corequisite: CIEC 5790

**CIEC 5790 KINDERGARTEN SEMINAR**

[2 hours] Seminar to accompany the 2, half days per week in-field experience related to CIEC 5770. Planning, research, teacher made materials appropriate for environments for kindergarten children will be covered. Prerequisite: Child Development Course; CIEC 6/8310; CIEC 6/8320 Corequisite: CIEC 5770

**CIEC 5800 TEACHER/PARENT CHILD RELATIONS**

[3 hours] This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.

**CIEC 5950 WORKSHOP IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] Workshops developed around topics of interest and concern to inservice teachers. Practical application of workshop topics will be emphasized. Students may include several workshops in their master's or specialist degree programs.

**CIEC 5980 SPECIAL TOPICS IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers within districts served by the Center for Educational Research and Services. Stresses solution and resolution of educational problems occurring within the district.

**CIEC 5990 GRADUATE INDEPENDENT STUDY IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty in Early Childhood Education.

**CIEC 6310 PRE-K/PRIMARY CURRICULUM**

[3 hours] The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.

**CIEC 6320 MEANING AND DEVELOPMENT OF PLAY BEHAVIOR**

[3 hours] Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior. Prerequisite: Child Development Course

**CIEC 6330 LANGUAGE AND CONCEPT DEVELOPMENT**

[3 hours] Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.

**CIEC 6340 CURRICULUM DESIGN FOR INFANTS AND TODDLERS**

[3 hours] Introduction to the sequential development of the young child from birth to 3 years. Students will engage in field hours in infant-toddler settings, design learning materials and critique research in topics related to infant/toddler curriculum. Prerequisite: EDP 3220; CIEC 3200

**CIEC 6750 DEVELOPMENTAL AND CLASSROOM ASSESSMENT**

[3 hours] Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.

**CIEC 6900 MASTERS RESEARCH SEMINAR IN EARLY CHILDHOOD EDUCATION**

[2-3 hours] Examination of research and current issues in early childhood education. Emphasis on theory and research and evaluation models. Prerequisite: CI 6490, 6590, 6690, 6790

**CIEC 6920 MASTERS RESEARCH PROJECT IN EARLY CHILDHOOD EDUCATION**

[1-3 hours] Student will complete an individual research project under the direction of a committee of at least two faculty members in Early Childhood ordinarily involving the faculty advisor.

**CIEC 6940 INTERNSHIP IN EARLY CHILDHOOD**

[1-3 hours] Placement of a Master's student in an appropriate PreK-Grade 3 school setting under the direction of a CIEC instructor.

**CIEC 6950 THEORY AND RESEARCH IN EARLY CHILDHOOD**

[3 hours] Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.

**CIEC 6960 MASTERS THESIS IN EARLY CHILDHOOD EDUCATION**

[1-3 hours] Students who elect this option will complete a thesis under the direction of committee of at least two faculty members from Early Childhood Education, ordinarily including the faculty advisor.

**CIEC 7800 TEACHER/PARENT CHILD RELATIONS**

[3 hours] This course is designed to assist the classroom teacher in building positive relationships with the parents of students and to develop effective strategies for communicating with them.

**CIEC 7940 SPECIALIST PRACTICUM IN EARLY CHILDHOOD EDUCATION**

[1-3 hours] Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.

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### **CIEC 7980 SPECIAL TOPICS IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers within districts served by the Center for Educational Research and Services. Stresses solution and resolution of educational problems occurring within the district.

### **CIEC 8310 PRE-K/PRIMARY CURRICULUM**

[3 hours] The study and design of early childhood curriculum from a best practice/developmental perspective including integrated curriculum, anti-bias approaches, authentic assessment, direct learning strategies. Student self assessment and change project required.

### **CIEC 8320 MEANING AND DEVELOPMENT OF PLAY BEHAVIOR**

[3 hours] Theoretical bases of play behavior and its role in curriculum development/assessment. Students implement and evaluate a sociodramatic play kit and conduct library research on one aspect of play behavior. Prerequisite: Child Development Course

### **CIEC 8330 LANGUAGE AND CONCEPT DEVELOPMENT**

[3 hours] Study of the language and literacy development of the young child with emphasis upon the factors that influence and support this development. Students will do projects to implement their learning.

### **CIEC 8340 CURRICULUM DESIGN FOR INFANTS AND TODDLERS**

[3 hours] Introduction to the sequential development of the young child from birth to 3 years. Students will engage in field hours in infant-toddler settings, design learning materials and critique research in topics related to infant/toddler curriculum. Prerequisite: EDP 3220; CIEC 3200

### **CIEC 8750 DEVELOPMENTAL AND CLASSROOM ASSESSMENT**

[3 hours] Focuses upon teaching and learning in a developmental learning environment. Emphases includes observing the developmental characteristics of young children and assessment for prescriptive teaching.

### **CIEC 8900 DOCTORAL SEMINAR IN EARLY CHILDHOOD EDUCATION**

[2-4 hours] This seminar will consider problems and provide advanced study for doctoral students in Early Childhood Education.

### **CIEC 8930 INDEPENDENT RESEARCH IN EARLY CHILDHOOD EDUCATION**

[1-5 hours] Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of Early Childhood faculty.

### **CIEC 8940 DOCTORAL INTERNSHIP IN EARLY CHILDHOOD**

[1-3 hours] Placement of doctoral students in an appropriate PreK-Grade 3 school, school district or other professional setting under the direction of joint placement personnel and CIEC faculty.

### **CIEC 8950 THEORY AND RESEARCH IN EARLY CHILDHOOD**

[3 hours] Review and analysis of theory and research related to rationale and methods for program options for young children. Critique research and prepare a review of synthesis of research.

### **CIEC 8960 DISSERTATION IN EARLY CHILDHOOD EDUCATION**

[1-12 hours] Original research in an area of early childhood education.

## **CIET - Curriculum & Instruction: Educational Technology**

### **Department of Curriculum & Instruction (EDU)**

### **CIET 2020 TECHNOLOGY AND MULTIMEDIA IN EDUCATIONAL ENVIRONMENTS**

[2 hours] Emphasizes the development of computing skills with a focus on productivity tools in organizing, managing, multimedia authoring, homepage development, software evaluation and presenting lessons for professional communication in K-12.

### **CIET 4010 SELECTION AND USE OF INSTRUCTIONAL MEDIA**

[3 hours] Examination of educational technology including communication principles, instructional design procedures and the proper selection and use of mediated instruction to improve learning.

### **CIET 4100 EDUCATIONAL COMPUTING: PRODUCTIVITY TOOLS**

[3 hours] Emphasizes developing skills in the use of this common productivity software and the use of computer technology in solving typical classroom problems.

### **CIET 4120 TELECOMMUNICATIONS IN EDUCATION**

[3 hours] Examination of telecommunications technology for instructional purposes. Collaborative learning, information storage and retrieval, teaching strategies using online technologies, developing access sites on the Internet. Prerequisite: CIET 4100

### **CIET 4150 DEVELOPING MULTIMEDIA INSTRUCTIONAL MATERIALS**

[3 hours] Designing and developing computer-based multimedia instructional materials. Examines the software, hardware and processes for developing multimedia instructional materials. Prerequisite: CIET 4100

### **CIET 4300 INSTRUCTIONAL TELEVISION PRODUCT**

[3 hours] ITV production/direction skills are practiced while the student produces and directs their own ITV production that may be used for classroom teaching or training in business.

### **CIET 4950 WORKSHOP IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Workshop developed around topics of interest and concern for pre-service and in-service teachers a other education personnel. Practical application of workshop topics will be emphasized.

### **CIET 4980 SPECIAL TOPICS IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Topics of interest and concern to pre-service, in-service and non-degree teachers within districts and community agencies served by the Center for Educational Development. May be included in an undergraduate degree

### **CIET 4990 UNDERGRADUATE INDEPENDENT STUDY IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of Educational Technology faculty.

### **CIET 5010 SELECTION AND USE OF INSTRUCTIONAL MEDIA**

[3 hours] An examination of educational technology which investigates communication principles, instructional design procedures and the proper selection and use of mediated instruction to improve learning.

### **CIET 5100 EDUCATIONAL COMPUTING: PRODUCTIVITY TOOLS**

[3 hours] Emphasizes developing skills in the use of this common productivity software and the use of computer technology in solving typical instructional problems.

### **CIET 5120 TELECOMMUNICATIONS IN EDUCATION**

[3 hours] Examination of telecommunications technology for instructional purposes. Collaborative learning, information storage and retrieval, teaching strategies using online technologies, developing access sites on the Internet. Prerequisite: CIET 5100

### **CIET 5150 DEVELOPING MULTIMEDIA INSTRUCTIONAL MATERIALS**

[3 hours] Designing and developing computer-based multimedia instructional materials. Examines the software, hardware and processes for developing multimedia instructional materials. Prerequisite: CIET 5100

### **CIET 5300 INSTRUCTIONAL TELEVISION PRODUCTION**

[3 hours] ITV production/direction skills are practiced while the student produces and directs their own ITV production that may be used for classroom teaching or training in business.

### **CIET 5950 WORKSHOP IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Workshops developed around topics of interest and concern to in-service teachers. Practical application of workshop topics will be emphasized. Students may include several workshops in their master's or specialist degree programs.

### **CIET 5980 SPECIAL TOPICS IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] A course developed around topics of interest and concern to in-service teachers within districts served by the Center for Educational Research and Services. Stresses solution and solution of educational problems occurring within the district.

### **CIET 5990 GRADUATE INDEPENDENT STUDY IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of the faculty in educational technology.

### **CIET 6300 PRINCIPLES OF INSTRUCTIONAL DEVELOPMENT**

[3 hours] Principles and procedures for designing, developing and evaluating instruction using an instructional systems approach. Emphasis is on replicable instructional designs and strategies and formative evaluation of an instructional design.

**CIET 6310 EDUCATIONAL AND INSTRUCTIONAL TELEVISION**

[3 hours] An investigation of the application of instructional television in schools and business. Emphasis on ITV research, strengths and weaknesses and television distance learning programs.

**CIET 6320 INSTRUCTIONAL DESIGN THEORY**

[3 hours] Examination of major theories underlying instructional design. Each phase of instructional design is examined for its theoretical base. Design, development and evaluation theories are emphasized. Prerequisite: CIET 6300

**CIET 6340 PRACTICUM IN INSTRUCTIONAL DEVELOPMENT**

[3 hours] Application of project management theory and practice in designing and developing instructional systems. Students are required to complete a design project with a client organization in an approved setting. Prerequisite: CIET 6300, 6320

**CIET 6350 DESIGNING INSTRUCTION FOR ADULT LEARNERS**

[3 hours] Research and application of instructional design to designing, developing and delivering instruction for adult learner populations. Emphasis on adult learning theory and principles. Prerequisite: CIET 6300

**CIET 6360 RESEARCH AND THEORY IN EDUCATIONAL TECHNOLOGY**

[3 hours] The investigation of research design, interpretation and evaluation of contemporary research in educational technology. The course required a research proposal having an introduction, survey of literature and methodology. Prerequisite: RESM 5110, 6320

**CIET 6370 CHANGE THEORY AND TECHNOLOGY**

[3 hours] Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

**CIET 6400 COMPUTER COURSEWARE DEVELOPMENT**

[3 hours] Design and development of instructional software using hypermedia development environments and strategies. Students will design and develop desktop presentations and various types of tutorials using hypermedia software. Prerequisite: CIET 5100, 5150

**CIET 6620 LIBRARY MEDIA: COLLECTION AND POLICY DEVELOPMENT**

[3 hours] Print and non-print collection development: Needs assessment, policy development, selection, acquisition and deselection of materials. Evaluation of fiction, non-fiction and reference materials. Intellectual freedom and censorship.

**CIET 6650 ADMINISTRATION AND INTEGRATION OF LIBRARY MEDIA SERVICES**

[3 hours] Systematic planning and management of school library media centers; strategic program planning, budget, public relations, facilities, personnel, security, integration and evaluation of information skills into the K-12 curriculum are examined.

**CIET 6680 CLASSIFICATION AND ORGANIZATION FOR THE LIBRARY MEDIA CENTER**

[3 hours] Organization of learning materials and equipment in school library media center: cataloging, classification, technical processing, organizational procedures, storage and retrieval. Emphasis on machine readable (MARC) cataloging, circulation systems and networking.

**CIET 6900 MASTERS RESEARCH SEMINAR I EDUCATIONAL TECHNOLOGY**

[2-3 hours] Examination of research and current issues in curriculum and instruction. Emphasis on theory and research and evaluation models.

**CIET 6920 MASTERS RESEARCH PROJECT IN EDUCATIONAL TECHNOLOGY**

[1-3 hours] Student will complete an individual research project under the orientation of a committee of at least two faculty members in Educational Technology, ordinarily including the faculty advisor.

**CIET 6940 INTERNSHIP IN EDUCATIONAL TECHNOLOGY**

[1-3 hours] Placement of a masters student in an appropriate school district setting under direction of Educational Technology faculty.

**CIET 6960 MASTERS THESIS IN EDUCATIONAL TECHNOLOGY**

[1-3 hours] Students who elect this option will complete a thesis under the direction of committee of at least two faculty members from Educational Technology, ordinarily including the faculty advisor.

**CIET 7940 SPECIALIST PRACTICUM IN EDUCATIONAL TECHNOLOGY**

[1-3 hours] Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel.

**CIET 7980 SPECIAL TOPICS IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] A course developed around topics of interest and concern to in-service teachers within districts served by the Center for Educational Research and Services. Stresses solution and resolution of educational problems occurring within the district.

**CIET 8300 PRINCIPLES OF INSTRUCTIONAL DEVELOPMENT**

[3 hours] Principles and procedures for designing, developing and evaluating instruction using an instructional systems approach. Emphasis is on replicable instructional designs and strategies and formative evaluation of an instructional design.

**CIET 8310 EDUCATIONAL AND INSTRUCTIONAL TELEVISION**

[3 hours] An investigation of the application of instructional television in schools and business. Emphasis on ITV research, strengths and weaknesses and television distance learning programs.

**CIET 8320 INSTRUCTIONAL DESIGN THEORY**

[3 hours] Examination of major theories underlying instructional design. Each phase of instructional design is examined for its theoretical base. Design, development and evaluation theories are emphasized. Prerequisite: CIET 6300

**CIET 8340 PRACTICUM IN INSTRUCTIONAL DEVELOPMENT**

[3 hours] Application of project management theory and practice in designing and developing instructional systems. Students are required to complete a design project with a client organization in an approved setting. Prerequisite: CIET 6300, 6320

**CIET 8350 DESIGNING INSTRUCTION FOR ADULT LEARNERS**

[3 hours] Research and application of instructional design to designing, developing and delivering instruction for adult learner populations. Emphasis on adult learning theory and principles. Prerequisite: CIET 6300

**CIET 8360 RESEARCH AND THEORY IN EDUCATIONAL TECHNOLOGY**

[3 hours] The investigation of research design, interpretation and evaluation of contemporary research in educational technology. The course required a research proposal having an introduction, survey of literature and methodology. Prerequisite: RESM 5110, 6320

**CIET 8370 CHANGE THEORY AND TECHNOLOGY**

[3 hours] Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

**CIET 8400 COMPUTER COURSEWARE DEVELOPMENT**

[3 hours] Design and development of instructional software using hypermedia development environments and strategies. Students will design and develop desktop presentations and various types of tutorials using hypermedia software. Prerequisite: CIET 5100, 5150

**CIET 8620 LIBRARY MEDIA: COLLECTION AND POLICY DEVELOPMENT**

[3 hours] Print and non-print collection development: Needs assessment, policy development, selection, acquisition and deselection of materials. Evaluation of fiction, non-fiction and reference materials. Intellectual freedom and censorship.

**CIET 8650 ADMINISTRATION AND INTEGRATION OF LIBRARY MEDIA SERVICES**

[3 hours] Systematic planning and management of school library media centers; strategic program planning, budget, public relations, facilities, personnel, security, integration and evaluation of information skills into the K-12 curriculum are examined.

**CIET 8680 CLASSIFICATION AND ORGANIZATION FOR THE LIBRARY MEDIA CENTER**

[3 hours] Organization of learning materials and equipment in school library media center: cataloging, classification, technical processing, organizational procedures, storage and retrieval. Emphasis on machine readable (MARC) cataloging, circulation systems and networking.

**CIET 8900 DOCTORAL SEMINAR IN EDUCATIONAL TECHNOLOGY**

[2-4 hours] This seminar will consider problems and provide advances study for doctoral students in educational technology.

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### **CIET 8930 INDEPENDENT RESEARCH IN EDUCATIONAL TECHNOLOGY**

[1-5 hours] Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of Educational Technology faculty.

### **CIET 8940 DOCTORAL INTERNSHIP IN EDUCATIONAL TECHNOLOGY**

[1-3 hours] Placement of doctoral students in appropriate school, school district, or other professional setting under direction of joint placement personnel and Educational Technology faculty.

### **CIET 8960 DISSERTATION IN EDUCATIONAL TECHNOLOGY**

[1-12 hours] Original research in an area of Educational Technology.

## **CIVE - Civil Engineering**

### **Department of Civil Engineering (ENG)**

#### **CIVE 1000 FRESHMAN CIVIL ENGINEERING EXPERIENCE**

[1 hour] Computer literacy, report writing, word processing, table creation, equation, equation writing, data manipulation, data graphical plotting. Introduction to various disciplines in Civil Engineering, Structural, Geotechnical, Transportation, Environmental. Practice in engineering problem solving process.

#### **CIVE 1100 MEASUREMENTS AND COMPUTER AIDED DESIGN FOR CIVIL ENGINEERS**

[4 hours] Study of graphical representations of engineering structures and systems and application by hand drawing and computer aided techniques. Instruments and methods for linear and angular measurements. Error theory and propagation. Familiarization with geographical information systems.

#### **CIVE 1150 ENGINEERING MECHANICS: STATICS**

[3 hours] Study of coplanar statics of particles, vector addition, resultant components, equilibrium, free body diagrams, equivalent force systems, vector products, scalar products, 2 & 3 dimensional equilibrium of rigid bodies, analysis of machines, pulleys, trusses. Centroids, moments of inertia, shear and bending moment diagrams. Prerequisite: MATH 1850, PHYS 2130

#### **CIVE 1160 ENGINEERING MECHANICS: STRENGTH OF MATERIALS**

[3 hours] Material properties. Axially loaded members, including eccentric loads and thin wall pressure vessels. Axial load applications: Stress-Strain relationships, Stress & Strain transformations. Torsion: solid sections, circular sections. Torsional load applications: Combined axial and torsion stress. Beams: shear and bending moment diagrams, bending stress, deflection. Beam load applications: Combined shear, torsion and bending stress. Buckling of long columns. Prerequisite: CIVE 1150

#### **CIVE 1170 FLUID MECHANICS FOR CIVIL ENGINEERS**

[3 hours] Fundamental concepts of fluid mechanics required for the solutions of air pollution problems, water resource problems and transportation problems. Use of continuity, momentum and energy equations and dimensional analysis. Application to pipe flow, open channel flow and boundary layer flow. Introduction to turbo machinery. Measurements of fluid flow and discussion on fluid flow devices. Prerequisite: PHYS 2130; MATH 1890 or 2890

#### **CIVE 2000 PROFESSIONAL DEVELOPMENT**

[1 hour] Basic concepts of career planning, co-op performance expectations, necessary skills for maximizing learning from experiences and realities of the professional community. Prerequisite: CIVE 1000

#### **CIVE 2110 CIVIL ENGINEERING MATERIALS WITH LABORATORY**

[3 hours] Introduction to properties of aggregates, Portland cement, concrete, steel, glass and bituminous mixtures. Mix designs of cement and asphalt concrete and standard test procedures for strength, workability, serviceability and durability. Prerequisite: CIVE 1160

#### **CIVE 2990 INDIVIDUAL STUDY IN CIVIL ENGINEERING**

[1-3 hours] An opportunity for qualified underclassmen to pursue a relevant area of Civil Engineering of particular personal interest under the supervision of a faculty member. Prerequisite: Permission of instructor

#### **CIVE 3120 CIVIL ENGINEERING SYSTEMS ANALYSIS**

[3 hours] Systems Approach, optimization by differential calculus techniques, linear programming, transportation and assignment problems, management of construction projects, critical path method, PERT and decision analysis. Prerequisite: MATH 3860

#### **CIVE 3210 SOIL MECHANICS**

[3 hours] A study of soil as an engineering material. Geologic origins, physical properties, movement of water through soil, soil stresses, consolidation, shear strength. Engineering properties testing of soils in laboratory. Prerequisite: CIVE 1160, 1170

#### **CIVE 3220 FOUNDATION ENGINEERING**

[3 hours] Application of soil mechanics principles to design for problems encountered in excavations, embankments, foundations, retaining structures, abutments, slope stability. Evaluation of the ability of soil to function in various capacities. Prerequisite: CIVE 3210

#### **CIVE 3310 STRUCTURAL ANALYSIS**

[3 hours] Analysis of statically determinate structures; analysis of simple and compound trusses, beams and frames; introduction to indeterminate structures; slope deflection and moment distribution. Introduction to computer applications. Prerequisite: CIVE 1160; EECS 1050, MATH 1890 or 2890

#### **CIVE 3320 BASIC FINITE ELEMENT METHODS**

[3 hours] Introduction to modern computer oriented structural analysis technique. It covers the beam-column element, triangular element and rectangular element. State-of-the-art computer software will be used to analyze bridge trusses, high-rise building frames, foundations, pavements and/or soil masses. Prerequisite: CIVE 3310; EECS 1050

#### **CIVE 3410 STEEL DESIGN I**

[3 hours] An introduction to the principles underlying design of axial tension members, axial compression members, beams, columns and base plates. Also includes welded and bolted connections. Prerequisite: CIVE 3310

#### **CIVE 3420 REINFORCED CONCRETE DESIGN I**

[3 hours] Introduction to principles and underlying design of basic structural beams, columns, one-way slabs in reinforced concrete. Shear reinforcement. Prerequisite: CIVE 3310

#### **CIVE 3510 TRANSPORTATION ENGINEERING I**

[3 hours] To provide an overview of transportation systems and operating characteristics of various highway modes. Concept of land use/transportation interaction. Considerations of vehicle and human characteristics in design of highway elements. Introduction to highway capacity and traffic control devices. Transportation planning process leading to local area traffic management with introduction to transportation system management and intelligent transportation systems. Prerequisite: CIVE 1100, MIME 2300

#### **CIVE 3520 TRANSPORTATION ENGINEERING II**

[3 hours] Survey of various modes of transport with emphasis on service provided by each and facilities required. Introduction to physical and practical aspects of design of transport facilities including drainage, pavements, railroads, ports and harbors, pipelines and transportation terminals. Prerequisite: CIVE 3510, 3210, 2110

#### **CIVE 3610 WATER SUPPLY AND TREATMENT**

[3 hours] This course includes lecture, laboratory exercises and a team-based design project. The topics covered will include water quality, water supply, design of the physical and chemical treatment processes, water distribution systems and contemporary issues related to drinking water. Prerequisite: CIVE 1170

#### **CIVE 3620 AIR POLLUTION ENGINEERING I**

[3 hours] Introduction to sources of air pollution, basic meteorological processes, air quality modeling, technology for air pollution control, odor control and noise pollution. Introduction to health effects of air pollutants, risk assessment and global atmospheric change. The students are required to use the USEPA programs for stack design and computations for ground level concentrations. Prerequisite: CIVE 1170

#### **CIVE 3630 WASTEWATER ENGINEERING**

[3 hours] This course includes lecture, laboratory exercises and a team-based design project. The topics covered will include wastewater collection, treatment and discharge, sludge treatment and disposal, and contemporary issues related to wastewater treatment. Prerequisite: CIVE 1170

#### **CIVE 3940 CO-OP EXPERIENCE**

[1 hour] Approved co-op work experience. Course may be repeated. Prerequisite: CIVE 1100, 1150, 2000; MATH 1860 or previous enrollment in CIVE 3940

#### **CIVE 4210 ADVANCED SOIL MECHANICS**

[3 hours] A study of soil behavior including stress distributions, deformation, consolidation and shear strength. The course focuses upon the development and use of well accepted solutions and practical applications. Prerequisite: CIVE 3210



**CIVE 4220 ADVANCED FOUNDATION ENGINEERING**

[3 hours] Discussion of advanced topics concerned with the application of soil mechanics to subsurface investigation and characterization, soil compaction and site improvement, shallow foundations, deep foundations, slope stability, lateral earth pressures, design of retaining structures and loads on buried structures. Prerequisite: CIVE 3210, 3220

**CIVE 4240 DESIGN WITH GEOSYNTHETICS**

[3 hours] Use of geosynthetic materials in engineering design for reinforcement, barrier, separation and/or drainage functions. Design applications for geotechnical, transportation and environmental uses. Prerequisite: CIVE 3210, 3220

**CIVE 4260 EXPERIMENTAL SOIL MECHANICS**

[3 hours] Measurement of and research on the engineering properties of soils, with special emphasis on tests not covered in an introductory soil mechanics laboratory. Design of a testing program to include single and three dimensional consolidation, triaxial and direct shear and hydraulic conductivity testing for fine grained soils. SHANSEP soil properties. Two hours lecture and two hour laboratory. Prerequisite: CIVE 3210

**CIVE 4300 ADVANCED MECHANICS OF MATERIALS**

[3 hours] Introduction to theory of elasticity, plane-stress and plane-strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetrical bending, torsion, shear center and axisymmetrically loaded members. Prerequisite: CIVE 1160, MATH 3860

**CIVE 4320 MATRIX ANALYSIS OF STRUCTURES**

[3 hours] Matrix analysis of continuous beams, trusses and frames by force method and displacement method. Methods of consistent deformation and slope deflection will be discussed to complement the matrix analysis. Computer applications. Prerequisite: CIVE 3310

**CIVE 4340 EXPERIMENTAL MECHANICS**

[3 hours] Application of experimental techniques to stress analysis. Comparison of experimental and analytical methods. Theory of electrical resistance strain gages. Methods of photoelasticity including photostress. Data acquisition systems and their use. Prerequisite: CIVE 2110 or permission of instructor

**CIVE 4350 INTRODUCTION TO STRUCTURAL DYNAMICS**

[3 hours] Study of undamped and damped response to free and forced vibrations of single and multi-degree of freedom systems subjected to dynamic loading. Introduction to estimation of seismic loading on structures. Prerequisite: MIME 2300; CIVE 3310, 3410 or 3420

**CIVE 4410 TIMBER DESIGN**

[3 hours] Properties of wood and the design of beams, columns, horizontal diaphragms, shearwalls and connections. Basic behavior of structures and how this behavior is reflected in the design of wood structures. Prerequisite: CIVE 3310

**CIVE 4430 STRUCTURAL STEEL DESIGN II**

[3 hours] Study of local failure in beams, biaxial bending, plate girders, composite beams, semi-rigid composite connections and beam columns. Prerequisite: CIVE 3410

**CIVE 4440 REINFORCED CONCRETE DESIGN II**

[3 hours] Analysis and design of columns under axial compression and biaxial bending. Consideration of bar cut-off, development lengths. Design of two-way slabs and building frames in reinforced concrete. Deflection of beams. Shear design provisions for deep beams. Prerequisite: CIVE 3420

**CIVE 4480 REINFORCED MASONRY DESIGN**

[3 hours] Study of the design of reinforced and unreinforced masonry design, beams and walls and columns. Working stress design, strength design and empirical design are studied. Prerequisite: CIVE 3420

**CIVE 4510 MATERIALS ENGINEERING**

[3 hours] Mechanical properties of various civil engineering materials including metallic, ceramic, polymeric and composite materials; microstructures; fracture mechanics; fatigue and other failure modes; environmental effects; fiber reinforced concrete; quality control and nondestructive evaluation. Prerequisite: CIVE 2110

**CIVE 4550 TRAFFIC CONTROL**

[3 hours] To provide a detailed understanding of the basic concepts of traffic engineering together with driver-roadway-vehicle system characteristics. Capacity analysis of freeways, rural highways, multilane and two lane highways. Traffic control devices and traffic signal design and capacity. Traffic studies and data collections; volume, speed and travel time, accident and parking studies. Introduction to other tools to mitigate traffic congestion. Prerequisite: CIVE 3510

**CIVE 4580 INTELLIGENT TRANSPORTATION SYSTEMS**

[3 hours] A study of the principles of advanced technologies and ideas that improve transportation mobility and efficiency, enhance safety, maximize use of existing transportation facilities, conserve energy resources and reduce environmental impacts. Prerequisite: CIVE 3510

**CIVE 4610 HYDROLOGY AND WATER RESOURCES**

[3 hours] Aspects of Hydrology. Stream gauging. Common and rare event analysis. Hydraulic and hydrologic routing. Irrigation, navigation, flood control and urban drainage. Resource demand conflicts and multiple use planning. Prerequisite: CIVE 3610; MIME 4000

**CIVE 4620 OPEN CHANNEL FLOW HYDRAULICS**

[3 hours] Energy and momentum in open channel flow. Channel controls and transitions. Open channel flow with backwater curves. Unsteady flow. Prerequisite: CIVE 3630

**CIVE 4630 INDOOR AIR QUALITY**

[3 hours] Characterization of indoor air pollutants, predictions of indoor air quality levels and indoor air quality control. Four to five design problems involving indoor air quality will be discussed/solved in the class. Special emphasis on the indoor radon and asbestos problems in the United States. Use of USEPA program. Prerequisite: Senior standing

**CIVE 4640 INDUSTRIAL HYGIENE**

[3 hours] Basic concepts of industrial hygiene and occupational health hazards, physical and chemical stresses of the industrial environment; sources; effects; measurements; evaluation; control of exposure; and control methods other than ventilation for conservation of industrial health, such as substitution and personal protection, with reference to special operation and industries. Prerequisite: CIVE 3620

**CIVE 4650 INDUSTRIAL VENTILATION**

[3 hours] Industrial ventilation as related to need of industrial hygiene engineer, including principles of air flow, natural and power ventilation, supply and exhaust, characteristics and design of systems, fans, collectors, testing instruments. Construction guidelines for local exhaust systems. Prerequisite: CIVE 1170; MATH 3860; PHYS 2140

**CIVE 4660 POLLUTION LABORATORY**

[1 hour] Use of different flow devices, calibration of pitot tubes, stack sampling, use of high volume sampler, use of weather station, calibration of primary and secondary flow devices and pollution control equipment. One hour laboratory. Prerequisite: Senior standing

**CIVE 4670 SOLID WASTE MANAGEMENT AND DISPOSAL**

[3 hours] A basic study of solid waste management concepts including origin, quantities, qualities, collection and disposal of solid waste materials. The course focuses upon municipal wastes and introduces the student to hazardous waste technologies. The primary course objective is to develop environmentally sound landfill design technologies and other ultimate disposal techniques. Prerequisite: CIVE 3630

**CIVE 4680 ENVIRONMENTAL LAW**

[3 hours] An overview of the major federal environmental statutes: Clean Air Act, Clean Water Act, RCRA, CERCLA, etc. and legal perspective of why they were developed. Exposure to some basic legal principles which will be integrated into the overall study of environmental law. Provides a practical perspective on how the law can be applied to situations encountered by environmental engineers and scientists in the real world. Prerequisite: Senior standing

**CIVE 4710 ADVANCED ENGINEERING SYSTEMS MODELING**

[3 hours] A systematic approach to the analysis of complicated engineering systems involving uncertain and probabilistic phenomena. Reliability analysis, systems simulation, Markov process, game theory, expert systems and probabilistic decision analysis. Prerequisite: CIVE 2120; MIME 4000

**CIVE 4750 SENIOR DESIGN PROJECTS**

[3 hours] To provide real world civil engineering design experience through a design problem as would be developed in an actual civil engineering consultant's office. Two hours lecture, two hours laboratory. Prerequisite: Minimum of 100 hours including CIVE 3610, 3410 or 3420; 3210; 3510; at least two of CIVE 3630, 3520 or 3220 completed or concurrent

**CIVE 4810 CONTRACTS AND SPECIFICATIONS**

[3 hours] To provide an in-depth understanding of contract writing procedures and development of comprehensive specifications for bid documents. Expose students to real world documents and to critically evaluate them in relations to ethics, professionalism and the end product. Pros, cons and necessary elements of a valid contract. Prerequisite: Senior standing

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### **CIVE 4820 PROJECT MANAGEMENT**

[3 hours] Concept of project management in the engineering and construction industry. Development and organization of projects with emphasis on application, preconstruction site investigation, planning, scheduling estimating and design. The bidding and award process. Construction and control methods for specifications. Selection of a professional construction manager. Methods of project management and methods of managing construction. Prerequisite: Senior standing

### **CIVE 4830 ENGINEERING ETHICS AND PROFESSIONALISM**

[2 hours] To provide a philosophical base upon which engineering students may anchor the professional practice and growth of their technical skills, as well as the development of business and professional relationship throughout their lives. Discussion of the entire range of the engineer's professional endeavors, obligation to society and commitment to professional ethics. Prerequisite: Senior standing

### **CIVE 4840 GIS FOR CIVIL ENGINEERING**

[3 hours] Introduction to the basic concepts to geographic information systems. The use of commercial software to integrate CAD and database to answer questions using both spatial (maps) and attribute (database) data. Topics studies include CAD/GIS conversion, database design, computer mapping. Prerequisite: consent of instructor

### **CIVE 4900 SEMINARS IN CIVIL ENGINEERING**

[1-3 hours] An opportunity for qualified upperclassmen to pursue a relevant area of Civil Engineering of particular personal interest under the supervision of a faculty member. Prerequisite: Permission of instructor

### **CIVE 4960 HONORS THESIS RESEARCH**

[1-3 hours] Independent research under the supervision of a faculty member to fulfill the thesis requirement of the University Honors Program. Prerequisite: Permission of instructor

### **CIVE 5210 ADVANCED SOIL MECHANICS**

[3 hours] A study of soil behavior including stress distributions, deformation, consolidation and shear strength. The course focuses upon the development and use of well accepted solutions and practical applications. Prerequisite: Permission of instructor

### **CIVE 5220 ADVANCED FOUNDATION ENGINEERING**

[3 hours] Discussion of advanced topics concerned with the application of soil mechanics to subsurface investigation and characterization, soil compaction and site improvement, shallow foundations, deep foundations, slope stability, lateral earth pressures, design of retaining structures and loads on buried structures. Prerequisite: Permission of instructor

### **CIVE 5240 DESIGN WITH GEOSYNTHETICS**

[3 hours] Use of geosynthetic materials in engineering design for reinforcement, barrier, separation and/or drainage functions. Design applications for geotechnical, transportation and environmental uses.

### **CIVE 5260 EXPERIMENTAL SOIL MECHANICS**

[3 hours] Measurement of and research on the engineering properties of soils, with special emphasis on tests not covered in an introductory soil mechanics laboratory. Design of a testing program to include single and three dimensional consolidation, triaxial and direct shear and hydraulic conductivity testing for fine grained soils. SHANSEP soil properties. Two hours lecture and two hour laboratory.

### **CIVE 5300 ADVANCED MECHANICS OF MATERIALS**

[3 hours] Introduction to theory of elasticity, plane-stress and plane-strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetrical bending, torsion, shear center and axisymmetrically loaded members.

### **CIVE 5320 MATRIX ANALYSIS OF STRUCTURES**

[3 hours] Matrix analysis of continuous beams, trusses and frames by force method and displacement method. Methods of consistent deformation and slope deflection will be discussed to complement the matrix analysis. Computer applications.

### **CIVE 5340 EXPERIMENTAL MECHANICS**

[3 hours] Application of experimental techniques to stress analysis. Comparison of experimental and analytical methods. Theory of electrical resistance strain gages. Methods of photoelasticity including photostress. Data acquisition systems and their use.

### **CIVE 5410 TIMBER DESIGN**

[3 hours] Properties of wood and the design of beams, columns, horizontal diaphragms, shearwalls and connections. Basic behavior of structures and how this behavior is reflected in the design of wood structures.

### **CIVE 5430 STRUCTURAL STEEL DESIGN II**

[3 hours] Study of local failure in beams, biaxial bending, plate girders, composite beams, semi-rigid composite connections and beam columns.

### **CIVE 5440 REINFORCED CONCRETE DESIGN II**

[3 hours] Analysis and design of columns under axial compression and biaxial bending. Consideration of bar cutoff, development lengths. Design of two-way slabs and building frames in reinforced concrete. Deflection of beams. Shear design provisions for deep beams.

### **CIVE 5450 BRIDGE DESIGN I**

[3 hours] Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.

### **CIVE 5480 REINFORCED MASONRY DESIGN**

[3 hours] Study of the design of reinforced and unreinforced masonry design, beams and walls and columns. Working stress design, strength design and empirical design are studied.

### **CIVE 5510 MATERIALS ENGINEERING**

[3 hours] Mechanical properties of various civil engineering materials including metallic, ceramic, polymeric and composite materials; microstructures; fracture mechanics; fatigue and other failure modes; environmental effects; fiber reinforced concrete; quality control and nondestructive evaluation.

### **CIVE 5550 TRAFFIC CONTROL**

[3 hours] To provide a detailed understanding of the basic concepts of traffic engineering together with driver-roadway-vehicle system characteristics. Capacity analysis of freeways, rural highways, multilane and two lane highways. Traffic control devices and traffic signal design and capacity. Traffic studies and data collections; volume, speed and travel time, accident and parking studies. Introduction to other tools to mitigate traffic congestion.

### **CIVE 5610 WATER RESOURCES AND HYDROLOGY**

[3 hours] Aspects of Hydrology. Stream gauging. Common and rare event analysis. Hydraulic and hydrologic routing. Irrigation, navigation, flood control and urban drainage. Resource demand conflicts and multiple use planning.

### **CIVE 5620 OPEN CHANNEL FLOW HYDRAULICS**

[3 hours] Energy and momentum in open channel flow. Channel controls and transitions. Open channel flow with backwater curves. Unsteady flow.

### **CIVE 5630 INDOOR AIR QUALITY**

[3 hours] Characterization of the indoor air pollutants, predictions of indoor air quality levels and indoor air quality control. Four to five design problems involving indoor air quality will be discussed/solved in the class. Special emphasis on indoor radon and asbestos problems in the United States. Use of USEPA program.

### **CIVE 5640 INDUSTRIAL HYGIENE**

[3 hours] Basic concepts of industrial hygiene and occupational health hazards, physical and chemical stresses of the industrial environment; sources; effects; measurements; evaluation; control of exposure; and control methods other than ventilation for conservation of industrial health, such as substitution and personal protection, with reference to special operation and industries.

### **CIVE 5650 INDUSTRIAL VENTILATION**

[3 hours] Industrial ventilation as related to need of industrial hygiene engineer, including principles of air flow, natural and power ventilation, supply and exhaust, characteristics and design of systems, fans, collectors, testing instruments. Construction guidelines for local exhaust systems.

### **CIVE 5660 POLLUTION LABORATORY**

[1 hour] Use of different flow devices, calibration of pitot tubes, stack sampling, use of high volume sampler, use of weather station, calibration of primary and secondary flow devices and pollution control equipment. One hour laboratory.

### **CIVE 5670 SOLID WASTE MANAGEMENT AND DISPOSAL**

[3 hours] A basic study of solid waste management concepts including origin, quantities, qualities, collection and disposal of solid waste materials. The course focuses upon municipal wastes and introduces the student to hazardous waste technologies. The primary course objective is to develop environmentally sound landfill design technologies and other ultimate disposal techniques. Prerequisite: Consent of instructor

**CIVE 5680 ENVIRONMENTAL LAW**

[3 hours] An overview of the major federal environmental statutes: Clean Air Act, Clean Water Act, RCRA, CERCLA, etc. and legal perspective of why they were developed. Exposure to some basic legal principles which will be integrated into the overall study of environmental law. Provides a practical perspective on how the law can be applied to situations encountered by environmental engineers and scientists in the real world.

**CIVE 5710 ADVANCED ENGINEERING SYSTEMS MODELING**

[3 hours] A systematic approach to the analysis of complicated engineering systems involving uncertain and probabilistic phenomena. Reliability analysis, systems simulation, Markov process, game theory, expert systems and probabilistic decision analysis.

**CIVE 5810 CONTRACTS AND SPECIFICATIONS**

[3 hours] To provide an in-depth understanding of contract writing procedures and development of comprehensive specifications for bid documents. Expose students to real world documents and to critically evaluate them in relations to ethics, professionalism and the end product. Pros, cons and necessary elements of a valid contract.

**CIVE 5820 PROJECT MANAGEMENT**

[3 hours] Concept of project management in the engineering and construction industry. Development and organization of projects with emphasis on engineering application, preconstruction site investigation, planning, scheduling, estimating and design. The bidding and award process. Construction and control methods for specifications. Selection of a professional construction manager. Methods of project management and methods of managing construction.

**CIVE 5830 ENGINEERING ETHICS AND PROFESSIONALISM**

[2 hours] To provide a philosophical base upon which engineering students may anchor the professional practice and growth of their technical skills, as well as the development of business and professional relationships throughout their lives. Discussion of the entire range of the engineer's professional endeavors, obligation to society and commitment to professional ethics.

**CIVE 5930 GRADUATE SEMINAR IN CIVIL ENGINEERING**

[1-3 hours] An opportunity for qualified graduate students to pursue a relevant area of Civil Engineering of particular personal interest under the supervision of a faculty member. Prerequisite: Permission of instructor

**CIVE 6230 GROUND WATER MODELING**

[3 hours] Introduction to topics concerning groundwater and its existence, Darcy's law, derivation of flow equation for saturated and unsaturated soil, flow nets, discussion of numerical methods and use of computer programs for groundwater modeling. Includes a term project. Prerequisite: Consent of instructor

**CIVE 6240 SITE INVESTIGATION**

[3 hours] A study of the availability and proper use of geotechnical and environmental investigative tools and techniques to include GIS, GPS, RS, non-destructive tests utilizing GPR, XRF and IR, destructive tests utilizing GC and MS, geotechnical testing to include SPT, vane shear, cone penetrometer and geophysical methods. Prerequisite: Consent of instructor

**CIVE 6250 MECHANICS OF UNSATURATED SOIL**

[3 hours] Application of Soil Mechanics to unsaturated soils, physics of unsaturated soils, characterization of unsaturated soils. Relationships for flow, shear strength and volume change. Measurements for flow, shear strength and volume change. Predictions for flow, shear strength and volume change. Includes journal reviews. Prerequisite: Consent of instructor

**CIVE 6260 NUMERICAL ANALYSIS FOR GEOMECHANICS**

[3 hours] A study of numerical methods used in geotechnical engineering and their applications. Emphasis on finite element and finite difference methods for stress, displacement, consolidation, stability and seepage analysis. Prerequisite: CIVE 6310/8310; CIVE 6370/8370 or consent of instructor

**CIVE 6270 CONTAMINANT TRANSPORT MODELING**

[3 hours] Continuum models of groundwater flow and pollution. Strategies to select domains, boundary and initial conditions to approximate reality. Inherent errors in solution schemes. Use of multidimensional analytic and numerical models to solve groundwater quality problems. Prerequisite: CIVE 6230/8230 or equivalent

**CIVE 6300 CONTINUUM MECHANICS**

[3 hours] A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statements of the laws of conservation of mass, momentum and energy and the formulation of the mechanical constitutive equations for various classes of solids and fluids. Prerequisite: Differential Equations

**CIVE 6310 FINITE ELEMENT METHODS**

[3 hours] Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.

**CIVE 6320 ADVANCED FINITE ELEMENT METHODS**

[3 hours] Formulation of isoperimetric elements, coordinate transformation, solids of revolution, bending of flat plates, general shell elements, dynamics, vibrations and time dependent problems, geometric and material nonlinearity. Prerequisite: CIVE 6310/8310

**CIVE 6330 OPTIMUM STRUCTURAL DESIGN**

[3 hours] Optimum design methods for structural systems. Techniques considered include unconstrained minimization methods, penalty function methods, constrained search techniques, genetic algorithm and computer application.

**CIVE 6340 MECHANICS OF STABILITY**

[3 hours] Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates. Prerequisite: Differential Equations

**CIVE 6360 DYNAMICS OF STRUCTURES**

[3 hours] Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.

**CIVE 6370 NUMERICAL METHODS IN CIVIL ENGINEERING**

[3 hours] The solutions of linear and nonlinear equations, characteristic value equations. Applications of Monte Carlo, random walk and finite difference techniques to the solution of civil engineering problems such as seepage, temperature distribution, beam-column, footing on elastic foundation, torsion and plates with various boundary conditions. Computer applications.

**CIVE 6380 MODAL ANALYSIS**

[3 hours] Theory and application of modal analysis. Experiments in modal analysis. Basic measurement techniques. Fourier transform theory and techniques. Transient and steady state excitation techniques. Windowing and modal parameter estimation. Prerequisite: CIVE 6360/8360

**CIVE 6390 WIND LOAD ANALYSIS AND DESIGN**

[3 hours] Study of wind, its cause effect and damage mechanisms. Analysis of wind forces on structures and associated structural dynamics. Examination of wind load provisions of building codes. Prerequisite: Consent of instructor

**CIVE 6430 BEHAVIOR OF STEEL STRUCTURES**

[3 hours] Study of the behavior of structural steel members and systems and their significance in terms of design and the development of specifications. Prerequisite: Consent of instructor

**CIVE 6440 BEHAVIOR OF REINFORCED CONCRETE STRUCTURES**

[3 hours] Studies of the behavior and strength of reinforced concrete members by means of reviews of the more significant experimental and analytical investigations. Emphasis is placed on the empirical nature of current design specification and their relation to the results of research.

**CIVE 6450 SEISMIC-RESISTANT DESIGN**

[3 hours] Characterization of strong ground motions for design; development of design criteria for elastic and inelastic structural systems; development of linear and nonlinear design spectra; basis for code design procedures; conceptual basis for seismic isolation and energy dissipation techniques; mechanics of isolation bearings.

**CIVE 6470 PLASTIC ANALYSIS OF STRUCTURES**

[3 hours] Study of the basis of plastic theory and analysis Application of these theories to the design of structures. Prerequisite: Consent of instructor

**CIVE 6480 PRESTRESSED CONCRETE STRUCTURES**

[3 hours] Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems. Prerequisite: CIVE 5440/7440

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### **CIVE 6510 PAVEMENT DESIGN AND ANALYSIS**

[3 hours] Understanding of fundamental concepts of various stresses in flexible and rigid pavements; traffic loading and volume considerations; climatic effects; materials characterization and variability; design procedures; performance evaluation and rehabilitation methods.

### **CIVE 6520 INFRASTRUCTURE SYSTEMS MANAGEMENT**

[3 hours] An integrated, systemic approach to the management of infrastructure. Analysis methods are introduced and developed recognizing the multidimensional nature of performance of facilities, resource constraints, technological innovations and institutional factors.

### **CIVE 6550 URBAN TRANSPORTATION DESIGN**

[3 hours] To provide a detailed understanding of the basic factors affecting location and design of fixed facilities for urban highways and mass transit systems. Design of Origin and Destination studies. Discussion of changing concerns regarding metropolitan transportation planning, the process of urban transportation planning; trip generation, distribution, modal split models and traffic assignments, new transportation technology and its effect on design of fixed facilities and considerations of urban goods movement in urban street design. Social, environmental and esthetic constraints on location and design.

### **CIVE 6560 TRANSPORTATION SYSTEM MANAGEMENT AND ECONOMICS**

[3 hours] To provide a detailed understanding of the economic principles that are applicable to public infrastructures. Critical analysis of conventional procedure in transportation studies; user and nonuser costs and benefits, the value of travel time, evaluations of transport investments and financing. Discussion on principles of Transportation System Management to maximize the efficiency and effectiveness of existing transportation systems. Funding sources and innovative funding of projects.

### **CIVE 6570 TRAFFIC FLOW THEORY AND SIMULATION MODELS**

[3 hours] To develop a theoretical understanding of macroscopic and microscopic traffic flow characteristics. Analytic techniques to analysis demand-supply, shock waves, car following theory and application of queuing theory. Traffic simulation techniques that have potential for use in Intelligent Transportation Systems and Architecture. Exposure to freeway operations and management. Steps in the development of a simulation model. Exposure to computer simulation

### **CIVE 6580 INTELLIGENT TRANSPORTATION SYSTEMS**

[3 hours] Intelligent Transportation Systems consist of advanced technologies and ideas which, in combination, can improve transportation mobility and productivity, enhance safety maximize use of existing transportation facilities, conserve energy resources and reduce environmental effects. The intent of the course is to study these technologies, their components and functions, and assess their impacts on solving transportation problems.

### **CIVE 6590 TRAFFIC SIGNAL DESIGN AND OPERATIONS**

[3 hours] To provide in-depth understanding of traffic control devices in particular to signal design. Role of signalized and unsignalized intersections in traffic operations, measure of performance. Time space correlation, actuated signals and detection, signal coordination. Signal control hardware and maintenance. Arterial performance, operations and management. Computer traffic-signal control systems.

### **CIVE 6610 PHYSICAL, CHEMICAL, AND BIOLOGICAL PROCESSES**

[4 hours] Theory and model development for physical, chemical and biological process design of wastewater treatment systems. Prerequisite: Consent of instructor

### **CIVE 6620 ENVIRONMENTAL MODELING**

[3 hours] Translation of the physics of environmental problems into mathematical models for engineering analysis. Topics include mathematics of equilibrium and kinetic chemical reaction systems; reactor modeling; mathematics of mass transfer. Prerequisite: Consent of instructor

### **CIVE 6630 DISPERSION AND RISK MODELING**

[3 hours] Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.

### **CIVE 6640 ENVIRONMENTAL ENGINEERING CHEMISTRY**

[3 hours] Study of the chemical progression of inorganic and organic materials that significantly contribute to water pollution. The engineering significance of these materials upon treatment systems and the environment. Selected written and/or oral presentations required. Prerequisite: Consent of instructor

### **CIVE 6650 ENVIRONMENTAL ENGINEERING MICROBIOLOGY**

[3 hours] Study of the microbiology, biochemistry and microorganisms of importance to biological waste treatment operations and environmental management systems. The optimization of biological waste treatment facilities and other purification bioremediation processes. Selected written and/or oral presentations required. Prerequisite: Consent of instructor

### **CIVE 6660 ADVANCED TREATMENT PROCESSES**

[3 hours] Theory, development and design of advanced processes for the treatment of water, wastewater and sludge. Processes such as reverse osmosis, electrodialysis, centrifugation, belt filtration, dissolved air flotation and foam fractionation are studied. Selected written and/or oral presentations required. Prerequisite: CIVE 6610/8610 or consent of instructor

### **CIVE 6680 SEDIMENT TRANSPORT**

[3 hours] Sediment movement in streams and rivers. Topics include sediment properties, threshold of movement, suspended sediment, stable channel design, sediment waves and bed features. Erosion of channels and the near bank region. Prerequisite: Consent of instructor

### **CIVE 6690 DISPERSION MODELING LABORATORY**

[1 hour] Use of USEPA network, use of ten computer programs from the USEPA network, use of Internet and environmental BBS, search for environmental data bases using search engines. Prerequisite: CIVE 6630/8630

### **CIVE 6840 APPLIED GIS FOR CIVIL ENGINEERING**

[3 hours] Advanced topics in Geographic Information Systems applied to civil engineering. Topics include generating transportation planning maps, environmental mapping, infrastructure mapping. Special techniques used in generating maps. Prerequisite: Consent of instructor

### **CIVE 6900 CIVIL ENGINEERING PROBLEMS**

[3 hours] Special assignment of civil engineering problems of various types at the graduate level. Prerequisite: Consent of instructor

### **CIVE 6960 GRADUATE RESEARCH AND THESIS - MASTERS**

[1-9 hours] MS student should register their adviser's section number. Prerequisite: Consent of instructor

### **CIVE 6980 GRADUATE RESEARCH AND PROJECT - MASTERS**

[1-6 hours] MS student should register their adviser's section number. Prerequisite: Consent of instructor

### **CIVE 7450 BRIDGE DESIGN I**

[3 hours] Design of the three most common types of short span bridges: concrete slabs, steel stringers and prestressed concrete. Additional topics are bearings, rehabilitation and retrofit and design to minimize maintenance.

### **CIVE 8230 GROUND WATER MODELING**

[3 hours] Introduction to topics concerning groundwater and its existence, Darcy's law, derivation of flow equation for saturated and unsaturated soil, flow nets, discussion of numerical methods and use of computer programs for groundwater modeling. Includes a term project. Prerequisite: Consent of instructor

### **CIVE 8240 SITE INVESTIGATION**

[3 hours] A study of the availability and proper use of geotechnical and environmental investigative tools and techniques to include GIS, GPS, RS, non-destructive tests utilizing GPR, XRF and IR, destructive tests utilizing GC and MS, geotechnical testing to include SPT, vane shear, cone penetrometer and geophysical methods. Prerequisite: Consent of instructor

### **CIVE 8250 MECHANICS OF UNSATURATED SOIL**

[3 hours] Application of Soil Mechanics to unsaturated soils, physics of unsaturated soils, characterization of unsaturated soils. Relationships for flow, shear strength and volume change. Measurements for flow, shear strength and volume change. Includes journal reviews. Prerequisite: Consent of instructor

### **CIVE 8260 NUMERICAL ANALYSIS FOR GEOMECHANICS**

[3 hours] A study of numerical methods used in geotechnical engineering and their applications. Emphasis on finite element and finite difference methods for stress, displacement, consolidation, stability and seepage analysis. Prerequisite: CIVE 6310/8310; CIVE 6370/8370 or consent of instructor

**CIVE 8270 CONTAMINANT TRANSPORT MODELING**

[3 hours] Continuum models of groundwater flow and pollution. Strategies to select domains, boundary and initial conditions to approximate reality. Inherent errors in solution schemes. Use of multidimensional analytic and numerical models to solve groundwater quality. Prerequisite: CIVE 6230/8230 or equivalent

**CIVE 8300 CONTINUUM MECHANICS**

[3 hours] A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statements of the laws of conservation of mass, momentum and energy and the formulation of the mechanical constitutive equations for various classes of solids and fluids. Prerequisite: Differential Equations

**CIVE 8310 FINITE ELEMENT METHODS**

[3 hours] Study of direct stiffness method, introduction to the minimum potential energy method and the Galerkin method, formulation of truss, beam, triangular and rectangular elements, applications to the analyses of space trusses, building frames, folded plates, fluid flow and seepage problems. Applications of modern computer software.

**CIVE 8320 ADVANCED FINITE ELEMENT METHODS**

[3 hours] Formulation of isoperimetric elements, coordinate transformation, solids of revolution, bending of flat plates, general shell elements, dynamics, vibrations and time dependent problems, geometric and material nonlinearity. Prerequisite: CIVE 6310/8310

**CIVE 8330 OPTIMUM STRUCTURAL DESIGN**

[3 hours] Optimum design methods for structural systems. Techniques considered include unconstrained minimization methods, penalty function methods, constrained search techniques, genetic algorithm and computer application.

**CIVE 8340 MECHANICS OF STABILITY**

[3 hours] Differential equations. Buckling of centrally and eccentrically loaded compression members; variational methods of determining critical loads; lateral and torsional buckling of beams; introduction to dynamic stability; parametric excitations; nonconservative stability problems; buckling of plates. Prerequisite: Differential Equations

**CIVE 8360 DYNAMICS OF STRUCTURES**

[3 hours] Evaluation of dynamic response of structures to arbitrary time-varying loadings; single degree-of-freedom, multi-degree-of-freedom and distributed-parameter systems; partial differential equation formulations of simple systems; mode superposition and wave propagation solutions; time history analysis and estimation of maximum response by spectral analysis; effects of nonlinearities on the structural response.

**CIVE 8370 NUMERICAL METHODS IN CIVIL ENGINEERING**

[3 hours] The solutions of linear and nonlinear equations, characteristic value equations. Applications of Monte Carlo, random walk and finite difference techniques to the solution of civil engineering problems such as seepage, temperature distribution, beam-column, footing on elastic foundation, torsion and plates with various boundary conditions. Computer applications.

**CIVE 8380 MODAL ANALYSIS**

[3 hours] Theory and application of modal analysis. Experiments in modal analysis. Basic measurement techniques. Fourier transform theory and techniques. Transient and steady state excitation techniques. Windowing and modal parameter estimation. Prerequisite: CIVE 6360/8360

**CIVE 8390 WIND LOAD ANALYSIS AND DESIGN**

[3 hours] Study of wind, its cause effect and damage mechanisms. Analysis of wind forces on structures and associated structural dynamics. Examination of wind load provisions of building codes. Prerequisite: Consent of instructor

**CIVE 8430 BEHAVIOR OF STEEL STRUCTURES**

[3 hours] Study of the behavior of structural steel members and systems and their significance in terms of design and the development of specifications. Prerequisite: Consent of instructor

**CIVE 8440 BEHAVIOR OF REINFORCED CONCRETE STRUCTURES**

[3 hours] Studies of the behavior and strength of reinforced concrete members by means of reviews of the more significant experimental and analytical investigations. Emphasis is placed on the empirical nature of current design specification and their relation to the results of research.

**CIVE 8450 SEISMIC-RESISTANT DESIGN**

[3 hours] Characterization of strong ground motions for design; development of design criteria for elastic and inelastic structural systems; development of linear and nonlinear design spectra; basis for code design procedures; conceptual basis for seismic isolation and energy dissipation techniques; mechanics of isolation bearings.

**CIVE 8470 PLASTIC ANALYSIS OF STRUCTURES**

[3 hours] Study of the basis of plastic theory and analysis. Application of these theories to the design of structures. Prerequisite: Consent of instructor

**CIVE 8480 PRESTRESSED CONCRETE STRUCTURES**

[3 hours] Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges and precast systems. Prerequisite: CIVE 5440/7440

**CIVE 8510 PAVEMENT DESIGN AND ANALYSIS**

[3 hours] Understanding of fundamental concepts of various stresses in flexible and rigid pavements; traffic loading and volume considerations; climatic effects; materials characterization and variability; design procedures; performance evaluation and rehabilitation methods.

**CIVE 8520 INFRASTRUCTURE SYSTEMS MANAGEMENT**

[3 hours] An integrated, systemic approach to the management of infrastructure. Analysis methods are introduced and developed recognizing the multidimensional nature of performance of facilities, resource constraints, technological innovations and institutional factors.

**CIVE 8550 URBAN TRANSPORTATION DESIGN**

[3 hours] To provide a detailed understanding of the basic factors affecting location and design of fixed facilities for urban highways and mass transit systems. Design of Origin and Destination studies. Discussion of changing concerns regarding metropolitan transportation planning, the process of urban transportation planning; trip generation, distribution, modal split models and traffic assignments, new transportation technology and its effect on design of fixed facilities and considerations of urban goods movement in urban street design. Social, environmental and esthetic constraints on location and design.

**CIVE 8560 TRANSPORTATION SYSTEM MANAGEMENT AND ECONOMICS**

[3 hours] To provide a detailed understanding of the economic principles that are applicable to public infrastructures. Critical analysis of conventional procedure in transportation studies; user and nonuser costs and benefits, the value of travel time, evaluations of transport investments and financing. Discussion on principles of Transportation System Management to maximize the efficiency and effectiveness of existing transportation systems. Funding sources and innovative funding of projects.

**CIVE 8570 TRAFFIC FLOW THEORY AND SIMULATION MODELS**

[3 hours] To develop a theoretical understanding of macroscopic and microscopic traffic flow characteristics. Analytic techniques to analysis demand-supply, shock waves, car following theory and application of queuing theory. Traffic simulation techniques that have potential for use in Intelligent Transportation Systems and Architecture. Exposure to freeway operations and management. Steps in the development of a simulation model. Exposure to computer simulation

**CIVE 8580 INTELLIGENT TRANSPORTATION SYSTEMS**

[3 hours] Intelligent Transportation Systems consist of advanced technologies and ideas which, in combination, can improve transportation mobility and productivity, enhance safety maximize use of existing transportation facilities, conserve energy resources and reduce environmental effects. The intent of the course is to study these technologies, their components and functions and assess their impacts on solving transportation problems.

**CIVE 8590 TRAFFIC SIGNAL DESIGN AND OPERATIONS**

[3 hours] To provide in-depth understanding of traffic control devices in particular to signal design. Role of signalized and unsignalized intersections in traffic operations, measure of performance. Time space correlation, actuated signals and detection, signal coordination. Signal control hardware and maintenance. Arterial performance, operations and management. Computer traffic-signal control systems.

**CIVE 8610 PHYSICAL, CHEMICAL, AND BIOLOGICAL PROCESSES**

[4 hours] Theory and model development for physical, chemical and biological process design of wastewater treatment systems. Prerequisite: Consent of instructor

## 346 Course Descriptions

### **CIVE 8620 ENVIRONMENTAL MODELING**

[3 hours] Translation of the physics of environmental problems into mathematical models for engineering analysis. Topics include mathematics of equilibrium and kinetic chemical reaction systems; reactor modeling; mathematics of mass transfer. Prerequisite: Consent of instructor

### **CIVE 8630 DISPERSION AND RISK MODELING**

[3 hours] Treatment of atmospheric dispersion problems, development of air quality models, components of a physical model, selection and evaluation of air pollution software, evaluation of models, risk modeling, EPA models and recent topics.

### **CIVE 8640 ENVIRONMENTAL ENGINEERING CHEMISTRY**

[3 hours] Study of the chemical progression of inorganic and organic materials that significantly contribute to water pollution. The engineering significance of these materials upon treatment systems and the environment. Selected written and/or oral presentations required. Prerequisite: Consent of instructor

### **CIVE 8650 ENVIRONMENTAL ENGINEERING MICROBIOLOGY**

[3 hours] Study of the microbiology, biochemistry and microorganisms of importance to biological waste treatment operations and environmental management systems. The optimization of biological waste treatment facilities and other purification bioremediation processes. Selected written and/or oral presentations required. Prerequisite: Consent of instructor

### **CIVE 8660 ADVANCED TREATMENT PROCESSES**

[3 hours] Theory, development and design of advanced processes for the treatment of water, wastewater and sludge. Processes such as reverse osmosis, electro dialysis, centrifugation, belt filtration, dissolved air flotation and foam fractionation are studied. Selected written and/or oral presentations required. Prerequisite: CIVE 6610/8610 or consent of instructor

### **CIVE 8680 SEDIMENT TRANSPORT**

[3 hours] Sediment movement in streams and rivers. Topics include sediment properties, threshold of movement, suspended sediment, stable channel design, sediment waves and bed features. Erosion of channels and the near bank region. Prerequisite: Consent of instructor

### **CIVE 8690 DISPERSION MODELING LABORATORY**

[1 hour] Use of USEPA network, use of ten computer programs from the USEPA network, use of Internet and environmental BBS, search for environmental data bases using search engines. Prerequisite: CIVE 6630/8630

### **CIVE 8900 INDEPENDENT PROBLEMS**

[1-6 hours] Ph.D. student should register their adviser's section number. Prerequisite: Consent of instructor

### **CIVE 8960 DOCTORAL GRADUATE RESEARCH & DISSERTATION**

[1-16 hours] Graduate research towards the completion of a Doctoral degree. Prerequisite: Consent of instructor

## CLC - Classics

### Department of Foreign Languages (ARS)

#### **CLC 1010 CLASSICAL HUMANITIES**

[3 hours] An introduction to the civilization of the Greeks and Romans in which history, literature, mythology, art and philosophy are interrelated and interpreted. (not for major credit) Humanities core course

#### **CLC 2040 ANCIENT NEAR EAST**

[3 hours] A survey of the history and civilization of ancient Sumer, Babylonia, Assyria, Egypt, Palestine and Persia. Humanities core course Non-western multicultural course

#### **CLC 2050 ANCIENT GREECE**

[3 hours] A survey of the history and civilization of Hellenic and Hellenistic Greece. Humanities core course

#### **CLC 2060 ANCIENT ROME**

[3 hours] A survey of the history and civilization of Rome from its origin through the Empire. Humanities core course

#### **CLC 3100 CLASSICAL MYTHOLOGY**

[3 hours] A survey of Greek and Roman mythology in classical literature, sculpture and art.

#### **CLC 3200 ENGLISH DERIVATIVES FROM GREEK AND LATIN**

[3 hours] Study of the origin and development of words in current use in a variety of fields for those with little or no previous language study in Latin or Greek.

#### **CLC 3250 GREEK AND ROMAN DRAMA IN ENGLISH**

[3 hours] A study of the origin and development of classical tragedy and comedy with extensive readings in English of the major dramatists from Aeschylus to Seneca.

#### **CLC 4010 GREEK INSTITUTIONAL HISTORY**

[3 hours] A study of selected topics on the political and social institutions of Greece in the classical and Hellenistic periods.

#### **CLC 4020 ROMAN INSTITUTIONAL HISTORY**

[3 hours] A study of selected topics on the political and social institutions of Rome in the Republic and the Empire.

#### **CLC 4980 SPECIAL TOPICS IN CLASSICS**

[1-3 hours] Study of a selected topic in Classics. May be repeated when topic varies.

## CMHS - Counseling & Mental Health Services

### Department of Counseling and Mental Health Services (HHS)

#### **CMHS 1110 FUNDAMENTALS OF HUMAN MENTAL HEALTH**

[4 hours] An introduction to the field of human services, especially mental health, history and current trends in treatment and prevention of disease and the basic skills common to the field. Students will learn skills at the demonstrable level as they will later be used in the field. Prerequisite: Admission to the program Corequisite: PSY 1010

#### **CMHS 1210 MENTAL HEALTH SKILLS**

[4 hours] This course is designed to enable students to master the therapeutic interpersonal skills required of mental health professionals. Successful completion of this course is a requirement for continuation into advanced courses. Prerequisite: CMHS 1110; PSY 1010 Corequisite: CMHS 1230

#### **CMHS 1220 THEORIES IN MENTAL HEALTH**

[3 hours] An overview of current approaches of psychological theory. This course includes an examination of the basic issues in mental health, including ethical issues and personal implications for the mental health professional. Prerequisite: CMHS 1110; PSY 1010

#### **CMHS 1230 PATHOLOGY IN MENTAL HEALTH**

[3 hours] This course deals with an introduction to the concepts of abnormal psychology with emphasis on understanding the cultural and historical bases for defining abnormality as well as modern classification systems, the biological model, treatment modalities and theoretical perspectives. Prerequisite: PSY 1010

#### **CMHS 1240 SUBSTANCE ABUSE ISSUES IN MENTAL HEALTH**

[3 hours] An overview and survey of addictive disorders, use and abuse, and the personal and cultural effects of chemical dependency. Prerequisite: CMHS 1110; PSY 1010

#### **CMHS 2060 CAREER EXPLORATION**

[3 hours] Designed for the university student undecided about a career. The student is assisted in self-assessment, exploration of occupations and in career decision-making skills.

#### **CMHS 2120 GROUP AND THERAPEUTIC APPROACHES**

[4 hours] A study of various types of groups and activity skills used in mental health environments both inpatient and community based. Focus on design, principles, procedures and applications of various techniques. Prerequisite: PSY 1010

#### **CMHS 2130 ASSESSMENT AND INTERVENTION IN MENTAL HEALTH**

[4 hours] The various techniques and requirements of assessment and interventions used in the most important mental health environments will be explored and practiced. Special emphasis is placed on interview assessment and crisis intervention; implications for record keeping in the variety of settings are also examined. Prerequisite: PSY 1010; sophomore standing in major

**CMHS 2220 FAMILY THEORIES AND CULTURAL INFLUENCES IN MENTAL HEALTH**

[3 hours] Study of basic family systems and structures and the influences of cultural patterns as they interact and impact the mental health and therapeutic needs of individual family members. Prerequisite: PSY 1010; second year standing in major

**CMHS 2940 MENTAL HEALTH INTERNSHIP**

[4 hours] Students are placed in community agencies relevant to mental health and work in a role related to the function of a mental health technician under the guidance of a supervisor. Prerequisite: CMHS 1210 with grade of B or better; grade of C or better in all other CMHS courses; sophomore standing; permission of director

**CMHS 2980 SPECIAL TOPICS IN COUNSELOR EDUCATION**

[1-3 hours] This course is open to an undergraduate student pursuing a degree program and may be a requirement of that program. Prerequisite: Permission of instructor

**CMHS 2990 INDEPENDENT STUDY**

[1-3 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

**CMHS 3070 FAMILY COUNSELING**

[3 hours] Overview of aspects of counseling with families. Major focus is on family as a system and a variety of interventions. Ethnic, gender and socioeconomic considerations of family systems will be stressed.

**CMHS 3110 CASE MANAGEMENT IN MENTAL HEALTH**

[3 hours] The study of and practice of using case management models and skills with clients within the mental health environment. Models appropriate for different agency types will be explored and the various modalities available will be introduced. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 3120 MENTAL RETARDATION AND MENTAL HEALTH**

[3 hours] The relationship between retardation and mental health with emphasis on the characteristics making this a population of special concern within the treatment protocols of the mental health profession. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 3130 ADVANCED INTERVENTIONS: CRISIS AND EMPLOYEE ASSISTANCE PROGRAMS**

[3 hours] Advanced intervention issues including crisis management, disaster survival, rescue and emergency personnel debriefing and Employee Assistance Programs. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 3140 SUBSTANCE ABUSE PREVENTION AND COMMUNITY PROGRAMMING**

[3 hours] An evaluation of prevention programs and community resources available in the prevention and treatment of substance abuse. Prerequisite: Permission of instructor

**CMHS 3150 MODELS OF TREATMENT FOR SUBSTANCE ABUSE**

[3 hours] A review of the various components of substance abuse and philosophies of treatment. Theories of etiology and maintenance are also addressed. Prerequisite: Permission of instructor

**CMHS 3160 CHARTING AND REPORTING IN THE MENTAL HEALTH PROFESSIONS**

[3 hours] The importance of coding, charting and record keeping in various fields of mental health professions is examined. Various types of report writing formats and requirements will be learned. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 3380 COLLEGE STUDENT LEADERSHIP DEVELOPMENT I**

[1-3 hours] First semester in development of skills for student leaders through didactic experience, simulation exercises and practicum experiences. Especially designed for student government leaders and peer counselor/advisers.

**CMHS 3390 COLLEGE STUDENT LEADERSHIP DEVELOPMENT II**

[1-3 hours] Second semester in student leadership training. The development of skills for student leaders working in the area of substance abuse under the guidance of a supervisor. Prerequisite: CMHS 2940, 4240 and 4940, all with grade of B or better; grade of C or better in all other CMHS courses

**CMHS 3940 SUBSTANCE ABUSE INTERNSHIP**

[4 hours] Students are placed in community agencies working in the area of substance abuse under the guidance of a supervisor. Prerequisite: CMHS 2940, 4240 and 4940, all with grade of B or better; grade of C or better in all other CMHS courses

**CMHS 4080 ESSENTIALS OF HELPING RELATIONSHIPS**

[3 hours] Emphasis upon skills, concepts and practices in the helping professions. Multicultural and ethical issues along with dealing with crisis situations will be covered.

**CMHS 4090 THERAPEUTIC ENVIRONMENTS FOR THE AGED**

[3 hours] This course focuses on therapeutic care giving for the aged in institutional settings, addressing techniques for developing activities and responding to sensory changes and social needs of individuals.

**CMHS 4110 CONSULTATION AND SUPERVISION IN MENTAL HEALTH SERVICES**

[3 hours] Explores the roles and techniques of consultation and supervision within the mental health professions, including individual and group skills, models, strategies and legal and ethical issues. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 4120 DUAL DIAGNOSIS: SUBSTANCE ABUSE AND MENTAL ILLNESS**

[3 hours] Issues involving clients with a dual diagnosis are explored. Specific treatment strategies for clients dually-diagnosed with substance abuse and mental illness will be learned. Prerequisite: CMHS 1110 or permission of instructor

**CMHS 4240 SUBSTANCE ABUSE TREATMENT TECHNIQUES**

[3 hours] An examination of ethical and legal issues in substance abuse, as well as examination of the specific skills needed by workers in substance abuse programs. Prerequisite: CMHS 3140; 3150 or permission of instructor

**CMHS 4580 TEACHER AS ADVISOR**

[3 hours] This course will provide students in education an overview of the role of art and music in curriculum development. (Students may enroll in either art or music education sections.) Prerequisite: CI 4250, 4260, 4270, 4280 Corequisite: CI 4000, 4010, 4400; SPED 4030

**CMHS 4940 ADVANCED INTERNSHIP**

[4 hours] Students are placed in community agencies relevant to mental health and work in a role related to the function of an advanced level mental health technician under the guidance of a supervisor. Prerequisite: CMHS 2940 with grade of B or better; CMHS 3110; grade of C or better in all CMHS courses other than CMHS 2940

**CMHS 4980 SPECIAL TOPICS IN COUNSELOR EDUCATION**

[1-3 hours] This course is open to an undergraduate student pursuing a degree program and may be a requirement of that program. Prerequisite: Permission of instructor

**CMHS 4990 INDEPENDENT STUDY**

[1-3 hours] Individual study is designed to provide the student to work independently on professional problems under the direction of a faculty member in the department of counseling and mental health services. Prerequisite: Permission of instructor

**CMHS 5010 PROFESSIONAL ORIENTATION TO SCHOOL COUNSELING**

[4 hours] Introduction to school counseling; historical foundations; roles and responsibilities; legal and ethical issues; implications of sociocultural diversity, organization and administration, and future trends within the context of the school community.

**CMHS 5020 PROFESSIONAL ORIENTATION TO COMMUNITY COUNSELING**

[3 hours] An orientation to the counseling profession; ethical and legal issues, counseling process, skills and theories; counselor roles, functions and work settings; and historical foundations of counseling.

**CMHS 5030 ROLE AND FUNCTION OF THE SCHOOL PSYCHOLOGIST**

[3 hours] An introduction to issues in school psychology and the differing roles and responsibilities of the school psychologist as a member of the school staff. Includes onsite observations in regular and special classrooms. Legal and ethical issues as well as a history of the profession will be included. Prerequisite: Permission of instructor

**CMHS 5040 LEGAL AND ETHICAL ISSUES FOR SCHOOL PSYCHOLOGISTS AND COUNSELORS**

[3 hours] Covers the ethical standards and legal regulation in school psychology and school counseling. Ethical standards, litigation and legal regulation are examined in regard to professional practice. Prerequisite: CMHS 5030 or permission of instructor

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### CMHS 5060 SCHOOL OBSERVATION

[2 hours] Orientation to the organization of schools for school psychology students without teaching experience. Students will serve a wide range of educational settings and integrate their observations through discussion and readings.

### CMHS 5110 CAREER COUNSELING AND DEVELOPMENT

[3 hours] Theories, resources and practices of career counseling and development are presented. Knowledge and skills for promoting career growth among a broad range of individuals across the life span is emphasized.

### CMHS 5120 INDIVIDUAL AND GROUP ASSESSMENT

[3 hours] This course provides an in-depth understanding of psychological testing through (1) an overview of basic testing concepts, (2) an understanding of test construction, (3) familiarity with instruments and (4) an overview of using test results. History and rationale of testing are included.

### CMHS 5130 GROUP COUNSELING

[4 hours] Provides training and experience in group development, dynamics, theories, methods and skills of group counseling, group leadership, research and evaluation, ethical issues and other group work approaches.

### CMHS 5140 COUNSELING THEORIES AND TECHNIQUES

[4 hours] Includes a study of basic counseling and consultation theories and helping relationships from individual, group and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors and legal and ethical considerations. Includes supervised training in counseling and consulting skills.

### CMHS 5150 COUNSELING ACROSS THE LIFE SPAN

[3 hours] Theories of individual and family development across the lifespan are examined. Developmental processes of individuals and families and implications for counseling are presented from a multi-generational family perspective.

### CMHS 5160 CULTURAL DIVERSITY FOR COUNSELORS AND SCHOOL PSYCHOLOGISTS

[3 hours] Addresses the cross-cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences which underlie counseling theories and therapies.

### CMHS 5170 CONSULTATION I: THEORIES AND TECHNIQUES

[3 hours] Addresses the theories and techniques of collaborative problem solving; includes an examination of variables affecting the consultation process.

### CMHS 5190 COUNSELING PRACTICUM

[4 hours] Students receive supervised, practical experiences in providing counseling services to clients. Performance of counseling skills; relationship skills; intervention techniques; documentation skills; and professional, ethical and legal conduct is expected. Prerequisite: CMHS 5110, 5130, 5140, 5010 or 5020 and a grade of B or better in these courses

### CMHS 5250 CREATING THERAPEUTIC ENVIRONMENTS FOR THE AGED

[3 hours] Explores the various aspects necessary for creating therapeutic physical and social psychological settings for older institutionalized adults. Models of care giving and programmatic skills are examined.

### CMHS 5300 PSYCHOEDUCATIONAL ASSESSMENT AND INTERVENTIONS I

[4 hours] Training in direct and standardized academic assessment techniques and in designing appropriate interventions. Prerequisite: CMHS 5030

### CMHS 5310 PSYCHOEDUCATIONAL ASSESSMENT AND INTERVENTIONS II

[4 hours] Training indirect and standardized assessment techniques of preschool and low-incidence population, and designing appropriate interventions. Introduces functional behavior assessment. Prerequisite: CMHS 5300; permission of instructor

### CMHS 5980 SPECIAL TOPICS IN COUNSELING, MENTAL HEALTH, AND SCHOOL PSYCHOLOGY

[1-3 hours] This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program. Prerequisite: Permission of instructor

### CMHS 6210 PSYCHOPATHOLOGY

[4 hours] The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling. Prerequisite: 30 hours toward departmental master's degree

### CMHS 6220 CHILD, ADOLESCENT, FAMILY THERAPY

[3 hours] Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized. Prerequisite: CMHS 5140

### CMHS 6230 CRISIS INTERVENTION COUNSELING

[3 hours] Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction. Prerequisite: CMHS 5140

### CMHS 6240 DIAGNOSIS AND MENTAL HEALTH

[4 hours] Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).

### CMHS 6470 DRUGS AND MENTAL HEALTH COUNSELING

[4 hours] Study of the psychobiological and psychophysiological effects of psychotropic medications used for the psychopharmacological treatment of mental and emotional disorder. Theoretical, efficacy and ethical concerns are reviewed. Prerequisite: Permission of instructor

### CMHS 6500 ADVANCED THEORY AND PRACTICE OF CAREER COUNSELING

[3 hours] Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development. Prerequisite: Completion of a Master's degree in counseling, school psychology, or the equivalent, or permission of instructor

### CMHS 6920 MASTER'S RESEARCH PROJECT

[1-3 hours] In this capstone experience, master's students review the literature, report implications and produce a project which can be applied in counseling-related settings. This can substitute for CMHS 6930. Prerequisite: 30 hours of master's program; permission of instructor

### CMHS 6930 MASTER'S RESEARCH SEMINAR

[2-3 hours] In this capstone experience, master's students review and critique the literature and report implications for research, theory and practice on counseling-related topic of interest, approved by the instructor. Prerequisite: 30 hours of departmental master's program and permission of instructor

### CMHS 6940 COUNSELING INTERNSHIP

[1-8 hours] Supervised practical experiences in various settings while assuming a spectrum of counseling roles and functions. Emphasis is placed upon integrating ethical practice, theory and research in work settings. Prerequisite: A grade of B or above in CMHS 5190

### CMHS 6950 WORKSHOP IN COUNSELING, MENTAL HEALTH, AND SCHOOL PSYCHOLOGY

[1-6 hours] Workshops developed around topics of interest and concern to counselors, school psychologists or other mental health care professionals. Practical application of topics will be stressed. Prerequisite: Permission of instructor

### CMHS 6960 MASTER'S RESEARCH THESIS

[1-3 hours] In this capstone experience, master's students complete an original piece of research, including literature review, methods, analysis and discussion. This can substitute for CMHS 6930. Prerequisite: 30 hours of master's program; permission of instructor

### CMHS 6990 MASTER'S INDEPENDENT STUDY

[1-4 hours] Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services. Prerequisite: Permission of instructor

### CMHS 7130 GROUP COUNSELING

[4 hours] Provides training and experience in group development, dynamics, theories, methods and skills of group counseling, group leadership, research and evaluation, ethical issues and other group work approaches.

### CMHS 7140 COUNSELING THEORIES AND TECHNIQUES

[4 hours] Includes a study of basic counseling and consultation theories and helping relationships from individual, group and systemic perspectives. Explores helper and helpee characteristics, sociocultural factors and legal and ethical considerations. Includes supervised training in counseling and consulting skills.



**CMHS 7150 COUNSELING ACROSS THE LIFE SPAN**

[3 hours] Theories of individual and family development across the lifespan are examined. Developmental processes of individuals and families and implications for counseling are presented from a multi-generational family perspective.

**CMHS 7160 CULTURAL DIVERSITY FOR COUNSELORS AND SCHOOL PSYCHOLOGISTS**

[3 hours] Addresses the cross-cultural theories, knowledge, beliefs and techniques required for providing effective services to culturally diverse populations. Examines assumptions about cultural differences which underlie counseling theories and therapies.

**CMHS 7170 CONSULTATION I: THEORIES AND TECHNIQUES**

[3 hours] Addresses the theories and techniques of collaborative problem solving; includes an examination of variables affecting the consultation process

**CMHS 7180 CONSULTATION II: PROMOTING SYSTEM SUCCESS**

[4 hours] Advanced theory and practice in consultation. Emphasis is on family, school-based and system-level techniques for promoting mental health in students. Includes a survey of current prevention programs and crisis management plans. Prerequisite: CMHS 5170 or 7170

**CMHS 7210 PSYCHOPATHOLOGY**

[4 hours] The study of various paradigms for conceptualizing psychopathology related to children, adolescents and adults. Includes study of specific personality theories and their application to clinical counseling. Prerequisite: 30 hours toward departmental master's degree

**CMHS 7220 CHILD, ADOLESCENT, FAMILY THERAPY**

[3 hours] Specialized study of therapeutic techniques commonly emphasized in working with children, adolescents and their families. Approaches to family therapy in a multicultural context, family assessment and ethical issues will be emphasized. Prerequisite: CMHS 5140

**CMHS 7230 CRISIS INTERVENTION COUNSELING**

[3 hours] Instruction in the theories, skills and techniques necessary to intervene into a variety of crisis situations such as suicide, violence, domestic violence, drug and alcohol abuse and family dysfunction. Prerequisite: CMHS 5140

**CMHS 7240 DIAGNOSIS AND MENTAL HEALTH**

[4 hours] Study of the signs, symptoms, etiology and psychodynamics of various mental and emotional disorders based on the most current edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM).

**CMHS 7310 PSYCHOEDUCATIONAL ASSESSMENT AND INTERVENTIONS II**

[4 hours] Training indirect and standardized assessment techniques of preschool and low-incidence population, and designing appropriate interventions. Introduces functional behavior assessment. Prerequisite: CMHS 5300; permission of instructor

**CMHS 7320 PSYCHOEDUCATIONAL ASSESSMENT AND INTERVENTIONS III**

[4 hours] Assessment of cognitive and personality functioning of school-age children using standardized tests, and the interpretation of results. Prerequisite: Grade of B or above in CMHS 5310 or 7310; permission of instructor

**CMHS 7330 SCHOOL PSYCHOLOGY PRACTICUM I**

[4 hours] Practice in individual evaluation, assessment and intervention design with school age children. Prerequisite: CMHS 5300, CMHS 5/7310

**CMHS 7340 SCHOOL PSYCHOLOGY PRACTICUM II**

[4 hours] Practice in individual evaluation, assessment and intervention design, with preschool and other special populations. Includes practice in functional behavioral assessment. Prerequisite: CMHS 7330 with grade B or above

**CMHS 7510 SUPERVISION IN COUNSELING AND SCHOOL PSYCHOLOGY**

[3 hours] Training in supervision models, methods, roles, ethical issues, research and evaluation. Advanced training in consultation.

**CMHS 7520 EDUCATION AND LEADERSHIP IN MENTAL HEALTH PROFESSIONS**

[3 hours] Orient students to the roles and tasks of educators and leaders in mental health professions, curricular issues of programs, professional and ethical issues and current status and future trends in higher education among mental health professions. Prerequisite: Enrolled in doctoral program

**CMHS 7530 ADVANCED THEORIES OF COUNSELING AND CONSULTATION**

[4 hours] Advanced preparation in theory pertaining to the principles and practice of individual counseling, group work and consultation. Prerequisite: Permission of instructor

**CMHS 7540 ADVANCED PERSONALITY ASSESSMENT**

[4 hours] Administration, scoring and interpretation of selected advanced personality assessment instruments. Special emphasis will be given to the MMPI-2 and the MCMI-III, CPI and report writing.

**CMHS 7920 SPECIALIST RESEARCH PROJECT**

[1-3 hours] In this capstone experience, specialist students review the literature, report implications and produce a project which can be applied in school psychology and counseling-related settings. Prerequisite: Permission of adviser and instructor

**CMHS 7930 DOCTORAL RESEARCH SEMINAR**

[3 hours] Advanced preparation in research problems, design and implementation of quantitative and qualitative research and methodology in the fields of counseling and supervision. Prerequisite: Master's degree in Counselor Education

**CMHS 7940 INTERNSHIP IN SCHOOL PSYCHOLOGY**

[8 hours] Academic year on-the-job experience in a school supervised by a school psychologist with further supervision by the university. Broad range of assessment, consultation and counseling experiences are emphasized. Prerequisite: CMHS 5030; Grade of B or better in CMHS 7320 and 7340; permission of instructor

**CMHS 8410 ADVANCED PRACTICUM IN INDIVIDUAL AND GROUP THERAPY**

[4 hours] Students receive supervised, practical experiences in providing counseling in individual and group modes of services. Advanced therapy skills will be emphasized. Prerequisite: Permission of instructor

**CMHS 8420 ADVANCED PRACTICUM IN FAMILY THERAPY**

[4 hours] This course is designed to provide specialized opportunity under live supervision to develop specialized skills in family therapy. The student will work in co-therapy with a family experiencing difficulties. Prerequisite: Permission of instructor

**CMHS 8440 ADVANCED THEORY AND PRACTICE OF GROUP COUNSELING**

[3 hours] Advanced training and experience in development, dynamics, theories, methods and skills of group counseling and therapy, leadership, research and evaluation and ethical issues as applicable to normal and abnormal populations. Prerequisite: Permission of instructor

**CMHS 8450 COUPLES AND FAMILY THERAPY**

[3 hours] Theories and practice of couples and family counseling are explored. Foundations of systems theories and their application to couples and family therapy are presented. Prerequisite: CMHS 5140, 5150

**CMHS 8460 SUBSTANCE ABUSE COUNSELING**

[3 hours] Review of treatment approaches, techniques and programs for counseling individuals and families experiencing substance-related problems.

**CMHS 8470 DRUGS AND MENTAL HEALTH COUNSELING**

[4 hours] Study of the psychobiological and psychophysiological effects of psychotropic medications used for the psychopharmacological treatment of mental and emotional disorder. Theoretical, efficacy and ethical concerns are reviewed. Prerequisite: Permission of instructor

**CMHS 8480 ADVANCED TRAINING IN PROFESSIONAL, LEGAL, AND ETHICAL ISSUES**

[3 hours] Advanced training in contemporary professional, legal and ethical issues that regulate or affect the work of counselors, psychologists and other mental health professionals.

**CMHS 8490 GENDER ISSUES IN COUNSELING AND MENTAL HEALTH SERVICES**

[3 hours] Examines the effect of gender role and related dynamics upon the psychological functioning of men and women and considers how these issues can be explored in counseling based upon an interactive model of gender roles emphasizing the learned nature of these characteristics.

**CMHS 8500 ADVANCED THEORY AND PRACTICE OF CAREER COUNSELING**

[3 hours] Advanced study in theories pertaining to the principles and practice of career counseling. Special emphasis on research, legal and ethical issues, and the role of culture in career choice and development. Prerequisite: Completion of a Master's degree in counseling, school psychology, or the equivalent, or permission of instructor

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### **CMHS 8930 ADVANCED DOCTORAL SEMINAR**

[3 hours] This seminar will consider problems and provide advanced study. Open only to advanced graduate students. Prerequisite: Permission of instructor

### **CMHS 8940 COUNSELING INTERNSHIP**

[1-8 hours] Supervised practical experiences in various settings while assuming a spectrum of counseling roles and functions. Emphasis is placed upon integrating ethical practice, theory and research in work settings. Prerequisite: A grade of B or above in CMHS 5190

### **CMHS 8950 WORKSHOP IN COUNSELING, MENTAL HEALTH, AND SCHOOL PSYCHOLOGY**

[1-6 hours] Workshops developed around topics of interest and concern to counselors, school psychologists, or other mental health care professionals. Practical application of topics will be stressed. Prerequisite: Permission of instructor

### **CMHS 8960 DOCTORAL RESEARCH DISSERTATION**

[1-12 hours] Dissertation credit may not total less than 10 semester hours and no greater than 32 hours. A doctoral student may register for such credit in more than one semester. Prerequisite: Permission of adviser

### **CMHS 8980 SPECIAL TOPICS IN COUNSELING, MENTAL HEALTH, AND SCHOOL PSYCHOLOGY**

[1-3 hours] This course is open to a graduate student pursuing a master's, specialist or doctoral degree program and may be a requirement of that program. Prerequisite: Permission of instructor

### **CMHS 8990 DOCTORAL INDEPENDENT STUDY**

[1-4 hours] Provides students the opportunity to work independently on professional problems under the direction of a faculty member in the Department of Counseling and Mental Health Services. Prerequisite: Permission of instructor

## **CMPT - Data Processing Technology**

### **Department of Business Technology (UNV)**

#### **CMPT 1010 COMPUTER FUNDAMENTALS**

[1 hour] Introduction to microcomputers. Topics covered are hardware, software, computer operation, terminology and applications.

#### **CMPT 1020 INFORMATION COMPUTER TECHNOLOGY**

[4 hours] Concepts and techniques on business applications of computers. Hands on experience in business applications. Programming concepts using COBOL programming language. Corequisite: CMPT 1050

#### **CMPT 1050 SCRIPTING LANGUAGES**

[4 hours] Introduces scripting technology focusing on industry trends and standards. Students will demonstrate the ability to evaluate, learn and adopt new scripting languages. Corequisite: CMPT 1020 or CMPT 1100

#### **CMPT 1100 COMPUTER INFORMATION APPLICATIONS**

[3 hours] Concepts and techniques on the application of computers to the solution of business computer information systems. Students will have hands-on experience in word processing, spreadsheet and database on microcomputers.

#### **CMPT 1110 PC OPERATING SYSTEMS**

[3 hours] In-depth study of both command line and graphical user-based contemporary PC operating systems. Topics include installation and upgrade, configuration, management, troubleshooting and network connectivity.

#### **CMPT 1120 APPLICATION AND WEB PROGRAMMING**

[4 hours] A currently popular programming language (such as JAVA) will be used to create stand-alone applications and World Wide Web pages.

#### **CMPT 1320 INTERNET AND THE WORLD WIDE WEB**

[1 hour] Internet topics including history of the Internet, IP addressing, Telnet, Gopher, FTP, WAIS and World Wide Web. Students will create a personal home page with Hyper Text.

#### **CMPT 1400 INTRODUCTION TO WEB PAGE DEVELOPMENT**

[2 hours] Students will learn the basics of creating custom Web designs by using tables, forms, graphics and interactive features. Plan, write and format Web pages for workplace applications.

#### **CMPT 1410 ELECTRONIC SPREADSHEET APPLICATIONS**

[2 hours] An analysis of the use of electronic spreadsheets in solving business problems with an emphasis on the design of templates to meet the needs of specific applications. Prerequisite: CMPT 1100 or 1020

#### **CMPT 1420 DATABASE MANAGEMENT SYSTEMS APPLICATIONS**

[2 hours] An analysis of the use of a DBMS in solving business problems with an emphasis on the entering, updating, manipulating, storing and retrieving of information. Prerequisite: CMPT 1100 or 1020

#### **CMPT 1430 MICROSOFT WORD**

[2 hours] MS Word will teach students word processing concepts and applications using industry standard software. Students will prepare a variety of documents and master basic software functions in an effective and efficient manner.

#### **CMPT 1440 ELECTRONIC PRESENTATIONS**

[2 hours] Students will learn basic to advanced features of PowerPoint software from creating a presentation and adding graphics to presenting a slide show and integrating PowerPoint with other software.

#### **CMPT 1450 MICROSOFT OUTLOOK**

[1 hour] Students will learn a flexible messaging and personal information management program used to send and receive e-mail and manage messages, contacts, appointments and tasks.

#### **CMPT 1500 WEB ANIMATION**

[2 hours] Students will learn advanced Web page design by incorporating graphics and images into animation features. Students will use popular animation software to create interactive Web sites. Prerequisite: CMPT 1400

#### **CMPT 1510 DIGITAL IMAGING**

[2 hours] This course offers a broad overview and extensive practical experience in the production of digital images. Students create digital images using scanners, video and digital cameras. Image resolution, format options, color correction, screen frequency, halftones and reproduction are also covered. Prerequisite: CMPT 1100

#### **CMPT 1520 DIGITAL ILLUSTRATION**

[3 hours] Explores the use of computers for digital image creation. Concepts, techniques and applications also covered. Students will use popular illustration software applications to create print, presentation and Web graphics. Prerequisite: CMPT 1100

#### **CMPT 1530 DIGITAL IMAGE DESIGN AND EDITING**

[3 hours] Explores digital imaging using popular image-editing and/or image creation software. Topics include photo-retouching, image editing techniques, color painting and software used to prepare images for the WWW. Prerequisite: CMPT 1100

#### **CMPT 1540 DIGITAL VIDEO**

[3 hours] Explores use of video editing software. Students will analyze, evaluate, describe terminology. Also develop proficiency in desktop video production and create an electronic resume using popular video-editing software. Prerequisite: CMPT 1100

#### **CMPT 1600 INTERNET DESIGN AND PUBLISHING**

[3 hours] This course offers a broad overview and extensive practical experience in the design and production of Web pages. Students learn current Web design technology and create Web pages using Microsoft FrontPage. Prerequisite: CMPT 1100

#### **CMPT 2010 RPG PROGRAMMING**

[4 hours] Experience in the operation of current mid-range computer architecture. Fundamental programming experience in the RPG language with emphasis on logic and efficiency. Prerequisite: CMPT 1020

#### **CMPT 2030 C FAMILY PROGRAMMING**

[4 hours] Students are introduced to the C family of programming languages. Students will write computer programs using the most up-to-date versions of this language family.

#### **CMPT 2110 ADVANCED CONCEPTS IN PROGRAMMING**

[4 hours] The course covers advanced programming techniques and the concepts of object-oriented programming using a currently popular programming language (such as C++). Prerequisite: CMPT 2030

#### **CMPT 2210 DATA MANAGEMENT WITH SQL**

[3 hours] Hands-on course utilizing a multi-user database management system. SQL will be used as a data manipulation and a data definition language. Prerequisite: CMPT 1020 or CMPT 1100

#### **CMPT 2220 INFORMATION SYSTEMS DESIGN AND IMPLEMENTATION**

[4 hours] Provides CIT majors with an opportunity to work on a project which utilizes the knowledge gained in the other CIT courses. The project will include analysis, design and implementation of a business application. Prerequisite: CMPT 2210 and 1120 or 2010

**CMPT 2310 COMPUTER END-USER SUPPORT**

[3 hours] Overview of knowledge and skills necessary to provide support to computer users; emphasis on problem solving and communication skills in addition to technical knowledge.

**CMPT 2320 XML CONCEPTS AND PROGRAMMING**

[3 hours] Creation of XML applications through document specification and self-defining data definition. The role of XML in business-to-business communication.

**CMPT 2400 MICROCOMPUTER PROJECT**

[4 hours] Provides practical experience in applying concepts studied in previous courses to a systems design project. The project consists of student teams performing the analysis, design, software selection, testing and implementation of a microcomputer system for a business. Prerequisite: CMPT 1100, 1410, 2210, 1420; CNET 2200

**CMPT 2410 DESKTOP PUBLISHING**

[3 hours] This course will enable the student to learn the elements of the publishing cycle: writing, editing, typesetting, design, graphic production, page makeup and final publication. Newsletters, brochures, pamphlets and fliers will be produced. Prerequisite: ADOT 1010

**CMPT 2420 ADVANCED DESKTOP PUBLISHING**

[3 hours] This course will cover advanced electronic desktop publishing concepts, procedures and applications. Students will design sophisticated desktop documents for print, internet and prepress. Prerequisite: CMPT 2410

**CMPT 2430 WORD PROCESSING**

[2 hours] This course will focus on the advanced word processing skills wanted by employers including generating large documents, creating a professional newsletter and a web page and learning advanced graphic features. Prerequisite: CMPT 1430

**CMPT 2460 ADVANCED ELECTRONIC SPREADSHEET APPLICATIONS**

[2 hours] Students will learn intermediate and advanced functions of electronic spreadsheets in order to utilize them effectively in workplace situations. Prerequisite: CMPT1410

**CMPT 2510 ADVANCED DIGITAL ILLUSTRATION**

[3 hours] An in-depth study of computer software applications for professional illustration creation and manipulation. Students will incorporate advanced typography, image compositing, painting and image-correction techniques integrating image editing and illustration software. Prerequisite: CMPT 1100

**CMPT 2530 ADVANCED DIGITAL IMAGE DESIGN AND EDITING**

[3 hours] An in-depth study of digital imaging using image-editing and creation software. Students capture, create, manipulate and edit composite images for high-end output by service bureaus and/or prepress industries using current software applications. Prerequisite: CMPT 1100

**CMPT 2550 ADVANCED DIGITAL VIDEO**

[3 hours] This course covers advanced techniques of video editing software. Students will use professional video-editing techniques to develop short- and long-format movies for video, film, desktops, multimedia and the WWW using popular video-editing software. Prerequisite: CMPT 1100

**CMPT 2620 WEB SITE MAINTENANCE**

[3 hours] This course develops skills for students who will function as Web developers or project managers responsible for increasing Web site traffic, updating Web content and designs. Students learn planning issues related to Web design and redesign. Prerequisite: CMPT 1100

**CMPT 2630 MOUS CERTIFICATION CONCEPTS**

[2 hours] Students will reinforce Word, Excel, Access and PowerPoint concepts to prepare them to take Microsoft Office User Specialist (MOUS) certification tests in these areas. Prerequisite: CMPT 1410, 1420, 1430, 1440, 2430, 2460

**CMPT 2990 INDEPENDENT STUDY**

[1-4 hours] Students will study a computer-related subject mutually agreed upon between the student and the instructor. The format may include lecture, computer lab and/or practical experience. Prerequisite: Permission of instructor

## CNET - Computer Networking Technology

### Department of Business Technology (UNV)

**CNET 2100 NETWORK OPERATING SYSTEMS I**

[4 hours] In-depth study of a contemporary network operating system. Topics include operating system installation and upgrade, configuration, management and troubleshooting. Prerequisite: CNET 2150

**CNET 2150 HARDWARE ARCHITECTURE AND MANAGEMENT**

[3 hours] Knowledge of computer hardware for the purpose of acquisition, installation and maintenance at the equipment level.

**CNET 2200 NETWORK TECHNOLOGIES**

[4 hours] Examines the network technologies utilized in today's networks. Emphasis is placed on understanding hardware and software concepts and protocols referred to in technical publications and advanced network studies.

**CNET 2300 NETWORK OPERATING SYSTEMS II**

[4 hours] This course builds on CNET 2100 by offering in-depth study of a second contemporary network operating system. Topics include operating system installation and upgrade, configuration, management and troubleshooting. Prerequisite: CNET 2100

**CNET 2400 NETWORK OPERATING SYSTEM SUPPORT**

[4 hours] Examines the support aspects of a contemporary network operating system in a local area network environment. Topics include operating system installation, upgrade, configuration, management and troubleshooting. Prerequisite: CNET 2200

**CNET 2410 NETWORK SERVICES**

[4 hours] This course builds on CNET-2400 by examining services available in contemporary network operating systems. Topics include network security and directory services installation, configuration, management and troubleshooting. Prerequisite: CNET 2400

**CNET 2420 ENTERPRISE NETWORK SERVICES**

[4 hours] This course builds on CNET 2410 by examining services available on enterprise networks. Topics include enterprise-wide directory and network services design, configuration, management and troubleshooting. Prerequisite: CNET 2410

**CNET 2940 NETWORK CAPSTONE PROJECT**

[2 hours] Practical experience in a networking environment either within the business technology department or at a business location under faculty supervision. Prerequisite: CNET 2200 Corequisite: CNET 2300

## COMM - Communication

### Department of Communication (ARS)

**COMM 1010 COMM PRINCIPLES AND PRACTICES**

[3 hours] An introductory course that provides instruction and practice in human communication including interpersonal communication, group discussion, public speaking and mass communication. (not for major credit) Humanities core course

**COMM 2000 MASS COMMUNICATION AND SOCIETY**

[3 hours] Overview of the media of mass communication, which considers social, economic and intellectual impact on American culture and democracy. Exploration of various mass media and their methods of shaping public perceptions. Humanities core course

**COMM 2100 NEWS WRITING**

[4 hours] Theory and practice of news writing as journalistic discourse. Emphasis on news style and values, story structure, types of stories. Ethics, taste and rudiments of law integrated throughout. Prerequisite: 30 hours, Type 20 wpm, pass gram/sp/punc test, 2.5 GPA

**COMM 2120 REPORTING METHODS**

[4 hours] Introduction to methodology of inquiry using primary sources, critical thinking skills, fact discrimination, interviewing, listening skills, data collection including electronic methods. Writing of originally researched stories for newspaper organizations. (COMM 2400 recommended) Prerequisite: COMM 2100

**COMM 2150 EDITING AND GRAPHICS**

[4 hours] Introduction to Writing, Editing, Design approach in editing newspapers, newsletters, electronic and similar publications. Fundamentals of desktop publishing, copy editing, headline writing, typography, layout, design, use of photos, illustrations. Prerequisite: COMM 2100

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### **COMM 2210 RADIO PRODUCTION AND PROGRAMMING**

[4 hours] Basic principles of production and programming including training and development in basic performance areas. A study of contemporary station programming theories and techniques. Includes individual weekly lab requirement.

### **COMM 2220 BASIC TELEVISION STUDIO OPERATION**

[4 hours] Study and practice in the use of studio and control room equipment, including editing equipment. Discussion of the role of the director and producer in television production.

### **COMM 2400 INFORMATION ANALYSIS AND SYNTHESIS**

[3 hours] Introductory course for all Communication majors. Identification of primary sources that match information needs, gaining access to these sources, retrieving information and using it for responsible media decision making.

### **COMM 2600 PUBLIC PRESENTATIONS**

[3 hours] Applies the principles of informative and suatory discourse in the construction and delivery of public presentations.

### **COMM 2630 VISUAL COMMUNICATION**

[4 hours] Instruction and laboratory experience in applying the principles of visual communication to human communication contexts including public relations releases, newsletters, direct mail and electronic media.

### **COMM 2810 ORAL INTERPRETATION OF LITERATURE**

[3 hours] Designed to help students read aloud with spontaneity, clarity and feeling by studying the mechanics of oral reading in relation to interpretive treatment of various genre of literature.

### **COMM 2990 INDEPENDENT STUDY**

[1-4 hours] A freshman/sophomore seminar in which the student pursues a problem of special interest in communication. A prospectus must be submitted to the faculty member with whom the student will work. Prerequisite: Permission of department chair

### **COMM 3150 FEATURE WRITING**

[4 hours] Theory and practice in writing in various kinds of discourse for newspapers, magazines and electronic publications and writing for specialized audiences. Developing context, analysis, background and appropriate standards of evidence for publication. Prerequisite: COMM 2120

### **COMM 3180 MASS COMMUNICATION LAW**

[4 hours] Case studies and readings in libel, privacy, access and other legal issues arising from constitutional, judicial and administrative laws that affect mass communication. Prerequisite: COMM 2000

### **COMM 3270 RADIO/TELEVISION NEWSWRITING**

[4 hours] Training in the skills required in the preparation, writing and editing of both radio and television news. Prerequisite: English Comp II with a C or better

### **COMM 3280 MEDIA PERFORMANCE**

[3 hours] A study of the principles and philosophies involved with successful broadcast communication and performance techniques. Includes laboratory projects in commercials, interviewing, news and ad-lib announcing.

### **COMM 3290 MEDIA MANAGEMENT**

[3 hours] The study of electronic media systems from an operations perspective. Course includes: programming, marketing, production and ethical considerations. Prerequisite: COMM 2000

### **COMM 3610 SPEECH AND PUBLICITY WRITING FOR PUBLIC RELATIONS**

[3 hours] Study and practice in developing speeches for others. Theory and practice of composing publicity materials using public relations standards.

### **COMM 3720 PUBLIC RELATIONS THEORY**

[3 hours] Public relations principles, planning and methods in business, government, educational institutions and other organizations. Examination of law, ethics, professionalism, history, theory, strategies and practices of the profession. Prerequisite: COMM 2100

### **COMM 3810 GROUP COMMUNICATION**

[3 hours] Theory and practice of group communication variables with an emphasis on problem solving approaches.

### **COMM 3820 PERSUASION THEORY**

[4 hours] Examination of the theory and practices used in persuasive communication in public presentations, advertising, sales and political campaigns.

### **COMM 3830 BASIC PRINCIPLES OF DEBATE AND FORENSICS**

[4 hours] Theory and practice in reasoned discourse; analysis, evidence, logical forms and fallacies. Problems and procedures in administering a forensic program, teaching and directing debate and individual speaking events.

### **COMM 3840 INTERPERSONAL COMMUNICATION**

[4 hours] Review and application of interpersonal communication theory and research in a variety of one-to-one social contexts. Humanities core course

### **COMM 3850 RESEARCH METHODS**

[3 hours] Introduction to qualitative and quantitative methods in communication research. Focus on evaluating and interpreting reports in various forms of communication.

### **COMM 3870 COMMUNICATION THEORY**

[3 hours] A review of human communication theory and research directed toward understanding and applying theory and research in various communication contexts and for various communication outcomes. Prerequisite: COMM 2400

### **COMM 3880 PROFESSIONAL BUSINESS COMMUNICATION**

[3 hours] Developing advanced oral and written organizational communications skills. Practice in various types of business communication formats: preparing reports, persuasive messages and memos.

### **COMM 3890 CASE STUDIES IN REDUCING WORKPLACE CONFLICT**

[3 hours] An examination of communication variables that may reduce the potential for workplace conflict. Students survey theoretical models, conduct interviews with professionals and write analyses of case studies of successful conflict management.

### **COMM 4090 MASS COMMUNICATION ETHICS**

[4 hours] Examination of ethical problems that face the media of mass communication and application of classical ethical theories to those problems. Prerequisite: COMM 2000

### **COMM 4110 HIGH SCHOOL PUBLICATIONS**

[3 hours] Problems involved in the production of high school newspapers and yearbooks including approaches to design, advertising, content, news, editorials, administration and business management.

### **COMM 4220 ADVANCED TELEVISION PRODUCTION**

[4 hours] Advanced principles and aesthetic considerations in the production of various television programs. Includes both in-studio as well as location work. Prerequisite: COMM 2220

### **COMM 4250 MASS COMMUNICATION HISTORY**

[4 hours] Historical consideration of the media of mass communication from colonial era to the present, with special emphasis on the role mass communication has played in the development of the nation. Prerequisite: COMM 2000

### **COMM 4330 NEW TECHNOLOGIES**

[3 hours] The content is designed to explore the changing complexity of the communication industry from both national and international perspectives. Prerequisite: COMM 2630

### **COMM 4630 PUBLIC RELATIONS PRACTICES**

[3 hours] Examination of practices, techniques, tools and strategies used in public relations. Research theory and techniques; strategic planning and management of public relations programs. In-depth study of one detailed project. Prerequisite: COMM 2000, 3720 Corequisite: COMM 2100

### **COMM 4640 PUBLIC RELATIONS CASE STUDIES**

[3 hours] Analysis of successful and unsuccessful public relations efforts and programs. Emphasis on the theoretical and ethical foundations of successful public relations programming. Prerequisite: COMM 4630

### **COMM 4810 NONVERBAL COMMUNICATION**

[3 hours] Survey, analysis and application of research in nonverbal communication variables and phenomena.

### **COMM 4830 GENDER, CULTURE & COMMUNICATION**

[3 hours] Explores how gender and culture simultaneously shape and are shaped by communication. Significance of relationships and language as building blocks for identity will be analyzed.

### **COMM 4900 COMMUNICATION SEMINAR**

[3-4 hours] An in-depth examination of a communication topic, problem or media event. May be writing intensive. Prerequisite: Permission of instructor

**COMM 4910 SENIOR PORTFOLIO**

[1 hour] Assessment of work from at least five Communication classes. The student will develop a portfolio highlighting their work. Students will also write cover letters, resumes and graduate school applications. Course offered P/NC. Prerequisite: COMM 2000, 2400; completion of five additional communication classes, at least two from both Applied and Conceptual Communication

**COMM 4940 COMMUNICATION INTERNSHIP**

[1-3 hours] Professional training in communication relating to newspaper work, public relations, broadcasting etc. Arrangements with the appropriate communication organization must be made in consultation with the internship director prior to enrollment. Course offered P/NC. Prerequisite: Permission of department chair

**COMM 4990 INDEPENDENT STUDY**

[1-4 hours] A seminar in which the student pursues a problem of special interest in communication. A prospectus must be submitted prior to registration to the participating faculty member. Prerequisite: Permission of department chair

## CRIM - Criminal Justice

### Department of Criminal Justice (HHS)

**CRIM 1010 CRIMINAL JUSTICE**

[4 hours] The overall history, philosophy and functioning of the criminal justice system in the U.S. The integrated roles of law enforcement, the courts and corrections will be analyzed and discussed.

**CRIM 1040 HUMAN RELATIONS**

[3 hours] Introduction to community policing concepts, community relations problems, policies and practices as they apply to law enforcement agencies and personnel.

**CRIM 1110 PENOLOGY**

[3 hours] The study of jails, prisons and other types of specialized correctional institutions. The philosophy of incarceration along with the administration, staffing and operations of these facilities will be reviewed.

**CRIM 1240 POLICING**

[3 hours] Introduction to law enforcement practices and agencies in the United States, including the history, philosophy and operation of federal, state and local enforcement agencies.

**CRIM 2010 COURT CASE PROCESSING**

[3 hours] A survey of federal, state and local courts, including structure, organization, processes and probation.

**CRIM 2050 COMMUNITY-BASED CORRECTIONS**

[3 hours] To present the overall objectives of community-based corrections programs as alternatives to incarceration. Probation and parole along with other specialized community-based, innovative corrections programs will be presented and discussed. Prerequisite: Sophomore status or permission of instructor

**CRIM 2100 SPECIAL PROBLEMS/LAW ENFORCEMENT**

[3 hours] Introduction to problems that affect law enforcement organizations and personnel. Topics covered include cultural sensitivity, selection training, police deviance, divorce, suicide, use of force, complaints and additional topics introduced by the instructor or students. Prerequisite: CRIM 1010

**CRIM 2150 APPLIED PSYCHOLOGY AND CRIMINOLOGY FOR CRIMINAL JUSTICE PERSONNEL**

[3 hours] An analysis of the classification and causes of crime and criminality along with the psychology of the corrections environment. Applied psychological principles will be utilized to explore adaptation and coping skills for both corrections personnel and offenders. Prerequisite: CRIM 1010 and PSY 1010

**CRIM 2160 OFFENDER MANAGEMENT AND SUPERVISION**

[3 hours] An in-depth analysis of the professional relationships between corrections workers and their clients including the development of effective interpersonal communications and interpersonal relationships that lead to a positive corrections environment. Prerequisite: Sophomore status or permission of instructor

**CRIM 2200 CRIMINAL LAW**

[3 hours] The statutes of Ohio relating to crime and the elements necessary for establishing and providing proof of crimes are studied. Prerequisite: CRIM 1010

**CRIM 2210 CRIMINAL INVESTIGATION I**

[3 hours] Introduction to the processes, theories and principles of criminal investigation. Methods of gathering information, report writing, interview/interrogation strategies, surveillance, search warrant information, affidavit preparation and execution are studied. Prerequisite: CRIM 1010

**CRIM 2220 LAWS OF EVIDENCE**

[3 hours] A thorough study of the evidence rules with specific emphasis on the application of these rules in preparing and presenting evidence. Prerequisite: CRIM 1010

**CRIM 2230 CONSTITUTIONAL LAW**

[3 hours] A comprehensive study and analysis of the Bill of Rights of the U.S. Constitution and its effect on the administration of justice. Prerequisite: Sophomore status or permission of instructor

**CRIM 2250 JUVENILE JUSTICE**

[3 hours] To analyze the causes of juvenile delinquency and the extent of the problem in the U.S. Also, to discuss the inter-workings of the juvenile justice system in response to the delinquency problem, in conjunction with delinquency prevention programs. Prerequisite: Sophomore status or permission of instructor

**CRIM 2300 TRAFFIC ACCIDENT INVESTIGATION**

[3 hours] This is a general course in accident investigation techniques. Prerequisite: CRIM 1010

**CRIM 2400 PATROL TECHNOLOGY**

[3 hours] Patrol, patrol operations, tactics, equipment and unusual occurrences are studied. Prerequisite: CRIM 1010

**CRIM 2950 FIELD OBSERVATION**

[1-6 hours] An examination of criminal justice through placement in the field to observe practices and behavior. Regular class meetings and writing about the experience are also required. Prerequisite: Permission of instructor

**CRIM 2990 INDEPENDENT STUDY**

[1-6 hours] Supervised independent study. Prerequisite: Permission of instructor

**CRIM 3100 HISTORY OF PUNISHMENT**

[3 hours] This course examines the history of Western European and Anglo-American penal institutions and theories. The course will consider the influence of Roman law, canon law and the Enlightenment on Western penology, as well as the impact on penology of modern reform movements. Prerequisite: Junior or senior standing

**CRIM 3110 HATE CRIMES**

[3 hours] The course examines the genesis, development, theory and practice of hate crimes and how society has and can respond to hate crimes. Prerequisite: Junior or senior standing, or permission of instructor

**CRIM 3180 THE LAW OF CORRECTIONS AND PUNISHMENT**

[3 hours] An examination of the law that governs punishment, institutional and community-based corrections and the rights and liabilities of corrections personnel. Prerequisite: Junior or senior standing, or permission of instructor

**CRIM 3210 CRIMINAL JUSTICE AND THE MASS MEDIA**

[3 hours] This course surveys the relationships between crime, criminal justice and mass media. Topics explored include the history, extent and social impact of media coverage of criminal activities.

**CRIM 3220 CRIME MAPPING AND CRIMINAL PROFILING**

[3 hours] The course content develops an understanding of the uses of information technologies and psychological profiling in defining criminal behavior as well as the geographic consideration. Prerequisite: Junior or senior standing, or permission of instructor

**CRIM 3230 WHITE COLLAR CRIME**

[3 hours] A historical overview of the evolution of white-collar crime in American Society as well as an understanding of the nature, causes and consequences of different forms of white-collar crime. Prerequisite: Junior standing

**CRIM 3240 VICTIMOLOGY**

[3 hours] This course examines the history of victimology and includes topics such as the characteristics of crime victims and specific types of victimization such as hate crimes and sexual assault. Prerequisite: CRIM 1010 or permission of instructor

**CRIM 3260 DOMESTIC AND INTERNATIONAL TERRORISM**

[3 hours] The history and evolution of terrorism in the United States and other countries, including the weapons, ideology and people involved in terrorist events and counterterrorist methods plus deterrents.

**CRIM 3270 ORGANIZED CRIME AND CRIMINAL ORGANIZATIONS**

[3 hours] This course will examine the origins and functioning of organized crime and criminal organizations from a criminal justice perspective. Prerequisite: Junior standing

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### **CRIM 3280 JUVENILE GANG CULTURE AND ORGANIZATION**

[3 hours] An examination of the behavioral, socioeconomic and cultural dimensions of juvenile gang activity in the United States plus prevention, intervention and law enforcement strategies.

### **CRIM 3290 CRIMINAL INVESTIGATION II**

[3 hours] An introduction to the crime scene, including methods of searching, photography, sketching and gathering of physical evidence. Fingerprint analysis. Methods utilized in drug investigations and development of information sources are studied. Prerequisite: CRIM 2210 and junior standing

### **CRIM 3300 DEATH PENALTY**

[3 hours] This course explores the legal, social, political and moral issues that surround the death penalty. Prerequisite: Junior or senior standing, or permission of instructor

### **CRIM 3310 CIVIL LIBERTIES AND TERRORISM**

[3 hours] This course explores the enhancement and erosion of civil liberties during times of crisis, especially during war and/or terrorism. Prerequisite: Junior or senior standing, or permission of instructor

### **CRIM 3400 TECHNOLOGY ISSUES IN CRIMINAL JUSTICE**

[3 hours] An examination of the use of technology to subvert the law and to enforce the law. The legal dimensions of technology in criminal justice will also be included. Prerequisite: Junior or senior standing, or permission of instructor

### **CRIM 3420 CRIMINAL JUSTICE LEADERSHIP**

[3 hours] An introduction to principles governing the organization, structure and administration of law enforcement organizations. Prerequisite: Junior or senior standing, or permission of instructor

### **CRIM 4100 CRIMINAL JUSTICE RESEARCH METHODS**

[3 hours] This course provides students with an understanding of criminal justice research, the concepts and logic of research designs and widely used statistical procedures. Prerequisite: MATH 1180 or higher and junior or senior

### **CRIM 4200 ETHICS IN CRIMINAL JUSTICE**

[3 hours] This course is designed to provide students with an opportunity to integrate ethics in their understanding of criminal justice. Prerequisite: Junior or senior standing

### **CRIM 4250 COMPARATIVE CRIMINAL JUSTICE SYSTEMS**

[3 hours] Examination of how different countries around the world have organized their law enforcement courts and corrections agencies into a uniquely structured system of criminal justice based on cultural and legal differences.

### **CRIM 4300 THEORIES OF CRIMINAL JUSTICE**

[3 hours] A critical study and appreciation of the theories of criminal justice, including micro and macro theories. Prerequisite: Junior or senior standing

### **CRIM 4310 ADVANCED CRIMINAL PROCEDURE**

[3 hours] An examination of the constitutional dimensions of the criminal justice process, with particular emphasis on the development of analysis skills and an examination of legal theory. Prerequisite: CRIM 2230

### **CRIM 4400 CRIMINAL JUSTICE FIELD STUDIES**

[1-3 hours] An examination of criminal justice operations in metropolitan areas through student participation in applied research and field observations related to program evaluation, policy analysis, etc.. Prerequisite: Permission of instructor

### **CRIM 4450 ADMINISTRATION OF POLICE SERVICES**

[3 hours] The application of management principles to municipal police departments, emphasizing the resources, constraints and strategies of police managers. Prerequisite: Junior or senior standing

### **CRIM 4490 CURRENT TOPICS IN CRIMINAL JUSTICE**

[3 hours] Examination of selected current issues in criminology/criminal justice that impact our knowledge and understanding of the field. Prerequisite: Sophomore standing

### **CRIM 4500 CORRECTIONS POLICY AND ADMINISTRATION**

[3 hours] Study of the political, managerial and legal factors in the corrections system. Prerequisite: Junior or senior standing

### **CRIM 4520 POLICE AND SOCIETY**

[3 hours] An examination of the role of the police in contemporary America, emphasizing the ambivalence of the self-image of the police and the social and political forces that compete to redefine police function. Prerequisite: Junior or senior standing

### **CRIM 4590 ADMINISTRATION OF CRIMINAL JUSTICE**

[3 hours] General systems approach to criminal justice from an organizational and legal perspective with emphasis on the interaction of the major components-police, prosecutors, courts and corrections. Prerequisite: Junior or senior standing

### **CRIM 4940 CRIMINAL JUSTICE INTERNSHIPS**

[3-12 hours] Field placement experience within a criminal justice agency to enhance the student's practical knowledge of the field in conjunction with career planning opportunities. Prerequisite: Permission of instructor

### **CRIM 4990 INDEPENDENT STUDY IN CRIMINAL JUSTICE**

[3 hours] Individual course of study in a selected topic pertaining to Criminal Justice chosen by the student, with the consent of the instructor. Prerequisite: Permission of instructor

### **CRIM 5370 DISPROPORTIONATE CONFINEMENT OF MINORITY YOUTH**

[3 hours] The course examines the issue of disproportionate minority confinement of youth in the juvenile and criminal justice systems. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

### **CRIM 5400 CRIMINAL JUSTICE FIELD STUDIES**

[1-3 hours] An examination of criminal justice operations in metropolitan areas through classroom study and field observations. Prerequisite: Permission of instructor

### **CRIM 6000 ADVANCED THEORIES: CRIMINAL JUSTICE**

[3 hours] This course critically examines contributions made by a variety of theorists to an understanding of crime/deviance and reactions to it. Prerequisite: Admission to Graduate School; permission of instructor

### **CRIM 6000 ADVANCED THEORIES: CRIMINAL JUSTICE**

[3 hours] This course critically examines contributions made by a variety of theorists to an understanding of crime/deviance and reactions to it. Prerequisite: Admission to Graduate School

### **CRIM 6100 METROPOLITAN PROBLEMS AND THE CRIMINAL JUSTICE SYSTEM**

[3 hours] This course will introduce students to the diverse populations and problems inherent in the metropolitan juvenile and criminal justice system. Prerequisite: Admission to Graduate School; permission of instructor

### **CRIM 6200 DATA ANALYSIS IN CRIMINAL JUSTICE**

[3 hours] This course provides students with a basic understanding of fundamental data analysis techniques utilized in criminal justice research.

### **CRIM 6300 ADVANCED STUDIES IN ETHICS AND CRIMINAL JUSTICE**

[3 hours] This course is designed to provide students with the opportunity to integrate ethics in an understanding of criminal justice. Prerequisite: Admission to Graduate School; permission of instructor

### **CRIM 6310 JUVENILE JUSTICE IN THE METROPOLITAN COMMUNITY**

[3 hours] Criminal justice theories of delinquency are studied and compared with a paradigmatic foundation of current criminal justice processes. Prerequisite: Admission to Graduate School

### **CRIM 6320 WOMEN, CRIME AND CRIMINAL JUSTICE**

[3 hours] This course explores women as offenders, victims and professionals in criminal justice. Prerequisite: Admission to Graduate School; permission of instructor

### **CRIM 6330 ADVANCED STUDIES IN VICTIMOLOGY**

[3 hours] This course will address crime victims' issues and will challenge students to consider how the criminal justice system can improve its response to victims. Prerequisite: Admission to Graduate School; permission of instructor

### **CRIM 6340 ADVANCED STUDIES IN MENTAL ILLNESS, CRIME AND CRIMINAL JUSTICE SYSTEM**

[3 hours] This course will examine the historical processes that have led to an influx of persons with mental illness and substance abuse into the metropolitan criminal justice system. Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6350 ADVANCED COMPARATIVE CRIMINAL JUSTICE**

[3 hours] This course examines how different countries around the globe have organized their criminal justice agencies into uniquely structured systems of criminal justice. Cultural and legal differences influencing justice are also examined. Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6360 GENOCIDE & CRIMES AGAINST HUMANITY IN INTERNATIONAL JUSTICE**

[3 hours] This course traces the genesis and evolution of genocide and crimes against humanity as distinct categories of international criminality. Prerequisite: Graduate standing

**CRIM 6400 GRADUATE CRIMINAL JUSTICE RESEARCH METHODOLOGY**

[3 hours] This course is designed to provide students with an understanding of criminal justice research. Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6400 GRADUATE CRIMINAL JUSTICE RESEARCH METHODOLOGY**

[3 hours] This course is designed to provide students with an understanding of criminal justice research. Prerequisite: Admission to Graduate School

**CRIM 6440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS**

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

**CRIM 6500 CORRECTIONS IN THE METROPOLITAN COMMUNITY**

[3 hours] This course will review the theoretical and historical roots of corrections. Students will examine metropolitan corrections problems and practices, particularly as they exist in Toledo, Lucas County and other metropolitan areas. Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6520 PRACTICUM: CHILD STUDY INSTITUTE**

[1 hour] The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

**CRIM 6550 THE CRIMINAL JUSTICE SYSTEM AND INEQUALITY**

[3 hours] This course examines critical theories and applications of law in reference to a variety of identities, groups and communities designated as "minority." Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6570 CIVIL AND CRIMINAL LIABILITY IN CRIMINAL JUSTICE**

[3 hours] This course examines the law and social science literature concerning the civil and criminal liability that attends working in the criminal justice field. Prerequisite: Admission to Graduate School; permission of instructor

**CRIM 6590 ADMINISTRATION OF CRIMINAL JUSTICE**

[3 hours] A research-oriented course into the relationship of the major structures of criminal justice-police, prosecutor, courts and corrections with emphasis on the development of performance evaluation criteria.

**CRIM 6610 CORRECTIONS POLICY AND ADMINISTRATION**

[3 hours] Study of the political, managerial and legal factors in the corrections system. Prerequisite: Criminal Justice major

**CRIM 6620 POLICE AND SOCIETY**

[3 hours] An examination of the role of the police in contemporary America, emphasizing the ambivalence of the self-image of the police and the social and political forces that compete to redefine the police function. Prerequisite: One course in criminal justice or public administration

**CRIM 6940 CRIMINAL JUSTICE GRADUATE INTERNSHIP**

[1-3 hours] Field placement experience in an approved criminal justice agency to enhance the knowledge of the student.

**CRIM 6950 POLICY PROJECTS IN CRIMINAL JUSTICE**

[3 hours] This course provides a forum to facilitate the development of individual scholarly criminal justice projects.

**CRIM 6960 THESIS**

[1-6 hours] This course involves research leading to a written thesis. Both the topic of the research and the final thesis must be defended and approved by the student's thesis committee. Prerequisite: Core classes of M.A. program completed

**CRIM 6980 SPECIAL TOPICS IN CRIMINAL JUSTICE**

[3 hours] Content will vary as instructors present a single concentration on developments, problems and controversies in criminal justice. Prerequisite: Admission to graduate degree program

**CRIM 6990 INDEPENDENT STUDY IN CRIMINAL JUSTICE**

[1-3 hours] Directed study in criminal justice under the supervision of a criminal justice faculty member. Prerequisite: Admission to graduate degree program; permission of instructor

**CRIM 8440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS**

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

**CRIM 8520 PRACTICUM: CHILD STUDY INSTITUTE**

[1 hour] The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

## CSET - Computer Science and Engineering Technology

### Department of Engineering Technology (ENG)

**CSET 1100 INTRODUCTION TO COMPUTER SCIENCE AND ENGINEERING TECHNOLOGY**

[3 hours] A first course in computer hardware and software for CSET majors. Single and multi-user operating systems, command-line processing, program planning and creation and simple Internet tools are covered.

**CSET 1200 GUI PROGRAMMING AND VISUAL BASIC**

[3 hours] Introduction to Windows-based programming for engineering technology applications. Topics include Windows Application Program Interface (API), message processing, Windows Procedures, using Windows resources, modal and modeless dialog boxes and the graphics Device Interface. Prerequisite: CSET 1100

**CSET 2200 PC AND INDUSTRIAL NETWORKS**

[4 hours] Current concepts and technologies used with personal computers and PLCs in both industrial (factory-floor) and commercial data networks. Topics include PC networking hardware and software, PLC hardware and programming and PLC networking alternatives. Prerequisite: CSET 2100

**CSET 3100 ADVANCED WEB SITE DESIGN**

[3 hours] HTML forms, creation of static and animated web graphics, Dynamic Fonts, SMIL (Synchronized Multimedia Integration Language) as it relates to G2, Realtext, Realpix and XML. The course also covers Frames, META Tags, Optimizing Speed, Cookies, Imagemapping (from both sides), HTML, tables and Shockwave. Prerequisite: CSET 1100 and Junior standing

**CSET 3200 CLIENT/SERVER COMPUTING**

[3 hours] Covers client/server architecture and programming techniques. Major topics include two-tier and three-tier client server architectures, programming considerations, cleanlayering, advanced graphical user interface controls, database processing, transaction processing and monitoring. Prerequisite: Junior standing

**CSET 3250 CLIENT-SIDE SCRIPTING**

[3 hours] Introduction to the Document Object Model (DOM), JavaScript and VBScript scripting languages, cascading style sheets, browser recognition, browser-specific content, data validation and layers. Prerequisite: CSET 3100

**CSET 3300 DATABASE-DRIVEN WEB SITES**

[4 hours] Creation of dynamic Web applications that interact with a database using client-side scripts, server-side scripts and compiled server programs. Includes database fundamentals, scripting language fundamentals and server considerations. Prerequisite: EET 3150

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### **CSET 4100 CGI PROGRAMMING WITH PERL AND JAVA**

[3 hours] Covers Common Gateway Interface (CGI) programming on the Internet using the most popular scripting languages. Topics include client-side programs, server-side programs, distributed database creation and searching. Prerequisite: Junior standing

### **CSET 4150 WEB SERVER ADMINISTRATION**

[3 hours] Installation and configuration of the web server operating systems (e.g., UNIX, Windows NT), installation and administration of web daemon (e.g., Apache, Microsoft IIS). Site management, including file and directory hierarchy, web log analysis, installation and configuration of various utilities for gopher, ftp, text ending and email. Prerequisite: CSET 2200 and Junior standing

### **CSET 4200 VLSI TECHNOLOGY**

[4 hours] Introduction to CMOS technology and circuits, MOS transistor switches and CMOS logic. Practical aspects of silicon manufacturing technology including wafer processing, layout design rules and process parameterization. Electrical and physical design of logic gates, clocking schemes, I/O structures and structures design strategies. Prerequisite: ENGT 1050

### **CSET 4250 APPLIED PROGRAMMING LANGUAGES**

[3 hours] How to select the most appropriate language for a specific engineering technology application. Topics include comparison of programming languages by evolution, formal specifications, structures, features, application domains, programming paradigms, implementation of syntax, semantics and program run-time behavior. Prerequisite: Junior standing

### **CSET 4650 FIELD PROGRAMMABLE LOGIC DEVICES**

[4 hours] This course covers the implementation of digital circuits using Field Programmable Logic Devices, with emphasis on Field Programmable Gate Arrays. Students learn to download their designs on Xilinx FPGA's using schematic capture and VHDL code. Prerequisite: EET 3350

### **CSET 4750 COMPUTER NETWORKS AND DATA COMMUNICATION**

[4 hours] Computer network architectures and their application to industry needs. Major topics include vocabulary, hardware, design concepts, current issues, trends, hardware, multi-user operating systems, network protocols, local and wide area networks, intranet and internet communications, analog and digital data transmissions. Prerequisite: CSET 2200

## **CTE - Career and Technical Education**

### **Department of Curriculum & Instruction (EDU)**

### **CTE 2010 OCCUPATION COMPETENCY EXAM - TECHNOLOGY**

[1-12 hours] Written examination covering technology. NOTE: Students must have completed 30 semester hours at UT before the examination credit can be applied toward the bachelor of career and technical education degree.

### **CTE 2020 OCCUPATION COMPETENCY EXAM - PERFORMANCE**

[1-12 hours] Performance examination covering the occupation to be taught. NOTE: Students must have 30 semester hours at UT before examination credit can be applied towards the bachelor of career and technical education degree.

### **CTE 2990 INDEPENDENT FIELD EXPERIENCE**

[1-4 hours] The student will contract with the faculty member assigned to set up an independent field experience that will enable the student to meet personal career objectives.

### **CTE 3010 TEACHING OCCUPATIONAL SKILLS**

[3 hours] The development of pedagogical skills designed to assist the beginning teacher with basic classroom techniques and strategies.

### **CTE 3020 TEACHING OCCUPATIONAL KNOWLEDGE**

[3 hours] The development of career and technical teaching concepts, designed to assist teachers with the presentation of occupational knowledge. Prerequisite: CTE 3010

### **CTE 3030 METHODS OF TEACHING CAREER AND TECHNICAL EDUCATION I**

[2 hours] The development and application of career and technical teaching methods and strategies in an actual classroom/laboratory situation or under a simulated classroom setting.

### **CTE 3040 METHODS OF TEACHING CAREER AND TECHNICAL EDUCATION II**

[2 hours] The continued development and application of career and technical teaching methods and strategies in an actual classroom/laboratory situation or under a simulated classroom setting.

### **CTE 3060 OCCUPATIONAL TEST DEVELOPMENT**

[3 hours] Study and construction of psychomotor, cognitive, affective and perceptual evaluation instruments for use in laboratory and related technology classes. Prerequisite: CTE 3010, 3020

### **CTE 3080 STRATEGIES FOR TEACHING TECHNICAL THEORY**

[3 hours] An analysis of occupational skills to identify mathematics, science and communication competencies and apply reflective analysis to teaching affective, cognitive and psychomotor skills using a results oriented teaching model. Prerequisite: CTE 3010, 3020

### **CTE 3100 CURRICULUM CONSTRUCTION CAREER AND TECHNICAL EDUCATION**

[3 hours] Development of knowledge and skill in competency based education to include occupational analysis, selection of course content, course of study and instructional guide development and credentialing students. Required for certification. Prerequisite: CTE 3010, 3020

### **CTE 3120 CONSTRUCTION & UTILIZATION OF LEARNING ACTIVITIES PACKED**

[3 hours] This course provides the career and technical teacher with the skills to develop and utilize individualized competency based learning activity packets from a previously developed curriculum.

### **CTE 3160 UPDATING OCCUPATIONAL SKILLS AND KNOWLEDGES**

[1-6 hours] This course provides the student with an opportunity to upgrade occupational proficiency and technical knowledge through business or industrial experiences or supplemental training for the purpose of improving instruction.

### **CTE 3910 SEMINAR FOR CAREER AND TECHNICAL TEACHERS**

[3 hours] The study of current developments in specific areas of instruction with the development of course materials as assigned. Prerequisite: CTE 3030, 3040

### **CTE 4020 OCCUPATIONAL SAFETY & LIABILITY**

[3 hours] The study of occupational health and safety hazards. Regulations applicable to school, business and industry will be examined. Strategies to minimize exposure to and prevent injuries will be developed.

### **CTE 4040 LABORATORY ORGANIZATION AND MANAGEMENT**

[3 hours] Designed for laboratory instructors to increase their operating efficiency and effectiveness. Focus is on arranging the facility and controlling materials, supplies, learning activities and maintenance through various system approaches.

### **CTE 4060 FOUNDATIONS OF CAREER AND TECHNICAL EDUCATION**

[3 hours] A study of social issues, historical events and philosophies that provide a basis for the development of career and technical education. Principles and their implications are also reviewed.

### **CTE 4080 PRINCIPLES OF SCHOOL-TO-WORK TRANSITION**

[3 hours] Designed for educators and employers to increase their knowledge and skill to build partnerships between schools and business, industry and labor. Examines transition concepts, components, implementation strategies and models.

### **CTE 4100 ORGANIZATION, ADMINISTRATION & REGULATION OF CAREER AND TECHNICAL EDUCATION**

[3 hours] Study of the organization and administration of career and technical education at the national, state and local levels, noting relationships existing between the agencies.

### **CTE 4120 SUPERVISION OF CAREER AND TECHNICAL EDUCATION**

[3 hours] Development of supervisory skills in career and technical education. Stresses human relations, team building, basic management and leadership skills in program inauguration and operations.

### **CTE 4140 COOPERATIVE EDUCATION**

[2 hours] Designed to present the basic fundamentals of establishing and operating a cooperative occupational program.

### **CTE 4160 CURRICULUM DEVELOPMENT & TEACHING CO-OPERATIVE EDUCATION**

[3 hours] A study of cooperative education curriculum and instructional methods, including the coordination of classroom-related instruction with on-the-job experience based on the commonalities of a variety of occupations. Prerequisite: CTE 4140



**CTE 4180 PROMOTION, RECRUITMENT & RETENTION IN CAREER AND TECHNICAL EDUCATION**

[3 hours] A study of career and technical education in the community, and promotion, recruitment and retention strategies, including school publics, theories of community power structure and the career and technical school in a democratic society.

**CTE 4220 ADVISER TRAINING - YOUTH LEADERSHIP DEVELOPMENT**

[3 hours] Designed for teachers and supervisors to increase their skills and knowledge of youth leadership development. Focus is on advising a student career and technical organization and includes both establishing and maintaining functions.

**CTE 4570 TEACHING ADULT LEARNERS IN CAREER AND TECHNICAL EDUCATION**

[3 hours] A study of the unique learning and teaching characteristics associated with adult learners, adult learning theory, learner characteristics, physical effects of aging and strategies consistent with adult learning styles.

**CTE 4910 DIRECTED RESEARCH IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Investigations in such fields as community surveys to determine needs for career and technical education, industrial surveys, follow-up studies of career and technical graduates, developing content of shop-related technology courses.

**CTE 4930 SUPERVISED TEACHING**

[3-8 hours] A planned field experience held in public school classrooms under the direction of University supervisors. Practicing teacher observed planning, presenting and demonstrating teaching skills and managing the laboratory and classroom. Prerequisite: CTE 3010, 3020, 3030, 3040, 3100

**CTE 4940 PRACTICUM-INTERNSHIP IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Observation and supervised experiences will be offered in a variety of appropriate settings, or students will be assigned to work as interns in a school setting under the joint supervision of school and university personnel. Prerequisite: CTE 4100, 4120

**CTE 4950 WORKSHOP IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] Workshops developed around topics of interest and concern for preservice and inservice teachers and other education personnel. Practical applications of workshop topics are emphasized.

**CTE 4980 PROBLEMS IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers. Stresses solution and resolution of educational problems occurring within selected districts.

**CTE 4990 INDIVIDUAL STUDY IN CAREER AND TECHNICAL EDUCATION FOR UNDERGRADUATE STUDENTS**

[1-3 hours] Individual study is designed to provide the opportunity to work individually on professional problems under the direction of the faculty in career and technical education.

**CTE 5020 OCCUPATIONAL SAFETY AND LIABILITY**

[3 hours] The study of occupational health and safety hazards. Regulations applicable to school, business and industry will be examined. Strategies to minimize exposure to and prevent injuries will be developed.

**CTE 5040 LABORATORY ORGANIZATION AND MANAGEMENT**

[3 hours] Designed for laboratory instructors to increase their operating efficiency and effectiveness. Focus is on arranging the facility and controlling materials, supplies, learning activities and maintenance through various system approaches.

**CTE 5060 FOUNDATIONS OF CAREER AND TECHNICAL EDUCATION**

[3 hours] A study of social issues, historical events and philosophies that provide a basis for the development of career and technical education. Principles and their implications are also reviewed.

**CTE 5080 PRINCIPLES OF SCHOOL-TO-WORK TRANSITION**

[3 hours] Design for educators and employers to increase their knowledge and skill to build partnerships between schools and business, industry and labor. Examines transition concepts, components, implementation strategies and models.

**CTE 5100 ORGANIZATION, ADMINISTRATION & REGULATIONS OF CAREER AND TECHNICAL EDUCATION**

[3 hours] Study of the organization and administration of career and technical education at the national, state and local levels, noting relationships existing between the agencies.

**CTE 5120 SUPERVISION OF CAREER AND TECHNICAL EDUCATION**

[3 hours] Development of supervisory skills in career and technical education. Stresses human relations, team building, basic management and leadership skills in program inauguration and operations.

**CTE 5140 COOPERATIVE EDUCATION**

[2 hours] Designed to present the basic fundamentals of establishing and operating a cooperative occupational program.

**CTE 5160 CURRICULUM DEVELOPMENT & TEACHING**

[3 hours] A study of cooperative education curriculum and instructional methods, including the coordination of classroom-related instruction with on-the-job experience based on the commonalities of a variety of occupations. Prerequisite: CTE 5140

**CTE 5180 PROMOTION, RECRUITMENT & RETENTION**

[3 hours] A study of career and technical education in the community, and promotion, recruitment and retention strategies, including school publics, theories of community power structure and the career and technical school in a democratic society.

**CTE 5220 ADVISER TRAINING FOR YOUTH LEADERS**

[3 hours] Designed for teachers and supervisors to increase their skills and knowledge of youth leadership development. Focus is on advising a student career and technical organization and includes both establishing and maintaining functions.

**CTE 5570 TEACHING ADULT LEARNERS**

[3 hours] A study of the unique learning and teaching characteristics associated with adult learners, adult learning theory, learner characteristics, physical effects of aging and strategies consistent with adult learning styles.

**CTE 5810 STAFF EVALUATION AND DEVELOPMENT**

[3 hours] An analysis of the processes and current instruments available for evaluation of programs and personnel, and an appraisal of the professional development needs of individuals in educational settings.

**CTE 5830 CURRICULUM PRINCIPLES AND MODELS**

[3 hours] Curriculum principles and models are examined. The characteristics of curricula are established and inferences are drawn for the planning, implementation and evaluation phases of curriculum development.

**CTE 5940 PRACTICUM-INTERNSHIP IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Observation and supervised experiences will be offered in a variety of appropriate settings, or students will be assigned to work as interns in a school setting under the joint supervision of school and university personnel. Prerequisite: CTE 5100

**CTE 5950 WORKSHOP IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] Workshops developed around topics of interest and concern for preservice and inservice teachers and other education personnel. Practical applications of workshop topics will be emphasized.

**CTE 5980 PROBLEMS IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers and administrators. Stresses solution and resolution of educational problems occurring within selected districts.

**CTE 5990 INDIVIDUAL STUDY IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Individual study is designed to provide the opportunity to work individually on professional problems under the direction of the faculty in career and technical education.

**CTE 6900 RESEARCH IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Investigations in such fields as community surveys to determine needs for career and technical education, industrial surveys, follow-up studies of vocational graduates, developing content of shop-related technology courses.

**CTE 6920 MASTER'S RESEARCH PROJECT IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Open to a graduate student who elects the completion of a research project in fulfilling the research requirement of the master's degree.

**CTE 6960 MASTER'S THESIS IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Open to a graduate student who elects the completion of a master's thesis in fulfilling the research requirement of the master's degree.

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### **CTE 7810 STAFF EVALUATION AND DEVELOPMENT**

[3 hours] An analysis of the processes and current instruments available for evaluation of programs and personnel, and an appraisal of the professional development needs of individuals in educational settings.

### **CTE 7830 CURRICULUM PRINCIPLES AND MODELS**

[3 hours] Curriculum principles and models are examined. The characteristics of curricula are established and inferences are drawn for the planning, implementation and evaluation phases of curriculum development.

### **CTE 7940 PRACTICUM-INTERNSHIP IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Observation and supervised experiences will be offered in a variety of appropriate settings, or students will be assigned to work as interns in a school setting under the joint supervision of school and university personnel. Prerequisite: CTE 5100

### **CTE 7950 WORKSHOP IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] Workshops developed around topics of interest and concern for preservice and inservice teachers and other education personnel. Practical applications of workshop topics will be emphasized.

### **CTE 7980 PROBLEMS IN CAREER AND TECHNICAL EDUCATION**

[1-5 hours] A course developed around topics of interest and concern to inservice teachers and administrators. Stresses solution and resolution of educational problems occurring within selected districts.

### **CTE 7990 INDIVIDUAL STUDY IN CAREER AND TECHNICAL EDUCATION**

[1-3 hours] Individual study is designed to provide the opportunity to work individually on professional problems under the direction of the faculty in career and technical education.

## **DANC - Dance**

### **Department of Music and Dance (ARS)**

#### **DANC 1220 DANCE IMPROVISATION I**

[3 hours] An introduction to dance improvisation technique. May be taken twice for credit.

#### **DANC 1230 TAPI**

[3 hours] Development of basic skills in tap dance. May be taken twice for credit.

#### **DANC 1240 MODERN DANCE I**

[3 hours] Development of basic skills in modern dance. May be taken twice for credit.

#### **DANC 1250 INTRODUCTION TO THE DANCE**

[3 hours] A fine arts course designed to acquaint the student with the nature of dance as a performing art. Humanities core course

#### **DANC 1260 JAZZ I**

[3 hours] Introduction to the American idiom of dance found in musical theatre forms. May be taken twice for credit.

#### **DANC 1270 BALLET I**

[3 hours] Introduction to ballet basics. May be taken twice for credit.

#### **DANC 2230 MODERN DANCE REPERTOIRE**

[3 hours] This course is designed for the advanced dance student with an interest in being an integral part of creating, rehearsing and presenting modern dance works. Prerequisite: DANC 2240 or permission of instructor

#### **DANC 2240 MODERN DANCE II**

[3 hours] An intermediate level dance technique course with emphasis on continuity and phrasing. May be taken twice for credit. Prerequisite: DANC 1240 or permission of instructor.

#### **DANC 2260 JAZZ II**

[3 hours] An intermediate level jazz technique class where elements of performing and group work are introduced. May be taken twice for credit. Prerequisite: DANC 1260 or permission of instructor.

#### **DANC 2270 BALLET II**

[3 hours] A second level ballet technique class where continuity and phrasing are introduced. May be taken twice for credit. Prerequisite: DANC 1270 or permission of instructor.

#### **DANC 2280 CHOREOGRAPHY**

[3 hours] An introduction to dance composition. The creative processes of well known choreographers will be examined in relationship to the personal process, facilitating the making of dances, solo and group work. Prerequisite: DANC 1250 or permission of instructor.

#### **DANC 2980 SPECIAL TOPICS IN DANCE**

[1-3 hours] Selected subjects in dance in areas of special interest to students who desire to enhance their dance education.

## **DST - Disability Studies**

### **Disability Studies Program (ARS)**

#### **DST 2020 DISABILITY IN THE UNITED STATES**

[3 hours] An overview of the emergence of disability rights in the U.S. with an emphasis on the independent living movement, disability history, culture and representation in mass media. (Not for credit in the minor). U.S. multicultural course

#### **DST 3020 DEFINITIONS OF DISABILITY**

[3 hours] An interdisciplinary exploration of the definitions, models and paradigms of disability, including medical, social, phenomenological, rehabilitative and independent living constructions of disability.

#### **DST 3030 ISSUES IN DISABILITY STUDIES**

[3 hours] An interdisciplinary exploration of the history and culture of disability, including the issues of stigmatizing and stereotyping, communication barriers and breakthroughs, educational segregation and mainstreaming and the experience of "passing." Prerequisite: ENGL 1110 Humanities core course

#### **DST 4890 DISABILITY STUDIES RESEARCH AND METHODOLOGIES**

[3 hours] An interdisciplinary exploration and review of research issues and methodologies suited to the study of disability. Prerequisite: DST 3020

#### **DST 4940 INTERNSHIP IN DISABILITY STUDIES**

[3 hours] This course is a service learning model internship with on-campus and/or community agencies addressing disability studies issues. Sites must be approved by the instructor. Prerequisite: DST 4890

## **EBUS - Electronic Commerce**

### **Department of Marketing (BUS)**

#### **EBUS 3090 E-COMMERCE AND THE NETWORKED ECONOMY**

[3 hours] This course is an introduction to the networked economy, e-commerce and business transformation. It covers the technological trends, business opportunities, competitive threats, marketing responses and public policy issues concerning e-commerce. Prerequisite: Junior standing

#### **EBUS 3180 WEB DESIGN FOR BUSINESS COMMUNICATION**

[3 hours] A study of Web site design and management process for effective business communication, including authoring software, graphic tools, scripting techniques, java applets and related technical, legal ethical and managerial issues. Prerequisite: Junior standing.

#### **EBUS 4040 E-COMMERCE INTELLIGENCE MANAGEMENT**

[3 hours] A study of business intelligence management in an e-commerce environment, including the use of data mining and warehousing tools for market analysis and business decision supports. Prerequisite: EBUS 3090

#### **EBUS 4150 E-COMMERCE BUSINESS MODELS AND PROJECT MANAGEMENT**

[3 hours] A hands-on course involving case studies of successful e-commerce business models and a team-based project to develop e-commerce plan for established and start-up businesses. Prerequisite: EBUS 3090 and senior standing

## **ECON - Economics**

### **Department of Economics (ARS)**

#### **ECON 1010 INTRODUCTION TO ECONOMIC ISSUES**

[3 hours] Basic concepts and theory applications to major economic problems and controversies. Designed primarily to meet requirements of students not planning to take upper level economics courses. (not for major credit) Social Sciences core course

**ECON 1150 PRINCIPLES OF MACROECONOMICS**

[3 hours] Explaining the level and the growth of economic activity, its fluctuations and ways of achieving greater stability, including the roles of money, banking and international finance. Social Sciences core course

**ECON 1200 PRINCIPLES OF MICROECONOMICS**

[3 hours] Theories of consumer behavior; determination of input and output; prices and quantities in factor and product markets; analysis of international trade and policy; applications include labor markets and income distribution. Social Sciences core course

**ECON 2120 MONEY AND BANKING**

[3 hours] The nature and role of money, credit and banking in an economic system. Emphasis on the structure, operation and objectives of the Federal Reserve System. Prerequisite: ECON 1150 or 1880

**ECON 2400 THE AMERICAN ECONOMY IN THE TWENTIETH CENTURY**

[3 hours] American economic growth in the recent past. Evolution of governmental roles, development of labor markets with respect to race and sex, effects of wars and depressions. Status of American competitiveness.

**ECON 2500 TOPICS IN INTERNATIONAL ECONOMICS**

[3 hours] Why nations trade; comparative advantage and gains from trade; free trade versus protectionism; free versus "fair" trade; balance of payments problems.

**ECON 2640 BUSINESS AND ECONOMIC STATISTICS**

[3 hours] Included is the study of hypothesis testing, single and multiple regression, correlation analysis, time series and index numbers, and non-parametric statistics. Prerequisite: MATH 2630

**ECON 2980 CURRENT TOPICS IN ECONOMICS**

[3 hours] Course content varies as changes in the interaction between economic topics and writing assignments occur.

**ECON 3030 CONSUMER ECONOMICS**

[3 hours] Economic role of the consumer, theory of choice-making - rational purchasing of food, housing, health care, transportation, insurance, credit, budgeting, investing and tax returns. Prerequisite: ECON 1150 or 1200 or 1880

**ECON 3050 ECONOMICS OF GENDER**

[3 hours] Analysis of labor market outcomes and income distribution characteristics resulting from gender differences; gender-related economic outcomes: the "feminization of poverty," persistent male-female wage differential, expanding proportion of female-headed households. U.S. multicultural course

**ECON 3070 ECONOMICS AND LAW**

[3 hours] Methodologies of Law and Economics; Legal institutions; Economic Theory of Property; Property Rights; Contract Theory; Economic Theory of Torts and Tort Law, Common Law Process; Economics of Crime and Punishment. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor

**ECON 3080 ECONOMICS OF CRIME**

[3 hours] Study of crime as an economic activity; costs of crime to the community; economic approach to crime reduction. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor

**ECON 3120 TOPICS IN MONETARY AND FINANCIAL ECONOMICS**

[3 hours] Current issues in money, banking and finance; interest rate theory; international money and banking; monetary policy and modeling monetary economies. Prerequisite: ECON 1150 or 1880

**ECON 3150 INTERMEDIATE MACROECONOMIC THEORY**

[3 hours] National income accounting; theory of income determination; causal relationships; analysis of consumption, investment, government and foreign demand functions; integration of theories of income, output, money and interest. Prerequisite: ECON 1150 or 1880

**ECON 3200 INTERMEDIATE MICRO-ECONOMIC THEORY**

[3 hours] Consumer theory, utility and indifference curve analysis, theory of the firm, industry pricing in perfect and imperfect competition and distribution theory. Prerequisite: ECON 1200 or 1880

**ECON 3410 WORLD ECONOMIC HISTORY**

[3 hours] Study of economic growth throughout the world, particularly in Europe, Asia, Africa and Latin America. Analysis of economic institutions, technological change, industrialization and living standards. Prerequisite: ECON 1150 or 1200 or 1880

**ECON 3490 ECONOMIC HISTORY OF THE AFRICAN AMERICAN COMMUNITY**

[3 hours] Development of the economic status, problems and role of the African American community from colonial times to the present. Special emphasis on economic writings of African American scholars. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor U.S. multicultural course

**ECON 3500 COMPARATIVE ECONOMIC SYSTEMS**

[3 hours] Theory and ideology of market, socialist and mixed economic systems. Case study of the economies of U.S., Russia, China and India. Prerequisite: ECON 1150 or 1200 or 1880 Non-western multicultural course

**ECON 3600 URBAN ECONOMICS**

[3 hours] Analysis bearing on intermetropolitan and intrametropolitan growth processes. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor

**ECON 3620 TOLEDO AREA ECONOMY**

[3 hours] Economic analysis and description of the Toledo area business, consumer, labor and government sectors - includes an introduction to local government forecasting. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor

**ECON 3900 UNDERGRADUATE SEMINAR**

[1-4 hours] Small group study of special topics initiated either by student or a faculty member.

**ECON 3910 HONORS RESEARCH**

[1-4 hours] Study of special topics initiated either by student or a faculty member.

**ECON 3920 HONORS READING**

[1-4 hours] Study of special topics initiated either by student or a faculty member.

**ECON 3980 CURRENT ECONOMIC ISSUES**

[3 hours] Course content varies as changes in the interaction between economic topics and writing assignments occur.

**ECON 4050 POPULATION ECONOMICS**

[3 hours] Interaction of economic changes and demographic variables; topics include birth rates, women's employment, marriage and divorce, aging and mortality, migration and overpopulation. Prerequisite: ECON 1150 or 1200 or 1880

**ECON 4100 BUSINESS CYCLES**

[3 hours] Historical and theoretical study of fluctuations in business activities and an examination of the various theories relating to causes and effects of such cycles. Prerequisite: ECON 1150 or 1880

**ECON 4120 MONETARY THEORY**

[3 hours] Modern theories of financial markets, money and the theory of interest rates, money's role in general equilibrium and growth models and money's ability to cause inflation. Prerequisite: ECON 2120 or 3120 or 3150

**ECON 4130 MONETARY AND FISCAL POLICY**

[3 hours] Changes in the quantity of money and alternative government spending, taxation and debt policies, interrelations of fiscal and monetary policies in stabilization programs. Prerequisite: ECON 3150 or 4120 or consent of instructor

**ECON 4150 ADVANCED MACROECONOMIC THEORY**

[3 hours] Theories of consumption and investment. Empirical estimates. Cycle and growth theory, multiplier-accelerator analysis and growth models. The theory and instruments of macroeconomic policy. Dynamic Macroeconomic Theory. Prerequisite: ECON 3150

**ECON 4160 TOPICS IN MACROECONOMICS**

[3 hours] Various topics in macroeconomics including income determination and growth theory; Keynesian, Neo-Classical, Real Business Cycle models and Monetary and Fiscal Policy analysis. Prerequisite: ECON 3150

**ECON 4200 ADVANCED MICROECONOMIC THEORY**

[3 hours] Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics. Prerequisite: ECON 3200

**ECON 4210 TOPICS IN MICROECONOMICS**

[3 hours] Extended analysis of microeconomic theory concerning individual and social choice issues. Selected topics may include: rational choice behavior, theory of markets, partial and general equilibrium analysis and welfare economics. Prerequisite: ECON 3200 and consent of instructor

**ECON 4230 POVERTY AND INCOME DISTRIBUTION**

[3 hours] Causes and consequences of current trends in poverty and income distribution in the U.S.; analysis of policies dealing with problems in these areas. Prerequisite: ECON 1150 or 1200 or 1880

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### **ECON 4240 ENVIRONMENTAL AND NATIONAL RESOURCE ECONOMICS**

[3 hours] The economics of the environment and natural resources. Examination of economic instruments for solving environmental problems. Analyzed policies include direct regulation, user charges, taxes on polluting products and marketable permits. Prerequisite: ECON 1150 or 1200 or permission of instructor, or major in either environmental sciences or environmental studies

### **ECON 4250 LABOR ECONOMICS**

[3 hours] Labor force characteristics, wage determination, hours and condition of work, unemployment, labor union structure and growth, collective bargaining and modern labor legislation. Prerequisite: ECON 1200 or 1880 or consent of instructor

### **ECON 4300 MATHEMATICAL ECONOMICS**

[3 hours] Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series. Prerequisite: ECON 1150 or 1200 or 1880 or consent of instructor

### **ECON 4380 BUSINESS AND AMERICAN SOCIETY**

[3 hours] The growth of American business enterprise and the relationship to culture, politics, technological developments and economic change.

### **ECON 4400 AMERICAN LABOR HISTORY**

[3 hours] Working-class resistance to industrialization and corporatism. Labor visions of empire, race and nation. Labor in the New Deal Order. Globalization of capital and the rusting of America.

### **ECON 4410 AMERICAN ECONOMIC HISTORY**

[3 hours] Exploration of economic growth in America from pre-Columbian times to the present day. Analysis of economic institutions, technological change, industrialization and standards of living. Prerequisite: ECON 1150 or 1200 or 1880

### **ECON 4440 CONTEMPORARY ECONOMIC THOUGHT**

[3 hours] The development of orthodox and non-orthodox economic thinking in the 20th century. Prerequisite: ECON 1150 or 1880

### **ECON 4450 HISTORY OF ECONOMIC THOUGHT**

[3 hours] Development of economic theory and thought from the 18th century through the present. Considers the theoretical and prescriptive contributions of orthodox and non-orthodox economists. Prerequisite: ECON 3150 or 3200 or consent of instructor

### **ECON 4510 INTERNATIONAL ECONOMICS I**

[3 hours] Theory of international trade; commercial policy; costs and benefits, economic integration; trade and economic growth and balance of payments problems. Prerequisite: ECON 1150 or 1880

### **ECON 4520 INTERNATIONAL ECONOMICS II**

[3 hours] The monetary aspects of international trade; balance of payments theory, problems and policies, problems and proposals for reform of the international monetary system. Prerequisite: ECON 1150 or 1880

### **ECON 4550 ECONOMIC DEVELOPMENT**

[3 hours] Economic problems and policies in less-developed countries, including such topics as schooling, population growth, urbanization, landholding, income distribution, capital formation and development strategies. Prerequisite: ECON 1150 or 1200 or 1880

### **ECON 4620 REGIONAL ECONOMICS**

[3 hours] Examination of regional income estimates and social accounts, regional multipliers, diverse location theories, supplemented with techniques of regional analysis. Prerequisite: ECON 1200 or 1880

### **ECON 4660 PUBLIC FINANCE ECONOMICS**

[3 hours] An analysis of the government sector in the economy, government expenditures, taxation and borrowing and their effects on employment, price levels and growth. Prerequisite: ECON 1200 or 1880

### **ECON 4700 AMERICAN INDUSTRY: STRUCTURE AND PERFORMANCE**

[3 hours] Analysis of the structure and economic efficiency of business enterprise in the U.S. Emphasis is placed on the manufacturing sector. Prerequisite: ECON 1200 or 1880

### **ECON 4750 HEALTH ECONOMICS**

[3 hours] Economic analysis of health and health services. Topics currently include medical and allied manpower, hospitals, drugs and cost-benefit analysis of selected health programs. Prerequisite: ECON 1200 or 1880

### **ECON 4810 ECONOMETRICS MODELS AND METHODS I**

[3 hours] An introduction to econometric methods and their use in quantitative analysis of economic theories. Diagnostics for problems typically encountered are detailed along with techniques for correcting these problems. Prerequisite: either ECON 1880 or both ECON 1150 and 1200 and either MATH 2630 or ECON 2640 or consent of instructor.

### **ECON 4820 ECONOMETRICS MODELS AND METHODS II**

[3 hours] An introduction to forecasting methods for economic time-series including Bayesian methods. Both theory and application of forecasting models and methods are covered. Prerequisite: ECON 4810 or consent of instructor.

### **ECON 4830 ECONOMETRICS MODELS AND METHODS III**

[3 hours] Econometric methods that apply to survey, spatial and cross-sectional/time-series data along with other specialized modeling techniques are covered. Prerequisite: ECON 4810 and consent of instructor.

### **ECON 4910 RESEARCH**

[1-4 hours] Prerequisite: consent of instructor

### **ECON 4920 READINGS**

[1-4 hours]

### **ECON 4960 SENIOR HONORS THESIS**

[1-4 hours]

### **ECON 4980 CURRENT ECONOMIC PROBLEMS**

[3 hours] Course content changes from time to time as important economic problems arise. Prerequisite: ECON 1150 or 1200

### **ECON 5050 POPULATION ECONOMICS**

[3 hours] Interaction of economic changes and demographic variables; topics include birth rates, women's employment, marriage and divorce, aging and mortality, migration and overpopulation. Prerequisite: ECON 1150 or 1200

### **ECON 5100 BUSINESS CYCLES**

[3 hours] Historical and theoretical study of fluctuations in business activities and an examination of the various theories relating to causes and effects of such cycles. Prerequisite: ECON 1150

### **ECON 5120 MONETARY THEORY**

[3 hours] Modern theories of financial markets, money and the theory of interest rates, money's role in general equilibrium and growth models and money's ability to cause inflation. Prerequisite: ECON 2120 or 3120 or 3150

### **ECON 5130 MONETARY AND FISCAL POLICY**

[3 hours] Changes in the quantity of money and alternative government spending, taxation and debt policies, interrelations of fiscal and monetary policies in stabilization programs. Prerequisite: ECON 3150 or 4120 or consent of instructor

### **ECON 5150 ADVANCED MACROECONOMIC THEORY**

[3 hours] Theories of consumption and investment. Empirical estimates. Cycle and growth theory, multiplier-accelerator analysis and growth models. The theory and instruments of macroeconomic policy. Dynamic Macroeconomic Theory. Prerequisite: ECON 3150 or equivalent or permission of graduate adviser.

### **ECON 5160 TOPICS IN MACROECONOMICS**

[3 hours] Various topics in macroeconomics including income determination and growth theory; Keynesian, Neo-Classical, Real Business Cycle models and Monetary and Fiscal Policy analysis. Prerequisite: ECON 3150

### **ECON 5200 ADVANCED MICROECONOMIC THEORY**

[3 hours] Advanced topics in microeconomic theory, consumer behavior, the firm and market structure, distribution theory, equilibrium conditions, welfare economics. Prerequisite: ECON 3200 or equivalent or permission of graduate adviser

### **ECON 5210 TOPICS IN MICROECONOMICS**

[3 hours] Extended analysis of microeconomic theory concerning individual and social choice issues. Selected topics may include: rational choice behavior, theory of markets, partial and general equilibrium analysis and welfare economics. Prerequisite: ECON 3200 and consent of instructor.

### **ECON 5230 POVERTY AND INCOME DISTRIBUTION**

[3 hours] Causes and consequences of current trends in poverty and income distribution in the U.S.; analysis of policies dealing with problems in these areas. Prerequisite: ECON 1150 or 1200 or permission of instructor.

**ECON 5240 ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS**

[3 hours] The economics of the environment and natural resources. Examination of economic instruments for solving environmental problems. Analyzed policies include direct regulation, user charges, taxes on polluting products and marketable permits. Prerequisite: ECON 1150 or 1200 or consent of instructor.

**ECON 5250 LABOR ECONOMICS**

[3 hours] Labor force characteristics, wage determination, hours and condition of work, unemployment, labor union structure and growth, collective bargaining and modern labor legislation. Prerequisite: ECON 1200 or consent of instructor

**ECON 5300 MATHEMATICAL ECONOMICS**

[3 hours] Development and applications of the mathematical tools used by economists. Differential and integral calculus, linear algebra, transcendental functions and series. Prerequisite: ECON 1150 or 1200 or consent of instructor

**ECON 5410 AMERICAN ECONOMIC HISTORY**

[3 hours] Exploration of economic growth in America from pre-Columbian times to the present day. Analysis of economic institutions, technological change, industrialization and standards of living. Prerequisite: ECON 1150 or 1200 or 1880

**ECON 5450 HISTORY OF ECONOMIC THOUGHT**

[3 hours] Development of economic theory and thought from the 18th century through the present. Considers the theoretical and prescriptive contributions of orthodox and non-orthodox economists.

**ECON 5510 INTERNATIONAL ECONOMICS I**

[3 hours] Theory of international trade; commercial policy; costs and benefits, economic integration; trade and economic growth and balance of payments problems. Prerequisite: ECON 1150

**ECON 5520 INTERNATIONAL ECONOMICS II**

[3 hours] The monetary aspects of international trade; balance of payments theory, problems and policies, problems and proposals for reform of the international monetary system. Prerequisite: ECON 1150

**ECON 5550 ECONOMIC DEVELOPMENT**

[3 hours] Economic problems and policies in less-developed countries, including such topics as schooling, population growth, urbanization, landholding, income distribution, capital formation and development strategies. Prerequisite: ECON 1150 or 1200

**ECON 5620 REGIONAL ECONOMICS**

[3 hours] Examination of regional income estimates and social accounts, regional multipliers, diverse location theories, supplemented with techniques of regional analysis. Prerequisite: ECON 1200

**ECON 5660 PUBLIC FINANCE ECONOMICS**

[3 hours] An analysis of the government sector in the economy, government expenditures, taxation and borrowing and their effects on employment, price levels and growth. Prerequisite: ECON 1200

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**CON 5700 AMERICAN INDUSTRY: STRUCTURE AND PERFORMANCE**

[3 hours] Analysis of the structure and economic efficiency of business enterprise in the U.S. Emphasis is placed on the manufacturing sector. Prerequisite: ECON 1200

**ECON 5750 HEALTH ECONOMICS**

[3 hours] Economic analysis of health and health services. Topics currently include medical and allied manpower, hospitals, drugs and cost-benefit analysis of selected health programs. Prerequisite: ECON 1200

**ECON 5810 ECONOMETRICS MODELS AND METHODS I**

[3 hours] An introduction to econometric methods and their use in quantitative analysis of economic theories. Diagnostics for problems typically encountered are detailed along with techniques for correcting these problems. Prerequisite: ECON 1150 and 1200 and either MATH 2630 or ECON 2640 or consent of instructor

**ECON 5820 ECONOMETRICS MODELS AND METHODS II**

[3 hours] An introduction to forecasting methods for economic time-series including Bayesian methods. Both theory and application of forecasting models and methods are covered. Prerequisite: ECON 5810 or consent of instructor

**ECON 5830 ECONOMETRICS MODELS AND METHODS III**

[3 hours] Econometric methods that apply to survey, spatial and cross-sectional/time-series data along with other specialized modeling techniques are covered. Prerequisite: ECON 5810 and consent of instructor

**ECON 5980 CURRENT ECONOMIC PROBLEMS**

[3 hours] Course content changes from time to time as important economic problems arise. Prerequisite: ECON 1150 or 1200

**ECON 6120 SEMINAR IN MONETARY POLICY**

[4 hours]

**ECON 6150 SEMINAR IN MACROECONOMICS**

[4 hours]

**ECON 6200 SEMINAR IN MICROECONOMICS**

[4 hours]

**ECON 6250 SEMINAR IN LABOR ECONOMICS**

[4 hours]

**ECON 6400 SEMINAR IN ECONOMIC HISTORY**

[4 hours]

**ECON 6500 SEMINAR IN INTERNATIONAL ECONOMICS**

[4 hours]

**ECON 6550 SEMINAR IN ECONOMIC DEVELOPMENT**

[4 hours]

**ECON 6600 SEMINAR IN URBAN ECONOMICS**

[4 hours]

**ECON 6660 SEMINAR IN PUBLIC FINANCE ECONOMICS**

[4 hours]

**ECON 6700 SEMINAR IN INDUSTRIAL ORGANIZATION**

[4 hours]

**ECON 6810 SEMINAR IN APPLIED ECONOMETRICS I**

[2 hours]

**ECON 6820 SEMINAR IN APPLIED ECONOMETRICS II**

[2 hours]

**ECON 6830 SEMINAR IN APPLIED ECONOMETRICS III**

[2 hours]

**ECON 6900 GRADUATE RESEARCH**

[1-7 hours] Prerequisite: Graduate Standing and permission of instructor

**ECON 6930 TEACHING PRACTICUM IN ECONOMICS**

[1-7 hours] Methods of teaching economics in a university. Supervised teaching of sections in Economic Principles.

Prerequisite: Graduate standing and permission of graduate adviser

**ECON 6940 PUBLIC SERVICE INTERNSHIP**

[2-7 hours] Supplements formal classroom work by providing field experience in some governmental agency through a

participant-observer relationship. Prerequisite: Consent of graduate adviser

**ECON 6960 THESIS**

[1-8 hours]

**ECON 6990 GRADUATE READINGS**

[1-7 hours] Prerequisite: Graduate standing and permission of instructor

## ECPT - Environmental Control Technology

### College of Arts & Sciences (ARS)

**ECPT 2110 INDUSTRIAL SAFETY AND HYGIENE**

[3 hours] An integrated course covering all major topics of Industrial Safety and Hygiene as prioritized by the U.S. Occupational Safety and Health Act as well as major industrial consensus standards of Industrial Safety And Hygiene.

Prerequisite: CHEM 1400 or equivalent

**ECPT 2220 HAZARDOUS MATERIALS FUNDAMENTALS**

[3 hours] Overview of the current field of hazardous materials and solid waste management from the toxicological and chemical perspective. Prerequisite: CHEM 1400; TSBS 2320

**ECPT 2300 PRACTICAL LABORATORY**

[3 hours] A laboratory or field experience for the Environmental Technician. Prerequisite: Permission of instructor

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### **ECPT 2400 AIR POLLUTION**

[3 hours] Effects, sources, evaluation and control of air pollution. Also includes current Federal legislation and regulations with regard to air quality. Prerequisite: TSBS 2320

### **ECPT 2600 ENVIRONMENTAL TOPICS**

[2 hours] A course covering current environmental topics in the greater Toledo area. Representatives of major environmental employers in water and air pollution and solid waste management are presenters in this course.

### **ECPT 2800 ENVIRONMENTAL TECHNICIAN CO-OP**

[1-4 hours] A course designed for the Environmental Technician to apply learned skills in an actual work setting. Permission of instructor. Prerequisite: Sophomore standing or higher and permission of instructor.

### **ECPT 2940 INTERNSHIP**

[1-4 hours] An unpaid internship in the Environmental Control Technologist's area or area of major interest. Prerequisite: Permission of instructor.

### **ECPT 2990 INDEPENDENT STUDY**

[1-4 hours] Individual or small group study of related topics of interest to students in the area of Environmental Control Technology. Prerequisite: Permission of instructor

## **EDAS - Educational Administration & Supervision**

### **Department of Educational Leadership (EDU)**

#### **EDAS 4100 SUPERVISORY SKILL DEVELOPMENT**

[3 hours] A study of supervisory skills for education and allied professions. The focus is on the supervisor and how she engages in activities to develop personal growth and development of staff members.

#### **EDAS 4260 LEADERSHIP FOR SUPERVISORS**

[3 hours] An examination of different leadership styles within the organization is the focal point of this course. Participants will conduct research related to directive and non-directive supervisory skills.

#### **EDAS 4280 ORGANIZATIONAL DEVELOPMENT**

[3 hours] The course explores the concepts of organizations and people who work in organizations. Participants will be involved in exercises and procedures of organizational diagnosis, evaluation and development.

#### **EDAS 4290 LABOR RELATIONS**

[3 hours] The course examines methods and procedures for improving labor relations in organizations. Participants will analyze a variety of models and issues that confront labor relations in education and allied professions.

#### **EDAS 4940 ADMINISTRATIVE FIELD EXPERIENCE**

[3-6 hours] Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working situations in positions in the private sector.

#### **EDAS 5950 WORKSHOP IN EDUCATIONAL ADMINISTRATION**

[3 hours] Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to doctoral degrees upon approval of the committee. Prerequisite: Permission of the instructor

#### **EDAS 5980 SPECIAL TOPICS IN EDUCATIONAL ADMINISTRATION**

[3 hours] Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to degree programs upon approval of the adviser or committee. Prerequisite: Permission of the instructor

#### **EDAS 6000 THE INDIVIDUAL IN ORGANIZATIONS**

[3 hours] An overview of the individual in educational administration, i.e., as strategic leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues.

#### **EDAS 6010 SUPERVISION FOR IMPROVED INSTRUCTION**

[3 hours] An examination of those principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for staff development to improve staff performance. Prerequisite: EDAS 6/8000

#### **EDAS 6020 INSTRUCTIONAL LEADERSHIP**

[3 hours] An in-depth analysis of instructional leadership to improve teacher classroom performance. Attention will focus on instructional analysis, strategies for providing feedback and writing professional growth plans. Prerequisite: EDAS 6/8000, 6/8010

#### **EDAS 6030 DEVELOPING EFFECTIVE LEARNING ENVIRONMENTS**

[3 hours] An exploration of group dynamics/processes. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning. Prerequisite: EDAS 6/8000

#### **EDAS 6110 LEGAL ASPECTS OF SCHOOL ADMINISTRATION**

[3 hours] This course provides students an opportunity to analyze major topics and issues through which law influences education. Participants will examine the basic legal structure for education.

#### **EDAS 6150 THE ADMINISTRATIVE EXPERIENCE**

[3 hours] A study of administrative leadership for modern schools. Emphasis is on blending current theory and practice and examining the interaction among the organization and the internal and external environment. Prerequisite: EDAS 6/8000, 6/8020

#### **EDAS 6200 CONTINUOUS IMPROVEMENT OF SCHOOLS**

[3 hours] Course addresses current Pre K-16 national and regional reform agendas, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

#### **EDAS 6210 LEADERSHIP IN DIVERSE SETTINGS**

[3 hours] Issues of multicultural, cross-cultural, race, gender, ethnicity, inter-agency cooperation in school settings are examined in diverse settings - urban, suburban and rural, noting problems, concerns and common issues for leaders.

#### **EDAS 6220 ADMINISTRATION OF SPECIAL PROGRAMS**

[3 hours] This course examines the administration of special programs that operate at the district and school level. These include special education, Chapter I, vocational education, guidance and athletic programs.

#### **EDAS 6230 COMMUNITY AND SCHOOLS**

[3 hours] The unique role of school systems in the democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools. Prerequisite: Graduate standing

#### **EDAS 6240 DEVELOPING LEARNING ORGANIZATIONS IN EDUCATIONAL SETTINGS**

[3 hours] Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes. Prerequisite: Adv. Graduate Standing

#### **EDAS 6320 SCHOOL BUSINESS MANAGEMENT**

[3 hours] The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

#### **EDAS 6330 COLLECTIVE BARGAINING AND DISPUTE RESOLUTION**

[3 hours] The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.

#### **EDAS 6350 COMPUTERS IN EDUCATIONAL ADMINISTRATION DECISION MAKING**

[3 hours] This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

#### **EDAS 6360 PERSONNEL MANAGEMENT AND CONTRACT ADMINISTRATION IN EDUCATION**

[3 hours] Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

**EDAS 6380 PLANNING EDUCATIONAL FACILITIES FOR LEARNING**

[3 hours] This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

**EDAS 6420 MICROPOLITICS OF SCHOOL COMMUNITIES**

[3 hours] Course focus is on the day to day politics of school work that increase the complexities of educating. Using case studies and problem-based learning, students will practice skills that support democratic practices in school communities. Prerequisite: School-Community Relations; Adv. Grad Standing

**EDAS 6430 LEGAL ASPECTS OF EDUCATIONAL ADMINISTRATION**

[3 hours] This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

**EDAS 6440 EQUITY ISSUES IN EDUCATIONAL FINANCE AND ECONOMICS**

[3 hours] Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity.

**EDAS 6900 MASTER'S SEMINAR IN EDUCATIONAL ADMINISTRATION AND SUPERVISION**

[3 hours] Examination and reflection on the practice of research in Educational Leadership. Prerequisite: Completion of all master's coursework or permission of instructor

**EDAS 6920 MASTER'S PROJECT IN EDUCATIONAL ADMINISTRATION**

[1-3 hours] Open to graduate students who elect the completion of a research project in fulfilling the research requirements of the master's program. Prerequisite: Consent of instructor.

**EDAS 6960 MASTER'S THESIS IN EDUCATIONAL ADMINISTRATION**

[1-3 hours] Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program. Prerequisite: Consent of instructor.

**EDAS 6990 INDIVIDUAL STUDY IN EDUCATIONAL ADMINISTRATION - MASTER'S**

[1-3 hours] Open to graduate students who wish to pursue individual study on professional problems in EDAS under the direction of an EDAS faculty member. Prerequisite: Consent of instructor.

**EDAS 7920 SPECIALIST PROJECT IN EDUCATIONAL ADMINISTRATION**

[1-3 hours] Open to graduate students to fulfill the completion of a research project in fulfilling the research requirements of the specialist program. Prerequisite: Consent of instructor

**EDAS 7950 WORKSHOP IN EDUCATIONAL ADMINISTRATION**

[3 hours] Topical workshops, based on practical application of skills and knowledge, are intended for in-service educational professionals. Credit may be applied to doctoral degrees upon approval of the committee. Prerequisite: Permission of the instructor

**EDAS 7980 SPECIAL TOPICS IN EDUCATIONAL ADMINISTRATION**

[3 hours] Courses, based on issues, topics and concerns of educational administrators for the real world. Credit may be applied to degree programs upon approval of the adviser or committee. Prerequisite: Permission of the instructor

**EDAS 7990 INDEPENDENT STUDY IN EDUCATION ADMINISTRATION**

[1-3 hours] Individual study on professional problems in EDAS under the direction of a EDAS faculty member. Prerequisite: Consent of instructor.

**EDAS 8000 THE INDIVIDUAL IN ORGANIZATIONS**

[3 hours] An overview of the individual in educational administration, i.e., as strategic leader, organizational leader, instructional leader and policy/community leader. Opportunities for personal assessment are provided as students explore critical educational issues.

**EDAS 8010 SUPERVISION FOR IMPROVED INSTRUCTION**

[3 hours] An examination of those principles of supervision which promote improved instruction. Emphasis is on teacher performance evaluation, curriculum management and strategies for staff development to improve staff performance. Prerequisite: EDAS 6/8000

**EDAS 8020 INSTRUCTIONAL LEADERSHIP**

[3 hours] An in-depth analysis of instructional leadership to improve teacher classroom performance. Attention will focus on instructional analysis, strategies for providing feedback and writing professional growth plans. Prerequisite: EDAS 6/8000, 6/8010

**EDAS 8030 DEVELOPING EFFECTIVE LEARNING ENVIRONMENTS**

[3 hours] An exploration of group dynamics/processes. Development of effective action plans to improve school climate/culture and the learning environment is explored using problem-based learning. Prerequisite: EDAS 6/8000

**EDAS 8110 LEGAL ASPECTS OF SCHOOL ADMINISTRATION**

[3 hours] This course provides students an opportunity to analyze major topics and issues through which law influences education. Participants will examine the basic legal structure for education.

**EDAS 8150 THE ADMINISTRATIVE EXPERIENCE**

[3 hours] A study of administrative leadership for modern schools. Emphasis is on blending current theory and practice and examining the interaction among the organization and the internal and external environment. Prerequisite: EDAS 6/8000, 6/8020

**EDAS 8190 INTEGRATED EXPERIENCES IN EDUCATION ADMINISTRATION**

[3 hours] Working in a guided reflective practice environment, the student will apply knowledge gained in previous coursework to working in school building operations.

**EDAS 8200 CONTINUOUS IMPROVEMENT OF SCHOOLS**

[3 hours] Course addresses current Pre K-16 national and regional reform agendas, relating them to systemic changes in policies, governance and articulation of learner outcomes in local settings.

**EDAS 8210 LEADERSHIP IN DIVERSE SETTINGS**

[3 hours] Issues of multicultural, cross-cultural, race, gender, ethnicity, inter-agency cooperation in school settings are examined in diverse settings - urban, suburban and rural, noting problems, concerns and common issues for leaders.

**EDAS 8220 ADMINISTRATION OF SPECIAL PROGRAMS**

[3 hours] This course examines the administration of special programs that operate at the district and school level. These include special education, Chapter I, vocational education, guidance and athletic programs.

**EDAS 8230 COMMUNITY AND SCHOOLS**

[3 hours] The unique role of school systems in the democratic social structure is examined through a theoretical critique of strategies that increase citizen involvement in and build support for schools. Prerequisite: Graduate standing

**EDAS 8240 DEVELOPING LEARNING ORGANIZATIONS IN EDUCATIONAL SETTINGS**

[3 hours] Course introduces the theories, techniques and practices of planned organizational learning. Students examine the philosophical, theoretical and practical differences of organizational development as interventionist, consultative and collaborative processes. Prerequisite: Adv. Graduate Standing

**EDAS 8300 INTEGRATE EXPERIENCES: POLICIES IN ACTION**

[3 hours] This course analyses policies employed by schools and school districts in providing for education of students and services to the school community. On-site fieldwork is required. Prerequisite: Completion of EDAS coursework for certification.

**EDAS 8310 SCHOOL DISTRICT LEADERSHIP**

[3 hours] Analysis of duties, roles and responsibilities of local school district leadership. Specific competencies of building school support, planning, curriculum development, personnel, legal, financial and planning are covered.

**EDAS 8320 SCHOOL BUSINESS MANAGEMENT**

[3 hours] The purpose of the course is to involve students in an analysis of the role and functions of school business management. Participants will analyze data in each topical area of school business management.

**EDAS 8330 COLLECTIVE BARGAINING AND DISPUTE RESOLUTION**

[3 hours] The purpose of the course is to examine the issues that arise before, during and after the collective bargaining process in the public sector, including resolving labor disputes and grievances.

**EDAS 8350 COMPUTERS IN EDUCATIONAL ADMINISTRATION DECISION MAKING**

[3 hours] This course allows the development for increased decision making based on local, state and national retrievable data concerning learning, achievement, efficiency and effectiveness of resource allocations.

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### **EDAS 8360 PERSONNEL MANAGEMENT AND CONTRACT ADMINISTRATION IN EDUCATION**

[3 hours] Course provides insight into the purposes, policies and processes of personnel administration and contract administration in public education, including recruitment, hiring, induction, evaluation, compensation and development.

### **EDAS 8380 PLANNING EDUCATIONAL FACILITIES FOR LEARNING**

[3 hours] This course examines the issues surrounding planning, building and maintaining educational facilities appropriate for maximizing learning. Included is an examination of legal, health and safety requirements.

### **EDAS 8420 MICROPOLITICS OF SCHOOL COMMUNITIES**

[3 hours] Course focus is on the day to day politics of school work that increase the complexities of educating. Using case studies and problem-based learning, students will practice skills that support democratic practices in school communities. Prerequisite: School-Community Relations; Adv. Grad Standing

### **EDAS 8430 LEGAL ASPECTS OF EDUCATIONAL ADMINISTRATION**

[3 hours] This course provides students a background in legislation and court decisions that affect the administration of public schools. Students will investigate legal problem areas in schools.

### **EDAS 8440 EQUITY ISSUES IN EDUCATIONAL FINANCE AND ECONOMICS**

[3 hours] Analysis of educational finance and economic issues pertinent to school districts. Analysis of various funding models at the local, state and national level are studied employing various measures of equity.

### **EDAS 8600 LEADERSHIP AND ORGANIZATIONAL THEORY**

[3 hours] An analysis of leadership and organizational theory as influences on current thinking about and approaches to educational administration. Emphasis is on understanding dominant themes that impact administrative theory. Prerequisite: Adm. to Ed. Ph.D.

### **EDAS 8610 ORGANIZATIONAL BEHAVIOR**

[3 hours] This course integrates the educational and management theories and knowledge bases on leadership, power, motivation and change to understand the internal and external dynamics of people in educational organizations. Prerequisite: Grad standing; Organ. Development

### **EDAS 8620 POLITICS AND POLICY ANALYSIS AND DEVELOPMENT**

[3 hours] This course examines the issues involved in policy formation and analysis along with the political process of public education. Local, intermediate, state and federal levels are considered.

### **EDAS 8640 LEADING SYSTEMS CHANGE**

[3 hours] Course explores processes and practices used by educators to redesign preK-12 educational systems to improve outcomes for students. Content examines processes of moving espoused organizational values to actionable knowledge. Organizational Development recommended.

### **EDAS 8650 INTERDISCIPLINARY PERSPECTIVES IN EDUCATIONAL ADMINISTRATION**

[3 hours] Seminar focused on interdisciplinary examination of critical issues in educational administration. Multiple theoretical lenses from sociology, political science, economics and science are used to address educational issues. Prerequisite: Adv. Grad. Standing

### **EDAS 8660 CRITICAL ANALYSIS OF INQUIRY IN SCHOOLS**

[3 hours] Addresses the knowledge base school leaders must have to evaluate, use and initiate educational research in school settings. Students use action research to monitor implementation of researched ideas in schools. Quant. I and/or Qual. I (E) recommended. Prerequisite: Adv. Grad Standing; Intro to Ed. Research (R)

### **EDAS 8930 DOCTORAL SEMINAR IN EDUCATIONAL ADMINISTRATION AND SUPERVISION**

[3 hours] The course examines research findings and research methodology in Educational Administration and Supervision as they are pertinent to development of dissertation proposals. Dissertation proposal development is encouraged. Prerequisite: Completion of major area coursework.

### **EDAS 8940 EDUCATIONAL ADMINISTRATION INTERNSHIP**

[3 hours] An advanced field/seminar experience for doctoral students with fieldwork at the school system level. Fieldwork employs application of graduate coursework under supervision by the school system and the university.

### **EDAS 8960 DOCTORAL DISSERTATION IN EDUCATIONAL ADMINISTRATION AND SUPERVISION**

[1-12 hours] Production of an original, scholarly product in the area Educational Administration and Supervision. Dissertation credit may total not less than 12 semester hours. Prerequisite: Consent of instructor.

## **EDP - Educational Psychology**

### **Department of Foundations of Education (EDU)**

### **EDP 1550 ADAPTIVE LEARNING IN COLLEGE**

[3 hours] Examines a variety of cognitive, affective and social factors associated with academic performance in college. Major emphasis is placed on applications to learning and college success.

### **EDP 3110 LEARNING AND INDIVIDUAL DIFFERENCES**

[3 hours] Focuses on selected research findings and theoretical principles on learning and individual differences. Considers relationships of this body of information to learning and performance in a variety of contexts.

### **EDP 3120 PSYCHOLOGY OF COPING AND ADAPTATION**

[3 hours] Reviews and analyzes principles, research findings, coping models, as well as personal and situational factors associated with coping and adaptational processes in a variety of life circumstances.

### **EDP 3200 APPLIED PSYCHOLOGY FOR TEACHERS**

[3 hours] Examination of the ways in which psychological principles can be applied to the planning and implementation of meaningful instruction in elementary and secondary classrooms.

### **EDP 3210 CHILD DEVELOPMENT FOR EARLY CHILDHOOD EDUCATORS**

[3 hours] Students in early childhood education will be introduced to emotional, social and cognitive factors in child development (birth to age eight) and examine how teachers can create optimal environments for students.

### **EDP 3230 HUMAN DEVELOPMENT FOR P-12 EDUCATORS**

[3 hours] This course will examine concepts in the physical, cognitive, social, emotional and personality development of children and adolescents. It will provide a necessary background for future teachers to deal effectively with children and youth and to better understand the issues and problems they face. Integrated field and clinical experiences will provide contexts for these concepts as they are exemplified in the lives of young people. Prerequisite: EDP 3200, admission to multi-age licensure program.

### **EDP 3240 CHILD AND ADOLESCENT DEVELOPMENT FOR MIDDLE GRADES EDUCATORS**

[3 hours] Students will consider the ways in which an understanding of development can be used to guide teacher behavior. Biological, social and psychological factors will be considered. Prerequisite: Admission to Middle-Grades Licensure program Corequisite: CI 4280, 4250 4260 or 4270 and CI 4290

### **EDP 3250 ADOLESCENT DEVELOPMENT AND LEARNING**

[3 hours] The purpose of this course is to provide pre-service teachers with an understanding of the psychological principles of adolescent development and learning as well as the application of these principles to classroom instruction, assessment, and management. Students develop ways of thinking about teaching and learning in order to make informed decisions concerning various aspects of student learning and instruction. The course focuses on learning theories, cognitive development, personal and social development, achievement motivation, and diversity and their application. Prerequisite: Admission to Professional Education

### **EDP 3280 FOUNDATIONS OF TEACHING AND LEARNING**

[3 hours] This course will focus on major conceptions of learning as applied to education, including basic principles of conditioning, information processing and social learning. Concepts such as designing instructional events, classroom management, student assessment and evaluation will be explored. Prerequisite: Admission to Special Education program



**EDP 3290 LIFE SPAN DEVELOPMENT**

[3 hours] This course will examine concepts delineating the physical (including genetic influences), cognitive, social and personality development across the life span. The course is designed to provide a necessary background in the concepts of development as they pertain to a life span orientation for students in special education. An emphasis will be placed on the application of developmental data issues and problems extant in working with special populations. Prerequisite: Admission to Special Education program.

**EDP 4120 ALTERNATIVE APPROACHES TO DISCIPLINE**

[3 hours] Reviews a variety of models, constructs and methodologies for addressing behavior and discipline problems, especially within school and family settings. Emphases are placed on individual and group approaches to discipline.

**EDP 4210 CHILD BEHAVIOR AND DEVELOPMENT**

[3 hours] Examines the physical, cognitive, social, emotional and personality development of children. Provides helping professionals with background to identify and solve problems related to child growth and development.

**EDP 4220 ADOLESCENT BEHAVIOR AND DEVELOPMENT**

[3 hours] Examines the physical, cognitive, social, emotional and personality development of adolescents. Provides helping professionals with background to identify and solve problems related to adolescent growth and development.

**EDP 4230 ADULT DEVELOPMENT**

[3 hours] An overview of life-span development analyzing cognitive, physical, personality and social development from early adulthood through the later years.

**EDP 4330 BEHAVIOR MANAGEMENT**

[3 hours] Theoretical and practical study of behavioral and cognitive approaches to behavior management. Students will design, develop, implement and evaluate management plans for themselves and others.

**EDP 4990 INDEPENDENT STUDY IN EDUCATIONAL PSYCHOLOGY**

[1-3 hours] Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

**EDP 5110 BASIC EDUCATIONAL PSYCHOLOGY**

[3 hours] A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.

**EDP 5120 ALTERNATIVE APPROACHES TO DISCIPLINE**

[3 hours] Reviews a variety of models, constructs and methodologies for addressing behavior and discipline problems, especially within school and family settings. Emphases are placed on individual and group approaches to discipline.

**EDP 5210 CHILD BEHAVIOR AND DEVELOPMENT**

[3 hours] Current theory and research on physical, cognitive, social, emotional and personality development are examined and used as the basis for identifying and solving problems related to child growth and development.

**EDP 5220 ADOLESCENT BEHAVIOR AND DEVELOPMENT**

[3 hours] Current theory and research on physical, cognitive, social, emotional and personality development are examined and used as the basis for identifying and solving problems related to adolescent growth and development.

**EDP 5230 ADULT DEVELOPMENT**

[3 hours] Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.

**EDP 5310 ISSUES AND INNOVATIONS IN LEARNING AND INSTRUCTION**

[3 hours] Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.

**EDP 5320 INSTRUCTIONAL PSYCHOLOGY**

[3 hours] Theory and research in psychology that contributes to effective instruction. Topics include varieties and conditions of learning, information processing, learning analysis, constructivism, mastery learning, cooperative learning, norm & criterion-referenced measurement.

**EDP 5330 BEHAVIOR MANAGEMENT**

[3 hours] Theory and research related to behavioral and cognitive approaches to behavior management. Students will carry out research-based behavior management projects requiring behavioral analyses, observation, program design, development and evaluation.

**EDP 5950 WORKSHOP IN EDUCATIONAL PSYCHOLOGY**

[3 hours] Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.

**EDP 6130 HUMAN COPING IN ADULTHOOD**

[3 hours] Considers models, research methodologies and constructs on coping in relation to a range of circumstances during the adult years. Emphasis is placed on coping behavior within an ecological context.

**EDP 6140 MOTIVATION THEORY AND APPLICATION**

[3 hours] Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry. Prerequisite: One of the following graduate level classes: EDP 5110/7110, 5210/7210, 5220/7220, or 5230/7230

**EDP 6190 SEMINAR IN EDUCATIONAL PSYCHOLOGY**

[3 hours] The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.

**EDP 6240 THEORIES OF DEVELOPMENT**

[3 hours] Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions. Prerequisite: EDP 5210 or 5220

**EDP 6250 SOCIAL DEVELOPMENT**

[3 hours] Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age. Prerequisite: EDP 5210 or 5220

**EDP 6260 RESEARCH METHODS IN CHILD AND ADOLESCENT DEVELOPMENT**

[3 hours] Builds upon basic understanding of development through direct experiences in child study. This course provides individual/small group experiences in the design, implementation and written/oral presentation of original research. Prerequisite: EDP 5210 or 5220

**EDP 6270 PARENTING: THEORY AND RESEARCH**

[3 hours] Analysis and evaluation of the research on parenting across a variety of sociocultural contexts. Prerequisite: EDP 5320 or 5420

**EDP 6340 THEORIES OF LEARNING**

[3 hours] Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

**EDP 6350 ADVANCED TOPICS IN COGNITION AND INSTRUCTION**

[3 hours] Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation. Prerequisite: EDP 5110/7110, 5320/7320

**EDP 6360 THINKING AND REASONING IN SCHOOL CONTEXTS**

[3 hours] Analysis of theory and research about thinking and reasoning in school subjects and school learning. Prerequisite: EDP 5210 or 5220

**EDP 6960 MASTER'S THESIS IN EDUCATIONAL PSYCHOLOGY**

[1-3 hours] A formal, independent study culminating in a written discourse that advances our understanding of educational psychology. Prerequisite: Consent of instructor

**EDP 6980 MASTER'S PROJECT IN EDUCATIONAL PSYCHOLOGY**

[1-3 hours] A formal, independent project applying principles of educational psychology to solve a particular problem and culminating in a written discourse.

## 366 Course Descriptions

### **EDP 6990 INDEPENDENT STUDY IN EDUCATIONAL PSYCHOLOGY**

[1-3 hours] Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes.

### **EDP 7110 BASIC EDUCATIONAL PSYCHOLOGY**

[3 hours] A graduate level introduction to the field of educational psychology. Instruction will cover fundamentals of learning, motivation, cognition, individual differences and instructional applications as well as a research-oriented approach to answering scientific questions.

### **EDP 7230 ADULT DEVELOPMENT**

[3 hours] Emphasizes classical and modern theories of adulthood from a critical perspective, as well as applications of research on cognitive, physical, personality and social development from early adulthood through old age.

### **EDP 7310 ISSUES AND INNOVATIONS IN LEARNING AND INSTRUCTION**

[3 hours] Reviews emergent theory, principles and research findings on cognition and learning and applies these concepts to developing instructional experiences and conditions for optimizing classroom learning and performance.

### **EDP 7320 INSTRUCTIONAL PSYCHOLOGY**

[3 hours] Theory and research in psychology that contributes to effective instruction. Topics include varieties and conditions of learning, information processing, learning analysis, constructivism, mastery learning, cooperative learning, norm & criterion-referenced measurement.

### **EDP 7330 BEHAVIOR MANAGEMENT**

[3 hours] Theory and research related to behavioral and cognitive approaches to behavior management. Students will carry out research-based behavior management projects requiring behavioral analyses, observation, program design, development and evaluation.

### **EDP 7950 WORKSHOP IN EDUCATIONAL PSYCHOLOGY**

[3 hours] Each workshop is developed around a topic of interest and concern to in-service teachers and other educational personnel. Practical application of workshop topics will be emphasized.

### **EDP 8130 HUMAN COPING IN ADULTHOOD**

[3 hours] Considers models, research methodologies and constructs on coping in relation to a range of circumstances during the adult years. Emphasis is placed on coping behavior within an ecological context.

### **EDP 8140 MOTIVATION THEORY AND APPLICATION**

[3 hours] Graduate-level study of conceptions of motivation in various settings. Emphasis is on understanding major concepts and principles, as well on application to such settings as classroom, counseling and industry. Prerequisite: One of the following graduate level classes: EDP 5110/7110, 5210/7210, 5220/7220, or 5230/7230

### **EDP 8180 INTERDISCIPLINARY SEMINAR IN FOUNDATIONS OF EDUCATION**

[1 hour] The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions. Prerequisite: Completion of at least two research tools or instructor consent.

### **EDP 8190 SEMINAR IN EDUCATIONAL PSYCHOLOGY**

[3 hours] The collaborative study of a specific topic in educational psychology by a group of advanced students under the direction of one or more professors.

### **EDP 8240 THEORIES OF DEVELOPMENT**

[3 hours] Analysis and evaluation of theories of development with emphasis on the philosophical and psychological evolutionary history of the theories and their usefulness for individuals in the helping professions. Prerequisite: EDP 5210 or 5220

### **EDP 8250 SOCIAL DEVELOPMENT**

[3 hours] Critical examination of theory and research on social behaviors such as attachment, aggression and prosocial behavior, including their causes, how they affect the person and how they change with age. Prerequisite: EDP 5210 or 5220

### **EDP 8260 RESEARCH METHODS IN CHILD AND ADOLESCENT DEVELOPMENT**

[3 hours] Builds upon basic understanding of development through direct experiences in child study. This course provides individual/small group experiences in the design, implementation and written/oral presentation of original research. Prerequisite: EDP 5210 or 5220

### **EDP 8270 PARENTING: THEORY AND RESEARCH**

[3 hours] Analysis and evaluation of the research on parenting across a variety of sociocultural contexts. Prerequisite: EDP 5320 or 5420

### **EDP 8340 THEORIES OF LEARNING**

[3 hours] Intensive inquiry into the study of learning with particular emphasis on more recent theories. Theory application in a wide variety of settings will also be stressed.

### **EDP 8350 ADVANCED TOPICS IN COGNITION AND INSTRUCTION**

[3 hours] Theory and research on cognition related to learning/instruction, to include study of expertise, knowledge learned from experience, analysis of ill-structured domains, tacit knowledge, and knowledge representation. Prerequisite: EDP 5110/7110, 5320/7320

### **EDP 8360 THINKING AND REASONING IN SCHOOL CONTEXTS**

[3 hours] Analysis of theory and research about thinking and reasoning in school subjects and school learning. Prerequisite: EDP 5210 or 5220

### **EDP 8960 DISSERTATION RESEARCH IN EDUCATIONAL PSYCHOLOGY**

[1-12 hours] A formal, independent study culminating in a written discourse that advances our understanding of educational psychology. Prerequisite: Permission of instructor

### **EDP 8990 INDEPENDENT STUDY IN EDUCATIONAL PSYCHOLOGY**

[1-6 hours] Directed study of a current topic in educational psychology. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

## **EDTH - Educational Technology & Human Resources**

### **Department of Curriculum & Instruction (EDU)**

### **EDTH 4760 HUMAN RESOURCE DEVELOPMENT**

[3 hours] Provides an introduction to the professional practice of Human Resource Development (HRD) for the interested undergraduate student. The course focuses on HRD within the context of Human Resources in organizations.

### **EDTH 5700 HUMAN RESOURCE DEVELOPMENT**

[3 hours] An in-depth introduction to the professional practice of Human Resource Development (HRD) for the interested graduate student. The course focuses on HRD within the context of Human Resources in organizations.

### **EDTH 5710 TRAINING FOR PERFORMANCE IMPROVEMENT**

[3 hours] Focus is on the organizational context in which training programs are designed, developed, implemented and evaluated. Extensive use of simulations, case studies and other strategies maximizes active participation.

### **EDTH 5950 WORKSHOP IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] A course developed around topics of interest and concern to HRD students. Students must meet prerequisites prior to taking this course. Advanced level students are expected to complete all the basic requirements of the course, as well as an additional, detailed application of the skills and knowledge which is the basis for the course. This may include an additional paper/presentation, leading a team through a problem solving/development process, or completion of a research project in the completion of the course content. Prerequisite: EDTH 6/8100, 6/8200

### **EDTH 5990 INDEPENDENT STUDY IN HUMAN RESOURCES DEVELOPMENT**

[1-3 hours] The student works individually with a faculty member on a specified project. Meetings are held as per an established schedule. Deadlines and evaluation criteria are established and observed. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

### **EDTH 6100 TRAINING AND PERFORMANCE SUPPORT SYSTEMS**

[3 hours] Students learn and apply the process of designing and developing instructional systems, including performance support systems. The application of concepts takes place in a project team setting. Prerequisite: EDTH 5/7700, 5/7710

**EDTH 6200 NEEDS ASSESSMENT THEORY AND TECHNIQUES**

[3 hours] Students learn how to systematically assess organizational, group and individual needs in organizations in order to design appropriate HRD interventions, such as training, job aids, performance support systems and others. Prerequisite: EDTH 5/7700, 5/7710

**EDTH 6210 CURRENT HRD THEORY AND PRACTICE**

[3 hours] Students investigate current trends in HRD and assist one another in pursuing detailed individual study of one major topic area. Requirements involve research, lesson design and presentation of findings. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 6220 ORGANIZATIONAL PERSPECTIVES IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] The course provides an in-depth exploration of several types of organizations in which HRD plays a significant role and which also provide major placement opportunities for HRD professionals. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 6230 CONSULTING AND CONTRACTING IN HRD**

[3 hours] Addresses relevant models, practices and concepts of both internal and external consulting in HRD. Proposals and contracts receive special emphasis. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

**EDTH 6250 MOTIVATING & TRAINING ADULT LEARNERS**

[3 hours] Students learn how to identify and motivate adult learners in a variety of settings. Based on these factors, strategies are selected to maximize the effectiveness and efficiency of training. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 6300 HRD PERFORMANCE INTERVENTION ANALYSIS**

[3 hours] Focus is on the conceptual framework and procedures involved in the analysis of various HRD interventions (including training) for improving performance and, ultimately, organizational results. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 6400 PRACTICUM IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] This culmination of the HRD student's program is a project experience in an organization. Master's students in project teams are supervised by doctoral HRD students and monitored by HRD faculty. Prerequisite: EDTH 6/8220 and permission of instructor

**EDTH 6940 FIELD EXPERIENCE IN HUMAN RESOURCE DEVELOPMENT**

[1-6 hours] Students complete structured assignments and projects under joint supervision of a field site supervisor and an HRD faculty member. A written contract specifies the product(s) and evaluation criteria. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

**EDTH 7700 HUMAN RESOURCE DEVELOPMENT**

[3 hours] An in-depth introduction to the professional practice of Human Resource Development (HRD) for the interested graduate student. The course focuses on HRD within the context of Human Resources in organizations.

**EDTH 7710 TRAINING FOR PERFORMANCE IMPROVEMENT**

[3 hours] Focus is on the organizational context in which training programs are designed, developed, implemented and evaluated. Extensive use of simulations, case studies and other strategies maximizes active participation.

**EDTH 7950 WORKSHOP IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] A course developed around topics of interest and concern to HRD students. Students must meet prerequisites prior to taking this course. Advanced level students are expected to complete all the basic requirements of the course, as well as an additional, detailed application of the skills and knowledge which is the basis for the course. This may include an additional paper/presentation, leading a team through a problem solving/development process, or completion of a research project in the completion of the course content. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 7990 IND STUDY IN HUMAN RESOURCES DEVELOPMENT**

[1-3 hours] The student works individually with a faculty member on a specified project. Meetings are held as per an established schedule. Deadlines and evaluation criteria are established and observed. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

**EDTH 8100 TRAINING AND PERFORMANCE SUPPORT SYSTEMS**

[3 hours] Students learn and apply the process of designing and developing instructional systems, including performance support systems. The application of concepts takes place in a project team setting. Prerequisite: EDTH 5/7700, 5/7710

**EDTH 8200 NEEDS ASSESSMENT THEORY AND TECHNIQUES**

[3 hours] Students learn how to systematically assess organizational, group and individual needs in organizations in order to design appropriate HRD interventions, such as training, job aids, performance support systems and others. Prerequisite: EDTH 5/7700, 5/7710

**EDTH 8210 CURRENT HRD THEORY AND PRACTICE**

[3 hours] Students investigate current trends in HRD and assist one another in pursuing detailed individual study of one major topic area. Requirements involve research, lesson design and presentation of findings. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 8220 ORGANIZATIONAL PERSPECTIVES IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] The course provides an in-depth exploration of several types of organizations in which HRD plays a significant role and which also provide major placement opportunities for HRD professionals. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 8230 CONSULTING AND CONTRACTING IN HRD**

[3 hours] Addresses relevant models, practices and concepts of both internal and external consulting in HRD. Proposals and contracts receive special emphasis. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

**EDTH 8250 MOTIVATING & TRAINING ADULT LEARNERS**

[3 hours] Students learn how to identify and motivate adult learners in a variety of settings. Based on these factors, strategies are selected to maximize the effectiveness and efficiency of training. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 8300 HRD PERFORMANCE INTERVENTION ANALYSIS**

[3 hours] Focus is on the conceptual framework and procedures involved in the analysis of various HRD interventions (including training) for improving performance and, ultimately, organizational results. Prerequisite: EDTH 6/8100, 6/8200

**EDTH 8400 PRACTICUM IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] This culmination of the HRD student's program is a project experience in an organization. Master's students in project teams are supervised by doctoral HRD students and monitored by HRD faculty. Prerequisite: EDTH 6/8220 and permission of instructor

**EDTH 8900 GENERAL SEMINAR IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] This course will consider problems and provide advanced study in Human Resource Development. Prerequisites must be satisfied, and permission of the instructor must be obtained before registering. Prerequisite: EDTH 8100, 8200 and permission of instructor

**EDTH 8940 FIELD EXPERIENCE IN HUMAN RESOURCE DEVELOPMENT**

[1-6 hours] Students complete structured assignments and projects under joint supervision of a field site supervisor and an HRD faculty member. A written contract specifies the product(s) and evaluation criteria. Prerequisite: EDTH 6/8100, 6/8200 and permission of instructor

**EDTH 8950 INTERDISCIPLINARY SEMINAR IN HUMAN RESOURCE DEVELOPMENT**

[3 hours] Considers issues and problems in Human Resource Development. Focus will be on interaction of HRD with other areas of professional practice and/or scholarly inquiry. Prerequisite: Permission of instructor

**EDTH 8960 DOCTORAL RESEARCH DISSERTATION IN HUMAN RESOURCE DEVELOPMENT**

[1-12 hours] Student and instructor meet regularly to assist student in completing doctoral research leading to completion of the dissertation. Prerequisite: Permission of instructor

## EDU - Education

### College of Education (EDU)

**EDU 1000 ORIENTATION TO EDUCATION**

[1 hour] Academic and student development course offering an introduction to College and University community. Offers strategies for successful transition to University environment by examining University resources, procedures, academic programs and advising.

## EECS - Electrical Engineering & Computer Science

### Department of Electrical Engineering and Computer Science (ENG)

#### EECS 1000 ORIENTATION TO EECS

[1 hour] Orientation to the facilities and procedures available to the student in the University, college and department plus an introduction to the fields of Electrical Engineering and Computer Science and Engineering.

#### EECS 1020 INTRODUCTION TO MODERN COMPUTING

[3 hours] This course provides an introduction to various fundamental areas in Computer Science: hardware, software, computer programming, communications, application programs, theoretical limitations of computers and artificial intelligence. The course features a series of computer projects and use of the Internet.

#### EECS 1050 INTRODUCTION TO COMPUTING IN C/C++

[2 hours] Covers the concept and properties of an algorithm, analysis and decomposition of computational problems, use of modern programming practices and application of the C/C++ language to problem solving.

#### EECS 1100 DIGITAL LOGIC DESIGN

[4 hours] Number representation and Boolean Algebra. Combinational circuit analysis and design. K-map and tabulation methods. Multiplexers, decoders, adders/subtractors and PLD devices. Sequential circuit analysis and design. Registers, counters and recognizers.

#### EECS 1530 INTRODUCTION TO PROGRAMMING

[3 hours] Covers the concept and properties of an algorithm, analysis and decomposition of computational problems, use of modern programming practices. Introduction to arrays and classes. Uses the C++ language.

#### EECS 1540 DISCRETE AND LINEAR STRUCTURES

[4 hours] Theory of discrete structures including logic, proofs, relations. Theory and implementations (array and dynamic based) of linear data structures for lists, stacks and queues. Prerequisite: EECS 1530.

#### EECS 1550 NONLINEAR DATA STRUCTURES

[4 hours] Introduces nonlinear data structures for binary trees, B+ trees, search trees and graphs. Investigates applications of the above topics. Also discusses the order of algorithms and sorting techniques. Prerequisite: EECS 1540.

#### EECS 2000 EECS PROFESSIONAL DEVELOPMENT

[1 hour] Preparation for entry to the professions of Electrical Engineering and Computer Science and Engineering, including ethics and social responsibilities, employment practices, continuing education and professional registration. One hour lecture.

#### EECS 2100 COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE

[4 hours] Design of CPU, memory, I/O and arithmetic units. Assembly language programming: symbolic coding, macros and program segmentation. Use of interactive debuggers, utility programs and system I/O facilities. Prerequisite: EECS 1100, either 1500 or 1530

#### EECS 2300 ELECTRIC CIRCUITS

[4 hours] An introduction to electrical circuit components and laws, including ideal op-amps and transformers, DC circuit analysis, AC circuit analysis, three phase circuits, transient analysis of RL and RC circuits, series and parallel resonance and computer-aided circuit analysis. Corequisite: PHYS 2140

#### EECS 2340 ELECTRIC CIRCUITS FOR NONMAJORS

[3 hours] For students not majoring in EECS. An introduction to electrical circuit components and laws, resistive circuit analysis, AC circuit analysis, phasers, three-phase circuits and computer-aided circuit analysis. Prerequisite: PHYS 2140

#### EECS 2550 OPERATING SYSTEMS AND SYSTEMS PROGRAMMING

[3 hours] Examines the external and internal characteristics of computer operating systems and related software. Details of at least one operating system and comparison with other operating systems. An introduction to systems level programming. Prerequisite: EECS 1530 or 1550, 2100

#### EECS 3100 MICROSYSTEMS DESIGN

[4 hours] Introduction to microprocessors, memory and I/O interfacing, interrupt structure, serial I/O and DMA operations. Development of microprocessor based digital systems, testing techniques, use of modern development tools for debugging hardware and software. Prerequisite: EECS 2100, 3400

#### EECS 3150 DATA COMMUNICATIONS

[3 hours] Analog and digital data transmission, transmission media, Modulation techniques. Data encoding, asynchronous and synchronous transmissions, USART, RS232-C, RS-449 standards. Data link configuration and control, error control, multiplexing and demultiplexing. Prerequisite: EECS 1100, 3400 Corequisite: MIME 4000

#### EECS 3200 SIGNALS AND SYSTEMS

[4 hours] Signals and system representation. Convolution and impulse response. Fourier series, Fourier transform and Laplace transform. State variable analysis of continuous and discrete systems. Digital computer simulation using MATLAB. Prerequisite: EECS 1530, 2300; MATH 2890, 3860

#### EECS 3300 PROBABILISTIC METHODS IN ENGINEERING

[3 hours] Techniques for modeling and analysis of random phenomena in EECS, including communication, control and computer systems. Distribution, density and characteristic functions. Computer generation. Functions of random variables. Prerequisite: EECS 3200

#### EECS 3400 ELECTRONICS I

[4 hours] Large-signal and incremental characteristics of the pn diode, BJT, MOSFET and JFET. Large-signal analysis and computer simulation of devices and digital circuits. Logic gate implementation. Laboratory experiments and projects. Prerequisite: EECS 2300

#### EECS 3420 ELECTRONICS II

[3 hours] Analog transistor, diode and integrated circuit analysis and design. Incremental analysis techniques, frequency response and feedback techniques. Prerequisite: EECS 3200, 3400

#### EECS 3440 ELECTRONICS LABORATORY

[1 hour] Laboratory experiments and projects in the testing and design of analog and mixed-signal electronic circuits. Corequisite: EECS 3420

#### EECS 3450 ELECTRICAL AND ELECTRONIC DEVICES

[3 hours] For students not majoring in EECS. An introduction to electrical engineering devices and techniques with an emphasis on applications. Topics include solid-state devices, amplifiers, digital logic circuits, transformers and AC and DC machines. Prerequisite: EECS 2340

#### EECS 3460 ELECTRICAL ENERGY CONVERSION

[3 hours] Traditional and renewable electrical energy sources, principles of electromechanical energy conversion, magnetic circuits and transformers, steady state performance of synchronous machines, dc machines, single phase and three phase induction motors. Corequisite: EECS 3700

#### EECS 3480 ENERGY CONVERSION LABORATORY

[1 hour] Laboratory studies of power transformers, synchronous machines, DC machines, single and three phase induction motors. Corequisite: EECS 3460

#### EECS 3500 AUTOMATA AND LANGUAGE TRANSLATION SYSTEMS

[3 hours] Examines formal models of computing (automata and grammars), computability and undecidability and language translation systems. Prerequisite: EECS 1550

#### EECS 3550 SOFTWARE ENGINEERING

[3 hours] An introduction to the Software Engineering process. Includes: the software lifecycle, user requirements, human-computer interaction, functional specification, software design, software tools, testing and modification. A major term project is assigned. Prerequisite: EECS 1510 or 1550; ENGL 2950 or 2960

#### EECS 3700 ELECTROMAGNETICS

[4 hours] Analysis of static electric and magnetic fields and steady currents, Faraday's law and time-varying fields. Maxwell's equations, propagation of electromagnetic waves in free space, lossy media and conductors. Transmission line theory. Prerequisite: MATH 3860; PHYS 2140

#### EECS 3940 CO-OP EXPERIENCE

[1 hour] Approved co-op work experience. Course may be repeated. Prerequisite: EECS 2100

#### EECS 4000 SENIOR DESIGN PROJECT

[4 hours] Student teams select and research a design project and propose a design which is implemented, tested and evaluated. Progress reports, a written final report and an oral presentation are required. One hour lecture, one-hour recitation, 5 hours lab. Prerequisite: Senior standing and EECS 3100 or EECS 3420

**EECS 4110 SIMULATION OF COMPUTER SYSTEMS**

[4 hours] Workload model, hardware and software monitors. Modeling and simulation of central server model with multiple disks, cyclic models, multiprogrammed interactive virtual memory model, product form solution. Case studies. Prerequisite: EECS 2100; MIME 4000

**EECS 4130 DIGITAL DESIGN**

[4 hours] The design of digital systems, design methodologies, hardware description language such as VHDL: behavioral-, data flow- and structural-level description of digital systems. Implementation technologies including PLDs and FPGAs. Prerequisite: EECS 2100

**EECS 4140 FAULT-TOLERANT DIGITAL SYSTEMS**

[3 hours] Faults testing in combinational and sequential circuits. Design techniques for fault tolerance in digital systems. Evaluation techniques. Fault masking and self-checking systems. Prerequisite: EECS 2100; MIME 4000

**EECS 4150 AUTOMOTIVE ELECTRONICS**

[4 hours] Introduction to automotive electronic subsystems. Design of various electronic control units and in-vehicle networks. Laboratory multidisciplinary team projects in the design of control units, using state-of-the-art microcontrollers. Project presentation and discussion. Prerequisite: EECS 3100, 3200, 4170

**EECS 4160 ADVANCED MICROSYSTEMS DESIGN**

[4 hours] Design of microcomputers at the system level. Buses for varying types of microcomputers in real-time and parallel processing. Software and hardware requirements for interprocessor communications. IEEE 488 and CAMAC standards buses. Prerequisite: EECS 3100

**EECS 4170 REAL-TIME EMBEDDED SYSTEMS DESIGN**

[3 hours] Programming applications in a real-time environment. C language is used to program various microcontroller functions, including timers, A/D and D/A converters, RS-232 communication and CAN networking. Prerequisite: EECS 3100

**EECS 4180 COMPUTER NETWORKS**

[4 hours] ISO/OSI layer models of computer networks. Review of the first two layers. Discussion of network, transport, session, presentation and application layers. Study of LANs and standards. Internetworking, routers and bridges. Prerequisite: EECS 3150 or 2100

**EECS 4200 FEEDBACK CONTROL SYSTEMS**

[3 hours] Feedback methods for the control of dynamic systems. Topics include: modeling, characteristics and performance of feedback systems, stability, root locus and frequency response methods and computer simulation. Prerequisite: EECS 3200

**EECS 4220 PROGRAMMABLE LOGIC CONTROLLERS**

[3 hours] An introduction to programmable logic controllers (PLCs), process control algorithms, interfacing of sensors and other I/O devices, simulation and networking. Prerequisite: EECS 1100, 3200

**EECS 4240 POWER SYSTEMS OPERATION**

[3 hours] Single line diagrams and per unit calculations, network matrices and Y-bus, load flow techniques, large system loss formula, real and reactive power dispatch, power system relays and protection. Prerequisite: EECS 3460

**EECS 4250 ROBOTICS**

[4 hours] The concepts, theory and application of robotics. Topics include: arm geometry, kinematics and transformation matrices, motion kinematics, dynamics of industrial robots, trajectory planning and execution and control robotic systems. Prerequisite: EECS 3200

**EECS 4260 CONTROL SYSTEMS DESIGN**

[3 hours] A general study of computer-aided design of control systems. Topics include: stability, compensation, pole placement, nonlinear systems and digital systems. Prerequisite: EECS 4200

**EECS 4290 ELECTRICAL MACHINES MODELING AND CONTROL**

[3 hours] Coupled rotating coils, primitive machines, machine winding transformations, state space modeling of DC, synchronous and three phase induction machines. Control schemes for dc, synchronous and three phase induction machines. Prerequisite: EECS 3460

**EECS 4320 INDUSTRIAL IMAGING SYSTEMS**

[3 hours] Systems (cameras and other components) and techniques for machine vision (surface imaging). Nondestructive evaluation (internal inspection) of industrial materials and products, using ultrasound and radiographic systems. Contemporary applications. Prerequisite: PHYS 2140; EECS 3400

**EECS 4330 IMAGE ANALYSIS AND COMPUTER VISION**

[3 hours] Imaging geometry, image filtering, segmentation techniques, image representation and description, stereo vision and depth measurements, texture analysis, dynamic vision and motion analysis, matching and recognition. Prerequisite: EECS 3300

**EECS 4340 IMAGING ARCHITECTURES AND HARDWARE**

[3 hours] Video work station components and display hardware; pyramid, pipeline, cellular logic and artificial neural net architectures for vision and image processing; real-time imaging; systolic implementation of image processing algorithms; current advances. Prerequisite: EECS 3100, 4330

**EECS 4360 COMMUNICATION SYSTEMS**

[3 hours] Fourier transform applications in signal analysis and communication. Signals spectra, filtering, AM and FM modulation, noise and optimum receiver, sampling theorem, multiplexing, PCM, introduction to digital modulators and demodulators. Prerequisite: EECS 3200

**EECS 4370 INFORMATION THEORY AND CODING**

[3 hours] Coding concepts, Huffman code, entropy analysis, channel and mutual information, channel capacity and Shannon's theorem, algebraic coding theory and application to blockcode and cyclic code, introduction to convolutional code. Prerequisite: EECS 3300

**EECS 4380 DIGITAL SIGNAL PROCESSING**

[3 hours] Discrete Fourier Transform (DFT), discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications, design of IIR and FIR digital filters, multirate/channel digital systems, decimation and interpolation. Prerequisite: EECS 3200

**EECS 4390 WIRELESS AND MOBILE NETWORKS**

[3 hours] Mobile radio propagation; the cellular concept; multiple radio access; multiple division techniques; channel allocation; mobile communication systems; existing wireless systems; network protocols; AD HOC and sensor networks; wireless LANS and PANS; recent advances. Prerequisite: EECS 3200; EECS 3300 or MIME 4000

**EECS 4400 SOLID STATE ELECTRONICS**

[3 hours] A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors and various models of BJT's and FET's. Prerequisite: EECS 3400; PHYS 3070

**EECS 4410 ELECTRO-OPTICS**

[3 hours] Introduction to laser physics, optics, optical waveguides, optical communication systems and electro-optics. Design of light processing and communication systems will be considered with emphasis on optics and optical communication. Prerequisite: EECS 3700

**EECS 4420 MICROWAVE ELECTRONICS**

[3 hours] Analysis and design of active and passive microwave components and systems. Theory and design of transmission lines, solid state and electron beam devices will be considered. Prerequisite: EECS 3700, 3420

**EECS 4430 MICROWAVE LABORATORY**

[1 hour] Laboratory introduction to microwave and millimeter wave hardware and high frequency measurement techniques. Corequisite: EECS 4420

**EECS 4440 ANTENNA THEORY AND DESIGN**

[3 hours] Introduction to antenna theory and design emphasizing engineering aspects of antenna systems. Dipole, loop and biconical antennas, arrays, broadband and aperture antennas will be considered. Prerequisite: EECS 3700

**EECS 4450 ELECTROMAGNETICS LABORATORY**

[2 hours] A general laboratory that provides experiences in several areas of electromagnetics and includes a special student project. Prerequisite: EECS 3700

**EECS 4460 POWER SYSTEM ANALYSIS**

[3 hours] Power system symmetrical components, fault analysis, transient stability analysis, transmission system modeling, distribution networks. Prerequisite: EECS 3460

**EECS 4470 ELECTRONIC DESIGN**

[3 hours] Principles and techniques of analog active circuit design. Selected design problems are given and circuits using standard parts are designed and laboratory tested. A design notebook is kept. Prerequisite: EECS 3200, 3420

## 370 Course Descriptions

### EECS 4480 ELECTRONIC ENERGY PROCESSING I

[3 hours] Electronic power switching circuits. Half-wave and full-wave rectification. Characteristics of power semiconductors. Phase-controlled rectifiers and inverters. Isolated and non-isolated dc-dc converters. Prerequisite: EECS 3400, 3460

### EECS 4490 ELECTRONIC ENERGY PROCESSING II

[3 hours] Resonant dc-dc converters. DC-AC inverters and harmonic analysis. Variable-speed motor drives. Laboratory design and analysis of various electronic energy processing circuits. Prerequisite: EECS 4480

### EECS 4500 PROGRAMMING LANGUAGE PARADIGMS

[3 hours] Fundamental concepts of modern programming languages. Differences and similarities between procedural, functional, object-oriented and rule-based languages are examined as well as their impact on the programming process. Prerequisite: EECS 1550, 3500

### EECS 4510 TRANSLATION SYSTEMS

[4 hours] Design of translation systems including compilers and interpreters, grammars and parsing methods, error detection and correction schemes and optimization techniques. Prerequisite: EECS 1550, 2100, 3500

### EECS 4520 ADVANCED SYSTEMS PROGRAMMING

[4 hours] Pertinent concepts of systems programming. Topics covered include: synchronization, distributed programming models, kernel design, peripheral handling, file systems and security history and methods. Prerequisite: EECS 2550

### EECS 4530 COMPUTER GRAPHICS I

[4 hours] An introduction to typical computer graphics systems and their operation. Interactive techniques will be introduced as well as representations and projections of three-dimensional images. Exercises using graphics equipment are assigned. Prerequisite: EECS 1050 or 1500

### EECS 4540 COMPUTER GRAPHICS II

[4 hours] Examines current topics related to realistic and representative 3D computer graphics. Topics include curve and surface geometry, solid modeling, ray tracing, radiosity and real-time computer graphics. Prerequisite: EECS 1550, 4530

### EECS 4550 CREATING MULTIMEDIA SOFTWARE

[4 hours] An audio-visual experience in the design and production of multimedia products. Investigates computer-human interfaces, performance measurement and analysis, storage/retrieval of data, compression/decompression techniques. Prerequisite: EECS 1550, 3520

### EECS 4560 DATABASE SYSTEMS I

[3 hours] The following topics are covered: relational database modeling, query languages, design issues and implementation issues of databases. An appropriate database language is introduced and used to demonstrate principles. Prerequisite: EECS 1550

### EECS 4570 DATABASE SYSTEMS II

[3 hours] The emphasis of this course is on database recovery techniques, integrity constraints and concurrency control. The similarities and differences between distributed, networked, client/server and object-oriented database systems are also investigated. Prerequisite: EECS 4560

### EECS 4580 SURVEY OF ARTIFICIAL INTELLIGENCE

[4 hours] This course covers, more in breadth than in depth, the areas that artificial intelligence currently encompasses. Topics cover: history, reasoning, search techniques, knowledge representation, uncertainty and learning. Prerequisite: EECS 1550

### EECS 4610 DIGITAL VLSI DESIGN I: BASIC SUBSYSTEMS

[4 hours] CMOS process technologies, CMOS logic families, custom and semi-custom design. Subsystem design of adders, counters and multipliers. System design methods and VLSI design tools. Prerequisite: EECS 3400

### EECS 4620 DIGITAL VLSI DESIGN II: MEMORY AND STRUCTURED LOGIC

[3 hours] Memory categories, functions, architectures, cells and peripheral circuitry in CMOS/BiCMOS. Overview and technology trends in SRAMs, DRAMs, EPROMs, EEPROMs, FPGAs...Class exercises in selected small system circuit and layout design. Prerequisite: Senior standing or permission of instructor

### EECS 4630 PHYSICAL DESIGN OF VLSI CIRCUITS

[4 hours] VLSI design process automation and tools, mask level design, compaction, module placement, routing area partitioning, loose routing, channel routing and P/G and clock routing. Prerequisite: EECS 4610

### EECS 4710 ADVANCED ELECTRO-MAGNETICS

[3 hours] Advanced topics in electromagnetic wave propagation in metals and dielectric waveguides, free space propagation in lossless and lossy media and good conductors, antennas and wave scattering will be considered. Prerequisite: EECS 3700

### EECS 4980 SPECIAL TOPICS IN EECS

[1-4 hours] Pilot offerings of new courses involving emerging topics of interest are introduced using this number. One credit per lecture/recitation hour and/or 2.5 lab hours per week. Prerequisite: Prerequisites vary with the course offering

### EECS 4990 INDEPENDENT STUDY IN EECS

[1-4 hours] Selected topics in electrical engineering or computer science and engineering. The instructor will specify the scope of the investigation and will meet regularly with the student(s). The study is expected to require an average of 3 hours student effort per week per credit. Prerequisite: Permission of instructor

### EECS 5110 SIMULATION OF COMPUTER SYSTEMS

[4 hours] Workload model, hardware and software monitors. Modeling and simulation of central server model with multiple disks, cyclic models, multiprogrammed interactive virtual memory model, product form solution. Case studies. Prerequisite: EECS 2100, MIME 4000

### EECS 5130 DIGITAL DESIGN

[4 hours] The design of digital systems, design methodologies, hardware description language such as VHDL, behavioral-, dataflow- and structural-level description of digital systems. Implementation technologies including PLDs and FPGAs. Prerequisite: EECS 2100

### EECS 5140 FAULT-TOLERANT DIGITAL SYSTEMS

[3 hours] Faults testing in combinational and sequential circuits. Design techniques for fault tolerance in digital systems. Evaluation techniques. Fault masking and self checking systems. Prerequisite: EECS 1100

### EECS 5150 AUTOMOTIVE ELECTRONICS

[4 hours] Introduction of automotive electronics and its various subsystems. Sensors and actuators, design of engine control unit, body control unit and vehicle control unit. Display and multiplexing systems. Prerequisite: EECS 3100, 3200

### EECS 5160 ADVANCED MICROCOMPUTER SYSTEMS

[4 hours] Design of microcomputers at the system level. Buses for varying types of microcomputers in real-time and parallel processing. Software and hardware requirements for interprocessor communications. IEEE 488 and CAMAC standards buses. Prerequisite: EECS 3100

### EECS 5170 REAL-TIME EMBEDDED SYSTEMS DESIGN

[3 hours] Programming applications in a real-time environment. Applications programs in a multitasking environment. Examples from process control, robotics, signal analysis and multiwindow software. Prerequisite: EECS 2550, 3200; permission of instructor

### EECS 5180 COMPUTER NETWORKS

[4 hours] ISO/OSI layer models of computer networks. Review of the first two layers. Discussion of network, transport, session, presentation and application layers. Study of LANS and standards. Internetworking routers and bridges.

### EECS 5220 PROGRAMMABLE LOGIC CONTROLLERS

[3 hours] Programmable Logic Controllers (PLCs), programming, sensors, process control algorithms, interfacing of sensors and other I/O devices, simulation and networking. Prerequisite: EECS 1100, 3200

### EECS 5240 POWER SYSTEMS OPERATION

[3 hours] Single Line Diagrams & Per Unit calculations, Network Matrices & Ybus for systems with uncoupled lines, Load Flow Techniques, Large system Loss Formula using Zbus, Real and Reactive Power Dispatch programming, Power systems relays & protection schemes. Prerequisite: EECS 3460

### EECS 5250 ROBOTICS

[4 hours] The concepts, theory and application of robotics. Topics include: arm geometry, kinematics and transformation matrices, motion kinematics, dynamics of industrial robots, trajectory planning and execution and control of robotic systems. Prerequisite: EECS 3200

### EECS 5260 CONTROL SYSTEMS DESIGN

[3 hours] A general study of computer-aided design of control systems. Topics include: stability, compensation, pole placement, nonlinear systems and digital systems. Prerequisite: EECS 4200

**EECS 5290 ELECTRIC MACHINES MODELING AND CONTROL**

[3 hours] Coupled rotating coils, Primitive machines, machine winding transformations, State space modeling of DC, synchronous and 3-phase induction machines. Control schemes for dc motors, synchronous machines and 3-phase induction motors. Prerequisite: EECS 3460

**EECS 5320 INDUSTRIAL IMAGING SYSTEMS**

[3 hours] Systems (cameras and other components) and techniques for machine vision (surface imaging). Nondestructive evaluation (internal inspection) of industrial materials and products, using ultrasound and radiographic systems. Contemporary applications. Prerequisite: PHYS 2140; EECS 3400

**EECS 5330 IMAGE ANALYSIS AND COMPUTER VISION**

[3 hours] Imaging geometry, image filtering, segmentation techniques, image representation and description, stereovision and depth measurements, texture analysis, dynamic vision and motion analysis, matching and recognition. Prerequisite: EECS 3200, 3300

**EECS 5340 IMAGING ARCHITECTURES AND HARDWARE**

[3 hours] Study of the hardware and parallel implementation of various image processing and vision algorithms. Topics include components of a video work station; video display hardware; pyramid, pipeline, cellular logic and artificial neural net architectures for vision and image processing; real-time imaging; systolic implementations of image processing algorithms; current advances. Prerequisite: EECS 3100, 4330

**EECS 5360 COMMUNICATION SYSTEMS**

[3 hours] Fourier transform applications in signal analysis and communication. Signals spectra, Filtering, AM and FM modulations, Noise and optimum receiver, Sampling theorem, Multiplexing, PCM Introduction to digital modulators and demodulators. Prerequisite: EECS 3300

**EECS 5370 INFORMATION THEORY AND CODING**

[3 hours] Coding concepts, Huffman code, Entropy analysis, Channel and mutual information, Channel capacity and Shannon's theorems, Algebraic coding theory and application to block code and cyclic code, Introduction to convolutional code. Prerequisite: EECS 3300

**EECS 5380 DIGITAL SIGNAL PROCESSING**

[3 hours] Discrete Fourier Transform (DFT), Discrete convolution and correlation, Fast Fourier Transform (FFT) and its applications. Design of IIR and FIR digital filters, Multi-rate/channel digital systems, Decimation and Interpolation. Prerequisite: EECS 3200

**EECS 5390 WIRELESS AND MOBILE NETWORKS**

[3 hours] Mobile radio propagation; traffic engineering; cellular concept; multiple radio access; multiple division techniques; channel allocation; mobile communication systems; existing wireless systems; network protocols; Ad Hoc and sensor networks; wireless LANS and PANS; recent advances. Prerequisite: EECS 3200; EECS 3300 or MIME 4000; or graduate standing

**EECS 5400 SOLID STATE ELECTRONICS**

[3 hours] A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors and various models of BJT's and FET's. Prerequisite: EECS 3400; PHYS 3070

**EECS 5410 ELECTRO-OPTICS**

[3 hours] Laser physics, optics, optical waveguides, optical communication systems and electro-optics. Design of light processing and communication systems will be considered with emphasis on optics and optical communication. Prerequisite: EECS 3700

**EECS 5420 MICROWAVE ELECTRONICS**

[3 hours] Analysis and design of active and passive microwave components and systems. Theory and design of transmission lines, solid state and electron beam devices. Prerequisite: EECS 3700, 3420

**EECS 5440 ANTENNA THEORY AND DESIGN**

[3 hours] Introduction to antenna theory and design emphasizing engineering aspects of antenna systems. Dipole, loop and biconical antennas, arrays, broadband and aperture antennas will be considered. Prerequisite: EECS 3700

**EECS 5460 POWER SYSTEMS ANALYSIS**

[3 hours] Fault analysis, Transient Stability Analysis, Transmission System modeling, Distribution Networks. Prerequisite: EECS 3460

**EECS 5470 ELECTRONIC DESIGN**

[3 hours] Principles and techniques of analog active circuit design. Selected design problems are given; working circuits using standard parts are designed and laboratory tested. A design notebook is kept. Prerequisite: EECS 3200, 3420

**EECS 5480 ELECTRONIC ENERGY PROCESSING I**

[3 hours] Basic electronic power switching circuits. Half-wave and full-wave rectification. Characteristics of power semiconductors. Phase-controlled rectifiers and inverters. Isolated and non-isolated dc-dc converters. Prerequisite: EECS 3400, 3460

**EECS 5490 ELECTRONIC ENERGY PROCESSING II**

[3 hours] Resonant dc-dc converters. DC-AC inverters and harmonic analysis. Variable-speed motor drives. Laboratory design and analysis of various electronic energy processing circuits. Prerequisite: EECS 5480

**EECS 5500 PROGRAMMING LANGUAGE PARADIGMS**

[3 hours] The course investigates the fundamentals of modern programming languages. Differences and similarities between procedural, functional, object-oriented and rule-based languages are examined along with their impact on the programming process. Prerequisite: EECS 1550, 2500

**EECS 5510 TRANSLATION SYSTEMS**

[4 hours] The course includes: the design of translation systems including compilers and interpreters, grammars and parsing methods, error detection and correction schemes and optimization techniques. Prerequisite: EECS 1550, 3500

**EECS 5520 ADVANCED SYSTEMS PROGRAMMING**

[4 hours] This course examines pertinent concepts of systems programming. Topics covered include: synchronization, distributed programming models, kernel design, peripheral handling, file systems and security history and methods. Prerequisite: EECS 2550

**EECS 5530 COMPUTER GRAPHICS I**

[4 hours] An introduction to typical computer graphics systems and their operation. Interactive techniques will be introduced as well as representations and projections of three-dimensional images. Exercises using graphics equipment are assigned. Prerequisite: EECS 1050 or 1500

**EECS 5540 COMPUTER GRAPHICS II**

[4 hours] Examines current topics related to realistic and representative 3D computer graphics. Topics include curve and surface geometry, solid modeling, raytracing, radiosity and real-time computer graphics. Prerequisite: EECS 1550, 4530

**EECS 5550 CREATING MULTIMEDIA SOFTWARE**

[4 hours] An audio-visual experience in the design and production of multimedia products. Investigates computer-human interfaces, performance measurement and analysis, storage/retrieval of data and compression/decompression techniques. Prerequisite: EECS 1550, 2550

**EECS 5560 DATABASE SYSTEMS I**

[3 hours] The following topics are covered: relational database modeling, query languages, design issues and implementation issued of databases. An appropriate database language is introduced and used to demonstrate principles. Prerequisite: EECS 1550

**EECS 5570 DATABASE SYSTEMS II**

[3 hours] The emphasis of this course is on database recovery techniques, integrity constraints and concurrency control. The similarities and differences between distributed, networked, client/server and object-oriented database systems are also investigated. Prerequisite: EECS 5560

**EECS 5580 SURVEY OF ARTIFICIAL INTELLIGENCE**

[4 hours] This course covers, more in breadth than in depth, the areas that artificial intelligence currently encompasses. Topics examined: history, reasoning, search techniques, knowledge representation, uncertainty and learning. Prerequisite: EECS 1550

**EECS 5610 DIGITAL VLSI DESIGN I: BASIC SUBSYSTEMS**

[4 hours] CMOS process technologies. CMOS logic families. Custom and semicustom design. Subsystem design; adders, counters, multipliers. System design methods. VLSI design tools. Prerequisite: EECS 3400

**EECS 5620 DIGITAL VLSI DESIGN II: MEMORY AND STRUCTURED LOGIC**

[3 hours] Memory categories, functions, architectures, cells and peripheral circuitry in CMOS/BiCMOS. Overview and technology trends in SRAMs, DRAMs, EPROMs, EEPROMs, FPGAs. Class exercises in selected small system circuit and layout design. Prerequisite: EECS 5610/7610 or BSEE degree and permission of instructor

## 372 Course Descriptions

### EECS 5630 PHYSICAL DESIGN OF VLSI CIRCUITS

[4 hours] VLSI design process automation and tools. Mask level design. Compaction. Module placement. Routing area partitioning. Loose routing, channel routing, P/G and clock routing. Prerequisite: Graduate standing

### EECS 5920 PROJECTS

[1-6 hours] Independent research project with intensive investigation into an area of practical interest to the student and the instructor. Prerequisite: Permission of instructor

### EECS 5930 ELECTRICAL ENGINEERING & COMPUTER SCIENCE SEMINAR

[1 hour] All graduate students are expected to attend the seminars and to prepare a report summarizing their experiences, questions and the impact of the seminar series. Students will also present their thesis and dissertation results. Prerequisite: Graduate standing

### EECS 6110 ADVANCED COMPUTER ARCHITECTURE

[3 hours] Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization. Prerequisite: EECS 2100

### EECS 6120 COMPUTER SYSTEMS PERFORMANCE AND RELIABILITY

[4 hours] Relative importance of performance and reliability. Fault-tolerance in computer systems. Techniques for reliability modeling and analysis. Markov and semi-Markov models. Queuing network models of computer systems. Performability modeling and analysis. Prerequisite: EECS 2100, MIME 4000

### EECS 6130 PARALLEL COMPUTING

[4 hours] Survey of computer architectures and languages that support parallelism. Analysis of algorithms for inherent parallelism. Issues surrounding the granularity of the parallelism. Mapping of parallel program structures to architectural topologies. Prerequisite: EECS 2100

### EECS 6140 LOGIC SYNTHESIS AND OPTIMIZATION

[3 hours] Architectural synthesis, scheduling algorithms, resource sharing and binding, multiple-level combinational logic optimization and sequential logic optimization. Prerequisite: EECS 2100

### EECS 6150 ADVANCED COMPUTER NETWORKS

[3 hours] High speed LANs and MANs. Performance analysis of Ethernet, token ring, token bus, FDDI, FDDI-II and DQDB protocols. WANS and their routing protocols. Flow control techniques in WANS. Prerequisite: EECS 4180/5180

### EECS 6160 B-ISDN AND ATM NETWORKS

[3 hours] ATM overview and B-ISDN networks. ATM adaptation layer and ATM LANs. Issues in traffic management. Admission control and policing. Flow control, priority control and self-learning strategies. Prerequisite: EECS 4180/5180

### EECS 6170 PETRI NETS AND SOFTWARE RELIABILITY

[3 hours] Petri Net structure, graphs and analysis. Modeling with Petri Nets. Software reliability modeling using Petri Nets and Markov chains. Comparison of software reliability models. Prerequisite: EECS 1550; MIME 4000

### EECS 6200 DIGITAL CONTROL SYSTEMS

[3 hours] Analysis and design of digital control systems by classical and state methods. Topics include: stability, pole placement, polynomial manipulation, quadratic optimal control and introduction to digital control system implementation. Prerequisite: EECS 4200

### EECS 6210 ADAPTIVE CONTROL SYSTEMS

[3 hours] Schemes of adaptive control systems, MIT rule for Model Reference Adaptive Control, self Tuning regulator systems, Recursive Least Squares for system identification, Minimum Variance, PID and other controller design techniques for STR systems. Prerequisite: EECS 6200

### EECS 6220 NONLINEAR CONTROL SYSTEMS

[3 hours] The multiple input describing function. Random signals in nonlinear systems. The phase plane, equilibrium points, limit cycles and linearization methods. Liapunov stability theorems. Optimum switching systems. Selected applications. Prerequisite: EECS 4200, 3300

### EECS 6230 OPTIMAL CONTROL THEORY

[3 hours] Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters. Prerequisite: EECS 4200 or permission of instructor

### EECS 6300 RANDOM SIGNALS AND OPTIMAL FILTERS

[3 hours] Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters). Prerequisite: EECS 3200, 3300

### EECS 6310 DIGITAL IMAGE PROCESSING

[3 hours] Image digitization, image transforms, image enhancement, spatial and frequency domain filtering, image restoration techniques, inverse filtering, least square filtering, image interpolation and motion estimation, video filtering, superresolution. Prerequisite: EECS 4380

### EECS 6320 IMAGE DATA COMPRESSION AND CODING

[3 hours] Mathematical preliminaries, lossless compression, Huffman and run-length coding of images, arithmetic coding, bit-plane coding; lossy compression, predictive, transform, pyramid coding; vector quantization and subband coding; image compression standards, JPEG, MPEG coding. Prerequisite: EECS 4370

### EECS 6340 MODERN COMMUNICATIONS ENGINEERING I

[3 hours] Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques. Prerequisite: EECS 4360 Corequisite: EECS 6300

### EECS 6350 MODERN COMMUNICATIONS ENGINEERING II

[3 hours] Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking. Prerequisite: EECS 6340

### EECS 6360 KNOWLEDGE BASED SYSTEMS

[3 hours] Knowledge representation, dealing with uncertainty in knowledge-based systems. Machine learning techniques for rule extraction. Prerequisite: EECS 4580

### EECS 6370 PATTERN RECOGNITION AND NEURAL NETWORKS

[3 hours] Bayes decision theory, parameter estimation and supervised learning, nonparametric techniques, linear discriminant functions, pattern recognition with neural networks, feed-forward networks, Hopfield and Kohonen networks, unsupervised learning and clustering. Prerequisite: MATH 4680

### EECS 6380 ADVANCED COMPUTATIONAL METHODS

[3 hours] MATLAB is used to solve mathematical engineering. Reviews fundamental structural code elements, followed by case study solutions that illustrate MATLAB functionality. Individual/group projects reinforce understanding principles and methodologies. Prerequisite: Graduate standing

### EECS 6400 ELECTROMAGNETIC FIELDS AND WAVES

[3 hours] An advanced study of electrostatic and magnetostatic fields and associated boundary-value problems. Time varying fields, wave propagation, wave scattering and electromagnetic radiation will be considered. Prerequisite: Consent of instructor

### EECS 6450 DYNAMIC ANALYSIS OF SWITCHING CONVERTERS

[3 hours] Cyclic steady-state analysis of the switching power converter using switching functions. Dynamic modeling of the switching converter as a discrete-time system and as a switching-period-averaged system. Prerequisite: EECS 5490

### EECS 6500 COMPUTATION, COMPUTABILITY AND COMPLEXITY

[3 hours] Covers: context-free languages and pushdown automata and their relationship with computer language implementation. Turing machines and U-recursive functions are examined. Uncomputability, the halting problem, computational complexity and NP-completeness are covered. Prerequisite: EECS 3500

### EECS 6520 OPERATING SYSTEMS DESIGN

[4 hours] This course investigates past and present trends in the design and implementation of operating systems. The unique requirements of real-time, highly reliable and distributed systems are addressed. Prerequisite: EECS 2550

### EECS 6530 CONCURRENT PROGRAMMING

[3 hours] This course studies theoretical and practical issues in concurrent programming. Topics include: mutual exclusion, the producer-consumer problem, the dining philosophers problem, semaphores, monitors, threads and the Ada model for multi-tasking. Prerequisite: EECS 2550



**EECS 6550 SOFTWARE SPECIFICATION AND DESIGN**

[3 hours] This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.

**EECS 6560 TOPICS IN SOFTWARE AND HUMAN ENGINEERING**

[3 hours] This course investigates issues in software engineering and human aspects of software engineering. Topics user interfaces, programming practices, documentation, programming environments, applications, empirical methods and physical aspects. Prerequisite: EECS 6550/8550

**EECS 6600 ANALOG INTEGRATED CIRCUITS**

[3 hours] Review of SPICE-based device models and analysis techniques. Bias and small signal design techniques in modern, low-voltage CMOS/BiCMOS. Op-amps, comparators and PLLs are emphasized; other topics as time permits. Prerequisite: BSEE degree or permission of instructor

**EECS 6620 DIGITAL VLSI CMOS/BICMOS CIRCUIT DESIGN**

[3 hours] Design styles; static, dynamic, T-gate intensive; optimization of speed and robustness of selected CMOS/BiCMOS examples using SPICE-high fan in/fan out, I/O buffers, other Hi-C loads, sense amps, programming drivers, other examples as time permits. Prerequisite: BSEE degree or permission of instructor

**EECS 6640 VLSI CHANNEL ROUTING**

[4 hours] Wiring models. Lower bounds on routing quality metrics. Theory of locally optimal braking of cyclic vertical constraints. Genetic, neural and other advanced channel routing algorithms. Prerequisite: EECS 5640

**EECS 6660 FIELD PROGRAMMABLE GATE ARRAYS**

[3 hours] Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools. Prerequisite: EECS 5610/7610

**EECS 6810 SOLID STATE ELECTRONICS WITH BIOENGINEERING APPLICATIONS**

[3 hours] A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors, various models of BJT's and FET's and applications to biochemical and biomechanical sensing will be considered. Prerequisite: Graduate standing

**EECS 6820 MICROELECTRONIC AND MICROMECHANICAL FABRICATION**

[3 hours] A comprehensive treatment of the theory, principles and techniques associated with microfabrication of electronic circuits and biosensors. Prerequisite: Graduate standing

**EECS 6900 INDEPENDENT RESEARCH**

[1-6 hours] Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor. Prerequisite: Permission of instructor

**EECS 6960 MASTER'S GRADUATE RESEARCH AND THESIS**

[1-9 hours] Graduate research towards the completion of a master's degree. Prerequisite: Permission of instructor

**EECS 6980 SPECIAL TOPICS IN ELECTRICAL ENGINEERING & COMPUTER SCIENCE**

[1-5 hours] Selected topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor. Prerequisite: Permission of instructor

**EECS 6990 INDEPENDENT STUDY**

[1-3 hours] In depth study of a selected topic of mutual interest to the student and the instructor.

**EECS 8110 ADVANCED COMPUTER ARCHITECTURE**

[3 hours] Architectural development in computer systems and scalability. Processors and arithmetic algorithms. Memory hierarchy, shared memory and cache architecture. Pipeline, superscaler and vector organization. Prerequisite: EECS 2100

**EECS 8120 COMPUTER SYSTEMS PERFORMANCE AND RELIABILITY**

[4 hours] Relative importance of performance and reliability. Fault-tolerance in computer systems. Techniques for reliability modeling and analysis. Markov and semi-Markov models. Queuing network models of computer systems. Performability modeling and analysis. Prerequisite: EECS 2100, MIME 4000

**EECS 8130 PARALLEL COMPUTING**

[4 hours] Survey of computer architectures and languages that support parallelism. Analysis of algorithms for inherent parallelism. Issues surrounding the granularity of the parallelism. Mapping of parallel program structures to architectural topologies. Prerequisite: EECS 2100

**EECS 8140 LOGIC SYNTHESIS AND OPTIMIZATION**

[3 hours] Architectural synthesis, scheduling algorithms, resource sharing and binding, multiple-level combinational logic optimization and sequential logic optimization. Prerequisite: EECS 2100

**EECS 8150 ADVANCED COMPUTER NETWORKS**

[3 hours] High speed LANs and MANs. Performance analysis of Ethernet, token ring, token bus, FDDI, FDDI-II and DQDB protocols. WANS and their routing protocols. Flow control techniques in WANS. Prerequisite: EECS 4180/5180

**EECS 8160 B-ISDN AND ATM NETWORKS**

[3 hours] ATM overview and B-ISDN networks. ATM adaptation layer and ATM LANs. Issues in traffic management. Admission control and policing. Flow control, priority control and self-learning strategies. Prerequisite: EECS 4180/5180

**EECS 8170 PETRI NETS AND SOFTWARE RELIABILITY**

[3 hours] Petri Net structure, graphs and analysis. Modeling with Petri Nets. Software reliability modeling using Petri Nets and Markov chains. Comparison of software reliability models. Prerequisite: EECS 1550; MIME 4000

**EECS 8200 DIGITAL CONTROL SYSTEMS**

[3 hours] Analysis and design of digital control systems by classical and state methods. Topics include: stability, pole placement, polynomial manipulation, quadratic optimal control and introduction to digital control system implementation. Prerequisite: EECS 4200

**EECS 8210 ADAPTIVE CONTROL SYSTEMS**

[3 hours] Schemes of adaptive control systems, MIT rule for Model Reference Adaptive Control, self Tuning regulator systems, Recursive Least Squares for system identification, Minimum Variance, PID and other controller design techniques for STR systems. Prerequisite: EECS 6200

**EECS 8220 NONLINEAR CONTROL SYSTEMS**

[3 hours] The multiple input describing function. Random signals in nonlinear systems. The phase plane, equilibrium points, limit cycles and linearization methods. Liapunov stability theorems. Optimum switching systems. Selected applications. Prerequisite: EECS 4200, 3300

**EECS 8230 OPTIMAL CONTROL THEORY**

[3 hours] Optimization of dynamic systems by the calculus of variations and Pontryagin's Maximum Principle. Solution of optimal control problems using direct and indirect computational methods. Applications include constrained state and/or control parameters. Prerequisite: EECS 4200 or permission of instructor

**EECS 8300 RANDOM SIGNALS AND OPTIMAL FILTERS**

[3 hours] Description and properties of random signals and their processing by optimal filters. Correlation and power spectra. GRP. Narrowband noise. Signal detection (matched filter) and estimation (Wiener and Kalman filters). Prerequisite: EECS 3200, 3300

**EECS 8310 DIGITAL IMAGE PROCESSING**

[3 hours] Image digitization, image transforms, image enhancement, spatial and frequency domain filtering, image restoration techniques, inverse filtering, least square filtering, image interpolation and motion estimation, video filtering, superresolution. Prerequisite: EECS 4380

**EECS 8320 IMAGE DATA COMPRESSION AND CODING**

[3 hours] Mathematical preliminaries, lossless compression, Huffman and run-length coding of images, arithmetic coding, bit-plane coding; lossy compression, predictive, transform, pyramid coding; vector quantization and subband coding; image compression standards, JPEG, MPEG coding. Prerequisite: EECS 4370

**EECS 8340 MODERN COMMUNICATIONS ENGINEERING I**

[3 hours] Introduction to detection and estimation and applications to the bandpass signals, Binary and M-ary digital modulation techniques, Error-control convolutional coding, Trellis Coded Modulation (TCM), Spread Spectrum (SS) communication techniques. Prerequisite: EECS 4360 Corequisite: EECS 6300

**EECS 8350 MODERN COMMUNICATIONS ENGINEERING II**

[3 hours] Digital transmission over Gaussian/non-Gaussian channels, Satellite systems (GEO and LEO) and multiple accesses, Cellular and satellite communication network, Mobile/wireless Personal communication services (PCS) and its networking. Prerequisite: EECS 6340

## 374 Course Descriptions

### EECS 8360 KNOWLEDGE BASED SYSTEMS

[3 hours] Knowledge representation, dealing with uncertainty in knowledge-based systems. Machine learning techniques for rule extraction. Prerequisite: EECS 4580

### EECS 8370 PATTERN RECOGNITION AND NEURAL NETWORKS

[3 hours] Bayes decision theory, parameter estimation and supervised learning, nonparametric techniques, linear discriminant functions, pattern recognition with neural networks, feed-forward networks, Hopfield and Kohonen networks, unsupervised learning and clustering. Prerequisite: MATH 4680

### EECS 8400 ELECTROMAGNETIC FIELDS AND WAVES

[3 hours] An advanced study of electrostatic and magnetostatic fields and associated boundary-value problems. Time varying fields, wave propagation, wave scattering and electromagnetic radiation will be considered. Prerequisite: Permission of instructor

### EECS 8450 DYNAMIC ANALYSIS OF SWITCHING CONVERTERS

[3 hours] Cyclic steady-state analysis of the switching power converter using switching functions. Dynamic modeling of the switching converter as a discrete-time system and as a switching-period-averaged system. Prerequisite: EECS 5490

### EECS 8500 COMPUTATION, COMPUTABILITY AND COMPLEXITY

[3 hours] Covers: context-free languages and pushdown automata and their relationship with computer language implementation. Turing machines and U-recursive functions are examined. Uncomputability, the halting problem, computational complexity and NP-completeness are covered. Prerequisite: EECS 3500

### EECS 8520 OPERATING SYSTEMS DESIGN

[4 hours] This course investigates past and present trends in the design and implementation of operating systems. The unique requirements of real-time, highly reliable and distributed systems are addressed. Prerequisite: EECS 2550

### EECS 8530 CONCURRENT PROGRAMMING

[3 hours] This course studies theoretical and practical issues in concurrent programming. Topics include: mutual exclusion, the producer-consumer problem, the dining philosophers problem, semaphores, monitors, threads and the Ada model for multi-tasking. Prerequisite: EECS 2550

### EECS 8550 SOFTWARE SPECIFICATION AND DESIGN

[3 hours] This course covers the software development steps of specification, requirements analysis and design in depth. Computer-human interfaces are also discussed.

### EECS 8560 TOPICS IN SOFTWARE AND HUMAN ENGINEERING

[3 hours] This course investigates issues in software engineering and human aspects of software engineering. Topics user interfaces, programming practices, documentation, programming environments, applications, empirical methods and physical aspects. Prerequisite: EECS 6550/8550

### EECS 8600 ANALOG INTEGRATED CIRCUITS

[3 hours] Review of SPICE-based device models and analysis techniques. Bias and small signal design techniques in modern, low-voltage CMOS/BiCMOS. Op-amps, comparators and PLLs are emphasized; other topics as time permits. Prerequisite: BSEE degree or permission of the instructor

### EECS 8620 DIGITAL VLSI CMOS/BICMOS CIRCUIT DESIGN

[3 hours] Design styles; static, dynamic, T-gate intensive; optimization of speed and robustness of selected CMOS/BiCMOS examples using SPICE-high fan in/fan out, I/O buffers, other Hi-C loads, sense amps, programming drivers, other examples as time permits. Prerequisite: BSEE degree or permission of the instructor

### EECS 8640 VLSI CHANNEL ROUTING

[4 hours] Wiring models. Lower bounds on routing quality metrics. Theory of locally optimal braking of cyclic vertical constraints. Genetic, neural and other advanced channel routing algorithms. Prerequisite: EECS 5640

### EECS 8660 FIELD PROGRAMMABLE GATE ARRAYS

[3 hours] Introduction to FPGA's. Programming technology. Logic block architectures. Routing architectures. FPGA based VLSI design. Design tools. Prerequisite: EECS 5610/7610

### EECS 8810 SOLID STATE ELECTRONICS WITH BIOENGINEERING APPLICATIONS

[3 hours] A comprehensive treatment of the theory and operation of physical electronic devices emphasizing electrical transport in metals and semiconductors, various models of BJT's and FET's and applications to biochemical and biomechanical sensing will be considered. Prerequisite: Graduate standing

### EECS 8820 MICROELECTRONIC AND MICROMECHANICAL FABRICATION

[3 hours] A comprehensive treatment of the theory, principles and techniques associated with microfabrication of electronic circuits and biosensors. Prerequisite: Graduate standing

### EECS 8900 INDEPENDENT RESEARCH

[1-6 hours] Selected topics from current EE and CSE research with intensive investigation into recent literature in an area of mutual interest to the student and the instructor. Prerequisite: Permission of instructor

### EECS 8960 DISSERTATION

[1-15 hours] Graduate research towards completion of a doctoral degree. Prerequisite: Permission of department

### EECS 8980 CURRENT TOPICS IN ELECTRICAL ENGINEERING & COMPUTER SCIENCE

[1-5 hours] Current topics in the field of Electrical Engineering and Computer Science in areas of special interest to the class and the professor. Students will be expected to complete a written project based on a review of the research literature of the area covered in this course. Prerequisite: Permission of instructor

### EECS 8990 INDEPENDENT STUDY

[1-3 hours] In depth study of a selected topic of mutual interest to the student and the instructor.

## EEES - Earth, Ecological and Environmental Science

### Department of Earth, Ecological and Environmental Science (ARS)

#### EEES 1010 PHYSICAL GEOLOGY

[3 hours] Introduction to classification and origins of rocks and minerals, surficial processes and landscape development, groundwater and other natural resources, geologic structures, earthquakes and the earth's interior, plate tectonics and geologic time. Natural Sciences core course

#### EEES 1020 INTRODUCTORY GEOLOGY LABORATORY

[1 hour] Identification of rocks and minerals. Study of the Earth's surface features and geologic structures through the use of topographic maps and aerial photographs. Corequisite: EEES 1010 or 1050 or 2100 Natural Sciences core course

#### EEES 1030 HISTORICAL GEOLOGY

[3 hours] Study of rock and fossil records to discover their tabulation of physical and biological earth history. Three hours lecture, laboratory (GEOL 1040) is optional. Offered as writing intensive. Prerequisite: EEES 1010 or 2100 Natural Sciences core course

#### EEES 1040 HISTORICAL GEOLOGY LABORATORY

[1 hour] Geologic maps and fossil assemblages are studied to interpret earth history and environments of deposition of sedimentary rocks. Two hours lab weekly. Corequisite: EEES 1030 Natural Sciences core course

#### EEES 1050 GEOLOGICAL HAZARDS AND THE ENVIRONMENT

[3 hours] Introduction to risk mitigation involving hazardous geological processes and materials: volcanic eruptions, earthquakes, floods, ground subsidence and collapse, radon, asbestos and others. Natural Sciences core course

#### EEES 1130 HUMAN ECOLOGY

[3 hours] The application of key ideas in modern ecology to ecosystems dominated by humans, including how culture influences such problems as overpopulation, food supply, resource depletion, pollution and endangered species. (not for major credit) Prerequisite: ENGL 1100 or 1110; MATH 1180 or higher Natural Sciences core course

#### EEES 1140 ENVIRONMENTAL PROBLEMS LABORATORY

[1 hour] Basic scientific methods are used to conduct laboratory and field studies relevant to contemporary environmental problems. Corequisite: EEES 1130 or 1160 Natural Sciences core course

#### EEES 1160 PLANTS AND SOCIETY

[3 hours] This course centers on the importance of plants to our planet. Includes an introduction to botany and discussion of plants that provide food, materials, spices, medicines, drugs and poisons. (not for major credit) Natural Sciences core course

**EEES 2010 INTRODUCTION TO ENVIRONMENTAL STUDIES**

[3 hours] Introduction to issues currently affecting environmental quality. Fundamental scientific concepts relating to those issues and ethical, economic, legal and political considerations that affect the resolution of environmental problems.

**EEES 2100 FUNDAMENTALS OF GEOLOGY**

[4 hours] Consideration of earth materials and the dynamic external and internal processes active on earth; the physical and biological history of the earth. No credit if EEES 1010 is taken. Intended for science majors. Prerequisite: CHEM 1090 or 1230

**EEES 2150 BIODIVERSITY**

[4 hours] Examination of the diversity of life on earth and its evolution, systematics and behavior; the structure of ecosystems and concepts of population and community ecology. Natural Sciences core course

**EEES 2160 BIODIVERSITY LABORATORY**

[1 hour] Laboratory exercises designed to complement the material covered in EEES 2150. Corequisite: EEES 2150 Natural Sciences core course

**EEES 2210 MINERALOGY**

[4 hours] Crystallization and stability of minerals in the geologic environment. Systematic classification and identification of silicate and non-silicate minerals. Prerequisite: EEES 1010 or 2100; CHEM 1230

**EEES 2220 MEGASCOPIC PETROLOGY**

[3 hours] Megascopic identification and classification of igneous, sedimentary and metamorphic rocks. Rock origins, including plate tectonic settings, are also discussed. Two hours lecture, two hours laboratory. Prerequisite: EEES 2210

**EEES 2400 OCEANOGRAPHY AND WATER RESOURCES**

[3 hours] Physical, chemical, geological and biological nature of oceans and ocean basins. Ocean resources, circulation, climate and the hydrologic cycle. Fresh water resources and resource management. Prerequisite: EEES 1010 or 2100

**EEES 2500 COMPUTER APPLICATIONS IN ENVIRONMENTAL SCIENCES**

[1 hour] Desktop computers used by scientists: word processing, spreadsheets, databases, e-mail and World-Wide Web, table digitizer, processing GPS and data logger files, contour and mapping software. Prerequisite: EEES 1010 or 2010; knowledge of algebra, plane geometry and basic trigonometry

**EEES 2900 SEMINAR**

[1 hour] Individual presentation and discussion of topics in the environmental sciences appropriate for students interested in environmental sciences but with little or no formal background in the discipline. Prerequisite: Permission of instructor

**EEES 2980 SPECIAL TOPICS**

[1-4 hours] A lower division undergraduate course covering some aspect of environmental sciences not covered in the formal course offerings of the department. Students may repeat the course for different topics. Prerequisite: Permission of instructor

**EEES 2990 INDEPENDENT STUDY**

[1-4 hours] Student selects an appropriate approved subject for individualized study and prepares a report or gives equivalent evidence of mastery of the selected subject. Prerequisite: Permission of instructor

**EEES 3000 GEOLOGY OF NATIONAL PARKS**

[3 hours] Study of regional geology of the U.S., focusing on national parks and monuments with the aim of furthering the student's geological knowledge and encouraging visitation as a tourist. Prerequisite: EEES 1010 or 2100

**EEES 3030 ENVIRONMENTAL DATA MANAGEMENT**

[3 hours] Instruments and methods for geo-referencing environmental field investigations. GPS, electronic total station, aerial photographs and maps. Organizing an environmental database for use with GIS (ArcView). Field trips. Prerequisite: EEES 1020, 2500

**EEES 3050 FUNDAMENTALS OF ECOLOGY**

[3 hours] The structure, function and regulation of populations, communities and ecosystems, emphasizing human activities and their ecological consequences. Prerequisite: EEES 2150 or BIOL 2150; CHEM 1090 or higher

**EEES 3060 FUNDAMENTALS OF ECOLOGY LABORATORY**

[1 hour] Laboratory and field exercises demonstrating ecological principles. Corequisite: EEES 3050

**EEES 3100 SURFICIAL PROCESSES**

[3 hours] Description and study of the earth's surface features from the point of view of their origin, including landforms created by volcanism, tectonics and erosional/depositional processes. Field trip required. Prerequisite: EEES 1010 or 2100

**EEES 3200 STRATIGRAPHY AND SEDIMENTOLOGY**

[3 hours] Introduction to depositional processes and environments of sediments; stratigraphic relationships of sedimentary rock. Prerequisite: EEES 2220

**EEES 3250 ENGINEERING GEOLOGY**

[3 hours] Application of geologic principles to engineering practices (dams, tunnels, drainage, foundations and water supply). Labs stress rock and mineral identification, quality control tests in engineering design and construction using rock. Prerequisite: MATH 1750 or 1850

**EEES 3320 STRUCTURAL GEOLOGY**

[3 hours] Descriptive analysis of rock structures, with emphasis on relationship to regional tectonics; term paper or field trip required. Prerequisite: EEES 1010 or 2100; basic trigonometry.

**EEES 3900 LITERATURE AND COMMUNICATIONS IN THE ENVIRONMENTAL SCIENCES**

[3 hours] Survey and analysis of environmental issues featuring guest experts from a variety of environment-related occupations, readings from the environmental literature and student reports. Prerequisite: junior or senior standing

**EEES 4000 INVERTEBRATE PALEONTOLOGY**

[3 hours] Biologic and stratigraphic significant taxa of invertebrate fossils, principles of taxonomy, morphology and paleoecology. Paleoenvironmental use of fossils. Field trip required. Prerequisite: EEES 1030 or 2150 or consent of instructor.

**EEES 4010 MICROSCOPIC PETROLOGY**

[3 hours] Principles of optical crystallography, training and use of the petrographic microscope; classification, occurrence, petrogenesis and petrography of igneous, metamorphic and sedimentary rocks. Two hours lecture, two hours laboratory. Prerequisite: EEES 2220, MATH 1320 or higher

**EEES 4100 GLACIAL GEOLOGY**

[3 hours] To understand glaciers and glacial landscapes. Topics include mass balance, ice flow, hydrology, erosion, deposition, landforms, glacial lakes and development of the Ohio glacial landscape. Field trip is mandatory. Prerequisite: EEES 3100 or permission of instructor

**EEES 4150 EVOLUTION**

[3 hours] The modern theory of evolution presented within a framework of theoretical genetics and population biology; phylogeny and evolution of the vertebrates. Prerequisite: EEES 2150 or BIOL 2150; CHEM 1230

**EEES 4200 QUATERNARY GEOLOGY**

[3 hours] To provide understanding of such cyclical events as climate change, sea level fluctuations, vegetation change and ice sheet paleogeography during the Quaternary Period and to explore future changes for planet Earth. Prerequisite: EEES 3200 or permission of instructor

**EEES 4220 ENVIRONMENTAL GEOCHEMISTRY**

[3 hours] Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Petroleum formation, migration and accumulation in the subsurface. Computer software used. Prerequisite: CHEM 1240

**EEES 4240 SOIL SCIENCE**

[3 hours] Basic principles of soil formation, physics, chemistry and biology with emphasis on their influence on fluid and chemical migration and preservation of soil quality from geological, agricultural and environmental perspectives. Prerequisite: CHEM 1240

**EEES 4250 SOIL ECOLOGY**

[3 hours] Underlying concepts and theory of modern soil ecology will be reviewed including spatial and temporal distributions, sampling methods, biogeochemical cycles and ecological functions of soil. (Spring, alternate years, odd) Prerequisite: EEES 3050 or 4240

**EEES 4260 SOIL ECOLOGY LABORATORY**

[1 hour] Laboratory exercises designed to complement the material covered in EEES 4250. Corequisite: EEES 4250

**EEES 4300 FIELD BOTANY**

[3 hours] Introduction to the principles and methodology of plant taxonomy with particular attention to the native plant species. Prerequisite: EEES 2150 or BIOL 2150 or permission of instructor

**EEES 4330 VERTEBRATE ECOLOGY AND SYSTEMATICS**

[4 hours] Ecology, systematics and conservation of the vertebrates, with special emphasis on forms native to North America. Prerequisite: EEES 2150

**EEES 4410 HYDROGEOLOGY**

[3 hours] Fundamentals of groundwater flow and geological controls, including applications to water resource evaluation, utilization, chemical characterization, contaminant transport and geological processes. Prerequisite: MATH 1850 or 1750

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### **EEES 4450 HAZARDOUS WASTE MANAGEMENT**

[3 hours] Environmental regulations concerning hazardous waste, characteristics of hazardous waste and disposal technologies, toxicology, characteristics of organic chemicals and heavy metals, biodegradation, soil science, groundwater contamination, risk assessment, site investigation. Prerequisite: CHEM 1230

### **EEES 4510 ENVIRONMENTAL MICROBIOLOGY**

[3 hours] The diversity of microbial life and activities, the functioning of microbial ecosystems in energy and carbon flow and remediation of polluted environments, and the detection and control of pathogens. Prerequisite: EEES 2150 and CHEM 1230 or permission of instructor

### **EEES 4520 BIOREMEDIATION**

[3 hours] The environmental fate and transport of contaminants; their transformation and biodegradation by plants and microorganisms; bioremediation strategies, including solid phase, slurry phase, and vapor-phase treatments, and natural attenuation. Corequisite: EEES 2150 and CHEM 1230 or permission of instructor

### **EEES 4530 PHYTOREMEDIATION PRINCIPLES**

[3 hours] Course describes the process of phytoremediation with references to both physiological modes of uptake and transformation of contaminants to field applications. Prerequisite: EEES 2150 and CHEM 1230 or permission of instructor

### **EEES 4540 MICROBIAL ECOLOGY**

[3 hours] Students will learn the underlying processes that drive microbial population structure and function in the environment and become familiar with classical and current methodology used in microbial community analysis. Prerequisite: EEES 2150 or BIOL 2170

### **EEES 4550 METHODS OF MICROBIAL INVESTIGATION**

[3 hours] Student will learn the classical and current methodologies (biochemical and molecular) used in microbial community analysis while developing an understanding of experimental design sample handling and data analysis. Prerequisite: EEES 4540

### **EEES 4610 GEOPHYSICS**

[3 hours] Survey of theory, field applications, interpretation principles of solid earth and exploration geophysics. Two hours lecture, three hours methods laboratory. Prerequisite: MATH 1760 or 1860; PHYS 2020 or 2120; EEES 3320

### **EEES 4620 ENVIRONMENTAL AND ENGINEERING GEOPHYSICS**

[3 hours] Electrical resistivity, electromagnetic conductivity, magnetometer and seismic methods are used to investigate subsurface structures and characterize materials concealed under the earth's surface. Prerequisite: EEES 2500

### **EEES 4630 NUMERICAL METHODS IN GEOPHYSICS**

[3 hours] Numerical filters and matrix operations used to process potential field data and wave forms, isolating anomalies and signals of interest; derivative maps, upward and downward continuation; current interpretation software. Term project. Prerequisite: EEES 4610

### **EEES 4650 GEOLOGY FIELD COURSE**

[6 hours] Intensive field studies in the Black Hills, South Dakota and Wyoming; stratigraphic section measuring, geologic mapping and interpretation and other field methods in geology. Prerequisite: EEES 2220, 3320, MATH 1340 or higher

### **EEES 4720 ECOLOGY OF FRESHWATER INVERTEBRATES**

[3 hours] Major freshwater invertebrate taxa are covered. The focus is the interaction of individual invertebrates with their biotic and abiotic environment with emphasis on community and ecosystem level interactions. Prerequisite: EEES 3050 or permission of instructor

### **EEES 4730 AQUATIC ECOLOGY**

[3 hours] The biology of populations, communities and ecosystems with emphasis on aquatic environments. Includes the application of principles and theory from aquatic ecology to help understand and solve management problems in aquatic systems. Prerequisite: EEES 3050 or permission of instructor

### **EEES 4740 AQUATIC ECOLOGY LABORATORY**

[1 hour] Laboratory exercises on the biology of aquatic populations, communities and ecosystems. Corequisite: EEES 4730

### **EEES 4750 CONSERVATION BIOLOGY**

[3 hours] The application of principles of ecology, biogeography, genetics, economics, philosophy and other disciplines to the study and maintenance of biological diversity in temperate, subtropical and tropical systems. Prerequisite: EEES 3050

### **EEES 4760 LANDSCAPE ECOLOGY**

[3 hours] Emphasis will be placed on ecological patterns, processes and management applications at multiple spatial and temporal scales. Prerequisite: EEES 3050

### **EEES 4770 ECOLOGY OF FRESHWATER INVERTEBRATES LAB**

[1 hour] Students will visit freshwater habitats, collect and identify freshwater invertebrate taxa, and conduct an independent project. Corequisite: EEES 4720

### **EEES 4790 ECOLOGY FIELD TRIP**

[2-4 hours] Field trip to a major ecosystem of a region other than northwestern Ohio. Includes analysis of structural and functional relationships within and between ecosystems, with opportunities for individual student projects. Prerequisite: EEES 3050

### **EEES 4800 PLANT PHYSIOLOGICAL ECOLOGY**

[4 hours] Study of how form (morphology, anatomy) and function (physiology, metabolism biophysics) affect plant ecology. Laboratory emphasizes experimentation and introduction to techniques. Lecture includes reading and written critiques of scientific literature. Prerequisite: EEES 2150 or BIOL 2170; CHEM 1230, 1240

### **EEES 4900 SEMINAR: ADVANCED UNDERGRADUATE**

[1 hour] Individual presentation and discussion of topics in the environmental sciences appropriate for juniors and seniors. Prerequisite: Permission of instructor

### **EEES 4910 DIRECTED RESEARCH**

[1-5 hours] Research under guidance of faculty member. An acceptable thesis is required for credit toward major. Prerequisite: Permission of instructor

### **EEES 4920 SENIOR GEOLOGY SEMINAR**

[2 hours] Survey of geology at a senior level using readings, class discussions and some lectures. The final exam will be one of the assessment vehicles of the department. Prerequisite: Consent of instructor

### **EEES 4940 INTERNSHIP**

[1-4 hours] Student gains up to 4 credits for relevant professional experience with an adviser-approved organization. Student must enroll during the term service is performed. Prerequisite: Permission of undergraduate adviser

### **EEES 4980 SPECIAL TOPICS: ADVANCED UNDERGRADUATE**

[1-4 hours] An advanced undergraduate course covering some aspect of the environmental sciences not covered in the formal upper-division undergraduate curriculum. Students may repeat the course for different topics.

### **EEES 4990 INDEPENDENT STUDY: ADVANCED UNDERGRADUATE**

[1-4 hours] Student selects an appropriate approved subject for individualized study and prepares a report or gives equivalent evidence of mastery of the selected subject. Prerequisite: Permission of instructor

### **EEES 5000 INVERTEBRATE PALEONTOLOGY**

[3 hours] Invertebrate fossil taxa of biologic and stratigraphic importance; morphology, paleoecology, biostratigraphy of each taxon reviewed. Field project required.

### **EEES 5100 ADVANCED GLACIAL GEOLOGY**

[3 hours] To understand glaciers and glacial landscapes. Topics include mass balance, ice flow, hydrology, erosion, deposition, landforms, glacial lakes and development of the Ohio glacial landscape. Field trip is mandatory. Prerequisite: EEES 3100 or permission of instructor

### **EEES 5150 ORGANIC EVOLUTION**

[3 hours] The modern theory of evolution presented within a framework of theoretical genetics and population biology. Prerequisite: EEES 2150 or BIOL 2150; CHEM 1210 or 1230

### **EEES 5200 ADVANCED QUATERNARY GEOLOGY**

[3 hours] To provide understanding of such cyclical events as climate change, sea level fluctuations, vegetation change and ice sheet paleogeography during the Quaternary Period and to explore future changes for planet Earth. Prerequisite: EEES 3200 or permission of instructor

### **EEES 5220 ENVIRONMENTAL GEOCHEMISTRY**

[3 hours] Chemical reactions of environmental concern. Water and soil chemistry related to contaminant fate and mobility. Petroleum formation, migration and accumulation in the subsurface. Computer software used.

### **EEES 5240 SOIL SCIENCE**

[3 hours] Basic principles of soil formation of physics, chemistry and biology with emphasis on their influence on fluid and chemical migration and preservation of soil quality from geological, agricultural and environmental perspectives.

**EES 5250 SOIL ECOLOGY**

[3 hours] Underlying concepts and theory of modern soil ecology will be reviewed including spatial and temporal distributions, sampling methods, biogeochemical cycles and ecological functions of soil. Prerequisite: BIOL 3050, EES 4240/5240

**EES 5260 SOIL ECOLOGY LABORATORY**

[1 hour] Laboratory exercises designed to complement the material covered in EES 5250. Corequisite: EES 5250

**EES 5300 ADVANCED FIELD BOTANY**

[3 hours] Principles of plant systematics stressing identification of local taxa; field trips.

**EES 5330 VERTEBRATE ECOLOGY AND SYSTEMATICS**

[4 hours] Ecology, systematics and conservation of the vertebrates, with special emphasis on forms native to North America. Prerequisite: Graduate standing

**EES 5410 HYDROGEOLOGY**

[3 hours] Fundamentals of groundwater flow and geological controls, including applications to water resource evaluation, utilization, chemical characterization, contaminant transport and geological processes. Primarily for graduate students in environmental sciences, geology and engineering. Prerequisite: MATH 1850 or 1750

**EES 5450 HAZARDOUS WASTE MANAGEMENT**

[3 hours] Environmental regulations concerning hazardous waste, characteristics of hazardous waste and disposal technologies, toxicology, characteristics of organic chemicals and heavy metals, biodegradation, soil science, groundwater contamination, risk assessment, site investigation.

**EES 5510 ENVIRONMENTAL MICROBIOLOGY**

[3 hours] Microbial diversity and activities in an applied environmental context. Topics include function of microbial ecosystems in energy and carbon flow, bioremediation, and the detection and control of pathogens. Prerequisite: EES 2150, CHEM 1230; or permission of instructor

**EES 5520 BIOREMEDIATION**

[3 hours] The environmental fate and transport of contaminants; their transformation and biodegradation by plants and microorganisms; bioremediation strategies, including solid phase, slurry phase and vapor-phase treatments, and natural attenuation. Prerequisite: Permission of instructor

**EES 5530 PHYTOREMEDIATION PRINCIPLES**

[3 hours] Course describes the process of phytoremediation with references to both physiological modes of uptake and transformation of contaminants to field applications. Prerequisite: Permission of instructor

**EES 5540 ADVANCED MICROBIAL ECOLOGY**

[3 hours] Students will learn the underlying processes that drive microbial population structure and function in the environment and become familiar with classical and current methodology used in microbial community analysis.

**EES 5550 ADVANCED METHODS OF MICROBIAL INVESTIGATION**

[3 hours] Student will learn the classical and current methodologies (biochemical and molecular) used in microbial community analysis while developing an understanding of experimental design sample handling and data analysis. Prerequisite: EES 5540

**EES 5610 SOLID EARTH GEOPHYSICS**

[3 hours] Survey of theory, field applications, interpretation principles of solid earth and exploration geophysics. Two hours lecture, three hours methods laboratory. Prerequisite: PHYS 2070, 2080, MATH 1850, 1860, or equivalents

**EES 5620 ENVIRONMENTAL AND ENGINEERING GEOPHYSICS**

[3 hours] Electrical resistivity, electromagnetic conductivity, magnetometer and seismic methods are used to investigate subsurface structures and characterize materials concealed under the earth's surface. Prerequisite: PHYS 2070 or 2130 or equivalent

**EES 5630 NUMERICAL METHODS IN GEOPHYSICS**

[3 hours] Numerical filters and matrix operations used to process potential field data and waveforms, isolating anomalies and signals of interest; derivative maps, upward and downward continuation; current interpretation software. Term project. Prerequisite: EES 5610

**EES 5650 GEOLOGY FIELD COURSE**

[6 hours] Intensive field studies in the Black Hills, South Dakota and Wyoming; stratigraphic section measuring, geologic mapping and interpretation and other field methods in geology. Prerequisite: Permission of instructor

**EES 5720 ECOLOGY AND LITERATURE OF FRESHWATER INVERTEBRATES**

[3 hours] Major freshwater invertebrate taxa are covered. The focus is the interaction of individual invertebrates with their biotic and abiotic environment with emphasis on community and ecosystem level interactions.

**EES 5730 ADVANCED AQUATIC ECOLOGY**

[3 hours] Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems. Prerequisite: EES 3050 or permission of instructor

**EES 5740 ADVANCED AQUATIC ECOLOGY LABORATORY**

[1 hour] Laboratory exercises on the biology of aquatic populations, communities and ecosystems. Corequisite: EES 5730

**EES 5750 ADVANCED CONSERVATION BIOLOGY**

[4 hours] Advanced cross-disciplinary concepts in the application of principles and theory to the study and maintenance of biological diversity in temperate, subtropical and tropical systems. Lectures, classroom discussion and readings. Prerequisite: EES 3050

**EES 5760 ADVANCED LANDSCAPE ECOLOGY**

[3 hours] This course is for graduate students from a variety of disciplines. Emphasis will be placed on up-to-date knowledge and methods in landscape analysis, pattern-process relationship and potential management applications at multiple spatial and temporal scales. Prerequisite: EES 3050

**EES 5770 ECOLOGY OF FRESHWATER INVERTEBRATES ADVANCED LAB**

[1 hour] Students will visit freshwater habitats, collect and identify freshwater invertebrate taxa, and conduct an independent project. Corequisite: EES5720

**EES 5790 ECOLOGY FIELD TRIP**

[2-4 hours] Field trip to a major ecosystems of a region other than northwestern Ohio. Includes analysis of structural and functional relationships within and between ecosystem, with opportunities for individual student projects. Prerequisite: EES 3050 or equivalent

**EES 5800 ADVANCED PLANT PHYSIOLOGICAL ECOLOGY**

[4 hours] Study of how form (morphology, anatomy) and function (physiology, metabolism biophysics) affect plant ecology. Laboratory emphasizes experimentation and introduction to techniques. Lecture includes reading and written critiques of scientific literature.

**EES 6100 GLACIAL STRATIGRAPHY AND GEOPHYSICS**

[3 hours] To integrate glacial sedimentology and stratigraphy, with near-surface, geophysical methodologies. Field work to collect a variety of field data to analyze in the lab is mandatory. Data to be presented as posters. Prerequisite: EES 3200 or permission of instructor

**EES 6150 SPREADSHEET PROGRAMMING FOR SCIENTISTS**

[3 hours] Programming the Excel spreadsheet using Microsoft Visual Basic for Applications (VBA); VBA programming language; controls, charts and objects; applications to geological and environmental science. Two hours lecture, two hours laboratory. Prerequisite: Permission of instructor

**EES 6200 EARTH SYSTEM SCIENCE THROUGH INQUIRY-BASED LEARNING**

[3 hours] The course is geared towards in-service teachers. Teachers will explore four natural events affecting the earth as a system, using inquiry-based learning and lesson plan development.

**EES 6400 BIOSTATISTICS**

[4 hours] Application of statistical tools to sampling and measurement in biology and testing of hypotheses. Computer lab is included.

**EES 6430 GEOHYDROLOGY OF DRAINAGE BASINS**

[3 hours] Hydrology and hydraulics of surface water such as rainfall/runoff, infiltration, precipitation, evaporation and stream flow.

**EES 6440 CONTAMINANT HYDROGEOLOGY**

[3 hours] Groundwater contaminant sources, impacts, transport, geochemistry and remediation in relation to geological environments with attention to sampling, detection, characterization, modeling and aquifer protection. Prerequisite: EES 5410 Corequisite: EES 6220

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### **EEES 6450 ADVANCED APPLIED HYDROGEOLOGY**

[3 hours] Applications of hydrogeological monitoring, analyses and modeling using mathematics, statistics and computers. Subjects include: well field and pump test design, sampling strategies, data presentation and analysis and modeling fundamentals. Prerequisite: EEES 5410

### **EEES 6500 MULTIVARIABLE GEOSTATISTICS**

[3 hours] Application of multivariate statistical methods to scientific data. Emphasis is on applied correlation, regression, cluster, principal components, discriminant and geostatistical analyses. Prerequisite: EEES 6400 or permission of instructor

### **EEES 6540 STRUCTURE, DEFECTS AND DIFFUSION**

[4 hours] A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials and the mechanisms and kinetics of diffusion in the condensed state.

### **EEES 6550 THERMODYNAMICS AND PHASE TRANSFORMATIONS CONDENSED SYSTEMS**

[4 hours] A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics.

### **EEES 6600 FOUNDATIONS OF ECOLOGY**

[4 hours] An overview of the development of ecological concepts for beginning graduate students. Readings and discussion focus on classic papers and historical essays.

### **EEES 6610 CURRENT TOPICS IN ECOLOGY**

[4 hours] Discussions dealing with current problems in the biology of populations, communities and ecosystems.

### **EEES 6650 SYSTEMS ECOLOGY**

[4 hours] Theory and techniques of system analysis and mathematical modeling applied to ecological problems. Prerequisite: EEES 3050; MATH 1760

### **EEES 6660 BIOPHYSICAL PROCESSES OF ECOSYSTEMS**

[3 hours] This course is for graduate students who are interested in the biophysical environment, energy flows and microclimate. Emphasis will be placed on hands-on experience and discussion on current literature. Prerequisite: Permission of instructor

### **EEES 6800 DIGITAL FIELD MAPPING**

[3 hours] Technology and techniques for determining locations and elevations during field surveys; transferring field measurements to a digital database; total station, GPS and other tools used in ecological and geological research. Prerequisite: Permission of instructor

### **EEES 6810 WRITING FOR THE ENVIRONMENTAL SCIENCES**

[3 hours] This course will familiarize students with technical and persuasive aspects of scientific text preparation. Writing exercises will focus on basic manuscript formatting for journal submission and grant proposals.

### **EEES 6930 SEMINAR**

[1 hour] Individual presentation and discussion of papers in the environmental sciences.

### **EEES 6960 THESIS RESEARCH**

[1-15 hours] Research on a particular geologic problem leading to a written thesis which must be presented and defended before a faculty committee. Prerequisite: Permission of adviser

### **EEES 6980 SPECIAL TOPICS**

[1-4 hours] A graduate course covering some aspect of environmental sciences not covered in the formal graduate curriculum. Students may repeat the course for credit as topics vary.

### **EEES 6990 INDEPENDENT STUDY**

[1-4 hours] Student selects an approved subject for individual study and prepares a detailed report, or gives equivalent evidence of mastering of the selected subject. Taken only as S/U. Prerequisite: Permission of instructor

### **EEES 7150 ORGANIC EVOLUTION**

[3 hours] The modern theory of evolution presented within a framework of theoretical genetics and population biology. Prerequisite: EEES 2150 or BIOL 2150; CHEM 1210 or 1230

### **EEES 7300 ADVANCED FIELD BOTANY**

[3 hours] Principles of plant systematics stressing identification of local taxa; field trips.

### **EEES 7330 VERTEBRATE ECOLOGY AND SYSTEMATICS**

[4 hours] Ecology, systematics and conservation of the vertebrates, with special emphasis on forms native to North America. Prerequisite: Graduate standing

### **EEES 7730 ADVANCED AQUATIC ECOLOGY**

[3 hours] Advanced cross-disciplinary concepts in the ecology of aquatic environments emphasizing the biology of populations, communities and ecosystems. Includes a project on the application of principles and theory to help understand and solve a management problem in aquatic systems. Prerequisite: EEES 3050 or permission of instructor

### **EEES 7740 ADVANCED AQUATIC ECOLOGY LABORATORY**

[1 hour] Laboratory exercises on the biology of aquatic populations, communities and ecosystems. Corequisite: EEES 7730

### **EEES 7750 ADVANCED CONSERVATION BIOLOGY**

[4 hours] Advanced cross-disciplinary concepts in the application of principles and theory to the study and maintenance of biological diversity in temperate, subtropical and tropical systems. Lectures, classroom discussion and readings. Prerequisite: EEES 3050

### **EEES 7790 ECOLOGY FIELD TRIP**

[2-4 hours] Field trip to a major ecosystems of a region other than northwestern Ohio. Includes analysis of structural and functional relationships within and between ecosystem, with opportunities for individual student projects. Prerequisite: EEES 3050 or equivalent

### **EEES 8400 BIOSTATISTICS**

[4 hours] Application of statistical tools to sampling and measurement in biology and testing of hypotheses. Computer lab is included.

### **EEES 8600 FOUNDATIONS OF ECOLOGY**

[4 hours] An overview of the development of ecological concepts for beginning graduate students. Readings and discussion focus on classic papers and historical essays.

### **EEES 8610 CURRENT TOPICS IN ECOLOGY**

[4 hours] Discussions dealing with current problems in the biology of populations, communities and ecosystems.

### **EEES 8650 SYSTEMS ECOLOGY**

[4 hours] Theory and techniques of system analysis and mathematical modeling applied to ecological problems. Prerequisite: EEES 3050; MATH 1760

### **EEES 8660 BIOPHYSICAL PROCESSES OF ECOSYSTEMS**

[3 hours] This course is for graduate students who are interested in the biophysical environment, energy flows and microclimate. Emphasis will be placed on hands-on experience and discussion on current literature. Prerequisite: Permission of instructor

### **EEES 8800 DIGITAL FIELD MAPPING**

[3 hours] Technology and techniques for determining locations and elevations during field surveys; transferring field measurements to a digital database; total station, GPS and other tools used in ecological and geological research. Prerequisite: Permission of instructor

### **EEES 8810 WRITING FOR THE ENVIRONMENTAL SCIENCES**

[3 hours] This course will familiarize students with technical and persuasive aspects of scientific text preparation. Writing exercises will focus on basic manuscript formatting for journal submission and grant proposals.

### **EEES 8930 SEMINAR IN ECOLOGY**

[1 hour] Presentation on research or current literature by graduate doctoral students, faculty or guest speakers. Prerequisite: Permission of instructor, admission to doctoral program

### **EEES 8960 DOCTORAL DISSERTATION RESEARCH**

[1-15 hours] Research on a particular problem leading a written dissertation that must be presented and defended before a faculty committee. Prerequisite: Permission of instructor

### **EEES 8980 ADVANCED TOPICS IN ECOLOGY**

[2-4 hours] Course covering some aspect of ecology not covered in the formal graduate curriculum. Students may repeat the course for different topics. Prerequisite: Permission of instructor and admission to doctoral program

### **EEES 8990 ADVANCED READINGS IN ECOLOGY**

[2-4 hours] Faculty-directed readings or projects in a specific area of ecology. Students may repeat the course for different topics. Prerequisite: Permission of instructor and admission to doctoral program

## EET - Electrical Engineering Technology

### Department of Engineering Technology (ENG)

#### EET 1010 RESISTIVE CIRCUITS

[4 hours] This course constitutes an introduction to electrical components, direct current circuit analysis, circuit theorems and basic electrical measurements. An introduction to sinusoidal waveforms, complex numbers, phasors and Pspice is also included. Corequisite: MATH 1340

#### EET 1020 REACTIVE CIRCUITS

[4 hours] This course involves transient analysis of first order, reactive DC circuits and steady state analysis of reactive circuits under AC conditions. Frequency response, three-phase analysis, oscilloscope usage and PSpice simulation methods are included. Prerequisite: EET 1010

#### EET 1410 ELECTRICAL DRAFTING

[3 hours] Use of electrical and electronic symbols, familiarization with industry standards and codes and familiarization with different kinds of schematics and other electrical drawings. Course work performed on personal computers using CAD software. Corequisite: ENGT 1050

#### EET 2010 ELECTRONIC PRINCIPLES

[4 hours] Semiconductor devices and applications with emphasis on power supplies and amplifiers. AC/DC analysis of small-signal amplifiers using both bipolar junction and field effect transistors in various biasing configurations. Prerequisite: EET 1010 Corequisite: EET 1020

#### EET 2020 ELECTRONIC DEVICE APPLICATIONS

[4 hours] This course covers principles and applications of electronic circuits and devices such as oscillators, power supplies, thyristors regulators and op amps. Prerequisite: EET 2010 Corequisite: MATH 2450

#### EET 2210 DIGITAL LOGIC FUNDAMENTALS

[4 hours] This course covers the fundamentals of digital logic circuits. Topics include number systems, logic gates, Boolean algebra, logic simplification, Karnaugh maps, adders, multipliers, multiplexers and decoders. Elementary digital circuits including flip-flops, counters, shift registers, memory devices, programmable logic devices and integrated circuits are also covered. Prerequisite: EET 1010

#### EET 2230 ASSEMBLY LANGUAGE PROGRAMMING

[4 hours] The study of machine and assembly language programming and circuit and system applications. Microprocessor architecture and organization are also presented. Prerequisite: EET 2210

#### EET 2410 PROGRAMMABLE CONTROLLER FUNDAMENTALS

[4 hours] A study of programmable controllers emphasizing program development, logic development and troubleshooting. Emphasis on relays, timers, counters, integer math and scan-dependent programming. Factory floor control concepts are stressed. Prerequisite: EET 2210

#### EET 2420 ELECTRONIC PROTOTYPES

[2 hours] Provides an opportunity for the student to apply integrated knowledge gained through the program in developing and constructing a working prototype. Team work, professionalism and presentation skills are stressed. Prerequisite: EET 2020

#### EET 2980 SPECIAL TOPICS

[1-4 hours] Student performs work on a specialized project of an advanced nature under the supervision of an Electrical Engineering Technology faculty member.

#### EET 3150 UNIX, C AND THE INTERNET

[4 hours] In this course students learn how to program in the C++ language using UNIX Workstations in a networked environment. Topics include UNIX Concepts and commands, C++ syntax and structures and object-oriented programming. Programming assignments focus on engineering technology applications and CGI scripting. Prerequisite: EET 2230

#### EET 3250 NETWORK ANALYSIS

[4 hours] This course consists of analysis of electrical wave-forms and first order time domain circuits, transient analysis of reactive circuits using Laplace transforms, system transfer functions, Bode plots and the interpretations of Fourier series and transforms. Prerequisite: EET 1020, ENGT 3020

#### EET 3350 DIGITAL SYSTEMS DESIGN

[4 hours] This course covers the design, analysis and applications of digital systems involving sequential circuits. Special attention is given to the formal analysis and design procedures for synchronous sequential logic circuits and bistable memory devices. Design projects focus on top-down design methodology using CAD tools and the VHDL hardware description language. Prerequisite: EET 3150

#### EET 4150 ANALOG SYSTEMS DESIGN

[4 hours] This course emphasizes the design and analysis of transistor and integrated circuits using computer-aided engineering techniques. Prerequisite: EET 3250

#### EET 4250 MICROCOMPUTER ARCHITECTURE

[4 hours] This course covers microcomputer architecture and computer organizations. Topics include CPU interface design, system buses, interrupts, pipeline and parallel processing, computer arithmetic, input-output peripherals, memory management and multiprocessors. Data flow, hypercube and systolic architectures are also covered. Prerequisite: EET 3350

#### EET 4350 ELECTRIC POWER SYSTEMS

[4 hours] This course constitutes a study of AC-DC machines, including transformers, power transmission and the regulations governing them as specified by industry and the National Electrical Code. Prerequisite: EET 1020

#### EET 4450 AUTOMATIC CONTROL SYSTEMS

[4 hours] This course is an introduction to industrial controls, including the PID control of closed-loop servo and process systems, with emphasis placed on the electronic circuits of the closed-loop sub-systems. Prerequisite: EET 4150

#### EET 4550 PROGRAMMABLE CONTROLLER APPLICATIONS

[4 hours] Use of programmable controllers and computers in factory automation. Topics included are process control, supervisory software, PLC networking, PLC/CNC integration, device configuration, use of programming software and PLC languages standards. Prerequisite: EET 3250; ELET 2410

## EFSB - Entrepreneurship, Family & Small Business

### Department of Management (BUS)

#### EFSB 3590 ENTREPRENEURSHIP

[3 hours] A study of entrepreneurship and the process of getting a new venture started. The course will provide hands-on exposure to students interested in starting their own businesses. Prerequisite: Junior standing

#### EFSB 4010 DYNAMICS OF FAMILY BUSINESS

[3 hours] This course is designed for students interested in working in a family business or a professional service field in which the clientele includes family business. Prerequisite: Senior standing

#### EFSB 4940 INTERNSHIP IN ENTREPRENEURSHIP AND FAMILY BUSINESS

[3 hours] Receive practical entrepreneurship experience working in a family or small business. Prerequisite: Permission of instructor or program adviser

#### EFSB 4980 SPECIAL TOPICS IN ENTREPRENEURSHIP AND FAMILY BUSINESS

[3 hours] This course is designed to focus on current issues in entrepreneurship and family business. Prerequisite: Permission of chair or program adviser

#### EFSB 4990 INDEPENDENT STUDY

[1-3 hours] Individually supervised study in Entrepreneurship and Family Business. Student must submit a proposal to be approved by the Program Advisor or Chair prior to enrolling in the course. Prerequisite: Senior standing; permission of chair or program adviser

## EMBA - Executive MBA Program

### College of Business Administration (BUS)

#### EMBA 5500 ANALYTIC FOUNDATION FOR EXECUTIVES

[3 hours] This course provides managers with the analytical foundations in economics, computer skills and statistical methods. Internet exercises prior to class meetings provide the basis for continuous discussions of current economic events.

#### EMBA 6100 GLOBAL COMPETITIVE CHALLENGE

[3 hours] An overview of the competitive challenge faced by firms in today's global setting. Prerequisite: EMBA 5500

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### EMBA 6120 FOREIGN BUSINESS PRACTICES

[3 hours] This course develops the executive's appreciation, knowledge and understanding of different cultures and legal systems as they impact on operational management. Prerequisite: EMBA 5500

### EMBA 6140 ACCOUNTING AND FINANCIAL FOUNDATIONS FOR EXECUTIVES

[3 hours] Introduces the balance sheet, income statement, statement of retained earnings and statement of cash flows. Financial techniques, domestic and foreign markets are explored. Prerequisite: EMBA 5500

### EMBA 6200 PERSONAL STRATEGIC PLANNING AND ENTREPRENEURSHIP

[3 hours] Executives assess their personal values, clarifying their personal goals and develop a career strategy. Identifying market opportunities and developing new businesses for today's technological and global environment are explored. Prerequisite: EMBA 5500

### EMBA 6210 PROBLEM SOLVING AND INTERPERSONAL SKILLS

[3 hours] Introduces executives to the tools used in solving complex and controversial problems in culturally diverse and competitive organizations. The course emphasizes creative and communication skills in providing feedback, conflict resolution, negotiation and persuasion. Team activities are integrated into the entire creative problem-solving process. Prerequisite: EMBA 5500

### EMBA 6220 ACCOUNTING SYSTEMS FOR OPERATIONAL AND STRATEGIC MANAGEMENT

[3 hours] Emphasizes the preparation and use of financial statements, accounting for international transactions and tax consequences of U.S. and international operatives. Managerial accounting and control systems are examined. Focuses on the tax consequences of selected transactions of both U.S. and international operations. Prerequisite: EMBA 5500

### EMBA 6230 MARKET-DRIVEN ANALYSIS AND STRATEGY

[3 hours] This course focuses on what it means to be market-oriented and provides individuals with a basic understanding of the market-based management practices needed to create superior customer value. Prerequisite: EMBA 5500

### EMBA 6240 ENTREPRENEURIAL FINANCIAL MANAGEMENT

[3 hours] Studies the management of international financial activities, including financial planning and forecasting, capital budgeting and leasing, capital structure, working capital management, sources of funds, business valuation and risk management. Prerequisite: EMBA 5500

### EMBA 6250 LEADERSHIP AND PERFORMANCE MANAGEMENT

[3 hours] Executives learn to be visionary leaders by understanding how change, culture and strategy link to vision and mission. Also focuses on employee motivation, development and empowerment. Prerequisite: EMBA 5500

### EMBA 6290 STRATEGIC MANAGEMENT IN A GLOBAL ENVIRONMENT

[3 hours] The goal of the capstone course is for each executive to finish an integrated business plan creating value for his or her sponsoring firm. Strategic planning tools are studied. Prerequisite: EMBA 5500

### EMBA 6300 E-BUSINESS COMPETITIVE CHALLENGE

[3 hours] Strategic and technical challenges using the internet/intranet to take advantage of web-enabled business opportunities are examined. The internet's impact on industries and use in business strategy is reviewed. Prerequisite:

### EMBA 6310 MANAGING GLOBAL SUPPLY CHAINS

[3 hours] Examines how e-business models, information technology and globalization have changed supply chain design and management. Effective information management for decision making is explored. Prerequisite: EMBA 5500

### EMBA 6320 PRODUCT DEVELOPMENT

[3 hours] This course is designed to provide an understanding of how new products/services and e-business initiatives are developed and managed and explores the tools and skills needed to manage these processes. Prerequisite: EMBA 5500

### EMBA 6330 CUSTOMER RELATIONSHIP MANAGEMENT

[3 hours] Strategies for integrating the customer centered areas of business (Sales, Marketing and Customer Services) to identify, attract and retain the best customers are discussed. Investigates customer relationship management. Prerequisite: EMBA 5500

### EMBA 6470 GLOBAL/E-BUSINESS FIELD TRIP

[2 hours] Visit pace-setting firms with best practices in global business or e-business. The destination of the trip changes each year, may be international or domestic and takes 7-9 days. Prerequisite: EMBA 5500

## EMHS - Emergency Medical Health Services

### Department of Health Professions (HHS)

#### EMHS 1030 FIRST RESPONDER

[3 hours] This course is required by the State of Ohio for persons employed by police, fire, EMS, industrial and office personnel who as part of their normal duties respond for request for emergency first aid. Student must hold current certification in CPR/AHA Health prior to course completion.

#### EMHS 1040 PREHOSPITAL EMERGENCY LIFE SUPPORT

[6 hours] Topics covered include patient assessment, advanced airway management, bandaging/splinting. Adult, pediatric emergency medicine topics are covered. Successful completion leads to eligibility to sit for National Registry examination as EMT-B. Prerequisite: Meet Basic EMT-B Program admission requirements

### EMHS 2030 PARAMEDIC EMERGENCY MEDICINE I

[6 hours] Roles and responsibilities of the EMT-P, including history and patient assessment techniques. Pathophysiology of shock, cardiac, renal and respiratory emergencies. Prerequisite: EMHS 1040; EMT-B certification; admission to program Corequisite: EMHS 2040, 2050

### EMHS 2040 ADVANCED CLINICAL PRACTICUM I

[2 hours] Clinical experiences are offered in patient assessment, airway management and venipuncture. Emphasis is on advanced assessment, ECG interpretation and skills needed to stabilize and manage critically ill patients. Prerequisite: EMHS 1040; permission of instructor Corequisite: EMHS 2030, 2050

### EMHS 2050 PARAMEDIC SKILLS I

[3 hours] Presentation of intubation, intravenous skills, patient assessment skills, airway and ventilation management skills. Prerequisite: EMHS 1040 or equivalent Corequisite: EMHS 2030, 2040

### EMHS 2060 DISASTER PLANNING AND RESPONSE

[2 hours] A systems approach to multiple casualties incidents will be presented. Topics include planning, organization and control, triage principles and incident command procedures. Prerequisite: Permission of instructor

### EMHS 2070 ADVANCED SKILLS FOR PARAMEDICS

[3 hours] Advanced physician extender skills for the paramedic. Lecture and laboratory include advanced assessment, suturing, critical care techniques, 12-lead EKGs. The evolving role of paramedics in primary care will be discussed. Prerequisite: EMHS 1040; EMT-P Certification

### EMHS 2080 CURRENT TRENDS AND PRACTICES IN EMERGENCY MEDICINE

[1 hour] Integration of practice with current issues in EMS designed to blend field work with up-to-date knowledge base. Research project required. Prerequisite: Permission of instructor

### EMHS 2160 PARAMEDIC EMERGENCY MEDICINE II

[6 hours] Advanced techniques and knowledge required to manage trauma and pediatric patients is the major emphasis. Also discussed are obstetric and gynecological behavioral and environmental emergencies. Prerequisite: EMHS 2030, 2040, 2050 Corequisite: EMHS 2170, 2180

### EMHS 2170 ADVANCED CLINICAL PRACTICUM II

[2 hours] Clinical experiences emphasize the initial stabilization and management of the acutely ill and/or injured patient. A wide range of exposure to patients in hospital and in prehospital setting. Prerequisite: EMHS 2030, 2040, 2050 Corequisite: EMHS 2160, 2180

### EMHS 2180 PARAMEDIC SKILLS II

[3 hours] Presentation of trauma assessment and management skills. Including adult invasive airway procedures. Emergency childbirth skills presentation. Prerequisite: EMHS 2030, 2040, 2050 Corequisite: EMHS 2160, 2170



**EMHS 2190 PREHOSPITAL EXTERNSHIP**

[3 hours] Clinical experience is offered providing concentrated experience in the prehospital care of the acutely ill/injured patient. Vehicle-based experience. Includes preparation for national certification examinations. Prerequisite: EMHS 2160, 2170, 2180

**EMHS 2200 PARAMEDIC EMERGENCY MEDICINE III**

[2 hours] Integration of pathophysiological principles and assessment findings to formulate a field impression and implement treatment plan for neonatal, pediatric, geriatric patients and physically or mentally challenged, chronically ill patients. Prerequisite: EMHS 2160, 2170, 2180 Corequisite: EMHS 2190, 2210

**EMHS 2210 PARAMEDIC EMERGENCY SKILLS III**

[1 hour] Properly perform the various psychomotor skills utilized by paramedics. Evaluation of psychomotor skills. Preparation of students for the National Registry written and practical EMT-Paramedic examinations. Prerequisite: EMHS 2160, 2170, 2180 Corequisite: EMHS 2190, 2200

**EMHS 2990 INDEPENDENT STUDY**

[1-3 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

## ENGL - English Language & Literature

### Department of English Language & Literature (ARS)

**ENGL 1020 WRITING AND GRAMMAR FOR STUDENTS OF ENGLISH AS A SECOND LANGUAGE**

[3 hours] Course work focuses on the major grammatical patterns of academic writing in English as well as accuracy in the mechanics of academic writing. The primary emphasis is on these features in the context of the students' own written work. Eligibility by placement exam only. A maximum of 3 semester hours in ENGL 1020 and 1120 may be counted toward fulfilling the 124 hour requirement for graduation.

**ENGL 1100 COMPOSITION I WITH WORKSHOP**

[5 hours] Explanatory and persuasive writing in both personal and public genres; instruction and practice in generating, focusing, developing, researching and presenting ideas in ways consistent with one's subject, purposes and intended audiences. Placement through examination or portfolio evaluation. Students receiving a grade of C or better enroll in Composition II; those who receive No Credit enroll in Composition I. From Composition I with Workshop, Composition I and Composition II, no more than 6 hours apply toward graduation.

**ENGL 1110 COLLEGE COMPOSITION I**

[3 hours] Explanatory and persuasive writing in both personal and public genres; instruction and practice in generating, focusing, developing, researching and presenting ideas in ways consistent with one's subject, purposes and intended audience. Placement through examination or portfolio evaluation or through completion of ENGL 1100 with grade of NC. (ESL students must have completed ENGL 1020 with grade of Pass. Students of ESL may be required to take ENGL 1120 as a corequisite.) From Composition I with Workshop, Composition I and Composition II, no more than 6 hours apply

**ENGL 1120 COLLEGE COMPOSITION I LABORATORY FOR STUDENTS OF ENGLISH AS A SECOND LANGUAGE**

[2 hours] The corequisite of ENGL 1120 is an ESL section of 1110. Graded PS/NC. Writing laboratory using students' writings from ENGL 1110 as well as other supplementary materials. May be required based on placement exam or ENGL 1020 final exam score. (Note: A student required to take this course who does not receive a PS cannot receive a passing grade in an ENGL 1110 taken concurrently.) Eligibility by placement exam only. A maximum of 3 semester hours in ENGL 1020 and 1120 may be counted toward fulfilling the 124 hour requirement for graduation. Corequisite: ENGL 1110

**ENGL 1130 COLLEGE COMPOSITION II: ACADEMIC DISCIPLINES AND DISCOURSE**

[3 hours] Reading and analyzing the documents from multiple disciplines to synthesize results from different perspectives and produce disciplinarily appropriate writing. Web enhanced. Critical reading, research papers required. Prerequisite: ENGL 1100 or 1110 English core course

**ENGL 1140 COLLEGE COMPOSITION II: WRITING THE COMMUNITY**

[3 hours] Reading and analytical writing growing from the study of and participation in specific communities. Web enhanced. Critical reading, research papers required. Prerequisite: ENGL 1100 or 1110 English core course

**ENGL 1150 COLLEGE COMPOSITION II: LANGUAGE AND IDENTITY**

[3 hours] Reading and analyzing the ways languages construct identities through interactions of race, class, gender, sexual orientation, disability, age and religion. Web enhanced. Critical reading; research paper required. Prerequisite: ENGL 1100 or 1110 English core course U.S. multicultural course

**ENGL 1930 TECHNICAL WRITING FOR ENGINEERS**

[3 hours] Instruction and practice in writing technical reports and documents for the field of engineering. Students will compose on the computer. Prerequisite: MIME 1000; ENGL 1100 or 1110 English core course

**ENGL 2010 ADVANCED COMPOSITION**

[3 hours] Instruction and practice in writing expository and persuasive prose for a variety of audiences with particular attention to the effect of content and style upon readers. Prerequisite: College Comp II

**ENGL 2710 READING FICTION**

[3 hours] Exploration of various kinds of fiction with goals of literary appreciation and analytical insight. (not for major credit) Prerequisite: ENGL 1100 or 1110 Humanities core course

**ENGL 2720 READING DRAMA**

[3 hours] Exploration of various kinds of drama with goals of literary appreciation and analytical insight. (not for major credit) Prerequisite: ENGL 1100 or 1110 Humanities core course

**ENGL 2730 READING POETRY**

[3 hours] Exploration of various kinds of poetry with goals of literary appreciation and analytical insight. (not for major credit) Prerequisite: ENGL 1100 or 1110 Humanities core course

**ENGL 2740 BRITISH LITERATURE: READINGS AND ANALYSIS**

[3 hours] This course offers students an opportunity to study British literature in a lecture/discussion format. Lectures provide historical and critical background, while discussion sections provide in-depth study of individual works. Prerequisite: Composition I Corequisite: Composition II Humanities core course

**ENGL 2760 AMERICAN LITERATURE: READINGS AND ANALYSIS**

[3 hours] This course offers students an opportunity to study American literature in a lecture/discussion format. Lectures provide historical and critical background, while discussion sections provide in-depth study of individual works. Prerequisite: Composition I Corequisite: Composition II Humanities core course

**ENGL 2800 WRITING ABOUT LITERATURE**

[3 hours] A writing-intensive (WAC) course introducing the process of writing various types of papers and analyzing literary works. Special emphasis on discovering a topic and on revision and structure in expository writing. Prerequisite: ENGL 1100 or 1110 Humanities core course

**ENGL 2950 SCIENCE AND TECHNICAL REPORT WRITING**

[3 hours] Instruction and practice in writing informational and analytical reports to varied audiences in medical, scientific or technical fields. Prerequisite: ENGL 1100 or 1110 English core course

**ENGL 2960 ORGANIZATIONAL REPORT WRITING**

[3 hours] Instruction and practice in report writing within an organizational context. Emphasis on the analytical report based on research. Prerequisite: ENGL 1100 or 1110 English core course

**ENGL 2990 INDEPENDENT STUDY**

[2 hours] Supervised independent study in special topics.

**ENGL 3000 HUMAN LANGUAGE**

[3 hours] A non-technical overview of the nature of human language, including issues relating to spoken and written language, language change and language development, and other aspects of language use in a variety of contexts.

**ENGL 3010 CREATIVE WRITING**

[3 hours] A basic introduction to creative writing. Students write poems, stories or creative nonfiction which serve as the basis for classroom discussion and for conferences with instructor. Prerequisite: College Comp II

**ENGL 3050 PERSUASIVE WRITING**

[3 hours] Analysis of and practice in the techniques of persuasive writing. Emphasis varies from writing about legal issues to writing about issues of public controversy. Prerequisite: College Comp II

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### **ENGL 3060 SCREENWRITING**

[3 hours] This course involves practical analysis of screenplays, emphasizing story structure and characterization. Students plan, write and refine story lines before writing actual scripts.

### **ENGL 3080 THE ART AND PROCESS OF THE BOOK**

[3 hours] This course examines all aspects of the printed book - from scrolls to Gutenberg to contemporary publishing - as students work towards designing, printing and binding a finely printed edition. Prerequisite: Composition II

### **ENGL 3150 LINGUISTIC PRINCIPLES**

[3 hours] An introduction to modern linguistic theories about the nature and structure of language with emphasis on English.

### **ENGL 3250 THE DETECTIVE STORY**

[3 hours] A survey of the genre, giving special attention to differences in the British and American versions of the genre. Includes Poe, Doyle, Christie, Sayers, Hammett and Chandler. Recommended: ENGL 2700, 2710, or 2800.

### **ENGL 3260 CONTEMPORARY FICTION**

[3 hours] A study, primarily for non-majors, of recent trends in American, British and Continental fiction. Recommended: ENGL 2710, 2800, or 3790.

### **ENGL 3280 CONTEMPORARY POETRY**

[3 hours] A study of recent trends in contemporary poetry. Recommended: ENGL 2730, 2800, or 3790.

### **ENGL 3360 MAJOR BRITISH AND AMERICAN POETS**

[3 hours] A course designed to enhance the student's appreciation and understanding of the art of poetry. Primarily for non-majors. Recommended: ENGL 2730, 2800 or 3790.

### **ENGL 3600 AMERICAN LITERARY MASTERPIECES**

[3 hours] A study, primarily for non-majors, of selected American literary works such as "The Scarlet Letter," "Walden," "Leaves of Grass," "The American," "The Great Gatsby" and "The Bear." Recommended: ENGL 2710 or 2800.

### **ENGL 3650 SCIENCE FICTION AND FANTASY LITERATURE**

[3 hours] This course examines literary works of science fiction and fantasy, and related scholarship, from a variety of perspectives. Readings are selected from prominent writers in both genres. Prerequisite: Any Composition II course

### **ENGL 3710 LITERATURE OF THE OLD TESTAMENT**

[3 hours] A study of the Old Testament from the literary point of view, including ancient poetry, history, romance, short story, hymn, prophecy and wisdom writing. Recommended: ENGL 2800.

### **ENGL 3720 LITERATURE AND MYTHOLOGY**

[3 hours] Study of classical and biblical mythologies in modern Western literature, private mythologies and literary adaptations of patterns from legend and folklore. Recommended: ENGL 2800.

### **ENGL 3730 FOLKLORE**

[3 hours] A survey of the field of folklore with an emphasis on folk narrative, folk music and material culture in America. Recommended: Consent of instructor and/or Composition II. U.S. multicultural course

### **ENGL 3740 FOLKLORE AND LITERATURE**

[3 hours] A study in the relationship of oral and written literature. Focus is on the literary uses of folk forms and use of tradition by specific writers and schools. Recommended: ENGL 3730.

### **ENGL 3750 WOMEN AND LITERATURE**

[3 hours] Offered as Writing Across the Curriculum (WAC) course. Examines literary works in light of major issues raised by feminist criticism. Specific emphasis varies. Recommended: ENGL 2800 or 3790. U.S. multicultural course

### **ENGL 3760 EUROPEAN LITERATURE TO THE RENAISSANCE**

[3 hours] The literary European heritage from its Biblical and Classical origins to the 16th century (in English translation). Includes such writers as Homer, Virgil and Dante. Recommended: ENGL 2800 or 3790.

### **ENGL 3770 WORLD LITERATURE AND CULTURES**

[3 hours] This course examines texts and cultures from around the world (and in particular the non-western world). The genres examined include autobiography, poetry, short fiction, novels, plays and histories. Prerequisite: Composition II Non-western multicultural course

### **ENGL 3780 MODERN EUROPEAN LITERATURE**

[3 hours] Continental European literature from the 17th to the early 19th century. (In English translation.) Includes such writers as Dostoyevsky, Baudelaire and Rilke. Recommended: ENGL 2800, or 3790.

### **ENGL 3790 CRITICAL APPROACHES TO LITERATURE**

[4 hours] Writing Across the Curriculum Course. An introduction to critical methods based on the study of poetry and long fiction; some consideration of historical forms in those genres. Extensive writing of short critiques and explications. Recommended: Composition II or equivalent. Humanities core course

### **ENGL 3800 VISUAL LANGUAGE**

[3 hours] Writing Across the Curriculum course. Lecture/studio, utilizes Toledo Museum of Art collection. Origins of writing, letterforms, artist's books, medieval manuscripts, collaborations, journals, sketchbooks, writing about visual art, concrete poetry.

### **ENGL 3810 SHAKESPEARE I**

[3 hours] A careful examination of several of Shakespeare's plays and a rapid reading of others. Recommended: ENGL 2720, 2800 or 3790.

### **ENGL 3980 STUDIES IN ENGLISH OR AMERICAN LITERATURE**

[3 hours] Group study of a period, genre, author or special literary topic. May be repeated with change of specialty number. Topics will be announced in the semester schedule of courses. Recommended: ENGL 2800 or 3790.

### **ENGL 4030 WRITING WORKSHOP IN NONFICTIONAL PROSE**

[3 hours] Directed study of nonfiction genres, rhetorical forms and elements of style; extensive practice in the writing and critical evaluation of prose. Prerequisite: ENGL 2010, 3010, or consent

### **ENGL 4060 SCREENWRITING II**

[3 hours] For students familiar with the fundamentals of screenplays, this course devotes attention to writing a complete script. Students are expected to come to the class with a planned story line. Prerequisite: ENGL 3060 or FILM 3350

### **ENGL 4070 WRITING WORKSHOP IN POETRY**

[3 hours] An advanced workshop in writing poetry emphasizing a wider range of readings, craft and technique. Prerequisite: ENGL 3010 or consent

### **ENGL 4080 WRITING WORKSHOP IN FICTION**

[3 hours] An advanced workshop emphasizing a wider range of readings, craft and technique. May be repeated once for credit. Prerequisite: ENGL 3010 or consent

### **ENGL 4090 CURRENT WRITING THEORY**

[3 hours] A study of current theory and research connecting reading, critical thinking and writing with applications of theory to students' writing practice. Prerequisite: College Comp II, ENGL 3790

### **ENGL 4100 THE HISTORY OF ENGLISH**

[3 hours] Description of the changes that have taken place in the English language from the earliest days to the present. Prerequisite: ENGL or LING 3150

### **ENGL 4110 OLD ENGLISH**

[3 hours] A study of phonology, morphology and syntax with representative readings in verse and prose. Prerequisite: Consent of instructor

### **ENGL 4120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose. Prerequisite: Consent of instructor

### **ENGL 4130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: ENGL or LING 3150

### **ENGL 4140 LANGUAGE IN THE AFRICAN AMERICAN COMMUNITY**

[3 hours] Focuses on the distinctive elements of African American Vernacular English, its historical origins, its sociocultural development, and its implications for pedagogy and language policy. U.S. multicultural course

### **ENGL 4150 APPLIED LINGUISTICS RESEARCH AND THEORY I**

[3 hours] Focus on the methods of applied linguistics in the broad sense, including their use in studies of first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas. Prerequisite: ENGL or LING 3150 or permission of instructor

### **ENGL 4170 APPLIED LINGUISTICS RESEARCH AND THEORY II**

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: ENGL or LING 4150

**ENGL 4190 ENGLISH STRUCTURE AND LANGUAGE TEACHING**

[3 hours] Description of major elements of English structure and applications to language acquisition. Prerequisite: ENGL or LING 3150

**ENGL 4200 BRITISH FICTION: 18TH CENTURY**

[3 hours] The development and achievement of British fiction in the 18th Century, including Defoe, Richardson, Fielding, Smollett and Sterne. Recommended: ENGL 2710, 2800, or 3790.

**ENGL 4220 BRITISH FICTION: EARLY 19TH CENTURY**

[3 hours] The development and achievement of British fiction from Romanticism to the mid-19th Century, including Austen, Scott, early Dickens and Thackeray. Recommended: ENGL 2710, 2800, or 3790.

**ENGL 4230 BRITISH FICTION: LATER 19TH CENTURY**

[3 hours] The development and achievement of British fiction in the later 19th century, including the later Dickens, Bronte, Eliot, Hardy and Trollope. Recommended: ENGL 2710, 2800, or 3790.

**ENGL 4240 BRITISH FICTION: 20TH CENTURY**

[3 hours] A study of the major trends in 20th century British fiction with particular emphasis on changes in technique and approach. Includes Woolf, Joyce, Lawrence and Conrad. Recommended: ENGL 2710, 2800, or 3790.

**ENGL 4280 AMERICAN FICTION: 20TH CENTURY**

[3 hours] Major developments in content and form of the 20th-century American short story and novel. Writers studied include Hemingway, Faulkner, Fitzgerald and Steinbeck. Recommended: ENGL 2710, 2800 or 3790.

**ENGL 4310 BRITISH DRAMA TO 1642**

[3 hours] A study of the drama in England to the closing of the theaters, excluding Shakespeare but including Marlowe, Jonson and Webster. Recommended: ENGL 2710, 2800, or 3790.

**ENGL 4340 MODERN DRAMA**

[3 hours] A study of Western Drama from the 1870's to the 1930's. Special emphasis on Ibsen, Strindberg, Chekhov, Brecht, O'Neill, Beckett, Pinter and Shepard. Recommended: ENGL 2710, 2720, 2800, or 3790.

**ENGL 4400 EARLY ENGLISH LITERATURE**

[3 hours] Reading of Beowulf, Sir Gawain and the Green Knight, Pearl, Morte d'Arthur and other representative works in translation. Recommended: ENGL 2800, or 3790.

**ENGL 4420 BRITISH LITERATURE: RENAISSANCE**

[3 hours] Poetry and prose of the English Renaissance. Authors may include Spenser, Sidney, Shakespeare (nondramatic works), More, Raleigh, Queen Elizabeth I and others. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4440 EARLY 17TH CENTURY ENGLISH LITERATURE**

[3 hours] Poetry and prose from 1603 to 1660 and beyond, including such authors as Milton, Donne, Jonson, Herrick, Herbert, Bacon, Cary, Lanyer, Marvell and others. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4460 BRITISH LITERATURE: RESTORATION AND 18TH CENTURY**

[3 hours] Drama, poetry, and essays of the Restoration, neo-classical and pre-Romantic periods. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4500 BRITISH LITERATURE: THE ROMANTIC PERIOD**

[3 hours] Study of major authors and genres of the Romantic period: approximately 1789 to 1837.

**ENGL 4520 BRITISH LITERATURE: THE VICTORIAN PERIOD**

[3 hours] Study of major authors, genres and ideas of the Victorian period: approximately 1837 to 1901.

**ENGL 4540 BRITISH LITERATURE: THE 20TH CENTURY**

[3 hours] Twentieth century British poetry and criticism with particular attention to the works of Hardy, Woolf, Yeats, Lawrence, Auden and Thomas. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4600 EARLY AMERICAN LITERATURE**

[3 hours] The poetry and theology of the New England Puritans, especially Bradstreet and Taylor, the literature of the American Enlightenment, the beginnings of American Romanticism in Bryant and Cooper. Recommended: ENGL 2800, or 3790.

**ENGL 4620 AMERICAN ROMANTICISM**

[3 hours] This course focuses on the literature of the United States from the early nineteenth century through about 1865, with concentration on the literary production between 1840 and 1865. Recommended: ENGL 2800, or 3790.

**ENGL 4630 AMERICAN LITERARY REALISM**

[3 hours] American literature from the post-Civil War period to the early 20th Century, particularly the fiction of Twain, James, Howells and Stephen Crane; some attention to humor, "naturalism" (in Kate Chopin or Dreiser) and poetry. Recommended: ENGL 2710, 2800 or 3790.

**ENGL 4640 EARLY 20TH CENTURY AMERICAN POETRY**

[3 hours] Significant developments in American poetry 1900-50 from the perspective of other literary and intellectual movements; includes, among others, such major writers as Frost, Pound, Eliot, Stevens, H. Crane and Williams. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4650 AFRICAN AMERICAN WRITERS BEFORE THE 20TH CENTURY**

[3 hours] A survey of African-American prose, poetry, drama and fiction from 1760 to 1915. Recommended: ENGL 2800, or 3790. U.S. multicultural course

**ENGL 4660 AFRICAN AMERICAN LITERATURE IN THE 20TH CENTURY**

[3 hours] Study of the literary achievement of major African-American writers beginning with DuBois and ending with Gwendolyn Brooks and Ed Bullins. Recommended: ENGL 2800, or 3790. U.S. multicultural course

**ENGL 4680 AMERICAN LITERATURE SINCE WORLD WAR II**

[3 hours] The postwar literary sensibility in poetry and fiction; the influence of existentialism and naturalism; includes such writers as Albee, Barthelme, Bellow, Lowell, Plath and Updike. Recommended: ENGL 2800, or 3790.

**ENGL 4690 NATIVE AMERICAN LITERATURE AND CULTURE**

[3 hours] Native American literature interrogates a selection of texts by and about Native Americans, including the oral traditions of storytelling and mythology. Prerequisite: Composition II- one of ENGL 2800 or 3790 U.S. multicultural course

**ENGL 4730 WORLD CINEMAS AND CULTURES**

[3 hours] World Cinema focuses on the question of representation across cultures in terms of the relations between film, its subjects and the camera. Prerequisite: Composition II-one of ENGL 2800 or 3790 Non-western multicultural course

**ENGL 4750 THE FOLK BALLAD AND BLUES**

[3 hours] Historical development of folk narrative in the form of ballads from England and America. Development of the Blues as an American form of folk lyric.

**ENGL 4780 PRINCIPLES OF LITERARY CRITICISM**

[3 hours] A comparative study of the principles of literary criticism, including readings from representative critics of all ages, and of basic aesthetic theories underlying the major approaches to literature. Recommended: ENGL 2800, or 3790

**ENGL 4800 CHAUCER**

[3 hours] A study of Chaucer's major poetry with emphasis on the Canterbury Tales. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4810 SHAKESPEARE II**

[3 hours] A study of Shakespeare's plays with emphasis on his development as a dramatist. Recommended: ENGL 3810.

**ENGL 4820 MILTON**

[3 hours] A study of the poetry and selected prose of Milton. Recommended: ENGL 2730, 2800, or 3790.

**ENGL 4850 STUDIES IN THE WORK OF A BRITISH AUTHOR**

[3 hours] Author changes with each offering. Consult Time Schedules for authors to be studied. Recommended: ENGL 2800, 3790.

**ENGL 4860 STUDIES IN THE WORK OF AN AMERICAN AUTHOR**

[3 hours] Author changes with each offering. Consult Time Schedules for authors to be studied. Recommended: ENGL 2800, or 3790.

**ENGL 4870 CAPSTONE COURSE FOR COLLEGE OF EDUCATION ENGLISH MAJORS**

[3 hours] Literary seminar/writing workshop in which students formulate critical judgments, polish, and synthesize knowledge and skills gathered in the course of the major.

**ENGL 4880 SENIOR SEMINAR IN LITERATURE (CAPSTONE)**

[3 hours] Focused study of a significant literary theme, topic, or group of writings. Course work normally includes concentrated reading, discussion and a substantial writing project.

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### **ENGL 4890 CAPSTONE: SENIOR SEMINAR IN WRITING**

[4 hours] Focusing on a single topic which varies term-by-term, this capstone course offers students the opportunity to demonstrate the ability to write in a variety of genres, e.g. personal essay, poem, documented paper, reportage. Prerequisite: ENGL 3010, or permission of instructor

### **ENGL 4900 ENGLISH HONORS SEMINAR**

[2 hours] The Honors Seminar is taken in conjunction with the Honors Thesis (English 4960). Required of all candidates for departmental honors. Prerequisite: Approval of the Honors Committee

### **ENGL 4940 INTERNSHIP IN ENGLISH**

[1-4 hours] Internship with an approved program, company or agency employing research, writing editing or linguistics expertise. Student must submit proposal for approval by advisory and a departmental committee. (Repeatable for a maximum of 4 hours credit.) Prerequisite: Junior or senior standing, 2.5 minimum GPA, major or minor in English or Linguistics, approval of instructor

### **ENGL 4950 SPECIAL TOPICS FOR WRITERS**

[3 hours] An advanced course in genre writing. Content varies with each offering. May be repeated once for credit. Prerequisite: College Comp II

### **ENGL 4960 ENGLISH HONORS THESIS**

[1-4 hours] Research and writing of a thesis on a topic in English or linguistics required of all candidates for departmental honors. Prerequisite: Approval of the Honors Committee

### **ENGL 4980 SPECIAL TOPICS IN LITERATURE**

[3 hours] An undergraduate course on a special topic. Consult Time Schedules for topic to be studied and semester offered. Recommended: ENGL 2800, or 3790.

### **ENGL 4990 INDEPENDENT STUDY**

[1-3 hours] Supervised independent study in special topics of British and American language and literature. Courses may be repeated more than once for credit.

### **ENGL 5010 WRITER'S WORKSHOP**

[3 hours] Students present their poetry and/or creative prose for peer critique and discussion. Readings in primary texts. Portfolio.

### **ENGL 5020 ACADEMIC WRITING FOR ESL STUDENTS**

[3 hours] For graduate students who speak English as a second language (ESL). Students will plan, draft, revise and edit several academic writing tasks. Not for major credit.

### **ENGL 5050 COMPARATIVE STUDY OF LITERATURE**

[3 hours] An introduction to the methods, history and practice of Comparative Literature, with special attention to the areas of this discipline useful to the student specializing in the study of English or American literature.

### **ENGL 5090 CURRENT WRITING THEORY**

[3 hours] An intensive study of current theories and research connecting reading, critical thinking and writing with applications of theory to students' literate practices and research.

### **ENGL 5100 HISTORY OF THE ENGLISH LANGUAGE**

[3 hours] Study of the origins and development of the English language. Prerequisite: ENGL or LING 3150/5150/7150, 4110/5110/7110, 4120/5120/7120, or permission

### **ENGL 5110 OLD ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.

### **ENGL 5120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose.

### **ENGL 5130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: ENGL or LING 5150/7150

### **ENGL 5150 LINGUISTIC PRINCIPLES**

[3 hours] Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.

### **ENGL 5190 ENGLISH STRUCTURE AND LANGUAGE TEACHING**

[3 hours] Description of major elements of English structure and applications to language acquisition. Prerequisite: ENGL or LING 3150/5150/7150

### **ENGL 5200 BRITISH FICTION: 18TH CENTURY**

[3 hours] A course in 18th Century fiction with emphasis on the novels of Defoe, Richardson, Fielding, Smollett, and Sterne and their relation to historical background and literary theory.

### **ENGL 5220 BRITISH FICTION: EARLY 19TH CENTURY**

[3 hours] Major developments in British fiction beginning with Scott and concluding with novels of the 1840's; particular attention to the works of one author.

### **ENGL 5230 BRITISH FICTION: LATER 19TH CENTURY**

[3 hours] Critical study of 19th Century British fiction, particular attention to the works of one author.

### **ENGL 5240 BRITISH FICTION: 20TH CENTURY**

[3 hours] Major developments in British fiction from Conrad to the present, with particular emphasis on changes in technique and approach.

### **ENGL 5280 AMERICAN FICTION: 20TH CENTURY**

[3 hours] A study of the chief developments in content and form of the American short story and novel since World War I, partly through intensive analysis of works by selected major writers.

### **ENGL 5310 BRITISH DRAMA: 1580-1642**

[3 hours] A study of early British drama exclusive of Shakespeare, with particular attention to Elizabethan drama and its background.

### **ENGL 5340 MODERN DRAMA**

[3 hours] A study of Western Drama from the 1870's to the 1980's, concentrating on Ibsen, Strindberg, Chekhov, Brecht, O'Neill, Williams, Pinter, Shepard and other dramatists, with special attention to modern theories of theater and performance.

### **ENGL 5410 OLD AND MIDDLE ENGLISH LITERATURE**

[3 hours] Study of Old and Middle English Literature, using translations where necessary, with emphasis on major works and genres, cultural, philosophical, and historical contexts and backgrounds.

### **ENGL 5420 ENGLISH RENAISSANCE**

[3 hours] Poetry and prose of the English Renaissance, including the sonnet tradition; "Spenser's Fairie Queene"; Shakespeare's longer poems; the prose of Raleigh, Hoby, Ascham, and Elyot; "Defense of Poesy"; More's "Utopia."

### **ENGL 5440 EARLY 17TH CENTURY ENGLISH LITERATURE**

[3 hours] Early and mid-17th Century non-dramatic texts. Including such authors as Milton, Donne, Jonson, Herrick, Herbert, Marvell, Bacon and Browne. Non-canonical writing by women and figures of historical as well as literary importance.

### **ENGL 5460 RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Drama, poetry, and prose of the Restoration, Neo-classical and pre-Romantic periods, focusing on literary strategies and themes, political and cultural contexts.

### **ENGL 5500 BRITISH LITERATURE: THE ROMANTIC PERIOD**

[3 hours] Study of major authors and genres of the Romantic period: approximately 1789 to 1837.

### **ENGL 5520 BRITISH LITERATURE: THE VICTORIAN PERIOD**

[3 hours] Study of major authors, genres and ideas of the Victorian period: approximately 1837 to 1901.

### **ENGL 5540 20TH CENTURY BRITISH LITERATURE**

[3 hours] British poetry of the early 20th century, including the works of such poets as Hopkins, Housman, Hardy, Yeats, Owen, Lawrence, Auden and Thomas, and the research and criticism relevant to them.

### **ENGL 5600 EARLY AMERICAN LITERATURE**

[3 hours] The poetry and prose writings of the New England Puritans and the American Enlightenment with emphasis on Bradford, Bradstreet, Taylor, Franklin, Jefferson, Paine and Wheatley.

### **ENGL 5620 AMERICAN LITERARY ROMANTICISM**

[3 hours] American literature from 1798 to 1865, from the beginnings of Romanticism in Bryant and Cooper through the Transcendental movement, with emphasis on Hawthorne, Melville, Stowe and Douglass.

### **ENGL 5630 AMERICAN LITERARY REALISM**

[3 hours] American literature from the post-Civil War period to the early 20th century: some emphasis on naturalism and humor; such writers as Twain, James, Howells, Dreiser and Wharton.

**ENGL 5640 EARLY 20TH CENTURY AMERICAN LITERATURE**

[3 hours] Study of American literature from 1900 to World War II, focusing on literary modernism and its social, political and philosophical contexts.

**ENGL 5650 AFRICAN AMERICAN WRITING BEFORE THE 20TH CENTURY**

[3 hours] Study of African American prose, poetry, drama and fiction from 1760 to 1915.

**ENGL 5660 AFRICAN AMERICAN WRITING IN THE 20TH CENTURY**

[3 hours] A literary, historical and social consideration of the achievement of black American writers since 1915.

**ENGL 5680 AMERICAN LITERATURE SINCE WORLD WAR II**

[3 hours] Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor's option.

**ENGL 5690 NATIVE AMERICAN LITERATURE AND CULTURE**

[3 hours] Native American literature interrogates a selection of texts by and about Native Americans, including the oral traditions of storytelling and mythology. Prerequisite: Composition II- one of ENGL 2700-2800 or 3790

**ENGL 5730 WORLD CINEMAS AND CULTURES**

[3 hours] World Cinema focuses on the question of representation across cultures in terms of the relations between film, its subjects and the camera. Prerequisite: Composition II-one of ENGL 2700-2800 or 3790

**ENGL 5750 HISTORY OF LITERARY CRITICISM**

[3 hours] A chronological examination of literary criticism, analyzing the variety of claims and practices which contribute to the current frameworks used to interpret and analyze literary texts.

**ENGL 5770 FOLK POETRY: BALLAD AND BLUES**

[3 hours] The focus is first the British and American folk and broadside ballad and then the downhome and urban blues.

**ENGL 5780 CONTEMPORARY LITERARY THEORIES AND CRITICISM**

[3 hours] An intensive examination of contemporary literary theories and criticism, focusing on selected issues and on representative theorists and critics.

**ENGL 5790 APPROACHES TO RESEARCH IN ENGLISH**

[3 hours] An introduction to the discipline(s) of English, the methods and resources of scholarship in the field.

**ENGL 5800 CHAUCER**

[3 hours] An examination of selected works in the light of important theories about medieval literature.

**ENGL 5810 SHAKESPEARE**

[3 hours] A study of Shakespeare's plays with emphasis on his development as a dramatist and with readings in major Shakespearean criticism.

**ENGL 5820 MILTON**

[3 hours] A study of the poetry and selected prose. Particular attention is given to biography and criticism.

**ENGL 5850 STUDIES IN THE WORK OF A BRITISH AUTHOR**

[3 hours] Author changes with each offering. Consult schedule of courses for authors to be studied.

**ENGL 5860 STUDIES IN THE WORK OF AN AMERICAN AUTHOR**

[3 hours] Author changes with each offering. Consult schedule of courses for authors to be studied.

**ENGL 5950 TOPICS IN COMPARATIVE AND GENERAL LITERATURE**

[3 hours] A seminar in which special problems, specific authors, the foreign relations of English literature, and other subjects can be considered from a comparative perspective. Prerequisite: Reading knowledge of an appropriate foreign language

**ENGL 5980 SPECIAL TOPICS**

[3 hours] Consideration of a special topic in literature and language.

**ENGL 6010 SEMINAR IN ENGLISH INSTRUCTION: COMPOSITION**

[3 hours] For prospective college instructors of composition. Includes supervised teaching of composition. Graded S/U only.

**ENGL 6060 SEMINAR IN ENGLISH INSTRUCTION: ENGLISH AS A SECOND LANGUAGE**

[4 hours] Seminar and extensive supervised practice teaching/observation for prospective teachers of English as a Second Language. Graded S/U only. Prerequisite: ENGL or LING 6150/8150, ENGL 5190/7190

**ENGL 6150 APPLIED LINGUISTICS I**

[3 hours] Focus on the methods of "applied linguistics" in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas.

**ENGL 6160 APPLIED LINGUISTICS LAB**

[1 hour] Computer lab for Applied Linguistics Research and Theory I. Corequisite: ENGL or LING 6150/8150.

**ENGL 6170 APPLIED LINGUISTICS RESEARCH AND THEORY II**

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: ENGL or LING 6150/8150.

**ENGL 6180 METHODS IN COMPOSITION RESEARCH, COURSE DESIGN AND ASSESSMENT**

[3 hours] Students will learn to use rhetorical analysis, discourse analysis and ethnographic research methodologies to write a substantial research proposal, and to design a course and write criteria for assessment of student writing accomplished in such a course. Prerequisite: ENGL 4090 or 5090

**ENGL 6410 SEMINAR: STUDIES IN EARLY ENGLISH LITERATURE**

[3 hours] Seminar on a specialized topic in Old and/or Middle English literature.

**ENGL 6420 SEMINAR: STUDIES IN ENGLISH RENAISSANCE LITERATURE**

[3 hours] Seminar on a specialized topic in English Renaissance literature.

**ENGL 6440 SEMINAR: STUDIES IN RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in early 17th century English literature.

**ENGL 6460 SEMINAR: STUDIES IN RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in Restoration and 18th century British literature.

**ENGL 6500 SEMINAR: STUDIES IN BRITISH ROMANTIC LITERATURE**

[3 hours] Seminar on a specialized topic in British Romantic literature.

**ENGL 6520 SEMINAR: STUDIES IN VICTORIAN LITERATURE**

[3 hours] Seminar on a specialized topic in Victorian literature.

**ENGL 6540 SEMINAR: STUDIES IN 20TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in 20th century British literature.

**ENGL 6600 SEMINAR: STUDIES IN EARLY AMERICAN LITERATURE**

[3 hours] Seminar on a specialized topic in early American literature.

**ENGL 6620 SEMINAR: STUDIES IN AMERICAN LITERARY ROMANTICISM**

[3 hours] Seminar on a specialized topic in American literary Romanticism.

**ENGL 6630 SEMINAR: STUDIES IN AMERICAN LITERARY REALISM**

[3 hours] Seminar on a specialized topic in American literary realism.

**ENGL 6640 SEMINAR: STUDIES IN 20TH CENTURY AMERICAN LITERATURE**

[3 hours] Seminar on a specialized topic in 20th century American literature.

**ENGL 6890 CERTIFICATE CAPSTONE**

[3 hours] This course completes the certificate program. Students will fulfill research on writing piloted in ENGL 6180, culminating in a research essay that will be submitted for publication to an appropriate scholarly journal. Prerequisite: ENGL 5090, 5780, 6010, 6180

**ENGL 6960 MASTER'S RESEARCH**

[1-3 hours] Research on, and writing of the master's paper or thesis.

**ENGL 6980 SEMINAR: LITERARY TYPES AND SPECIAL TOPICS**

[3 hours] Seminar on a specialized topic in English studies.

**ENGL 6990 INDEPENDENT STUDY**

[1-3 hours] By permission of department; may be repeated for additional credit.

**ENGL 7010 WRITER'S WORKSHOP**

[3 hours] Students present their poetry and/or creative prose for peer critique and discussion. Readings in primary texts. Portfolio.

## 386 Course Descriptions

### **ENGL 7020 ACADEMIC WRITING FOR ESL STUDENTS**

[3 hours] For graduate students who speak English as a second language (ESL). Students will plan, draft, revise and edit several academic writing tasks. Not for major credit.

### **ENGL 7050 COMPARATIVE STUDY OF LITERATURE**

[3 hours] An introduction to the methods, history and practice of Comparative Literature, with special attention to the areas of this discipline useful to the student specializing in the study of English or American literature.

### **ENGL 7090 CURRENT WRITING THEORY**

[3 hours] An intensive study of current theories and research connecting reading, critical thinking and writing with applications of theory to students' literate practices and research.

### **ENGL 7100 HISTORY OF THE ENGLISH LANGUAGE**

[3 hours] Study of the origins and development of the English language. Prerequisite: ENGL or LING 3150/5150/7150, 4110/5110/7110, 4120/5120/7120, or consent.

### **ENGL 7110 OLD ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.

### **ENGL 7120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose.

### **ENGL 7130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: ENGL or LING 5150/7150

### **ENGL 7150 LINGUISTIC PRINCIPLES**

[3 hours] Intensive study of modern linguistic theories about the nature and structure of language, with emphasis on English.

### **ENGL 7190 ENGLISH STRUCTURE AND LANGUAGE TEACHING**

[3 hours] Description of major elements of English structure and applications to language acquisition. Prerequisite: ENGL or LING 3150/5150/7150

### **ENGL 7200 BRITISH FICTION: 18TH CENTURY**

[3 hours] A course in 18th Century fiction with emphasis on the novels of Defoe, Richardson, Fielding, Smollett, and Sterne and their relation to historical background and literary theory.

### **ENGL 7220 BRITISH FICTION: EARLY 19TH CENTURY**

[3 hours] Major developments in British fiction beginning with Scott and concluding with novels of the 1840's; particular attention to the works of one author.

### **ENGL 7230 BRITISH FICTION: LATER 19TH CENTURY**

[3 hours] Critical study of 19th Century British fiction, particular attention to the works of one author.

### **ENGL 7240 BRITISH FICTION: 20TH CENTURY**

[3 hours] Major developments in British fiction from Conrad to the present, with particular emphasis on changes in technique and approach.

### **ENGL 7280 AMERICAN FICTION: 20TH CENTURY**

[3 hours] A study of the chief developments in content and form of the American short story and novel since World War I, partly through intensive analysis of works by selected major writers.

### **ENGL 7310 BRITISH DRAMA: 1580-1642**

[3 hours] A study of early British drama exclusive of Shakespeare, with particular attention to Elizabethan drama and its background.

### **ENGL 7340 MODERN DRAMA**

[3 hours] A study of Western Drama from the 1870's to the 1980's, concentrating on Ibsen, Strindberg, Chekhov, Brecht, O'Neill, Williams, Pinter, Shepard and other dramatists, with special attention to modern theories of theater and performance.

### **ENGL 7410 OLD AND MIDDLE ENGLISH LITERATURE**

[3 hours] Study of Old and Middle English Literature, using translations where necessary, with emphasis on major works and genres, cultural, philosophical, and historical contexts and backgrounds.

### **ENGL 7420 ENGLISH RENAISSANCE**

[3 hours] Poetry and prose of the English Renaissance, including the sonnet tradition; "Spenser's Fairie Queene"; Shakespeare's longer poems; the prose of Raleigh, Hoby, Ascham, and Elyot; "Defense of Poesy"; More's "Utopia."

### **ENGL 7440 EARLY 17TH CENTURY ENGLISH LITERATURE**

[3 hours] Early and mid-17th Century non-dramatic texts. Including such authors as Milton, Donne, Jonson, Herrick, Herbert, Marvell, Bacon and Browne. Non-canonical writing by women and figures of historical as well as literary

### **ENGL 7460 RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Drama, poetry, and prose of the Restoration, Neo-classical and pre-Romantic periods, focusing on literary strategies and themes, political and cultural contexts.

### **ENGL 7500 BRITISH LITERATURE: THE ROMANTIC PERIOD**

[3 hours] Study of major authors and genres of the Romantic period: approximately 1789 to 1837.

### **ENGL 7520 BRITISH LITERATURE: THE VICTORIAN PERIOD**

[3 hours] Study of major authors, genres and ideas of the Victorian period: approximately 1837 to 1901.

### **ENGL 7540 20TH CENTURY BRITISH LITERATURE**

[3 hours] British poetry of the early 20th century, including the works of such poets as Hopkins, Housman, Hardy, Yeats, Owen, Lawrence, Auden, and Thomas, and the research and criticism relevant to them.

### **ENGL 7600 EARLY AMERICAN LITERATURE**

[3 hours] The poetry and prose writings of the New England Puritans and the American Enlightenment with emphasis on Bradford, Bradstreet, Taylor, Franklin, Jefferson, Paine and Wheatley.

### **ENGL 7620 AMERICAN LITERARY ROMANTICISM**

[3 hours] American literature from 1798 to 1865, from the beginnings of Romanticism in Bryant and Cooper through the Transcendental movement, with emphasis on Hawthorne, Melville, Stowe and Douglass.

### **ENGL 7630 AMERICAN LITERARY REALISM**

[3 hours] American literature from the post-Civil War period to the early 20th century: some emphasis on naturalism and humor; such writers as Twain, James, Howells, Dreiser and Wharton.

### **ENGL 7640 EARLY 20TH CENTURY AMERICAN LITERATURE**

[3 hours] Study of American literature from 1900 to World War II, focusing on literary modernism and its social, political and philosophical contexts.

### **ENGL 7650 AFRICAN AMERICAN WRITING BEFORE THE 20TH CENTURY**

[3 hours] Study of African American prose, poetry, drama and fiction from 1760 to 1915.

### **ENGL 7660 AFRICAN AMERICAN WRITING IN THE 20TH CENTURY**

[3 hours] A literary, historical and social consideration of the achievement of black American writers since 1915.

### **ENGL 7680 AMERICAN LITERATURE SINCE WORLD WAR II**

[3 hours] Major trends in postwar American literature, including traditional and uncanonical writers. Emphasis may be on poetry or prose by instructor's option.

### **ENGL 7750 HISTORY OF LITERARY CRITICISM**

[3 hours] A chronological examination of literary criticism, analyzing the variety of claims and practices which contribute to the current frameworks used to interpret and analyze literary texts.

### **ENGL 7770 FOLK POETRY: BALLAD AND BLUES**

[3 hours] The focus is first the British and American folk and broadside ballad and then the downhome and urban blues.

### **ENGL 7780 CONTEMPORARY LITERARY THEORIES AND CRITICISM**

[3 hours] An intensive examination of contemporary literary theories and criticism, focusing on selected issues and on representative theorists and critics.

### **ENGL 7790 APPROACHES TO RESEARCH IN ENGLISH**

[3 hours] An introduction to the discipline(s) of English, the methods and resources of scholarship in the field.

### **ENGL 7800 CHAUCER**

[3 hours] An examination of selected works in the light of important theories about medieval literature.

**ENGL 7810 SHAKESPEARE**

[3 hours] A study of Shakespeare's plays with emphasis on his development as a dramatist and with readings in major Shakespearean criticism.

**ENGL 7820 MILTON**

[3 hours] A study of the poetry and selected prose. Particular attention is given to biography and criticism.

**ENGL 7850 STUDIES IN THE WORK OF A BRITISH AUTHOR**

[3 hours] Author changes with each offering. Consult schedule of courses for authors to be studied.

**ENGL 7860 STUDIES IN THE WORK OF AN AMERICAN AUTHOR**

[3 hours] Author changes with each offering. Consult schedule of courses for authors to be studied.

**ENGL 7950 TOPICS IN COMPARATIVE AND GENERAL LITERATURE**

[3 hours] A seminar in which special problems, specific authors, the foreign relations of English literature, and other subjects can be considered from a comparative perspective. Prerequisite: Reading knowledge of an appropriate foreign language.

**ENGL 7960 DOCTORAL READINGS**

[1-10 hours] Graded S/U only.

**ENGL 7980 SPECIAL TOPICS**

[3 hours] Consideration of a special topic in literature and language.

**ENGL 8010 SEMINAR IN ENGLISH INSTRUCTION: COMPOSITION**

[3 hours] For prospective college instructors of composition. Includes supervised teaching of composition. Graded S/U only.

**ENGL 8020 SEMINAR IN ENGLISH INSTRUCTION: LITERATURE**

[3 hours] Seminar for prospective college instructors of literature in English. Includes supervised teaching of an introductory literature course. Graded S/U only.

**ENGL 8030 SEMINAR IN ENGLISH INSTRUCTION: LANGUAGE AND LINGUISTICS**

[3 hours] Seminar for prospective college instructors of linguistics and English language. Includes supervised teaching of an introductory courses in grammar and language. Graded S/U only.

**ENGL 8060 SEMINAR IN ENGLISH INSTRUCTION: ENGLISH AS A SECOND LANGUAGE**

[4 hours] Seminar and extensive supervised practice teaching/observation for prospective teachers of English as a Second Language. Graded S/U only. Prerequisite: ENGL or LING 6150/8150, ENGL 5190/7190

**ENGL 8150 APPLIED LINGUISTICS I**

[3 hours] Focus on the methods of "applied linguistics" in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing and other related areas.

**ENGL 8160 APPLIED LINGUISTICS LAB**

[1 hour] Computer lab for Applied Linguistics Research and Theory I. Corequisite: ENGL or LING 6150/8150.

**ENGL 8170 APPLIED LINGUISTICS RESEARCH AND THEORY II**

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: ENGL or LING 6150/8150

**ENGL 8410 SEMINAR: STUDIES IN EARLY ENGLISH LITERATURE**

[3 hours] Seminar on a specialized topic in Old and/or Middle English literature.

**ENGL 8420 SEMINAR: STUDIES IN ENGLISH RENAISSANCE LITERATURE**

[3 hours] Seminar on a specialized topic in English Renaissance literature.

**ENGL 8440 SEMINAR: STUDIES IN RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in early 17th century English literature.

**ENGL 8460 SEMINAR: STUDIES IN RESTORATION AND 18TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in Restoration and 18th century British literature.

**ENGL 8500 SEMINAR: STUDIES IN BRITISH ROMANTIC LITERATURE**

[3 hours] Seminar on a specialized topic in British Romantic literature.

**ENGL 8520 SEMINAR: STUDIES IN VICTORIAN LITERATURE**

[3 hours] Seminar on a specialized topic in Victorian literature.

**ENGL 8540 SEMINAR: STUDIES IN 20TH CENTURY BRITISH LITERATURE**

[3 hours] Seminar on a specialized topic in 20th century British literature.

**ENGL 8600 SEMINAR: STUDIES IN EARLY AMERICAN LITERATURE**

[3 hours] Seminar on a specialized topic in early American literature.

**ENGL 8620 SEMINAR: STUDIES IN AMERICAN LITERARY ROMANTICISM**

[3 hours] Seminar on a specialized topic in American literary Romanticism.

**ENGL 8630 SEMINAR: STUDIES IN AMERICAN LITERARY REALISM**

[3 hours] Seminar on a specialized topic in American literary realism.

**ENGL 8640 SEMINAR: STUDIES IN 20TH CENTURY AMERICAN LITERATURE**

[3 hours] Seminar on a specialized topic in 20th century American literature.

**ENGL 8960 DISSERTATION RESEARCH**

[1-15 hours] Graded S/U only. Maximum of 30 hours.

**ENGL 8980 SEMINAR: LITERARY TYPES AND SPECIAL TOPICS**

[3 hours] Seminar on a specialized topic in English studies.

**ENGL 8990 INDEPENDENT STUDY**

[1-3 hours] By permission of department; may be repeated for additional credit.

## ENGT - Engineering Technology

### Department of Engineering Technology (ENG)

**ENGT 1000 ENGINEERING TECHNOLOGY ORIENTATION**

[1 hour] Overview of careers in engineering technology, information about each program in Engineering Technology, and skills required for success in technological fields, such as computer skills.

**ENGT 1050 COMPUTERS FOR ENGINEERING TECHNOLOGY**

[3 hours] Concepts and techniques on the application of computers to the solution of manufacturing and engineering technology problems. Provides an introduction to computer operating systems, programming language and technical software.

**ENGT 2000 PROFESSIONAL DEVELOPMENT**

[1 hour] An introduction to the performance expectations of the engineering profession. Topics covered include resume writing, public speaking, interviewing skills, ethics, social responsibilities and the value of continuing education and professional registration. Prerequisite: ENGT 1000; sophomore standing

**ENGT 3010 APPLIED STATISTICS AND DESIGN OF EXPERIMENTS**

[4 hours] Introduction to probability, statistical inference and design of experiments. Topics include confidence intervals, tests of hypothesis, regression, analysis of variance, factorial experimental designs and propagation of experimental errors. Corequisite: ENGT 3020

**ENGT 3020 APPLIED ENGINEERING MATHEMATICS**

[3 hours] Introduction to partial derivatives, series expansions, complex variables, differential equations and Laplace transform analysis. Application of computers for numerical solution techniques. Corequisite: ENGT 3010

**ENGT 3040 APPLIED MATERIALS SCIENCE**

[4 hours] Study of the relationships between structures and properties for common engineering materials, including metals, polymers, ceramics and composites. Mechanical behavior, temperature effects, heat treatment, corrosion and electrical properties are covered. Prerequisite: ENGT 3010; Chemistry with lab

**ENGT 3050 FUNDAMENTALS OF ELECTRICITY**

[4 hours] An introduction to basic analytical techniques for resistive and reactive DC and AC electric circuits, and an introduction to electronic devices, including diodes and transistors. No credit towards EET degree. Prerequisite: MATH 1340

**ENGT 3940 CO-OP EXPERIENCE**

[1 hour] Approved co-op work experience. Course may be repeated. Prerequisite: ENGT 2000; sophomore standing

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### **ENGT 4050 SENIOR TECHNOLOGY CAPSTONE**

[3 hours] A comprehensive problem in engineering technology is assigned to a group of students who work together as a team to present a solution in a formal written and oral report. Prerequisite: C average for all courses in major

### **ENGT 4900 ENGINEERING REVIEW FOR PROFESSIONAL CERTIFICATION**

[3 hours] A review and application of general engineering principles and procedures in preparation for the Fundamentals of Engineering (FE) exam. Offered for students preparing to take the exam and for those considering it. Prerequisite: Senior standing in the College of Engineering

### **ENGT 4980 SPECIAL TOPICS IN ENGINEERING TECHNOLOGY**

[2-4 hours] Selected topics in engineering technology with emphasis on intensive investigation of recent literature in areas of special interest. Prerequisite: Consent of instructor

### **ENGT 6920 SPECIAL PROJECTS IN ENGINEERING TECHNOLOGY**

[1-6 hours] A special project is intended for the graduate student to investigate or solve a problem in an area of mechanical, electrical, construction or computer science engineering technology. The scope of the project is defined by the instructor in the area of mutual interest of the instructor and the student. Prerequisite: Graduate standing

### **ENGT 6980 SPECIAL TOPICS IN ENGINEERING TECHNOLOGY**

[1-6 hours] A special topic in advanced engineering or technology emphasizing investigation of literature and /or methods in areas of special interest to the class and the instructor. Prerequisite: Permission of Engineering Technology faculty member

## **ETPT - Educational Technology & Performance Technology**

### **Department of Curriculum & Instruction (EDU)**

### **ETPT 2020 TECHNOLOGY AND MULTIMEDIA IN EDUCATIONAL ENVIRONMENTS**

[3 hours] Emphasizes the development of computing skills with a focus on productivity tools in organizing, managing, multimedia authoring, homepage development, software evaluation and presenting lessons for professional communication in K-12.

### **ETPT 4200 COMPUTER SKILLS FOR INSTRUCTIONAL PROFESSIONALS**

[3 hours] Emphasizes developing skills in the use of this common productivity software and the use of computer technology in solving typical classroom problems.

### **ETPT 4400 TRAINING AND HUMAN PERFORMANCE TECHNOLOGY**

[3 hours] Provides an introduction to human performance technology (HPT), with an emphasis on the use of training as an HPT intervention.

### **ETPT 4950 WORKSHOP IN EDUCATIONAL TECHNOLOGY & PERFORMANCE TECHNOLOGY**

[1-5 hours] Workshops are developed around topics of interest in all areas of educational technology and performance technology. Students should discuss specific content for each offering with educational technology faculty.

### **ETPT 4990 INDEPENDENT STUDY IN EDUCATIONAL TECHNOLOGY & PERFORMANCE TECHNOLOGY**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of educational technology & performance technology faculty.

### **ETPT 5000 INTRODUCTION TO EDUCATIONAL TECHNOLOGY**

[3 hours] Introduces the field of Educational Technology and its relevant competencies. Examines current trends in Educational Technology.

### **ETPT 5100 INSTRUCTIONAL SYSTEMS DESIGN PRINCIPLES**

[3 hours] An introduction to various ISD models and approaches for designing effective systems of instruction. Students will begin to acquire experience in the actual analysis, design, development and evaluation of instruction.

### **ETPT 5200 COMPUTER SKILLS FOR INSTRUCTIONAL PROFESSIONALS**

[3 hours] Emphasizes developing skills in the use of this common productivity software and the use of computer technology in solving typical instructional problems.

### **ETPT 5210 INTRODUCTION TO MULTIMEDIA AND WEB DESIGN**

[3 hours] An introduction to the software, hardware and processes involved in the design and development of multimedia and Web-based instructional materials.

### **ETPT 5270 INSTRUCTIONAL TELEVISION PRODUCTION**

[3 hours] An introduction to all facets of producing video for use in various instructional settings.

### **ETPT 5550 USING THE INTERNET IN THE CLASSROOM**

[3 hours] An introduction to effective use of Internet resources in instruction.

### **ETPT 5950 WORKSHOP IN EDUCATIONAL TECHNOLOGY & PERFORMANCE TECHNOLOGY**

[1-5 hours] Workshops are developed around topics of interest in all areas of educational technology and performance technology. Students should discuss specific content for each offering with educational technology faculty.

### **ETPT 5980 SPECIAL TOPICS IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[1-5 hours] Special offerings are of interest to graduate students in educational technology and performance technology. Students should discuss specific content for each offerings with ETPT faculty.

### **ETPT 5990 GRADUATE INDEPENDENT STUDY IN EDUCATIONAL TECHNOLOGY & PERFORMANCE TECHNOLOGY**

[1-5 hours] Individual study designed to provide a student the opportunity to work individually on professional problems under the direction of educational technology & performance technology faculty.

### **ETPT 6110 INSTRUCTIONAL SYSTEMS DESIGN APPLICATIONS**

[3 hours] Based on the knowledge and skills acquired in ETPT 6100/8100, students design, develop and evaluate multimedia-based instructional modules and systems. Prerequisite: ETPT 5100 and 5210, corequisite or prerequisite

### **ETPT 6150 DESIGNING INSTRUCTION FOR DIVERSE LEARNER POPULATIONS**

[3 hours] Focuses on instructional designer's role in assessing and addressing such differences as performance environment, culture, ethnicity, physical attributes, age/experience and socioeconomic factors to maximize learning. Prerequisite: ETPT 5100

### **ETPT 6220 DEVELOPING COMPUTER-BASED INSTRUCTIONAL MATERIALS**

[3 hours] Teaches design and development of instructional software, using multimedia development environments and strategies. Prerequisite: ETPT 5100 and 5210

### **ETPT 6230 DEVELOPING WEB-BASED INSTRUCTIONAL MATERIALS**

[3 hours] Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web. Prerequisite: ETPT 5100 and 5210

### **ETPT 6300 TECHNOLOGY MANAGEMENT IN K-16 EDUCATION**

[3 hours] Provides teachers and technology coordinators with the knowledge and skills necessary to manage instructional computer laboratories and services in K-16 settings.

### **ETPT 6400 HUMAN PERFORMANCE TECHNOLOGY**

[3 hours] Provides an introduction to human performance technology (HPT) for the graduate educational technology major.

### **ETPT 6410 PERFORMANCE IMPROVEMENT INTERVENTIONS**

[3 hours] Investigates the options available to the human performance technology (HPT) professional for improving performance.

### **ETPT 6420 ASSESSING NEEDS IN IMPROVING PERFORMANCE**

[3 hours] Focuses on the theoretical foundations and techniques for assessing gaps in results at individual, group and organizational levels in order to improve performance.

### **ETPT 6430 HUMAN PERFORMANCE TECHNOLOGY THEORY AND PRACTICE**

[3 hours] Students investigate current trends in human performance technology (HPT) and assist one another in pursuing detailed individual study of one major topic area in HPT.



**ETPT 6440 CONSULTING FOR PERFORMANCE IMPROVEMENT**

[3 hours] Addresses relevant models, practices and concepts of both internal and external consulting in human performance improvement (HPT) contexts in all types of organizations.

**ETPT 6470 PERFORMANCE INTERVENTION ANALYSIS**

[3 hours] Focus is on the conceptual framework and procedures involved in the analysis of various HRD interventions (including training) for improving performance and, ultimately, organizational results. Prerequisite: ETPT 6420

**ETPT 6510 TEACHING AND LEARNING AT A DISTANCE**

[3 hours] Investigates various applications of distance learning for education and training.

**ETPT 6710 SYSTEMIC CHANGE PRINCIPLES AND APPLICATIONS**

[3 hours] Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

**ETPT 6810 RESEARCH AND THEORY IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Investigates current major research trends and topics in various areas of educational technology and performance technology. Students develop and present a research proposal. Prerequisite: RESM 5110 and 6320

**ETPT 6900 MASTER'S SEMINAR IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] This course is the culminating experience in the ETPT master's program. Students complete a project under supervision of an educational technology faculty member. Prerequisite: ETPT 5000 and 6110

**ETPT 6930 MASTER'S RESEARCH PROJECT IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[1-3 hours] Student will complete an individual research project under the orientation of a committee of at least two faculty members in ETPT, ordinarily including the faculty adviser.

**ETPT 6940 PRACTICUM IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Students apply ETPT course work to solve an instructional and/or performance problem for a client organization under the supervision of educational technology faculty. Prerequisite: ETPT 5100 and 6110

**ETPT 6960 MASTER'S THESIS IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Students who elect this option will complete a thesis under the direction of committee of at least two faculty members from ETPT, ordinarily including the faculty adviser. Prerequisite: ETPT 5100/7100

**ETPT 7000 INTRODUCTION TO EDUCATIONAL TECHNOLOGY**

[3 hours] Introduces the field of educational technology and its relevant competencies. Examines current trends in educational technology.

**ETPT 7100 INSTRUCTIONAL SYSTEMS DESIGN PRINCIPLES**

[3 hours] An introduction to various ISD models and approaches for designing effective systems of instruction. Students will begin to acquire experience in the actual analysis, design, development and evaluation of instruction.

**ETPT 7210 INTRODUCTION TO MULTIMEDIA AND WEB DESIGN**

[3 hours] An introduction to the software, hardware and processes involved in the design and development of multimedia and Web-based instructional materials.

**ETPT 7270 INSTRUCTIONAL TELEVISION PRODUCTION**

[3 hours] An introduction to all facets of producing video for use in various instructional settings.

**ETPT 7550 USING THE INTERNET IN THE CLASSROOM**

[3 hours] An introduction to effective use of Internet resources in instruction.

**ETPT 7940 SPECIALIST PRACTICUM IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Observation and supervised experience in an appropriate setting. Students will be assigned to work as interns under the joint supervision of school and University personnel. Prerequisite: ETPT 5100/7100

**ETPT 7980 SPECIAL TOPICS IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[1-5 hours] Special offerings are of interest to graduate students in educational technology and performance technology. Students should discuss specific content for each offerings with ETPT faculty.

**ETPT 8110 INSTRUCTIONAL SYSTEMS DESIGN APPLICATIONS**

[3 hours] Based on the knowledge and skills acquired in ETPT 6100/8100, students design, develop and evaluate multimedia-based instructional modules and systems. Prerequisite: ETPT 5100/7100 and 5210/7210, corequisite or prerequisite

**ETPT 8150 DESIGNING INSTRUCTION FOR DIVERSE LEARNER POPULATIONS**

[3 hours] Focuses on instructional designer's role in assessing and addressing such differences as performance environment, culture, ethnicity, physical attributes, age/experience and socioeconomic factors to maximize learning. Prerequisite: ETPT 7100

**ETPT 8220 DEVELOPING COMPUTER-BASED INSTRUCTIONAL MATERIALS**

[3 hours] Teaches design and development of instructional software, using multimedia development environments and strategies. Prerequisite: ETPT 7100 and 7210

**ETPT 8230 DEVELOPING WEB-BASED INSTRUCTIONAL MATERIALS**

[3 hours] Students apply previously acquired skills in multimedia and Web design to develop instructional materials for delivery via the World Wide Web. Prerequisite: ETPT 7100 and 7210

**ETPT 8300 TECHNOLOGY MANAGEMENT IN K-16 EDUCATION**

[3 hours] Provides teachers and technology coordinators with the knowledge and skills necessary to manage instructional computer laboratories and services in K-16 settings.

**ETPT 8400 HUMAN PERFORMANCE TECHNOLOGY**

[3 hours] Provides an introduction to human performance technology (HPT) for the graduate educational technology major.

**ETPT 8410 PERFORMANCE IMPROVEMENT INTERVENTIONS**

[3 hours] Investigates the options available to the human performance technology (HPT) professional for improving performance.

**ETPT 8420 ASSESSING NEEDS IN IMPROVING PERFORMANCE**

[3 hours] Focuses on the theoretical foundations and techniques for assessing gaps in results at individual, group and organizational levels in order to improve performance.

**ETPT 8430 HUMAN PERFORMANCE TECHNOLOGY THEORY AND PRACTICE**

[3 hours] Students investigate current trends in human performance technology (HPT) and assist one another in pursuing detailed individual study of one major topic area.

**ETPT 8440 CONSULTING FOR PERFORMANCE IMPROVEMENT**

[3 hours] Addresses relevant models, practices and concepts of both internal and external consulting in human performance improvement (HPT) contexts in all types of organizations.

**ETPT 8470 PERFORMANCE INTERVENTION ANALYSIS**

[3 hours] Focus is on the conceptual framework and procedures involved in the analysis of various HRD interventions (including training) for improving performance and, ultimately, organizational results. Prerequisite: ETPT 6420/8420

**ETPT 8510 TEACHING AND LEARNING AT A DISTANCE**

[3 hours] Investigates various applications of distance learning systems for education and training.

**ETPT 8710 SYSTEMIC CHANGE PRINCIPLES AND APPLICATIONS**

[3 hours] Examines the process of change in the diffusion and adoption of innovations in education as well as business and industry. Adoption theory is analyzed.

**ETPT 8810 RESEARCH AND THEORY IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Investigates current major research trends and topics in various areas of educational technology and performance technology. Students develop and present a research proposal. Prerequisite: RESM 5110, 6320

**ETPT 8900 DOCTORAL SEMINAR IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] This seminar will consider problems and provide advanced study for doctoral students in educational technology and performance technology. Prerequisite: ETPT 7100

**ETPT 8920 INTERDISCIPLINARY SEMINAR IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY**

[3 hours] Considers issues and problems in various areas of educational technology and performance technology. Intended for advanced ETPT doctoral students. Prerequisite: Permission of instructor

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### ETPT 8930 ADVANCED RESEARCH IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY

[1-5 hours] Individual study is designed to provide the doctoral student opportunity to work individually on professional problems under the direction of educational technology and performance technology faculty.

### ETPT 8940 PRACTICUM IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY

[3 hours] Students apply ETPT course work to solve an instructional and/or performance problem for a client organization under the supervision of educational technology faculty. Prerequisite: ETPT 5100/7100 and 6110/8110

### ETPT 8960 DISSERTATION IN EDUCATIONAL TECHNOLOGY AND PERFORMANCE TECHNOLOGY

[1-12 hours] Original research in an area of educational technology and performance technology.

## FILM - Film

### Department of Theatre and Film (ARS)

#### FILM 1310 INTRODUCTION TO FILM

[3 hours] Introduction to the history and interpretation of cinema as art form, with emphasis on discovering how meaning is encoded in film at the levels of shot, sequence and narrative construction. (Not recommended or required for majors.) Humanities core course

#### FILM 2310 FILM I

[3 hours] An intensive introduction to the theory and practice of creative filmmaking utilizing the professional 16 mm format. Individual and group production exercises. Students must purchase supplies.

#### FILM 2320 VIDEO I

[3 hours] An intensive introduction to the theory and practice of video as an art form and means of expression. Individual and group production projects supported by critical reading and writing assignments. Students are required to purchase supplies. Writing Intensive (WAC) Course.

#### FILM 2340 CRITICAL APPROACHES TO CINEMA

[3 hours] A critical approach to the development of cinema as an industrial, artistic and ideological practice. Emphasis on theories of film construction and interpretation and the development of research skills for cinema studies. WAC course

#### FILM 2350 CINEMA HISTORY

[3 hours] A study of the major movements and authors of Cinema History. Screenings included in class.

#### FILM 2980 CINEMA STUDIES TOPIC I

[3 hours] Topics of Cinema Studies, concentrating on a specific style, genre, or national cinema, such as, Italian Cinema, Non-Western Cinema, etc. Topics vary. May be repeated for 9 hours. Prerequisite: FILM 2340 or FILM 1310

#### FILM 2990 SPECIAL PROJECTS

[1-3 hours] Individual study provides the student an opportunity to work independently on a problem of special interest in Film/Video under the direction of the faculty. For Freshman and Sophomore students.

#### FILM 3310 FILM II

[4 hours] Intermediate 16mm filmmaking workshop. Emphasis on sync-sound and narrative film, advanced lighting and exposure techniques, and camera movement. Individual and group projects. Students are required to purchase supplies. Prerequisite: FILM 2310

#### FILM 3320 VIDEO II

[4 hours] Intermediate video production; emphasis on personal and political uses of the medium. Individual and group projects. Students are required to purchase supplies. Prerequisite: FILM 2320

#### FILM 3350 SCREENWRITING

[3 hours] This course involves practical analysis of screenplays, emphasizing story structure and characterization. Students plan, write and refine story lines before writing actual scripts. Cross-listed with ENGL 3060; WAC course

#### FILM 3360 PRODUCTION TOPIC

[4 hours] Topics of Film or Video production including Animation, Sound, Lighting, Editing, etc. Individual and group projects. Students must purchase supplies. Repeatable to 12 credit hours Prerequisite: FILM 2310 or 2320

#### FILM 3370 DOCUMENTARY FILM

[3 hours] A study of the major movements and authors of Documentary Film. Screenings included in class.

#### FILM 3380 EXPERIMENTAL FILM

[3 hours] A study of the major movements and authors of Experimental Film. Screenings included in class.

#### FILM 3390 HISTORY OF VIDEO ART

[3 hours] A study of the major movements of the History of Video Art and Installation. Screenings included in class.

#### FILM 3410 EUROPEAN CINEMA

[3 hours] A study of the major movements and authors of European cinema. Screenings included in class. FILM 2350 recommended.

#### FILM 3420 THIRD CINEMA

[3 hours] A study of the major movements and authors of Third World Cinema. Screenings included in class. FILM 2350 is recommended before taking this class. Non-western multicultural course

#### FILM 3730 DIRECTING FOR CAMERA

[3 hours] Directing dramatic scenes for camera with emphasis on effective director/actor communication and the creation of dramatically meaningful camera and actor blocking. Prerequisite: FILM 2310 or 2320

#### FILM 3980 CINEMA STUDIES TOPIC II

[4 hours] A non-historical approach to specific topics of cinema studies, concentrating on problems of film theory and individual research projects. Topics vary. (May be repeated to 12 hours.)

#### FILM 4320 FILM/VIDEO WORKSHOP

[4 hours] Advanced independent production projects, including screenwriting. Weekly critiques of work in progress. Requires proposal for admission. Larger projects may be completed over successive semesters. May be repeated up to 8 hours. Prerequisite: Junior standing, approval of a project proposal, and one of the following: FILM 3310, 3320, 3350, 3360

#### FILM 4340 TOPICS IN FEMINIST CINEMA STUDIES

[3 hours] Cross-listings of film classes with the department of women's and gender studies. Specific topics vary. Check Course Schedule for specific subject and prerequisites.

#### FILM 4350 SCREENWRITING II

[3 hours] For students familiar with the fundamental elements of screenplays, this course devotes attention to writing a complete script. Students are expected to come to the class with a planned story line. Prerequisite: FILM 3350 or ENGL 3060

#### FILM 4360 LE CINEMA FRANCAIS

[3 hours] A study of the development of French film and its place in world cinema.

#### FILM 4370 CINEMA STUDIES SEMINAR (TOPICS)

[4 hours] A research oriented seminar concerning a specific topic of cinema studies, emphasizing original research culminating in an individual research project. Prerequisite: FILM 2340 or permission of instructor

#### FILM 4940 INTERNSHIP

[3 hours] Internship with an approved program, company, or agency in Film. Video or television. (Repeatable for 6 credit hours)

#### FILM 4950 HONORS THESIS

[3 hours] Research or a creative project on a topic in Film or Video. Required of all BA candidates seeking department honors. (Repeatable for 6 credit hours.)

#### FILM 4990 SPECIAL PROJECTS

[1-3 hours] Individual study provides the student an opportunity to work independently on a problem of special interest in Film/Video under the direction of the faculty. For junior and senior students.

## FINA - Finance

### Department of Finance and Business Economics (BUS)

#### FINA 2000 PERSONAL INVESTING

[3 hours] Learn about common stocks and other securities, how to invest, and how to build financial security, using a real time stock market simulation. Not applicable toward Finance major.

#### FINA 3060 PERSONAL FINANCE

[3 hours] Designed for the non-business major, encompasses personal financial planning such as credit, insurance, home ownership, stocks, bonds, mutual funds, income tax planning and strategies. Not applicable toward finance major.

#### FINA 3480 INVESTMENTS

[3 hours] An introduction to investment alternatives, risk-reward trade-offs, valuation techniques and performance evaluation. Developing investment strategies based on objectives and constraints. Prerequisite: BUAD 3040

**FINA 3500 INTERNATIONAL BUSINESS FINANCE**

[3 hours] Examines the role of a financial manager in international transactions. The international environment and the role of international asset markets are emphasized. Prerequisite: BUAD 3040

**FINA 3600 RISK MANAGEMENT**

[3 hours] Investigates non-speculative risks and the methods used to deal with them. Emphasizes on the insurance mechanism. Explores the functional aspect of the insurance operations. Prerequisite: BUAD 3040

**FINA 3610 LIFE AND HEALTH INSURANCE**

[3 hours] Combines a discussion of the economic aspects of life and health insurance with basic analysis on life insurance, health and annuity contracts. Includes investigation of major functional aspects. Prerequisite: BUAD 3040

**FINA 3660 REAL ESTATE PRINCIPLES, PRACTICES AND FINANCE**

[3 hours] A basic discussion in real estate economics, valuation theory, transfer procedures, legal characteristics, brokerage, taxation and financing techniques. Emphasis on residential properties. A term project is required. Prerequisite: BUAD 3040

**FINA 3670 REAL ESTATE VALUATION**

[3 hours] Methodology of appraising large and small commercial real properties and the theory underlying appraisal techniques and valuation. A term project is required. Prerequisite: BUAD 3040

**FINA 3680 REAL ESTATE LAW, INSURANCE AND TAXES**

[3 hours] An integrative analysis of real estate, insurance, taxes and legislation as they impact commercial real estate ownership returns and risk. A term project is required. Prerequisite: BUAD 3040

**FINA 3890 QUANTITATIVE APPLICATIONS IN FINANCE**

[3 hours] The financial applications of economic forecasting, economic model building, univariate and multivariate analysis, hypothesis testing and probability theory. Uses statistical package for analysis. Applications come from all areas of finance. Prerequisite: BUAD 2070, 3040

**FINA 4080 INTERMEDIATE FINANCIAL MANAGEMENT**

[3 hours] Explores financial decision making in depth, using case studies and computer projects. Topics include cost of capital, capital budgeting, leasing, financial planning, financial statement analysis, leverage and capital structure. Prerequisite: BUAD 3040

**FINA 4090 FINANCIAL MARKETS AND INSTITUTIONS**

[3 hours] The operation and function of financial institutions and markets are examined. Emphasis on interest rate theory, institutions management and the role of e-commerce, internationalization, and the role of government through regulation and monetary policy. Prerequisite: BUAD 3040

**FINA 4100 SECURITY ANALYSIS & PORTFOLIO MANAGEMENT**

[3 hours] Emphasizes the importance of portfolio management techniques and evaluation. Techniques of financial statement analysis, economic analysis, industry analysis, theoretical issues of efficient markets, technical analysis and fundamental analysis. Prerequisite: BUAD 3040, FINA 3480

**FINA 4670 ADVANCED FINANCIAL MANAGEMENT**

[3 hours] Applies financial analysis techniques and outside information through case studies of small, medium, and large companies to formulate policies, practices and funding approaches that resolve their problems and/or achieve their goals. Prerequisite: FINA 3480, 4080 Corequisite: FINA 4090

**FINA 4840 SMALL BUSINESS FINANCIAL POLICIES AND PRACTICES**

[3 hours] Financial management and planning in small and medium-sized firms. Course focuses on the financial analysis and management of their problems, policies, practices and funding requirements. Prerequisite: BUAD 3040

**FINA 4870 ADVANCED FINANCIAL INSTITUTIONS & MARKETS**

[3 hours] Seminar focusing on current issues in financial institutions and services management.

**FINA 4880 REAL ESTATE PROPERTY MANAGEMENT**

[3 hours] Methodology of managing large and small commercial properties and buildings to maximize current earnings, earnings potential and asset value for the property owners. Prerequisite: BUAD 3040, FINA 3670, FINA 3680

**FINA 4890 FINANCIAL AND ESTATE PLANNING**

[3 hours] Nature and methods of Financial planning. Creation, conservation and distribution of estates. Emphasis is on investments, insurance wills, trusts and tax laws. Prerequisite: BUAD 3040

**FINA 4900 SEMINAR IN FINANCE**

[3 hours] Seminar course in advanced and specialized topics. Current readings from finance journals. Written paper required. Prerequisite: FINA 3480, 4080

**FINA 4940 FINANCE INTERNSHIP**

[1-3 hours] A prearranged work-study program where students gain on-the-job experience while learning some basic concepts and techniques. A written report is required. Prerequisite: BUAD 3040

**FINA 4990 INDEPENDENT STUDY: READINGS AND RESEARCH IN FINANCE**

[1-3 hours] An independent, professor supervised, course dealing with an in depth investigation of a financial area not covered adequately in another listed course. Prerequisite: FINA 3480, 4080, 4090

**FINA 5160 FUNDAMENTALS OF HEALTH CARE FINANCE**

[3 hours] Information about accounting and the financial environment of the health care industry provide a foundation for financial concepts and techniques necessary for health care administrators. For non-business students only.

**FINA 5310 MANAGERIAL FINANCE**

[3 hours] A course that focuses on how firms raise capital and how they allocate this capital in a manner consistent with the maximization of a firm's value. Prerequisite: ACCT 5000

**FINA 6130 MANAGERIAL FINANCE**

[3 hours] Emphasizes integrated financial decision making tools, techniques and theory. Stresses interpretation and analysis of data to manage long and short-term capital expenditure and financing decisions. Prerequisite: FINA 5310 or equivalent

**FINA 6140 INVESTMENTS AND SECURITY ANALYSIS**

[3 hours] Includes investment alternatives, risk-reward trade-offs, index models, strategies of using common stock, bonds and derivative securities, and portfolio evaluation criteria. Investment policy and strategies illustrated through a portfolio simulation. Prerequisite: FINA 5310 or equivalent

**FINA 6150 FINANCIAL INSTITUTIONS AND MARKETS**

[3 hours] Operations of financial institutions and financial markets. Topics include financial institutions as intermediaries, interest rate theory, financial instrument characteristics, institution management, internationalization and government regulation. Prerequisite: FINA 5310 or equivalent

**FINA 6160 ADVANCED HEALTH CARE FINANCE**

[3 hours] Information about the health care industry provides a foundation for knowledge of financial management theory, principles and concepts required for analysis and decision-making by health care administrators. Prerequisite: FINA 5310

**FINA 6330 SEMINAR IN FINANCIAL MANAGEMENT PROBLEMS AND POLICIES**

[3 hours] An in-depth analysis of capital budgeting, capital structure, cost of capital, valuation, dividend policy, mergers and acquisitions, agency theory, options and corporate finance, immunization, duration, swaps and risk management. Prerequisite: FINA 6130

**FINA 6340 SEMINAR IN PORTFOLIO MANAGEMENT**

[3 hours] An in-depth analysis of individual and institutional portfolios, active portfolio management, derivative security analysis, hedging techniques, international diversification and financial innovations. Prerequisite: FINA 6140

**FINA 6350 FINANCIAL INSTITUTION MANAGEMENT**

[3 hours] Topics include current issues in financial institution management, such as interest rate risk measurement and management, credit and liquidity risk, capital adequacy, institution marketing banking structures. Prerequisite: FINA 6150

**FINA 6370 MBA INTERNATIONAL FINANCIAL MANAGEMENT**

[3 hours] Techniques and theory of financial management in an international environment. The role of international markets in risk reduction and profit maximization are emphasized. Prerequisite: FINA 5310 or equivalent

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### **FINA 6380 FINANCIAL INSTITUTIONS MANAGEMENT**

[3 hours] Topics include investment and liquidity management, lending policies, bank marketing, liability management, capital management and banking structure. Cases and PC applications are used. Prerequisite: FINA 6150

### **FINA 6750 RESEARCH IN FINANCE**

[1-3 hours] Independent research, professor supervised, on a specific topic in finance that is not covered adequately in another listed course. Prerequisite: FINA 6130

### **FINA 6840 SMALL BUSINESS FINANCIAL MANAGEMENT**

[3 hours] In depth financial management and planning in small and medium-sized firms. Course focuses on the financial analysis and management of their problems, policies, practices and funding requirements. Prerequisite: FINA 6130

### **FINA 7310 MANAGERIAL FINANCE**

[3 hours] A course that focuses on how firms raise capital and how they allocate this capital in a manner consistent with the maximization of a firm's value. Prerequisite: ACCT 5000

## **FLAN - Foreign Language**

### **Department of Foreign Languages (ARS)**

### **FLAN 3440 INTERCULTURAL COMMUNICATION: PRINCIPLES AND PRACTICE**

[4 hours] This course offers a survey of major concepts in intercultural communication. It emphasizes a balance between theoretical and practical learning opportunities and seeks to promote intercultural understanding. Non-western multicultural course

## **FREN - French**

### **Department of Foreign Languages (ARS)**

### **FREN 1080 CULTURE AND COMMERCE IN THE FRENCH-SPEAKING WORLD**

[3 hours] A study of the French-speaking world with emphasis on the relationship between its culture and its business and economic institutions and practices. Taught in English. (Not for major credit.) Humanities core course

### **FREN 1090 FRENCH & FRANCOPHONE CULTURE IN THE MODERN WORLD**

[3 hours] This course focuses on modern French and Francophone culture and their historical and geographical sources. Taught in English. (Not for major credit.) Humanities core course

### **FREN 1110 ELEMENTARY FRENCH I**

[4 hours] A comprehensive introductory course in French language and culture through the four basic skills: aural comprehension, reading, speaking and writing. Laboratory practice required. (not for major credit)

### **FREN 1120 ELEMENTARY FRENCH II**

[4 hours] A comprehensive introductory course in French language and culture through the four basic skills: aural comprehension, reading, speaking and writing. Laboratory practice required. (not for major credit) Prerequisite: FREN 1110 or satisfactory score on placement test. Humanities core course

### **FREN 1500 REVIEW OF ELEMENTARY FRENCH**

[4 hours] Review of first-year college French for students who studied the language in high school and who need to strengthen communication skills, vocabulary, grammar and pronunciation before study at the 2000 level. (not for major credit) Prerequisite: high school French; placement test Humanities core course

### **FREN 2140 INTERMEDIATE FRENCH I**

[3 hours] Review and further development of command of the French language and culture through the four basic skills: aural comprehension, reading, speaking and writing. Laboratory practice required. (not for major credit) Prerequisite: FREN 1120, 1500 or satisfactory score on placement test. Humanities core course

### **FREN 2150 INTERMEDIATE FRENCH II**

[3 hours] Further review and development of command of the French language and culture through the four basic skills: aural comprehension, reading, speaking and writing. Laboratory practice required. (not for major credit) Prerequisite: FREN 2140 or satisfactory score on placement test. Humanities core course

### **FREN 2190 STUDY ABROAD**

[1-3 hours] This course is designed to permit and encourage non-majors to spend time in a country where French is spoken. Credit granted in accordance with established departmental procedures. (Not for major credit.) Prerequisite: FREN 2150 and consent of instructor.

### **FREN 3010 CONVERSATION AND COMPOSITION I**

[3 hours] Idiomatic conversation practice, dictation and pronunciation drill as well as development of practical writing skills. Prerequisite: FREN 2150 or satisfactory score on placement test.

### **FREN 3020 CONVERSATION AND COMPOSITION II**

[3 hours] Further aural/oral development with emphasis on the mechanics of writing in French and the organization of ideas. A writing-intensive course. Prerequisite: FREN 3010 or consent of instructor

### **FREN 3170 BUSINESS FRENCH**

[3 hours] An introduction to the language of the French-speaking world, with emphasis on business and commerce. Prerequisite: FREN 2150 or consent of instructor

### **FREN 3210 SURVEY OF FRENCH LITERATURE I**

[3 hours] French literature from its origins through the eighteenth century. Prerequisite: FREN 2150 or consent of instructor

### **FREN 3220 SURVEY OF FRENCH LITERATURE II**

[3 hours] French and Francophone literature from the 19th and 20th centuries. Prerequisite: FREN 2150 or consent of instructor

### **FREN 3400 CROSS-CULTURAL UNDERSTANDING**

[3 hours] An examination of the notions of culture, multiculturalism and Francophone cultures. Course content emphasizes issues of race, class and gender in U.S. and Francophone contexts. Non-western multicultural course

### **FREN 3410 SURVEY OF FRENCH CIVILIZATION I**

[3 hours] A study of the many ways in which France has contributed to world culture through architecture, painting, sculpture, music, literature, folklore, science, philosophy and education. Prerequisite: FREN 2150 or consent of instructor

### **FREN 3420 SURVEY OF FRENCH AND FRANCOPHONE CIVILIZATION II**

[3 hours] An introductory study of selected sociological, political, cultural and economic issues of contemporary France and Francophone areas. Prerequisite: FREN 2150 or consent of instructor

### **FREN 3710 FRENCH PHONETICS**

[3 hours] Introduction to phonetic theory and practice in pronunciation. Prerequisite: FREN 2150 or consent of instructor

### **FREN 4010 FRENCH SYNTAX AND STYLISTICS I**

[3 hours] A thorough study of syntax, morphology, phonetic principles and grammatical structure of French. Emphasizes various writing activities and styles. Prerequisite: FREN 3020 or consent of instructor

### **FREN 4020 FRENCH SYNTAX AND STYLISTICS II**

[4 hours] Emphasizes various writing activities and styles. Includes a research component and basic literary criticism as well as a review of syntax and grammar. A writing-intensive and capstone course. Prerequisite: FREN 4010

### **FREN 4040 FRENCH LINGUISTICS**

[3 hours] Key issues in French linguistics and contrastive structures of French and English. Prerequisite: 2 3000 level courses

### **FREN 4050 ADVANCED CONVERSATION**

[3 hours] Advanced practice in speaking idiomatic French. Special attention to problems of pronunciation and oral proficiency. Prerequisite: FREN 3020

### **FREN 4070 FRENCH TRANSLATION**

[3 hours] Practice in translation of texts from French into English and English into French. Subject matter area will include commerce, natural, physical, and social sciences and the humanities. Prerequisite: two 3000-level courses

### **FREN 4160 TEACHING COLLOQUIUM**

[3 hours] A course in the theory and practice of teaching French and of second language acquisition in general. Prerequisite: two 3000-level courses

### **FREN 4190 STUDY ABROAD**

[1-12 hours] Designed to permit and encourage the French major to pursue study in a country where French is spoken. Credit granted in accordance with established departmental procedures. Prerequisite: FREN 3020 & consent of instructor

**FREN 4200 CONTEMPORARY FRENCH AND FRANCOPHONE CIVILIZATION**

[3 hours] A study of contemporary France and/or Francophone cultures including discussion of economics, daily life, the family, social groups, industry, politics and education. Prerequisite: 2 3000 level courses

**FREN 4230 FRANCE AND THE EUROPEAN UNION**

[3 hours] The European Union has political, economic and social functions that resemble those traditionally carried out by individual countries. French civilization will be seen in terms of both French and European political, economic, social and cultural structures today. Course given in French. Prerequisite: Advanced level French language proficiency

**FREN 4310 MEDIEVAL FRANCE: LANGUAGE AND LITERATURE**

[3 hours] Introduction to Old French and readings in the major genres from the twelfth through fifteenth centuries. Prerequisite: FREN 3210, 3220

**FREN 4410 FRENCH LITERATURE OF THE 16TH CENTURY**

[3 hours] Literature reflecting major currents of the Renaissance. Prerequisite: FREN 3210, 3220

**FREN 4510 FRENCH LITERATURE OF THE 17TH CENTURY**

[3 hours] A study of the development of French Classicism. Prerequisite: FREN 3210, 3220

**FREN 4610 FRENCH LITERATURE OF THE 18TH CENTURY**

[3 hours] Readings from the novels, plays and prose of the major writers of the Enlightenment. Prerequisite: FREN 3210, 3220

**FREN 4710 FRENCH LITERATURE OF THE 19TH CENTURY I**

[3 hours] Literary and intellectual trends from Romanticism to Symbolism. Prerequisite: FREN 3210, 3220

**FREN 4720 FRENCH LITERATURE OF 19TH CENTURY II**

[3 hours] Literary and intellectual trends from Romanticism to Symbolism. Prerequisite: FREN 3210, 3220

**FREN 4810 FRENCH & FRANCOPHONE LITERATURE OF THE 20TH CENTURY I**

[3 hours] Literature of all genres from the period before World War I to the present. Prerequisite: FREN 3210, 3220

**FREN 4820 FRENCH & FRANCOPHONE LITERATURE OF THE 20TH CENTURY II**

[3 hours] Literature of all genres from the period before World War I to the present. Prerequisite: FREN 3210, 3220

**FREN 4850 LE CINEMA FRANCAIS**

[3 hours] A study of the development of French film and its place in world cinema. Prerequisite: FREN 3210, 3220

**FREN 4860 LA PRODUCTION FEMININE**

[3 hours] A study of texts produced by women in the French language in various fields (for example, literary theory, film, literature, philosophy, psychoanalysis, semiotics, post-colonial theory). Prerequisite: FREN 3210, 3220

**FREN 4910 HONORS RESEARCH IN FRENCH**

[3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Honors student status and consent of instructor.

**FREN 4950 STUDY IN THE WORKS OF AN AUTHOR OR AUTHORS**

[3 hours] Readings of the works of an author or authors of French or Francophone literature. May be repeated when topic varies. Prerequisite: FREN 3210, 3220

**FREN 4980 SPECIAL TOPICS IN FRENCH STUDIES**

[1-3 hours] Study of a selected topic in French or Francophone language, literature, or culture. May be repeated when topic varies. Prerequisite: 2 3000 level courses

**FREN 4990 INDEPENDENT STUDY IN FRENCH**

[1-3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Consent of instructor

**FREN 5010 ADVANCED FRENCH STYLISTICS I**

[3 hours] A study of structural and stylistic principles of French with emphasis on various writing activities.

**FREN 5020 ADVANCED FRENCH STYLISTICS II**

[4 hours] A study of structural and stylistic principles of French with emphasis on various writing activities.

**FREN 5040 FRENCH LINGUISTICS**

[3 hours] Key issues in French linguistics and contrastive structures of French and English.

**FREN 5050 ADVANCED CONVERSATION**

[3 hours] Intensive practice in speaking French.

**FREN 5070 FRENCH TRANSLATION**

[3 hours] Practice in translation of texts from French into English and English into French. Subject matter area will include commerce, natural, physical, and social sciences and the humanities.

**FREN 5160 TEACHING COLLOQUIUM I**

[3 hours] A course in the theory and practice of teaching French and of second language acquisition in general.

**FREN 5170 TEACHING COLLOQUIUM II**

[3 hours] A course in the theory and practice of teaching French and of second language acquisition in general.

**FREN 5190 STUDY ABROAD**

[1-12 hours] Graduate credit may be granted for foreign study on the basis of credentials that certify the nature of the student's academic achievements in a French-speaking country. Prerequisite: Consent of instructor

**FREN 5200 CONTEMPORARY FRENCH AND FRANCOPHONE CIVILIZATION**

[3 hours] A study of contemporary France and/or Francophone cultures including discussion of economics, daily life, the family, social groups, industry, politics and education.

**FREN 5210 FRENCH FOR READING KNOWLEDGE I**

[3 hours] Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)

**FREN 5220 FRENCH FOR READING KNOWLEDGE II**

[3 hours] Course designed to develop sufficient reading proficiency to conduct and process research in French. (Not for majors)

**FREN 5230 FRANCE AND THE EUROPEAN UNION**

[3 hours] The European Union has political, economic and social functions that resemble those traditionally carried out by individual countries. French civilization will be seen in terms of both French and European political, economic, social and cultural structures today. Course given in French. Prerequisite: Advanced level French language proficiency

**FREN 5310 MEDIEVAL STUDIES**

[3 hours] Introduction to Old French and readings in the major genres from the twelfth through fifteenth centuries.

**FREN 5410 RENAISSANCE STUDIES**

[3 hours] Literature reflecting major currents of the Renaissance.

**FREN 5510 17TH CENTURY FRENCH LITERATURE**

[3 hours] A study of the development of French Classicism.

**FREN 5610 18TH CENTURY FRENCH LITERATURE**

[3 hours] Readings from the novels, plays and prose of the major writers of the Enlightenment.

**FREN 5710 19TH CENTURY FRENCH LITERATURE I**

[3 hours] Literary and intellectual trends from Romanticism to Symbolism.

**FREN 5720 19TH CENTURY FRENCH LITERATURE II**

[3 hours] Literary and intellectual trends from Romanticism to Symbolism.

**FREN 5810 CONTEMPORARY FRENCH & FRANCOPHONE LITERATURE I**

[3 hours] Literature of all genres from the period before World War I to the present.

**FREN 5820 CONTEMPORARY FRENCH AND FRANCOPHONE LITERATURE II**

[3 hours] Literature of all genres from the period after World War I to the present.

**FREN 5850 LE CINEMA FRANCAIS**

[3 hours] A study of the development of French film and its place in world cinema.

**FREN 5860 LA PRODUCTION FEMININE**

[3 hours] This course deals with examples of feminine production which have influenced French culture in the areas of film, literary criticism, literature, philosophy, psychoanalysis and semiotics.

**FREN 5980 SPECIAL TOPICS IN FRENCH STUDIES**

[3 hours] Study of a selected topic in French or Francophone language, literature, or culture. May be repeated when topic varies.

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### **FREN 5990 INDEPENDENT STUDY IN FRENCH**

[1-3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Consent of instructor

### **FREN 6900 RESEARCH IN FRENCH**

[1-3 hours] Independent research of a selected topic in French or Francophone language, literature, or culture. May be repeated once for additional credit.

### **FREN 6930 SEMINAR**

[1-3 hours] Study of selected topics in French or Francophone language, literature, or culture. May be repeated once for additional credit.

## **GEPL - Geography and Planning**

### **Department of Geography and Planning (ARS)**

#### **GEPL 1010 HUMAN GEOGRAPHY**

[3 hours] Presentations of major approaches to geographic thought: the natural environment, regional studies, human ecology, development issues and spatial interrelationships. (not for major credit) Social Sciences core course

#### **GEPL 1100 ENVIRONMENTAL GEOGRAPHY**

[3 hours] While gaining a fundamental understanding of the world's physical environment, students explore issues regarding humanity's interaction with the earth. Current issues such as global warming, acid rain, ozone depletion, deforestation and desertification are addressed. Social Sciences core course

#### **GEPL 2010 FUNDAMENTALS OF GEOGRAPHY**

[3 hours] An introduction to basic geographic concepts of both physical and human geography, with emphasis on the interrelationships of people with their physical and cultural environments. Social Sciences core course

#### **GEPL 2030 CULTURAL GEOGRAPHY**

[3 hours] A learning-through-writing course. Systematic applications of the concept of cultural to geographic themes: culture areas, cultural landscapes, culture history, cultural ecology and cultural diversity. Non-western multicultural course

#### **GEPL 2040 WORLD REGIONAL GEOGRAPHY**

[3 hours] The course examines the geographical distribution of urban, cultural, economic and demographic phenomena in several contrasting regions of the world.

#### **GEPL 2980 SELECTED TOPICS IN GEOGRAPHY**

[3 hours] Explores a topic representing a contemporary and significant issue of interest to geographers, the study of which reveals appropriate geographical principles, concepts and methodologies.

#### **GEPL 3030 GEOGRAPHY OF EUROPE**

[3 hours] A detailed study of several regions. Special consideration of agriculture, industry and commerce from a regional viewpoint. Russia excluded.

#### **GEPL 3050 GEOGRAPHY OF U.S. AND CANADA**

[3 hours] Systematic and regional survey of physical, social and economic geography of the region. Emphasis on the region with respect to worldwide/continental problems and prospects in economic development, management of resources and population adjustment. U.S. multicultural course

#### **GEPL 3060 GEOGRAPHY OF THE GREAT LAKES**

[3 hours] A geographic regional study of the Great Lakes, including the physical characteristics, impacts of resource uses, human activities, and related management and planning issues, with special focus on Lake Erie. Social Sciences core course

#### **GEPL 3120 GEOGRAPHY OF ASIA**

[3 hours] Compares and contrasts physical and human aspects of Asian countries and peoples in relation to economic development. Non-western multicultural course

#### **GEPL 3160 PATTERNS OF WORLD DEVELOPMENT**

[3 hours] An examination of contemporary global economic patterns and trends. Compares and contrasts population problems; the diffusion of multinational corporations, and the emergence of post-industrial economies.

#### **GEPL 3220 GEOGRAPHY OF AFRICA**

[3 hours] Course begins with a general overview of Africa's physical environment, its colonial history and its people and cultures. It then examines a variety of themes associated with development, population, urban and political geography. Non-western multicultural course

#### **GEPL 3300 GEOGRAPHY OF LATIN AMERICA**

[3 hours] Survey and analysis of the physical and cultural characteristics of Latin America. Non-western multicultural course

#### **GEPL 3420 QUANTITATIVE METHODS AND MAPPING**

[4 hours] The presentation of quantitative methods and statistics in a spatial context with an emphasis on cartographic display of results. Social Sciences core course

#### **GEPL 3440 POPULATION GEOGRAPHY**

[3 hours] A learning through writing course. Space and place facets of population size, growth, migration, distribution and composition with emphasis on the population trends and patterns in both developing and developed nations.

#### **GEPL 3460 GEOGRAPHY OF HOUSING**

[3 hours] An examination of the spatial dynamics and socioeconomic problems associated with housing submarkets in the US and in selected countries. Innovative policies for neighborhoods, communities and cities are reviewed.

#### **GEPL 3540 WEATHER AND CLIMATE**

[3 hours] A survey analysis of meteorology and climatology. The physical processes of weather and the pattern of climate provide the basis for this course.

#### **GEPL 3550 PHYSICAL GEOGRAPHY**

[3 hours] The development, characteristics and distribution of landforms, soils, vegetation, water resources and climates are presented.

#### **GEPL 3610 CONSERVATION AND RESOURCES**

[3 hours] An examination of the basic philosophies, principles and ethics of conservation and resource use. Case studies of selected resource management and environmental problems.

#### **GEPL 3650 INDUSTRIAL GEOGRAPHY**

[3 hours] An introduction to industrial geography; including industrial location theory, competing production systems, and shifts from manufacturing to service-based economies.

#### **GEPL 3710 URBAN ENVIRONMENTS**

[3 hours] Social, political and economic functions of cities. Geographic perspectives on land use, residential and consumer behavior, health care, recreation and criminal justice systems in contemporary and future cities.

#### **GEPL 3750 TRANSPORTATION GEOGRAPHY**

[3 hours] The role of transportation and communication in the economic development of places. Theories of geographic interaction, location of transport routes and the developmental implications of transport investments are explored.

#### **GEPL 3810 POLITICAL GEOGRAPHY**

[3 hours] An examination of geopolitical and geostrategic issues at the nation-state and international level.

#### **GEPL 3860 GENDER ISSUES IN GEOGRAPHY**

[3 hours] Traces the development and institutionalization of gender roles and how these influence spatial decisions and the formation of perceptual landscapes.

#### **GEPL 3890 GEOGRAPHIC RESEARCH & NATURAL DISASTERS**

[3 hours] Analysis and evaluation of all types of natural disasters within a geographic framework. Some discussion of physical processes, but focus is on social/economic implications of natural hazards and disasters on a worldwide scale.

#### **GEPL 3900 ENVIRONMENTAL PLANNING**

[3 hours] GEPL 1100, 3550 or 3540 recommended. Explores history, goals, methods, ethics and social dilemmas encountered when trying to achieve environmentally sensitive planning. Presents case studies of environmental planning successes and failures, both within and outside the U.S. Prerequisite: Major in either environmental sciences or environmental studies

#### **GEPL 4040 GEOGRAPHY EDUCATION STRATEGIES**

[3 hours] Use of geographic inquiry in the emerging integrated social studies and standard geography education curricula for K-12 instruction. Social Sciences core course

#### **GEPL 4180 GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS**

[4 hours] Advanced applications in geographic information systems (GIS) with an emphasis on advanced GIS analysis techniques, Global Positioning System applications in GIS, database design, and a survey of vector- and raster-based GIS software and databases. Prerequisite: GEPL 4510

**GEPL 4210 LAND USE PLANNING**

[3 hours] A broad review of urban and regional planning in the US and Western Europe, introducing land use planning concepts and practices and their role in shaping the direction of urban development.

**GEPL 4490 REMOTE SENSING OF THE ENVIRONMENT**

[4 hours] Introduction to theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition. Recommended: GEPL 3350.

**GEPL 4500 DIGITAL IMAGE ANALYSIS**

[4 hours] Explores digital image analysis techniques such as classification and principle component analysis. Terrestrial and coastal applications of satellite image analysis are performed in intensive laboratory sessions. Prerequisite: GEPL 4490

**GEPL 4510 GEOGRAPHIC INFORMATION SYSTEMS**

[4 hours] Introduction to computerized methods for the capture, storage, management, analysis and display of spatially-referenced data for the solution of planning, management and research problems. Prerequisite: GEPL 2400

**GEPL 4520 ANALYTICAL AND COMPUTER CARTOGRAPHY**

[4 hours] The theoretical and mathematical foundations of the mapping process in a digital environment. An introduction to the structure and manipulation of graphic and nongraphic geographical data to produce maps. Prerequisite: GEPL 4510

**GEPL 4530 PRINCIPLES OF URBAN PLANNING**

[3 hours] An introduction to planning theory. the planner's role in land use regulation economic development, housing and social service delivery is reviewed.

**GEPL 4550 COMMUNITY ECONOMIC DEVELOPMENT PLANNING**

[3 hours] This course explores community-based alternatives and bottom-up development as a response to economic and social difficulties. The specific issues, strategies and applications of this approach are discussed.

**GEPL 4570 LAND DEVELOPMENT AND PLANNING**

[4 hours] The exploration of theoretical location analysis, pragmatic land development issues and analytic feasibility tools, and the consequences of land use policies that affect development.

**GEPL 4580 LOCATION ANALYSIS**

[4 hours] The application of geographic location theory, spatial interaction modeling, optimization techniques and geographic information system processing to the solution of facility location problems. Prerequisite: GEPL 4570

**GEPL 4600 URBAN DESIGN**

[3 hours] Concepts and procedures for the organization, design and development of public and private urban forms and spaces at the micro level, including a survey of intraurban elements, cultural, ecological and aesthetic considerations, and interdisciplinary collaboration.

**GEPL 4890 FIELD EXPERIENCE**

[3 hours] Personal explorations of urban space and place emphasizing an array of practical and ethical issues in the collection and interpretation of primary geographic data.

**GEPL 4900 PROSEMINAR IN GEOGRAPHY**

[3 hours] Prerequisite: 6 hours in geography and consent of instructor

**GEPL 4910 DIRECTED RESEARCH IN GEOGRAPHY**

[1-4 hours] Prerequisite: Consent of instructor

**GEPL 4920 DIRECTED READINGS IN GEOGRAPHY**

[1-3 hours] Prerequisite: Consent of the instructor

**GEPL 4960 HONORS THESIS IN GEOGRAPHY**

[4 hours]

**GEPL 5040 GEOGRAPHY EDUCATION STRATEGIES**

[3 hours] Graduate level preparation for K - 12 educators with geography specialization. Integrates social studies and standard geography curricula in response to state and federal mandates.

**GEPL 5180 GEOGRAPHIC INFORMATION SYSTEMS APPLICATIONS**

[4 hours] Advanced applications in geographic information systems (GIS) with an emphasis on advanced GIS analysis techniques, Global Positioning System applications in GIS, database design, and a survey of vector- and raster-based GIS software and databases. Research project required.

**GEPL 5210 LAND USE PLANNING**

[3 hours] A broad review of urban and regional planning in the US and Western Europe, introducing land use planning concepts and practices and their role in shaping the direction of urban development.

**GEPL 5490 REMOTE SENSING OF THE ENVIRONMENT**

[4 hours] Immersion in theory, methods and techniques used to gather and analyze remote sensor data. Topics range from low altitude air photo interpretation through satellite image acquisition. Recommended GEPL 3550.

**GEPL 5500 DIGITAL IMAGE ANALYSIS**

[4 hours] Explores digital image analysis techniques such as classification and principal components analysis. Terrestrial and coastal applications of satellite image analysis are performed in intensive laboratory sessions. Prerequisite: GEPL 4490 or 5490

**GEPL 5510 GEOGRAPHIC INFORMATION SYSTEMS**

[4 hours] Introduction to computerized methods for the capture, storage, management, analysis and display of spatially-referenced data for the solution of planning, management and research problems. Prerequisite: GEPL 2400

**GEPL 5520 ANALYTICAL AND COMPUTER CARTOGRAPHY**

[4 hours] The theoretical and mathematical foundations of the mapping process in a digital environment. An introduction to the structure and manipulation of graphic and nongraphic geographical data to produce maps. Prerequisite: GEPL 5510

**GEPL 5530 PRINCIPLES OF URBAN PLANNING**

[3 hours] Elaborations on planning theory. The planner's role in land use regulation, economic development, housing and social service delivery is reviewed.

**GEPL 5550 COMMUNITY ECONOMIC DEVELOPMENT PLANNING**

[3 hours] This course explores community-based alternatives and bottom-up development as a response to economic and social difficulties. The specific issues, strategies and applications of this approach are discussed.

**GEPL 5570 LAND DEVELOPMENT AND PLANNING**

[4 hours] The exploration of theoretical location analysis, pragmatic land development issues and analytic feasibility tools, and the consequences of land use policies that affect development.

**GEPL 5580 LOCATION ANALYSIS**

[4 hours] The application of geographic location theory, spatial interaction modeling, optimization techniques and geographic information system processing to the solution of facility location problems. Prerequisite: GEPL 5570

**GEPL 5600 URBAN DESIGN**

[3 hours] Concepts and procedures for the organization, design and development of public and private urban forms and spaces at the micro-level, including a survey of intraurban elements, cultural, ecological and aesthetic considerations, historic preservation, and interdisciplinary collaboration. Research project required.

**GEPL 5890 FIELD EXPERIENCE**

[3 hours] Personal explorations of urban space and place emphasizing an array of practical and ethical issues in the collection and interpretation of primary geographic data.

**GEPL 5910 DIRECTED RESEARCH IN GEOGRAPHY**

[1-3 hours] Prerequisite: Consent of Instructor

**GEPL 5920 DIRECTED READINGS IN GEOGRAPHY**

[1-3 hours] Prerequisite: Consent of Instructor

**GEPL 6100 PHILOSOPHY & GENERAL METHODOLOGY**

[3 hours] Past and current trends in geographic thought and related methodological implications, with elaborations by current faculty members.

**GEPL 6150 SEMINAR IN RESEARCH METHODS**

[4 hours] A computer-based course in geographic research methodology. The course includes an introduction to research design, data measurement, spatial sampling and multivariate approaches to the study of areal networks and spatial distributions.

**GEPL 6160 SEMINAR IN SPATIAL ANALYSIS**

[4 hours] A computer-based laboratory course in multivariate spatial analysis methodologies. The course includes the study of spatial graphics and mapping, computerized regionalization, areal forecasting and predictive modeling techniques. Prerequisite: GEPL 6150

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### **GEPL 6190 ADVANCED GEOGRAPHIC INFORMATION SYSTEMS SEMINAR**

[4-6 hours] Seminar in advanced GIS topics which include database design, spatial analysis and specialized application to spatial problems. Prerequisite: GEPL 5180/6180

### **GEPL 6200 EARTH SYSTEM SCIENCE THROUGH INQUIRY-BASED LEARNING**

[3 hours] The course is geared towards in-service teachers. Teachers will explore four natural events affecting the earth as a system, using inquiry-based learning and lesson plan development.

### **GEPL 6250 ADVANCED REMOTE SENSING SEMINAR**

[3 hours] Explores advanced remote sensing techniques using satellite imagery and applications, including water resources, urbanization and agriculture. Prerequisite: GEPL 5490

### **GEPL 6300 SEMINAR IN RESOURCE MANAGEMENT**

[3 hours] Intensive group study of major themes in the resource management literature. Primary emphasis is placed on individual student research projects oriented toward resource management problems.

### **GEPL 6400 SEMINAR/ENVIRONMENTAL PERCEPTION**

[3 hours] Explores current research in environmental perception/behavioral geography. Addresses how environmental perception (or, cognition) affects the way people respond to and interact with their surroundings.

### **GEPL 6530 SEMINAR-URBAN/REGIONAL PLANNING APPLICATIONS**

[3 hours] The course applies forecasting and projection techniques to urban and regional problems. Population, economic base, land use, retail and fiscal impact analyses are examined.

### **GEPL 6550 SEMINAR IN ENVIRONMENT PLANNING**

[3 hours] An introduction to and the practical application of scientific and technical Germanic language in the German-speaking world. Course is conducted in German. Prerequisite: GERM 2150 or permission of instructor

### **GEPL 6570 SEMINAR IN NEIGHBORHOOD REVITALIZATION**

[3 hours] Intensive group study of major themes in the revitalization of urban neighborhoods, both residential and commercial. Major emphasis is placed upon individual residential and commercial. Major emphasis is placed upon individual student research projects oriented toward specific revitalization problems.

### **GEPL 6580 URBAN DEVELOPMENT AND HOUSING**

[3 hours] Course examines the changing land use and functions of metropolitan regions. City suburban linkages, urban restructuring, urban policy and metropolitan planning issues are examined.

### **GEPL 6590 SEMINAR-HEALTH CARE SYSTEM DESIGN**

[3 hours] A seminar in theoretical and applied location issues related to medical geography and health care delivery systems. Emphasis is placed on the allocation of services to meet the geographic distribution of health needs.

### **GEPL 6700 TEACHING PRACTICUM IN GEOGRAPHY**

[1-6 hours] Methods of teaching geography in a university of college setting. Supervision of labs or discussion.

### **GEPL 6910 PROBLEMS IN GEOGRAPHY**

[1-2 hours] The course is used to search for a thesis topic prior to formal admittance as a M.A candidate.

### **GEPL 6930 GENERAL SEMINAR**

[3 hours] Prerequisite: 6 hrs in geography and consent of instructor

### **GEPL 6940 INTERNSHIP IN PLANNING**

[1-6 hours] Professional work experience with a Greater Toledo planning organization related to academic education.

### **GEPL 6950 APPLIED GEOGRAPHIC WORKSHOP**

[3 hours] Capstone course for GIS/Applied Geographics certificate program to provide hands-on experience in applying GIS, remote sensing and desktop mapping systems to spatially-oriented problems that are unique to their individual disciplines. Prerequisite: 12 credits from any of the following (GEPL 5180, GEPL 5490, GEPL 5500, GEPL 5510, GEPL 5520, GEPL 6190).

### **GEPL 6960 THESIS**

[1-6 hours] Work on a thesis is the culmination of graduate education and occupies most of the second year.

## **GERM - German**

### **Department of Foreign Languages (ARS)**

### **GERM 1080 GERMAN CULTURE AND COMMERCE**

[3 hours] Study of German culture and society with emphasis on business and economics. Taught in English. (Not for major credit.) Humanities core course

### **GERM 1090 INTRODUCTION TO MODERN GERMAN CULTURE**

[3 hours] An introduction to principal social, artistic and literary aspects of modern German culture. Taught in English. (Not for major credit.) Humanities core course

### **GERM 1110 ELEMENTARY GERMAN I**

[4 hours] An introduction to German language and culture through listening, speaking, reading and writing. Laboratory practice required.

### **GERM 1120 ELEMENTARY GERMAN II**

[4 hours] An introduction to German language and culture through listening, speaking, reading and writing. Laboratory practice required. Prerequisite: GERM 1110 or satisfactory score on placement test Humanities core course

### **GERM 1500 REVIEW OF ELEMENTARY GERMAN**

[4 hours] Review of first-year college German for students who studied the language in high school and who need to strengthen communication skills, vocabulary, grammar and pronunciation before study at the 2000 level. (not for major credit) Prerequisite: high school German; placement test Humanities core course

### **GERM 2140 INTERMEDIATE GERMAN I**

[3 hours] Practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (not for major credit) Prerequisite: GERM 1120, 1500 or satisfactory score on placement test. Humanities core course

### **GERM 2150 INTERMEDIATE GERMAN II**

[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (Not for major credit) Prerequisite: GERM 2140 or satisfactory score on placement test Humanities core course

### **GERM 2190 STUDY ABROAD**

[1-3 hours] The course permits beginning students of German to study or work in a country where German is spoken. Credit will be awarded in accordance with established departmental procedures. (Not for major credit.) Prerequisite: GERM 2150 & consent of instructor

### **GERM 3010 CONVERSATION AND COMPOSITION I**

[3 hours] Work on advanced listening, speaking, reading and writing skills through intensive work with authentic texts that deal with contemporary issues relating to the German-speaking world. Prerequisite: GERM 2150 or satisfactory score on placement test.

### **GERM 3020 CONVERSATION AND COMPOSITION II**

[3 hours] Work on advanced speaking, listening, reading and writing skills through intensive work with authentic texts that deal with contemporary issues relating to the German-speaking world. A writing-intensive course. Prerequisite: GERM 3010 or consent of instructor

### **GERM 3170 BUSINESS GERMAN**

[3 hours] An introduction to the language and practices of German business and commerce. Prerequisite: GERM 2150 or consent of instructor

### **GERM 3180 SCIENTIFIC AND TECHNICAL GERMAN**

[3 hours] An introduction to and the practical application of scientific and technical German language in the German-speaking world. Course is conducted in German. Prerequisite: GERM 2150 or permission of instructor

### **GERM 3200 SURVEY OF GERMAN LITERATURE**

[3 hours] A survey of German literature from its origins to the present, with emphasis on literature after 1750. Prerequisite: GERM 2150 or consent of instructor

### **GERM 3410 SURVEY OF GERMAN CIVILIZATION I**

[3 hours] A study of different aspects of German culture and civilization such as fine arts, history, science and philosophy. Prerequisite: GERM 2150 or consent of instructor

### **GERM 3420 SURVEY OF GERMAN CIVILIZATION II**

[3 hours] A study of different aspects of German culture and civilization such as fine arts, history, science and philosophy. Prerequisite: GERM 2150 or consent of instructor



**GERM 4010 GERMAN SYNTAX AND STYLISTICS I**

[3 hours] Refinement of conversation and composition skills through the analysis of texts and written and oral exercises. Prerequisite: GERM 3020 or permission of instructor

**GERM 4020 ADVANCED CONVERSATION AND COMPOSITION II**

[4 hours] A practical application of language skills in the preparation of a German-related project chosen, developed and presented by the student. A writing-intensive and capstone course. Prerequisite: GERM 3020 or permission of instructor

**GERM 4160 TEACHING COLLOQUIUM**

[3 hours] A course in the theory and practice of teaching German and of second language acquisition in general.

Prerequisite: two 3000 level courses

**GERM 4190 STUDY ABROAD**

[1-12 hours] The course permits the German major or minor to study or work in a country where German is spoken. Credit awarded in accordance with established departmental procedures. Prerequisite: GERM 3020; permission of instructor

**GERM 4200 GERMAN CULTURE AND CIVILIZATION**

[3 hours] Study of major trends and current developments in German Landeskunde. May be repeated when topic varies. Prerequisite: GERM 3410 or 3420 & 1 additional course at 3000 level

**GERM 4500 HISTORY OF THE GERMAN LANGUAGE**

[3 hours] The course traces the emergence of the German language from its Indo-European roots to its present-day form with regard to phonological, morphological, semantic and syntactic developments. Prerequisite: Two 3000 level courses or permission of instructor

**GERM 4510 GERMAN LITERATURE BEFORE 1750**

[3 hours] Study of major works, figures and trends in a period of German literary history before 1750 such as Middle High German or Baroque. Prerequisite: Two 3000 level courses

**GERM 4610 GERMAN LITERATURE OF THE 18TH CENTURY**

[3 hours] Study of writers from Leibniz to Lessing and their contributions to German Enlightenment. Prerequisite: Two 3000 level courses

**GERM 4620 GERMAN CLASSICISM**

[3 hours] Study of Classical writers of Germany: Goethe, Schiller and their contemporaries. Prerequisite: Two 3000 level courses

**GERM 4710 GERMAN LITERATURE OF THE 19TH CENTURY**

[3 hours] Study of selected works by authors from Büchner to Fontane. Prerequisite: Two 3000 level courses

**GERM 4720 GERMAN ROMANTICISM**

[3 hours] Study of Romantic writers of Germany such as Novalis, Eichendorff, E.T.A. Hoffmann and Bettina Brentano. Prerequisite: Two 3000 level courses

**GERM 4810 GERMAN LITERATURE OF THE 20TH CENTURY**

[3 hours] Study of selected works by authors from the turn of the century to the present. Prerequisite: Two 3000 level courses

**GERM 4850 GENRE STUDIES**

[3 hours] Study of a selected literary or film genre, its development, and its influence on German culture. May be repeated for credit when topic varies. Prerequisite: Two 3000 level courses

**GERM 4870 GERMAN LITERATURE IN TRANSLATION**

[3 hours] In-depth study of selected works of German literature in English translation. (Not for major credit).

**GERM 4900 STUDIES IN THE WORKS OF AN AUTHOR OR AUTHORS**

[1-3 hours] Readings of the works of a major author or authors of German literature. May be repeated when topic varies. Prerequisite: two 3000 level courses

**GERM 4910 HONORS RESEARCH IN GERMAN**

[3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Honors student status & permission of instructor

**GERM 4940 WORK EXPERIENCE ABROAD**

[1-12 hours] Educational work experience in a selected professional field. Experience must be carried out in a German-speaking country. Maximum of 3 hours may be applied to the German major or minor program. Prerequisite: GERM 3020 or permission of instructor

**GERM 4980 SPECIAL TOPICS IN GERMAN STUDIES**

[1-3 hours] Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies. Prerequisite: Two 3000 level courses

**GERM 4990 INDEPENDENT STUDY IN GERMAN**

[1-3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Permission of instructor

**GERM 5010 GERMAN SYNTAX AND STYLISTICS I**

[3 hours] A review of German stylistic structures through the analysis of texts and written and oral exercises.

**GERM 5020 GERMAN SYNTAX AND STYLISTICS II**

[4 hours] Further review of German stylistic structures through the analysis of texts and written and oral exercises. Prerequisite: GERM 5010

**GERM 5160 TEACHING COLLOQUIUM**

[3 hours] A practical course in the theories, methods and specific techniques of teaching German. May be repeated once for additional credit.

**GERM 5190 STUDY ABROAD**

[1-12 hours] Graduate credit may be granted for foreign study on the basis of credentials that certify the nature of the student's academic achievements in a German-speaking country. Prerequisite: Permission of instructor

**GERM 5200 GERMAN CULTURE AND CIVILIZATION**

[3 hours] Study of major trends and current developments in German Landeskunde. May be repeated when topic varies.

**GERM 5210 GERMAN FOR READING KNOWLEDGE I**

[3 hours] Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in German. (Not for major credit).

**GERM 5220 GERMAN FOR READING KNOWLEDGE II**

[3 hours] Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in German. (Not for major credit).

**GERM 5500 HISTORY OF THE GERMAN LANGUAGE**

[3 hours] The course traces the emergence of the German language from its Indo-European roots to its present-day form with regard to phonological, morphological, semantic and syntactic developments.

**GERM 5510 GERMAN LITERATURE BEFORE 1750**

[3 hours] Study of major works, figures and trends in a period of German literary history before 1750 such as Middle High German or Baroque.

**GERM 5610 GERMAN LITERATURE OF THE 18TH CENTURY**

[3 hours] Study of writers from Leibniz to Lessing and their contributions to German Enlightenment.

**GERM 5620 GERMAN CLASSICISM**

[3 hours] Study of Classical writers of Germany: Goethe, Schiller and their contemporaries.

**GERM 5710 GERMAN LITERATURE OF THE 19TH CENTURY**

[3 hours] Study of selected works by authors from Büchner to Fontane.

**GERM 5720 GERMAN ROMANTICISM**

[3 hours] Study of Romantic writers of Germany such as Novalis, Eichendorff, E.T.A. Hoffmann and Bettina Brentano.

**GERM 5810 GERMAN LITERATURE OF THE 20TH CENTURY**

[3 hours] Study of selected works by authors from the turn of the century to the present.

**GERM 5850 GENRE STUDIES**

[3 hours] Study of a selected literary or film genre, its development, and its influence on German culture. May be repeated for credit when topic varies.

**GERM 5870 GERMAN LITERATURE IN TRANSLATION**

[3 hours] In-depth study of selected works of German literature in English translation. (Not for major credit).

**GERM 5940 WORK EXPERIENCE ABROAD**

[1-6 hours] Educational work experience in a selected professional field. Experience must be carried out in a German-speaking country. Prerequisite: Permission of instructor

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### **GERM 5950 STUDIES IN THE WORKS OF AN AUTHOR OR AUTHORS**

[1-3 hours] Readings of the works of a major author or authors of German literature. May be repeated when topic varies.

### **GERM 5980 SPECIAL TOPICS IN GERMAN STUDIES**

[1-3 hours] Study of a selected topic in German language, literature, or culture. May be repeated for credit when topic varies.

### **GERM 5990 INDEPENDENT STUDY IN GERMAN**

[1-3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Permission of instructor

### **GERM 6900 RESEARCH IN GERMAN**

[1-3 hours] Independent research of a selected topic in German language, literature, or culture. May be repeated once for additional credit.

### **GERM 6930 SEMINAR: SELECTED TOPICS**

[1-3 hours] Study of selected topics in German language, literature, or culture. May be repeated once for additional credit.

## **GIFT - Gifted and Talented Education**

### **Department of Early Childhood, Physical and Special Education (EDU)**

### **GIFT 5100 INTRODUCTION TO TALENTED AND GIFTED EDUCATION**

[3 hours] Survey of major topics about the education and development of talents and gifts, including history, identification, social-emotional development, curriculum, creativity, intelligence, programming and evaluation.

### **GIFT 5200 ASSESSMENT AND EVALUATION IN TALENTED AND GIFTED EDUCATION**

[3 hours] The study of assessment and evaluation as it pertains to the special educational needs of talented and gifted persons. Theoretical and practical issues in assessing talent domains and educational programs are emphasized. Prerequisite: GIFT 5100

### **GIFT 5300 SOCIOEMOTIONAL DEVELOPMENT OF THE TALENTED AND GIFTED**

[3 hours] Examination of the social and emotional needs of talented and gifted persons within the context of roles in family, school and society. Attention to issues of guidance, parenting, special populations and underachievement. Prerequisite: GIFT 5100

### **GIFT 5400 CREATIVITY IN THE CLASSROOM**

[3 hours] Explores existing theories about creativity; examination of approaches and their implementation within various educational settings. Prerequisite: GIFT 5100

### **GIFT 5500 CURRICULUM I: DIFFERENTIATION FOR THE TALENTED AND GIFTED**

[3 hours] The study of curriculum models, theories and trends, principles and practices of differentiation, and application of content within various educational settings. Prerequisite: GIFT 5100 or permission of instructor

### **GIFT 5600 CURRICULUM II: INTEGRATING & IMPLEMENTING SERVICE PLANS FOR THE TALENTED & GIFTED**

[3 hours] The study, development and implementation of curriculum models across content areas both vertically and horizontally within various educational settings. Focuses on multi-exceptionalities and implications of varied service delivery plans. Prerequisite: GIFT 5100; GIFT 5500 or permission of instructor

### **GIFT 5700 PRACTICUM IN TALENTED AND GIFTED EDUCATION**

[3-6 hours] Provides opportunities for field experience to use and refine the strategies for persons with talented and gifted abilities. Prerequisite: GIFT 5100 Corequisite: GIFT 5500 or GIFT 5600

### **GIFT 6000 ISSUES & TRENDS IN TALENTED AND GIFTED EDUCATION**

[3 hours] The course examines the current theoretical and practical issues that are dominating the literature in the field. Perennial issues such as identification and intelligence will be discussed, as well as emergent topics such as the biological bases of advanced development and creativity and emotional adjustment. Prerequisite: GIFT 5100

### **GIFT 6100 ADVANCED DEVELOPMENT IN SOCIAL, CULTURAL & POLITICAL CONTEXT IN TALENTED & GIFTED EDUCATION**

[3 hours] The course explores social, cultural and political contexts related to advanced development or expression of talents. Emphasizes personal reflection and recognition of hegemony related to gifted individuals' past, present and future. Prerequisite: GIFT 5100, 5300, or permission of instructor

### **GIFT 6900 ADVANCED SEMINAR IN TEACHING, LEARNING & CURRICULUM THEORY IN TALENTED & GIFTED EDUCATION**

[3 hours] The course studies teaching, learning and curriculum from theoretical and historical perspectives to establish defensible lines of scholarly inquiry in gifted education. Prerequisite: GIFT 5600 or permission of instructor

### **GIFT 6910 SEMINAR IN TALENT & ADVANCED DEVELOPMENT I: ACADEMIC TALENTS**

[3 hours] The course studies the theoretical and research basis of development of specific academic domains, such as science, mathematics, language and literature, etc. Attention is paid to tacit as well as more public kinds of knowledge. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

### **GIFT 6920 SEMINAR IN TALENT & ADVANCED DEVELOPMENT II: AESTHETIC TALENTS**

[3 hours] The course studies development and expression of aesthetic abilities and talents such literacy, theatrical and/or musical expressiveness, visual and performing arts, emotional giftedness, movement and dance. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

### **GIFT 6930 SEMINAR IN TALENT & ADVANCED DEVELOPMENT III: PRACTICAL, FOLK & SPORT**

[3 hours] The course studies the theoretical and research basis for development of talents in folk, practical and athletic domains. Attention is paid to tacit, esoteric and public forms of knowledge. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

### **GIFT 6950 MASTER'S RESEARCH PROJECT IN TALENTED AND GIFTED EDUCATION**

[3 hours] Independent research project that integrates and synthesizes concepts and practices in gifted and talented education with implementation of action research and practical inquiry study. Prerequisite: GIFT 5400, 5500, 5600

### **GIFT 6980 SPECIAL TOPICS ABOUT ADVANCED DEVELOPMENT IN THE TALENTED AND GIFTED**

[3-6 hours] Collaborative inquiry into emerging topics in the field. This course is open to advanced graduate students in the master's or doctoral program. Prerequisite: Permission of instructor

### **GIFT 6990 INDEPENDENT STUDY IN THE DEVELOPMENT OF THE TALENTED & GIFTED**

[1-6 hours] Directed readings and/or study on a topic selected in conjunction with a faculty mentor. Prerequisite: Permission of instructor

### **GIFT 7100 INTRODUCTION TO TALENTED AND GIFTED EDUCATION**

[3 hours] Survey of major topics about the education and development of talents and gifts, including history, identification, social-emotional development, curriculum, creativity, intelligence, programming and evaluation.

### **GIFT 7200 ASSESSMENT AND EVALUATION IN TALENTED AND GIFTED EDUCATION**

[3 hours] The study of assessment and evaluation as it pertains to the special educational needs of talented and gifted persons. Theoretical and practical issues in assessing talent domains and educational programs are emphasized. Prerequisite: GIFT 5100

### **GIFT 7300 SOCIOEMOTIONAL DEVELOPMENT OF THE TALENTED AND GIFTED**

[3 hours] Examination of the social and emotional needs of talented and gifted persons within the context of roles in family, school and society. Attention to issues of guidance, parenting, special populations and underachievement. Prerequisite: GIFT 5100

**GIFT 7400 CREATIVITY IN THE CLASSROOM**

[3 hours] Explores existing theories about creativity; examination of approaches and their implementation within various educational settings. Prerequisite: GIFT 5100

**GIFT 7500 CURRICULUM I: DIFFERENTIATION FOR THE TALENTED AND GIFTED**

[3 hours] The study of curriculum models, theories and trends, principles and practices of differentiation, and application of content within various educational settings. Prerequisite: GIFT 5100 or permission of instructor

**GIFT 7600 CURRICULUM II: INTEGRATING & IMPLEMENTING SERVICE PLANS FOR THE TALENTED & GIFTED**

[3 hours] The study, development and implementation of curriculum models across content areas both vertically and horizontally within various educational settings. Focuses on multi-exceptionalities and implications of varied service delivery plans. Prerequisite: GIFT 5100; GIFT 5500 or permission of instructor

**GIFT 7700 PRACTICUM IN TALENTED AND GIFTED EDUCATION**

[3-6 hours] Provides opportunities for field experience to use and refine the strategies for persons with talented and gifted abilities. Prerequisite: GIFT 5100 Corequisite: GIFT 5500 or GIFT 5600

**GIFT 8000 ISSUES & TRENDS IN TALENTED AND GIFTED EDUCATION**

[3 hours] The course examines the current theoretical and practical issues that are dominating the literature in the field. Perennial issues such as identification and intelligence will be discussed, as well as emergent topics such as the biological bases of advanced development and creativity and emotional adjustment. Prerequisite: GIFT 5100

**GIFT 8100 ADVANCED DEVELOPMENT IN SOCIAL, CULTURAL & POLITICAL CONTEXT IN TALENTED & GIFTED EDUCATION**

[3 hours] The course explores social, cultural and political contexts related to advanced development or expression of talents. Emphasizes personal reflection and recognition of hegemony related to gifted individuals' past, present and future. Prerequisite: GIFT 5100, 5300, or permission of instructor

**GIFT 8900 ADVANCED SEMINAR IN TEACHING, LEARNING & CURRICULUM THEORY IN TALENTED & GIFTED EDUCATION**

[3 hours] The course studies teaching, learning and curriculum from theoretical and historical perspectives to establish defensible lines of scholarly inquiry in gifted education. Prerequisite: GIFT 5600 or permission of instructor

**GIFT 8910 SEMINAR IN TALENT & ADVANCED DEVELOPMENT I: ACADEMIC TALENTS**

[3 hours] The course studies the theoretical and research basis of development of specific academic domains, such as science, mathematics, language and literature, etc. Attention is paid to tacit as well as more public kinds of knowledge. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

**GIFT 8920 SEMINAR IN TALENT & ADVANCED DEVELOPMENT II: AESTHETIC TALENTS**

[3 hours] The course studies development and expression of aesthetic abilities and talents such literacy, theatrical and/or musical expressiveness, visual and performing arts, emotional giftedness, movement and dance. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

**GIFT 8930 SEMINAR IN TALENT & ADVANCED DEVELOPMENT III: PRACTICAL, FOLK & SPORT**

[3 hours] The course studies the theoretical and research basis for development of talents in folk, practical and athletic domains. Attention is paid to tacit, esoteric and public forms of knowledge. Majors must take a minimum of 2 GIFT seminars from GIFT 6910/8910, 6920/8920 and 6930/8930. Prerequisite: GIFT 6000 or permission of instructor

**GIFT 8940 INTERNSHIP IN GIFTED STUDIES**

[3-6 hours] Supervised internship in college teaching, or administration/leadership in agencies, or research and evaluation for advanced graduate students to practice skills and knowledge within settings relevant to career goals in talented and gifted education. Course may be repeated. Prerequisite: Permission of major adviser

**GIFT 8960 DOCTORAL DISSERTATION**

[1-15 hours] Developing, conducting analyzing and writing the dissertation.

**GIFT 8980 SPECIAL TOPICS ABOUT ADVANCED DEVELOPMENT IN THE TALENTED AND GIFTED**

[3-6 hours] Collaborative inquiry into emerging topics in the field. This course is open to advanced graduate students in the master's or doctoral program. Prerequisite: Permission of instructor

**GIFT 8990 INDEPENDENT STUDY IN THE DEVELOPMENT OF THE TALENTED & GIFTED**

[1-6 hours] Directed readings and/or study on a topic selected in conjunction with a faculty mentor. Prerequisite: Permission of instructor

## GLST - Global Studies

### Department of Political Science and Public Administration (ARS)

**GLST 2000 PRINCIPLES OF GLOBAL STUDIES**

[3 hours] A multidisciplinary exploration of the world. Global processes will be examined using many viewpoints, such as culture, politics, economics, geography and philosophy. Non-western multicultural course

**GLST 2980 TOPICS IN GLOBAL STUDIES**

[3 hours] An exploration of a specific global issue. Approaches will be explicitly multidisciplinary and will make use of a variety of perspectives. May be repeated for credit.

**GLST 4900 SENIOR SEMINAR IN GLOBAL STUDIES**

[3 hours] Theories and research methods in global studies will be examined. A major component of the course will be a research project on some aspect of global studies. Prerequisite: GLST 2000 or 9 hours of courses on international subjects

**GLST 4960 HONORS THESIS IN GLOBAL STUDIES**

[3 hours] Supervised research and writing for honors students only. May be taken twice for credit. Prerequisite: GLST 2000 or 9 hours of courses on international subjects

**GLST 4980 ADVANCED TOPICS IN GLOBAL STUDIES**

[3 hours] An advanced multidisciplinary exploration of a specific issue in global studies. May be repeated for credit.

## HCAR - Health Care

### Department of Public Health and Rehabilitative Services (HHS)

**HCAR 4360 QUALITY IMPROVEMENT IN HEALTH CARE**

[3 hours] Purpose and philosophy of quality assessment and system design. Selection/application of tools for data collection, analysis and problem resolution. Incorporates requirements of Joint Commission on the Accreditation of Healthcare Organizations.

**HCAR 4500 HEALTH CARE INFORMATICS**

[4 hours] Case study approach to application and evaluation of health care-related information systems. Includes different information systems used in health care organizations. Basic systems concepts and interrelation between departments and entire organizations.

**HCAR 4510 MEDICAL AND LEGAL ASPECTS OF HEALTH CARE**

[3 hours] Coverage of historical development of legal controls in health care facilities, contemporary legal medical analysis and strategy. Also involves major factors influencing education in the allied health professions. Prerequisite: BUAD 3470

**HCAR 4530 PROBLEM SOLVING IN HEALTH CARE ENVIRONMENT**

[4 hours] An investigation and study of problem solving and effective decision making within the dynamics of current health care organizations.

**HCAR 4540 INTERNSHIP IN HEALTH MID-MANAGEMENT**

[3 hours] Internship in institutional health care focusing on mid-management.

**HCAR 4550 HEALTH CARE FINANCE**

[3 hours] Study of financial problems and current sources of reimbursement to health care organizations. Emphasis on departmental financial management as integrated with financial management of organizations. Prerequisite: BUAD 2050

## 400 Course Descriptions

# HEAL - Health Education

## Department of Public Health and Rehabilitative Services (HHS)

### HEAL 1500 FIRST AID

[2 hours] Provides knowledge, skills and confidence of care for victims of sudden illnesses and injuries. CPR for Professional Rescuer and First Responder certification (NSC) upon successful course completion.

### HEAL 1800 MEDICAL TERMINOLOGY

[3 hours] Study of the origin and structure of medical words, their prefixes, suffixes, special endings and singular to plural forms. Medical terms relating to the body and to clinical procedures will be explored.

### HEAL 2000 FOUNDATIONS OF HEALTH EDUCATION

[3 hours] Designed to acquaint students with basic information, history, philosophy and competencies unique to health educators in both the school and community setting. The Competencies for Entry-Level Health Educators will be introduced in this course and a portfolio documenting achievement in each competency will be started.

### HEAL 2400 GENERAL SAFETY

[3 hours] An analysis of accident causation and disasters occurring in the home, workplace and community, and the presentation of a framework for developing accident counter-measures.

### HEAL 2500 PERSONAL HEALTH

[3 hours] Information is presented on the prevention and control of health problems including heart disease, cancer, infectious diseases, mental health, nutrition, human sexuality and other pertinent personal health issues.

### HEAL 2600 MENTAL HEALTH

[3 hours] An examination of the principles of mental health, mental illnesses, mental health professionals and mental health facilities.

### HEAL 2700 COMMUNITY HEALTH

[3 hours] Focuses on health issues in the community such as drug abuse, environment, disease and nutrition. The course also addresses appropriate responses to problems related to these same health issues. In addition, needs assessment, program planning, program implementation and program evaluation will be addressed in this course.

### HEAL 2800 PRINCIPLES OF NUTRITION

[3 hours] Students learn basic nutrition concepts. Personal nutritional practices are analyzed and evaluated to plan improvements. Encourages making informed decisions about nutrition by critically analyzing nutrition information which abounds in popular media.

### HEAL 2900 HEALTH EDUCATION LINKING SEMINAR

[2 hours] In this course, health education major students will discuss the information learned in health content courses and teaching.

### HEAL 2940 PRACTICUM IN COMMUNITY HEALTH

[1 hour] Supervised field experience with community health agency. Students work under direct supervision of the agency's staff and a University supervisor. Prerequisite: Approval of adviser

### HEAL 3100 HEALTH EDUCATION FOR EARLY CHILDHOOD EDUCATORS

[2 hours] This course will focus on developmentally integrated learning experiences in basic health, safety and nutrition, health appraisal procedures, and utilization of community resources.

### HEAL 3200 CONSUMER HEALTH

[3 hours] An examination of responsible and fraudulent practices in the health field. Evaluation of selected health services, products, fads and types of quackery. Prerequisite: HEAL 2500

### HEAL 3300 DRUG AWARENESS

[3 hours] Focuses on the impact of drug abuse and misuse on the individual and society. Explores physiological, psychological and rehabilitative aspects of drug misuse and abuse. Prevention strategies are discussed.

### HEAL 3400 HEALTH EDUCATION IN ELEMENTARY SCHOOLS

[3 hours] Provides students with an introduction to comprehensive school health education programs and to the health information and skills necessary to teach health education.

### HEAL 3500 ENVIRONMENTAL HEALTH

[3 hours] An overview of the environmental effects of factors such as population growth, pollution, energy use, agriculture practices and waste disposal on the environment. Consideration will be given to solutions.

### HEAL 3600 PREVENTION AND CONTROL OF DISEASE

[3 hours] An examination of the etiology, pathogenesis, prevention and control of acute and chronic diseases. Current techniques of prevention, control and detection are examined.

### HEAL 3700 FOUNDATIONS OF HUMAN SEXUALITY

[3 hours] The course is designed to provide an introduction to the scientific study of human sexuality. The topic is approached from a variety of perspectives, including the historical, psychological, sociological, biological, ethical and legal.

### HEAL 3800 DEATH AND DYING

[3 hours] The course is designed to analyze the relationship between death and health with emphasis upon the biological, psychological, bioethical and legal aspects of death in contemporary society.

### HEAL 4100 HEALTH BEHAVIOR

[3 hours] Examines the major theories and models of health behavior and explores how those theories/models can be used to promote health and wellness in individuals, groups and populations. Prerequisite: HEAL 2000, 2500

### HEAL 4200 METHODS AND MATERIALS IN COMMUNITY HEALTH

[3 hours] Introduces students to resource materials and methods appropriate for community health education. Students will use various mediums of instruction in direct application to community health programs.

### HEAL 4300 INSTRUCTIONAL PROGRAMS IN HEALTH

[4 hours] A course emphasizing theory, methods, materials and curriculum in health instruction. Required prior to student teaching. Prerequisite: Admission into professional education Corequisite: HEAL 4350

### HEAL 4350 INSTRUCTIONAL PROGRAMS IN HEALTH: FIELD EXPERIENCE

[2 hours] This field experience allows school health education majors the opportunity to observe and practice teaching health education in a secondary school setting. Corequisite: HEAL 4300

### HEAL 4400 HEALTH PROBLEMS OF YOUTH

[3 hours] Designed to provide education majors with the knowledge and skills to help identify, understand and prevent preadolescent and adolescent health problems which directly impact school and future success.

### HEAL 4500 WOMEN'S HEALTH CARE

[3 hours] The course is designed to consider personal health topics of special interest and applicability to women. The focus is upon the role of self-understanding and self-help in promotion of health and well-being.

### HEAL 4560 HEALTH PROBLEMS OF AGING

[3 hours] Acquaints students with physical changes and socio-psychological problems that occur with aging. Focus is on personal adjustment important in maintaining health throughout the aging process.

### HEAL 4600 SCHOOL HEALTH PROGRAMS

[3 hours] Acquaints students with the organization, administration and evaluation of the eight components of a coordinated school health program. Prerequisite: Admission into professional education.

### HEAL 4700 NUTRITIONAL SCIENCE

[3 hours] Introduces basic human nutritional needs. Examines the role of diet and health and disease throughout the lifestyle, including weight control and fitness issues. Personal nutritional practices are analyzed and evaluated. Prerequisite: KINE 2530 or 2560 or 2570 or HHS 2570

### HEAL 4750 OBESITY AND EATING DISORDERS

[3 hours] Examines the issues of obesity and eating disorders. Consideration of effects on the individual as well as the public health implications. Explores causes, health and emotional impact, and treatment approaches. Prerequisite: HEAL 2800

### HEAL 4800 PUBLIC HEALTH RESEARCH AND STATISTICS

[3 hours] An examination of research and statistical techniques commonly employed in the health field. Topics will include research design, ethics of research, hypothesis testing and critiques of published research in health journals.

### HEAL 4900 HEALTH EDUCATION SEMINAR

[1-3 hours] Seminars are developed around selected topics of interest and allow in-depth consideration of the subject. They provide the student with advanced study in the area. Prerequisite: Permission of instructor

**HEAL 4920 STUDENT TEACHING****SEMINAR: HEALTH EDUCATION**

[1-2 hours] This course will focus on reflection and feedback on student teaching, portfolio development, interviewing and resume writing. Prerequisite: Admission to professional standing Corequisite: HEAL 4930

**HEAL 4930 STUDENT TEACHING IN HEALTH EDUCATION**

[6-12 hours] Planned field experience in public school health education classroom under the direction of a university supervisor. Observation of an experienced teacher followed by full responsibility by the student teacher. Prerequisite: All health education teacher education sequence; met GPA requirement

**HEAL 4940 SENIOR FIELD EXPERIENCE**

[1-9 hours] Planned supervised field experience with a health related agency. Students will work under direct supervision of staff personnel of the specific agency and a university supervisor. Prerequisite: Approval of adviser

**HEAL 4950 WORKSHOP IN HEALTH EDUCATION**

[1-4 hours] A workshop developed around topics of interest and concern for preservice teachers and other educational personnel.

**HEAL 4990 INDEPENDENT STUDY IN HEALTH EDUCATION**

[1-3 hours] Directed individual study. Specialty title, seminar sheet and permission of instructor are required.

**HEAL 5200 TEACHING ELEMENTARY HEALTH EDUCATION**

[3 hours] Designed to provide information, skills and materials that are needed to teach elementary health education.

**HEAL 5400 PROFESSIONAL ISSUES IN SCHOOL NURSING**

[3 hours] Examination of the roles and standards of school nursing, legal and ethical issues faced by school nurses, and techniques commonly employed by school nurses.

**HEAL 5500 REPRODUCTIVE EPIDEMIOLOGY**

[3 hours] The course is designed to consider personal health topics of special interest and applicability to women. The focus is upon the role of self-understanding and self-help in promotion of health and well-being.

**HEAL 5750 OBESITY AND EATING DISORDERS**

[3 hours] Examines the issues of obesity and eating disorders. Consideration of effects on the individual as well as the public health implications. Explores causes, health and emotional impact, and treatment approaches. Prerequisite: HEAL 2800, 4700 or equivalent.

**HEAL 5930 GENERAL SEMINAR IN HEALTH EDUCATION**

[1-3 hours] A seminar to consider health problems and provide advanced study in health education. A graduate student may register for this seminar two or more times with permission of the adviser.

**HEAL 5940 SCHOOL HEALTH INTERNSHIP**

[1-4 hours] A field internship designed to supplement classroom experience by providing direct insights into the operation of a comprehensive school health education program in public schools.

**HEAL 5950 WORKSHOP IN HEALTH EDUCATION**

[1-4 hours] Topical workshops developed around areas of interest and concern to health professionals. Credit cannot be applied toward a degree program.

**HEAL 6000 PROFESSIONAL ISSUES IN HEALTH EDUCATION**

[2 hours] This course will examine the historical and philosophical foundations underlying the health education profession. Occupational and ethical issues specific to the field of health education will be explored.

**HEAL 6100 COLLEGE TEACHING IN HEALTH EDUCATION**

[2 hours] This course is designed to provide an overview of the issues surrounding teaching at the college level.

**HEAL 6200 METHODS AND MATERIALS IN PUBLIC HEALTH**

[3 hours] Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.

**HEAL 6250 NUTRITIONAL EPIDEMIOLOGY**

[3 hours] Examination of human nutritional needs. Emphasized the role of diet in health and disease throughout the lifecycle and includes current nutrition issues. Population nutritional practices are analyzed and evaluated.

**HEAL 6280 HEALTH COMMUNICATION**

[3 hours] Designed to help students identify, analyze, and apply concepts, theories and methodologies related to health communication in various settings and at various levels of influence. Emphasis will be placed on learning how to design, communicate and evaluate effective health promotion messages. Prerequisite: HEAL 6600

**HEAL 6300 COMMUNITY HEALTH ORGANIZATION**

[3 hours] Focuses on techniques to bring about change in a community's health status through assessment, public advocacy, coalition building, decision making, planning, policy development and political influence. Application will be emphasized.

**HEAL 6360 APPLIED SURVEY RESEARCH IN HEALTH**

[3 hours] An examination of applied survey research techniques essential in conducting health-related surveys. Topics will include standard health survey instruments, sample selection, quality instruments, response rates and data presentation for publication. Prerequisite: HEAL 6700

**HEAL 6420 SPORTS NUTRITION**

[3 hours] Examines basic nutritional needs as applied to physical activity and athletic performance. Focuses on the application of current research in sports nutrition to determine the nutritional needs of athletes. Prerequisite: HEAL 6250

**HEAL 6460 HEALTH PROMOTION PROGRAMS**

[3 hours] An examination of current issues and research associated with health promotion in the workplace. This course will focus on the implementation and evaluation of health promotion programs appropriate to the workplace.

**HEAL 6500 ISSUES IN SCHOOL HEALTH**

[3 hours] Acquaints students with problems and issues in school health education and with today's youth. The coordinated school health program is examined as a possible solution to many of these problems.

**HEAL 6520 PUBLIC HEALTH NUTRITION**

[3 hours] Explore the interdisciplinary and entrepreneurial approaches that lead to effective community nutrition programs. Investigates the impact of these programs to alleviate national and international nutritional problems. Prerequisite: HEAL 6250/8250 or Instructor approval

**HEAL 6530 DRUG USE AND MISUSE**

[3 hours] Focuses on impact of drug abuse and misuse on the individual and society. Explores physiological, psychological, societal and rehabilitative aspects of substance abuse. Prevention strategies are addressed.

**HEAL 6540 HUMAN SEXUALITY**

[3 hours] The course examines the historical, physiological, psychological, sociological and ethical aspects of human sexuality in health and illness. Extensive emphasis is placed on reviewing the pertinent periodical literature.

**HEAL 6550 CHRONIC DISEASE EPIDEMIOLOGY**

[3 hours] Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates associations, etiology, prevention and control. Pertinent literature critically reviewed.

**HEAL 6590 EPIDEMIOLOGY OF AGING**

[3 hours] An examination of major health problems and health care delivery needs of the older adult. Prerequisite: HEAL 6700

**HEAL 6600 HEALTH BEHAVIOR**

[3 hours] Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory. Applications through projects are emphasized. Prerequisite: RESM 5110

**HEAL 6640 ISSUES IN PUBLIC HEALTH**

[3 hours] Examination of various contemporary issues in public health. Included are social, economic, political and community problems in the provision of health services, health manpower and payment for health care.

**HEAL 6700 EPIDEMIOLOGY**

[3 hours] An examination of the process utilized in determining the distribution of disease and in analyzing factors related to disease occurrence. The course focuses on measurements used in the surveillance and investigation of diseases.

**HEAL 6720 ISSUES IN MINORITY HEALTH**

[3 hours] This course will be an examination of the demographic trends of racial/ethnic minorities and social, political and economic factors affecting the physical and mental well-being of minorities.

**HEAL 6750 APPLIED BIostatISTICS**

[3 hours] Fundamental statistical concepts related to the practice of public health. Topics include: descriptive statistics; probability; sampling theory; hypothesis testing; life tables; and applied statistical methods, including basic non-parametric analyses. Use of the computer in statistical analyses.

## 402 Course Descriptions

### **HEAL 6800 EVALUATION OF HEALTH PROGRAMS**

[3 hours] An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation. Prerequisite: HEAL 6460/8460 Corequisite: HEAL 6750

### **HEAL 6820 EPIDEMIOLOGIC METHODS**

[3 hours] This course covers advanced concepts in epidemiologic methods with an emphasis on statistical considerations of both observational and experimental designs. Prerequisite: HEAL 6700, 6750

### **HEAL 6900 GRANT WRITING IN HEALTH SCIENCES**

[2 hours] Consideration is given to funding sources, proposal guidelines, procedures for support, budgetary requirements and evaluation procedures. Students examine different types of funded projects, develop a research prospectus and grant proposal, and explore the art of politics and grantsmanship. Prerequisite: RESM 6320/8320 and HEAL 6800/8800.

### **HEAL 6920 MASTER'S RESEARCH PROJECT IN HEALTH EDUCATION**

[1-4 hours] Open to graduate students who elect the completion of a master's project in fulfilling the research elective of the master's program. Students may register for the credits in more than one semester.

### **HEAL 6930 INTERDISCIPLINARY SEMINAR IN HEALTH EDUCATION**

[1-3 hours] A seminar to consider problems and provide advanced study in several fields of education and other disciplines related to health education. Open only to advanced graduate students.

### **HEAL 6940 PUBLIC HEALTH INTERNSHIP**

[1-4 hours] A field internship designed to supplement classroom experience by providing direct insight into the operation of a public health agency through participant-observer experience.

### **HEAL 6960 MASTER'S RESEARCH THESIS IN HEALTH EDUCATION**

[1-4 hours] Open to graduate students who elect the completion of a master's thesis in fulfilling the research elective of the master's program. Students may register for the credits in more than one semester.

### **HEAL 6990 INDEPENDENT STUDY IN HEALTH EDUCATION**

[1-3 hours] The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.

### **HEAL 7500 REPRODUCTIVE EPIDEMIOLOGY**

[3 hours] This course is designed to consider personal health topics of special interest and applicability to reproductive health. The focus is on the etiology, pathology and prevention sex-specific health problems. Prerequisite: HEAL 6700

### **HEAL 7930 GENERAL SEMINAR IN HEALTH EDUCATION**

[1-3 hours] A seminar to consider health problems and provide advanced study in health education. A graduate student may register for this seminar two or more times with permission of the adviser.

### **HEAL 7940 SCHOOL HEALTH INTERNSHIP**

[1-4 hours] A field internship designed to supplement classroom experience by providing direct insights into the operation of a comprehensive school health education program in public schools.

### **HEAL 7950 WORKSHOP IN HEALTH EDUCATION**

[1-4 hours] Topical workshops developed around areas of interest and concern to health professionals. Credit cannot be applied towards a degree program.

### **HEAL 8000 PROFESSIONAL ISSUES IN HEALTH EDUCATION**

[2 hours] This course will examine the historical and philosophical foundations underlying the health education profession. Occupational and ethical issues specific to the field of health education will be explored.

### **HEAL 8100 COLLEGE TEACHING IN HEALTH EDUCATION**

[2 hours] This course is designed to provide an overview of the issues surrounding teaching at the college level.

### **HEAL 8200 METHODS AND MATERIALS IN PUBLIC HEALTH**

[3 hours] Introduces students to resource materials and methods appropriate for public health education. Students will use various mediums of instruction in direct application to public health programs.

### **HEAL 8250 NUTRITIONAL EPIDEMIOLOGY**

[3 hours] Examination of human nutritional needs. Emphasized the role of diet in health and disease throughout the lifecycle and includes current nutrition issues. Personal nutritional practices are analyzed and evaluated.

### **HEAL 8280 HEALTH COMMUNICATION**

[3 hours] Designed to help students identify, analyze, and apply concepts, theories and methodologies related to health communication in various settings and at various levels of influence. Emphasis will be placed on learning how to design, communicate and evaluate effective health promotion messages. Prerequisite: HEAL 8600

### **HEAL 8300 COMMUNITY HEALTH ORGANIZATION**

[3 hours] Focuses on techniques to bring about change in a community's health status through assessment, public advocacy, coalition building, decision making, planning, policy development and political influence. Application will be emphasized.

### **HEAL 8360 APPLIED SURVEY RESEARCH IN HEALTH**

[3 hours] An examination of applied survey research techniques essential in conducting health-related surveys. Topics will include standard health survey instruments, sample selection, quality instruments, response rates and data presentation for publication. Prerequisite: HEAL 6700

### **HEAL 8420 SPORTS NUTRITION**

[3 hours] Examines basic nutritional needs as applied to physical activity and athletic performance. Focuses on the application of current research in sports nutrition to determine the nutritional needs of athletes. Prerequisite: HEAL 6250

### **HEAL 8460 HEALTH PROMOTION PROGRAMS**

[3 hours] An examination of current issues and research associated with health promotion in the workplace. This course will focus on the implementation and evaluation of health promotion programs appropriate to the workplace.

### **HEAL 8500 ISSUES IN SCHOOL HEALTH**

[3 hours] Acquaints students with problems and issues in school health education and with today's youth. The coordinated school health program is examined as a possible solution to many of these problems.

### **HEAL 8520 PUBLIC HEALTH NUTRITION**

[3 hours] Explore the interdisciplinary and entrepreneurial approaches that lead to effective community nutrition programs. Investigates the impact of these programs to alleviate national and international nutritional problems. Prerequisite: HEAL 6250/8250 or instructor approval

### **HEAL 8530 DRUG USE AND MISUSE**

[3 hours] Focuses on impact of drug abuse and misuse on the individual and society. Explores physiological, psychological, societal and rehabilitative aspects of substance abuse. Prevention strategies are addressed.

### **HEAL 8540 HUMAN SEXUALITY**

[3 hours] The course examines the historical, physiological, psychological, sociological and ethical aspects of human sexuality in health and illness. Extensive emphasis is placed on reviewing the pertinent periodical literature.

### **HEAL 8550 CHRONIC DISEASE EPIDEMIOLOGY**

[3 hours] Epidemiology of selected chronic diseases and non-infectious conditions: cancer, cardiovascular diseases, musculoskeletal diseases and other chronic diseases. Emphasis on classification, rates associations, etiology, prevention and control. Pertinent literature critically reviewed.

### **HEAL 8590 EPIDEMIOLOGY OF AGING**

[3 hours] An examination of major health problems and health care delivery needs of the older adult. Prerequisite: HEAL 8700

### **HEAL 8600 HEALTH BEHAVIOR**

[3 hours] Examines the role of behaviors on health status and how to influence and understand behavior through use of cognitive models and change theory. Applications through projects are emphasized. Prerequisite: RESM 5110

### **HEAL 8640 ISSUES IN PUBLIC HEALTH**

[3 hours] Examination of various contemporary issues in public health. Included are social, economic, political and community problems in the provision of health services, health manpower and payment for health care.

### **HEAL 8700 EPIDEMIOLOGY**

[3 hours] An examination of the process utilized in determining the distribution of disease and in analyzing factors related to disease occurrence. The course focuses on measurements used in the surveillance and investigation of diseases.

**HEAL 8720 ISSUES IN MINORITY HEALTH**

[3 hours] This course will be an examination of the demographic trends of racial/ethnic minorities and social, political and economic factors affecting the physical and mental well-being of minorities.

**HEAL 8750 APPLIED BIOSTATISTICS**

[3 hours] Fundamental statistical concepts related to the practice of public health. Topics include: descriptive statistics; probability; sampling theory; hypothesis testing; life tables; and applied statistical methods, including basic non-parametric analyses. Use of the computer in statistical analyses.

**HEAL 8800 EVALUATION OF HEALTH PROGRAMS**

[3 hours] An exploration of types of program evaluation, evaluation models, data collection, types of data, data quality, evaluation reports, standard data collection instruments and ethical issues in health program evaluation. Prerequisite: HEAL 6460/8460 Corequisite: HEAL 6750

**HEAL 8820 EPIDEMIOLOGIC METHODS**

[3 hours] This course covers advanced concepts in epidemiologic methods with an emphasis on statistical considerations of both observational and experimental designs. Prerequisite: HEAL 6700, 6750

**HEAL 8900 GRANT WRITING IN HEALTH SCIENCES**

[2 hours] Consideration is given to funding sources, proposal guidelines, procedures for support, budgetary requirements and evaluation procedures. Students examine different types of funded projects, develop a research prospectus and grant proposal, and explore the art of politics and grantsmanship. Prerequisite: RESM 6320/8320 and HEAL 6800/8800.

**HEAL 8930 INTERDISCIPLINARY SEMINAR IN HEALTH EDUCATION**

[1-3 hours] A seminar to consider problems and provide advanced study in several fields of education and other disciplines related to health education. Open only to advanced graduate students.

**HEAL 8940 PUBLIC HEALTH INTERNSHIP**

[1-4 hours] A field internship designed to supplement classroom experience by providing direct insight into the operation of a public health agency through participant-observer experience.

**HEAL 8960 DOCTORAL RESEARCH DISSERTATION**

[1-12 hours] Graduate students may register for credit in more than one semester. Dissertation credit toward the degree program may not exceed 16 hours.

**HEAL 8990 INDEPENDENT STUDY IN HEALTH EDUCATION**

[1-3 hours] The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.

**HED - Higher Education****Department of Educational Leadership (EDU)****HED 5930 INTERDISCIPLINARY SEMINAR**

[3 hours] This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education. Prerequisite: Graduate status

**HED 5950 WORKSHOP IN HIGHER EDUCATION**

[1-3 hours] Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized. Prerequisite: Graduate status

**HED 5980 SPECIAL TOPICS IN HIGHER EDUCATION**

[1-3 hours] This seminar formatted course will provide advanced study in special topics of interest to faculty and administrators in higher education. Prerequisite: Graduate status

**HED 6010 HISTORY OF HIGHER EDUCATION**

[3 hours] Introduction to the historical development of American higher education from colonial times to the 20th century. Emphasis on the major historical events that contributed to the diversity of higher education. Prerequisite: Graduate status

**HED 6210 THE COMMUNITY COLLEGE**

[3 hours] A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances) and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy. Prerequisite: Graduate status

**HED 6250 TECHNICAL HIGHER EDUCATION**

[3 hours] Technical, occupational and career education account for over 40 percent of community college enrollments. This course examines the development, mission, functions and assessment of technical education, including community needs assessment. Prerequisite: Graduate status

**HED 6270 TEACHING AND LEARNING IN THE COMMUNITY COLLEGE**

[3 hours] Course facilitates application of theory to practice of teaching in community colleges. Students explore diverse pedagogical approaches, professional faculty roles, and transfer and articulation policies for effective teaching and learning. Prerequisite: Graduate status

**HED 6410 COLLEGE & UNIVERSITY CURRICULUM**

[3 hours] Introduction to patterns of curriculum development and organization in post-secondary education. Addresses issues governing curriculum planning, including social, economic, political, historical and philosophical contexts influencing curriculum formation and operation. Prerequisite: Graduate status

**HED 6440 GENERAL EDUCATION IN HIGHER EDUCATION**

[3 hours] This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula. Prerequisite: Graduate status

**HED 6510 THE AMERICAN COLLEGE STUDENT**

[3 hours] This course explores the character and nature of student populations in contemporary American colleges and universities and considers the impact of campus environments and experiences on development, interaction and learning. Prerequisite: Graduate status

**HED 6520 ORGANIZATION & MANAGEMENT OF STUDENT AFFAIRS**

[3 hours] A brief overview of functional areas and philosophies is followed by a comprehensive examination of student affair's organization and management from the perspective of the Chief Student Affairs Officer. Prerequisite: Graduate status

**HED 6530 THEORIES OF STUDENT DEVELOPMENT**

[3 hours] Students will critically examine traditional and contemporary theories of college student development, identify methods of assessing that development, and explore ways to apply the theories to everyday practice. Prerequisite: Graduate status

**HED 6610 ISSUES OF ACCESS IN HIGHER EDUCATION**

[3 hours] This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.

**HED 6640 GOVERNANCE AND ADMINISTRATION IN HIGHER EDUCATION**

[3 hours] Course focuses on internal administrative organization and governance that supports the academic enterprise. Purposes and development of mission and functions, centralization and decentralization, accreditation, appraisal, accountability, and assessment are discussed. Prerequisite: Graduate status

**HED 6660 BUILDING ACADEMIC CULTURE**

[3 hours] An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions. Prerequisite: Graduate Status

**HED 6700 FINANCE OF HIGHER EDUCATION**

[3 hours] This course discusses issues related to the expenditure of funds for higher education within institutions and systems. Issues addressed include capital funding, endowment management and budget preparation. Prerequisite: Graduate status

**HED 6710 ECONOMICS OF HIGHER EDUCATION**

[3 hours] This course discusses issues related to the revenue sources of higher education and discussion of the social worth of public and private sector investment in higher education. Issues include the connection of educational outcomes to educational budget making and how sources of funds drive educational policymaking. Prerequisite: Graduate status

## 404 Course Descriptions

### **HED 6730 LEGAL ASPECTS OF HIGHER EDUCATION**

[3 hours] Law, its history, philosophy and practical application to and effect on the creation and administration of public and private higher education is examined in the context of court decisions. Prerequisite: Graduate status

### **HED 6750 STRATEGIC PLANNING AND DECISION MAKING**

[3 hours] Engages students in development of model strategic plans applicable to academic and nonacademic programs. Students learn how "big strategic decisions are made right," by focusing on strategic mission, analysis, goals, objectives, implementation and evaluation. Policies and practices regarding how institutions create internal climates for data-driven decision-making are discussed.

### **HED 6770 EVALUATION AND OUTCOMES ASSESSMENT IN HIGHER EDUCATION**

[3 hours] Historical concepts and basis for evaluation of college and university programs, emphasizing criteria and procedure and how evaluation and outcomes assessment through regional accrediting bodies, state and federal agencies contribute to public confidence in higher education. Prerequisite: Graduate status

### **HED 6790 MANAGING COLLEGE AND UNIVERSITY PERSONNEL**

[3 hours] This course acquaints students with key concepts regarding how to effectively manage human resources within large, medium-sized, small, public and private institutions of higher education. Topics covered will include collective bargaining in higher education. Prerequisite: Graduate status

### **HED 6810 WOMEN IN HIGHER EDUCATION**

[3 hours] This course will study the history of women's college education in the United States with special emphases on the influence of cultural and social events that shape this history.

### **HED 6820 INSTITUTIONAL ADVANCEMENT IN HIGHER EDUCATION**

[3 hours] Overview of the field of development and introduction to the knowledge, research and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs. Prerequisite: Graduate status

### **HED 6830 THE INDEPENDENT COLLEGE**

[3 hours] This course details the role, place and function of the four year independent colleges, focusing on their development, organization, funding and evaluation. Prerequisite: Graduate status

### **HED 6840 ADULT CONTINUING EDUCATION**

[3 hours] Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults. Prerequisite: Graduate status

### **HED 6850 CRITICAL ISSUES IN HIGHER EDUCATION**

[3 hours] Focus on critical issues facing administrators in post-secondary education in the United States. Issues discussed change yearly. Students will read widely and prepare a research paper or a project. Prerequisite: Graduate status

### **HED 6870 ECONOMIC DEVELOPMENT AND HIGHER EDUCATION**

[3 hours] How do institutions of higher education impact their local economies? This course examines various roles and methods by which institutions of higher education add to economic development. Prerequisite: Graduate status

### **HED 6920 MASTER'S PROJECT IN HIGHER EDUCATION**

[1-3 hours] Open to graduate students who elect the completion of a research project in fulfilling the research requirements of the master's program. Prerequisite: Consent of instructor.

### **HED 6940 MASTER'S PRACTICUM IN HIGHER EDUCATION**

[1-3 hours] This course provides students with the opportunity to develop specialized skills working in an area of college student personnel administration. Students will work under the supervision of an experienced administrator. Prerequisite: Graduate status

### **HED 6960 MASTER'S THESIS IN HIGHER EDUCATION**

[1-3 hours] Open to graduate students who elect the completion of a research thesis in fulfilling the research requirements of the master's program. Prerequisite: Consent of instructor.

### **HED 6990 INDEPENDENT STUDY IN HIGHER EDUCATION-MASTERS**

[1-3 hours] Provides student the opportunity to work independently on professional problem under direction of Higher Education Program faculty member. Student meets individually with instructor rather than through formal class meetings. Prerequisite: Graduate status; instructor approval.

### **HED 7930 INTERDISCIPLINARY SEMINAR**

[3 hours] This seminar formatted course will provide the opportunity to explore problems and issues from the perspectives of the various fields of education and of other disciplines related to higher education. Prerequisite: Graduate status

### **HED 7950 WORKSHOP IN HIGHER EDUCATION**

[1-3 hours] Each workshop is developed on a topic of interest to faculty members and administrators of higher education institutions. Practical applications of the workshop topic will be emphasized. Prerequisite: Graduate status

### **HED 7980 SPECIAL TOPICS IN HIGHER EDUCATION**

[1-3 hours] This seminar formatted course will provide advanced study in special topics of interest to faculty and administrators in higher education. Prerequisite: Graduate status

### **HED 8010 HISTORY OF HIGHER EDUCATION**

[3 hours] Introduction to the historical development of American higher education from colonial times to the 20th century. Emphasis on the major historical events that contributed to the diversity of higher education. Prerequisite: Graduate status

### **HED 8020 ADVANCED SEMINAR IN HISTORIOGRAPHY HIED**

[3 hours] Historical methods applied to research in higher education discussed. Course focuses on in-depth readings of primary source material on liberal arts colleges, universities and community colleges. Research paper required. Prerequisite: Graduate status; HED 6010/8010

### **HED 8030 FEDERAL AND STATE POLICY ANALYSIS**

[3 hours] Designed for those interested in federal and state policy as related to higher education. Students will investigate specific federal and state legislation and regulatory issues. Prerequisite: Graduate status; HED 6010/8010

### **HED 8210 THE COMMUNITY COLLEGE**

[3 hours] A study of the history, distinguishing characteristics (mission, functions, organization, curriculum, finances), and current issues facing community colleges, including marginalization of students and institutions, and transfer and articulation policy. Prerequisite: Graduate status

### **HED 8250 TECHNICAL HIGHER EDUCATION**

[3 hours] Technical, occupational and career education account for over 40 percent of community college enrollments. This course examines the development, mission, functions and assessment of technical education, including community needs assessment. Prerequisite: Graduate status

### **HED 8270 TEACHING AND LEARNING IN THE COMMUNITY COLLEGE**

[3 hours] Course facilitates application of theory to practice of teaching in community colleges. Students explore diverse pedagogical approaches, professional faculty roles, and transfer and articulation policies for effective teaching and learning. Prerequisite: Graduate status

### **HED 8410 COLLEGE & UNIVERSITY CURRICULUM**

[3 hours] Introduction to patterns of curriculum development and organization in post-secondary education. Addresses issues governing curriculum planning, including social, economic, political, historical and philosophical contexts influencing curriculum formation and operation. Prerequisite: Graduate status

### **HED 8440 GENERAL EDUCATION IN HIGHER EDUCATION**

[3 hours] This course will examine the meaning and purposes of general education in the United States. Students will become acquainted with the design, analysis and evaluation of general education curricula. Prerequisite: Graduate status

### **HED 8510 THE AMERICAN COLLEGE STUDENT**

[3 hours] This course explores the character and nature of student populations in contemporary American colleges and universities and considers the impact of campus environments and experiences on development, interaction and learning. Prerequisite: Graduate status

### **HED 8520 ORG & MGMT OF STUDENT AFFAIRS**

[3 hours] A brief overview of functional areas and philosophies is followed by a comprehensive examination of student affair's organization and management from the perspective of the Chief Student Affairs Officer. Prerequisite: Graduate status



**HED 8530 THEORIES OF STUDENT DEVELOPMENT**

[3 hours] Students will critically examine traditional and contemporary theories of college student development, identify methods of assessing that development, and explore ways to apply the theories to everyday practice. Prerequisite: Graduate status

**HED 8570 RESEARCH IN HIGHER EDUCATION**

[3 hours] Introduces students to the research literature in higher education; historical, qualitative and sociological research approaches are discussed. Introduces students to many of the major scholarly figures and modern research controversies within the field of higher education. Prerequisite: Doctoral status or consent of instructor

**HED 8580 LEADERSHIP THEORY**

[3 hours] Focuses on historical and philosophical aspects of leadership theory, as well as on personalized models for the students' future leadership roles in higher education. Other emphases include the importance of vision and values in the leadership process and development of analytical and communication abilities. Prerequisite: Doctoral status or consent of instructor

**HED 8610 ISSUES OF ACCESS IN HIGHER EDUCATION**

[3 hours] This course explores access issues that result from the changing educational needs of society and analyzes the application of democratic ideals of American education to current educational policies affecting access.

**HED 8630 FACULTY ISSUES IN HIGHER EDUCATION**

[3 hours] Course focuses on faculty issues in higher education, and addresses academic and student freedom, developing effective promotion and tenure policies appropriate to different types of institutions, and faculty development programs. Prerequisite: Graduate status

**HED 8640 GOVERNANCE AND ADMINISTRATION IN HIGHER EDUCATION**

[3 hours] Course focuses on internal administrative organization and governance that supports the academic enterprise. Purposes and development of mission and functions, centralization and decentralization, accreditation, appraisal, accountability, and assessment are discussed. Prerequisite: Graduate status

**HED 8660 BUILDING ACADEMIC CULTURE**

[3 hours] An examination of institutional culture and the interplay of student, faculty and administrative subcultures. Critical perspectives are used to analyze and understand cultural inquiry, conflict and collaboration in post secondary institutions. Prerequisite: Graduate status

**HED 8700 FINANCE OF HIGHER EDUCATION**

[3 hours] This course discusses issues related to the expenditure of funds for higher education within institutions and systems. Issues addressed include capital funding, endowment management and budget preparation. Prerequisite: Graduate status

**HED 8710 ECONOMICS OF HIGHER EDUCATION**

[3 hours] This course discusses issues related to the revenue sources of higher education and discussion of the social worth of public and private sector investment in higher education. Issues include the connection of educational outcomes to educational budget making and how sources of funds drive educational policymaking. Prerequisite: Graduate status

**HED 8730 LEGAL ASPECTS OF HIGHER EDUCATION**

[3 hours] Law, its history, philosophy and practical application to and effect on the creation and administration of public and private higher education is examined in the context of court decisions. Prerequisite: Graduate status

**HED 8750 STRATEGIC PLANNING AND DECISION MAKING**

[3 hours] Engages students in development of model strategic plans applicable to academic and nonacademic programs. Students learn how "big strategic decisions are made right," by focusing on strategic mission, analysis, goals, objectives, implementation and evaluation. Policies and practices regarding how institutions create internal climates for data-driven decision-making are discussed.

**HED 8770 EVALUATION AND OUTCOMES ASSESSMENT IN HIGHER EDUCATION**

[3 hours] Historical concepts and basis for evaluation of college and university programs, emphasizing criteria and procedure and how evaluation and outcomes assessment through regional accrediting bodies, state and federal agencies contribute to public confidence in higher education. Prerequisite: Graduate status

**HED 8790 MANAGING COLLEGE AND UNIVERSITY PERSONNEL**

[3 hours] This course acquaints students with key concepts regarding how to effectively manage human resources within large, medium-sized, small, public and private institutions of higher education. Topics covered will include collective bargaining in higher education. Prerequisite: Graduate status

**HED 8810 WOMEN IN HIGHER EDUCATION**

[3 hours] This course will study the history of women's college education in the United States with special emphases on the influence of cultural and social events that shape this history.

**HED 8820 INSTITUTIONAL ADVANCEMENT IN HIGHER EDUCATION**

[3 hours] Overview of the field of development and introduction to the knowledge, research, and theory emerging in the field. Focus on practical skill enhancement as it applies to building development programs. Prerequisite: Graduate status

**HED 8830 THE INDEPENDENT COLLEGE**

[3 hours] This course details the role, place and function of the four year independent colleges, focusing on their development, organization, funding and evaluation. Prerequisite: Graduate status

**HED 8840 ADULT CONTINUING EDUCATION**

[3 hours] Course assists student in interpreting the highly diversified field of adult continuing education from the point of view of the student's current or anticipated involvement. Intended for teachers of adults. Prerequisite: Graduate status

**HED 8850 CRITICAL ISSUES IN HIGHER EDUCATION**

[3 hours] Focus on critical issues facing administrators in post-secondary education in the United States. Issues discussed change yearly. Students will read widely and prepare a research paper or a project. Prerequisite: Graduate status

**HED 8870 ECONOMIC DEVELOPMENT AND HIGHER EDUCATION**

[3 hours] How do institutions of higher education impact their local economies? This course examines various roles and methods by which institutions of higher education add to economic development. Prerequisite: Graduate status

**HED 8920 ADVANCED SEMINAR**

[3 hours] An in-depth review of key issues related to campus leadership are discussed in seminar form. Students may work with professor on cutting-edge research project. Prerequisite: Doctoral status or consent of instructor

**HED 8930 DOCTORAL RESEARCH SEMINAR IN HIGHER EDUCATION**

[3 hours] This course examines research findings and research methodology in Higher Education as they are pertinent to the development of dissertation proposals. Dissertation proposal development is encouraged. Prerequisite: Doctoral status

**HED 8940 DOCTORAL INTERNSHIP IN HIGHER EDUCATION**

[1-3 hours] Designed specifically for doctoral students in the higher education program who are interested in an actual supervised experience in teaching or administration. Prerequisite: Doctoral status

**HED 8960 DISSERTATION**

[1-12 hours] Original and specific research problem of a scholarly nature, requiring the application of advanced research skills and techniques to study. Students must take a minimum of 10 semester dissertation hours and may count a maximum of 12 hours towards the degree. Prerequisite: Advanced to Candidacy

**HED 8990 INDEPENDENT STUDY IN HIGHER EDUCATION**

[1-3 hours] Provides student the opportunity to work independently on professional problem under direction of Higher Education Program faculty member. Student meets individually with instructor rather than through formal class meetings. Prerequisite: Doctoral status

## HHS - Health and Human Services

### College of Health and Human Services (HHS)

**HHS 1000 HEALTH AND HUMAN SERVICES/COLLEGE ORIENTATION**

[1 hour] Acquaints the new student with the services, policies, procedures and layout of the university, college and department. Establishes relationships between new students, full-time professors and peer mentors during this time of adjustment. Must be taken first semester of enrollment.

**HHS 2550 HUMAN ANATOMY**

[3 hours] This course considers all anatomical structures related to all human organs and body systems.

**HHS 2570 HUMAN PHYSIOLOGY**

[3 hours] Function of various body systems. Prerequisite: HHS 2550 or consent of coordinator

## 406 Course Descriptions

### **HHS 2590 MICROBIOLOGY AND INFECTIOUS DISEASES**

[3 hours] Structure and function of bacteria and viruses; antigen-antibody reactions, immunology, serology, growth and inhibition of microorganisms. Pathologic responses to infection; pathogenesis and disease, principal infectious diseases of man. Prerequisite: Human physiology or consent of coordinator

### **HHS 2980 SPECIAL TOPICS IN HEALTH & HUMAN SERVICES**

[1-3 hours] Selected subjects in the field of Health and/or Human Service of special interest to the class and the professor - lower division.

### **HHS 4980 SPECIAL TOPICS IN HEALTH & HUMAN SERVICES**

[1-3 hours] Selected subjects in the field of Health and/or Human Service of special interest to the class and the professor - upper division.

## **HIM - Health Information Management**

### **Department of Health Professions (HHS)**

#### **HIM 1110 BASIC MEDICAL TERMINOLOGY**

[3 hours] This course introduces medical word building, prefixes, suffixes and special endings. The medical terms relating to body structure are presented. The following systems are explored in detail: musculoskeletal, respiratory, cardiovascular, genitourinary and blood and lymph systems.

#### **HIM 1220 AMBULATORY OFFICE PRACTICES**

[3 hours] Course addresses service and quality in ambulatory medical office policies and standards, personnel, patient satisfaction and financial management. Course focuses on office management, problem solving and effectiveness of office systems. Prerequisite: HEAL 1800

#### **HIM 2200 AMBULATORY DOCUMENTATION & BILLING**

[3 hours] Course covers documentation in an ambulatory medical office and focuses on accurate billing for payment of services, as well as compliance to federal regulations and electronic submission of claims. Prerequisite: HEAL 1800

#### **HIM 2210 MEDICAL LINGUISTICS IN ANCILLARY SERVICES**

[3 hours] Expanded medical linguistics utilized in coding, classification systems and ancillary services, especially surgery, medical imaging, anesthesiology, medical tests and laboratory procedures. Linguistics of pharmacology, pathophysiology and infectious/parasitic diseases are analyzed. Prerequisite: HEAL 1800

#### **HIM 2940 PROFESSIONAL AMBULATORY OFFICE PRACTICE**

[3 hours] Guided professional practice experience in an ambulatory setting, such as a physician's office, hospital, clinic, etc. Prerequisite: Permission of instructor

### **HIM 3200 HEALTHCARE RESOURCES, PAYORS AND CONSUMERS**

[3 hours] Introduction to roles of professionals in meeting standards of regulatory agencies and voluntary organizations in healthcare delivery systems. Data collection, quality, access, retention, technology and impact on healthcare financing.

### **HIM 3210 ICD-9-CM**

[3 hours] Principles of coding diseases, conditions and procedures with the International Classification of Disease System. Practice in the assignment of codes using both computerized and manual methods. Prerequisite: HIM 2210

### **HIM 3220 HCPCS/CTP**

[3 hours] Principles of coding with the HCPCS classification system. Practice in the assignment of codes using both computerized and manual methods. Prerequisite: HIM 2210, HIM 3210

### **HIM 3230 HEALTHCARE DOCUMENTATION**

[4 hours] Inpatient and ambulatory health care data requirements will be identified and analyzed, including collection, analysis and implementation. Form design and screen design will be developed and reviewed. Prerequisite: HIM 2210

### **HIM 3240 HEALTH INFORMATION ADMINISTRATION PRACTICES**

[4 hours] Theory and principles related to facilities, organizations and agencies in healthcare. Focus on HIM strategic planning, departmental responsibilities, marketing, training and development, privacy and security, compliance, and research and epidemiology. Prerequisite: BUAD 1020, HIM 3200

### **HIM 3940 PROFESSIONAL PRACTICE EXPERIENCE I**

[4 hours] Generalized health information administrative duties in regards to staffing, managing, record release, storage and retrieval, coding, abstracting, utilization management, quality improvement, computer applications in health information practice. Prerequisite: Completion of all junior level HIM core course requirements or permission of instructor

### **HIM 4200 REIMBURSEMENT METHODOLOGIES**

[2 hours] DRGs, APCs, RBRVs and reimbursement methods used by federal, state and private insurance. Compliance issues and case mix reviewed. Processes explored for providing and improving healthcare cost containment and quality. Prerequisite: HIM 3220, HIM 3240

### **HIM 4210 HEALTHCARE STATISTICS, REGISTRIES, RESEARCH**

[3 hours] Various procedures specific to health information practice will be addressed including medical information, calculation and interpretation of health care statistics, tumor registry and health care records. Prerequisite: MATH 2600, HIM 3220

### **HIM 4260 LAW AND ETHICS IN HEALTH INFORMATION**

[2 hours] Medicolegal practice and professional ethics in healthcare. Overview of the legal system, identification of medicolegal topics, and related ethical concerns. Hardcopy and electronic health record legal issues examined in detail. Prerequisite: HIM 3200

### **HIM 4910 INTEGRATIVE CAPSTONE EXPERIENCE**

[3 hours] Course consists of demonstrating proficiencies and competencies in HIM core course through project assignments. Prerequisite: HIM 4200

### **HIM 4940 PROFESSIONAL PRACTICE EXPERIENCE II**

[4 hours] Specialized administrative assignment within health information management in a facility, agency or organization. Students submit a major project for the site and members of the related HIM community of practice. Prerequisite: Completion of all senior level HIM core course requirements or concurrent enrollment status, along with senior standing

## **HIST - History**

### **Department of History (ARS)**

#### **HIST 1010 EUROPE TO 1600**

[3 hours] A survey of western Europe, including its ancient Jewish, Greco-Roman and Christian roots; the Middle Ages, Renaissance and Reformation. Humanities core course

#### **HIST 1020 EUROPE FROM 1600**

[3 hours] A survey of European history from the 17th century to the present with emphasis on the major political, economic, social and cultural trends. Humanities core course

#### **HIST 1050 WORLD HISTORY TO 1500**

[3 hours] A survey of the ancient world from the stone age to around 1500. Cultural and political topics are treated so as to compare the major civilizations. Humanities core course

#### **HIST 1060 WORLD HISTORY FROM 1500**

[3 hours] A survey of world history from 1500 to the present. Cultural and political topics are treated so as to draw comparisons between the most significant modern societies. Humanities core course

#### **HIST 1070 THE CONTEMPORARY WORLD**

[3 hours] This thematic survey of the 20th century from a historical and global perspective emphasizes the origins of the world in which we live and discusses some of our alternative futures. Humanities core course Non-western multicultural course

#### **HIST 1080 EAST ASIA TO 1800**

[3 hours] Multidisciplinary introduction to traditional East Asia (origins-1800) with emphasis on the historical development, political traditions, socio-economic patterns, religious and philosophical values, and cultural accomplishments of China and Japan. Humanities core course Non-western multicultural course

#### **HIST 1090 EAST ASIA FROM 1800**

[3 hours] Multidisciplinary introduction to the history, civilization, political organization, international relations, social and economic patterns, and cultural trends of China and Japan since 1800. Humanities core course Non-western multicultural course

#### **HIST 1100 LATIN AMERICAN CIVILIZATIONS**

[3 hours] A thematic survey from pre-Columbian times to the present. Covers Native American cultures, European colonial policies and institutions, independence movements, the emergence of new nations and twentieth-century problems. Humanities core course Non-western multicultural course

**HIST 1110 AFRICAN CIVILIZATION**

[3 hours] General cultural and historical survey of Africa south of the Sahara from earliest times to the 20th century. Includes topics on art, literature, philosophy, religion and society. Humanities core course Non-western multicultural course

**HIST 1120 MIDDLE EAST CIVILIZATION**

[3 hours] General cultural and historical survey of the Middle East and Islam from 600 to the 20th century. Includes topics in historical movements, literature, religion, and social and intellectual history. Humanities core course Non-western multicultural course

**HIST 1130 INTRODUCTION TO HISTORICAL THINKING**

[3-4 hours] (Not for major credit) An introduction to the nature, concepts and skills of the discipline of history designed to improve historical awareness and the ability to think historically. Occasionally offered as a writing intensive course. 01: America, 02: Asia, 03: Europe, 04: Latin America, 05: Africa, 06: Special Topics Humanities core course

**HIST 1200 MAIN THEMES IN AMERICAN HISTORY**

[3 hours] This thematic survey introduces students to historical theory, methods, and the primary sub-fields of American history from colonial conquest to the present day. Humanities core course

**HIST 2000 METHODS SEMINAR**

[4 hours] Research techniques, writing of term papers and book reviews. Introduction to historiography. Offered as a writing intensive course.

**HIST 2010 AMERICA TO 1865**

[3 hours] The development of the United States from its Native American and immigrant roots through the Civil War.

**HIST 2020 AMERICA FROM 1865**

[3 hours] Survey of American history since the Civil War, with special attention to political, social, economic and cultural developments.

**HIST 2030 GREAT AMERICANS**

[3 hours] The careers of selected Americans in politics, business, science, religion and literature.

**HIST 2040 ANCIENT NEAR EAST**

[3 hours] Survey of the Sumerian, Babylonian, Hittite, Assyrian, Egyptian, Palestinian and Persian worlds. Humanities core course Non-western multicultural course

**HIST 2050 ANCIENT GREECE**

[3 hours] Survey of the Greek and Hellenistic world. Humanities core course

**HIST 2060 ANCIENT ROME**

[3 hours] Survey of the Roman Republic and Empire. Humanities core course

**HIST 2070 ANCIENT JEWISH HISTORY**

[3 hours] Institutions, culture and religion from earliest times through the Biblical Period and the fall of the Temple in the 1st century.

**HIST 2090 MODERN JEWISH HISTORY**

[3 hours] Background to the contemporary Jewish community. Ghetto, emancipation, Zionism, Holocaust and third Jewish commonwealth in Israel.

**HIST 2100 HISTORY OF THE FUTURE**

[3 hours] Explores expectations about the future of successive generations, mainly in the U.S., by examining cultural artifacts such as architecture, films, literature and the press. Offered as a writing intensive course.

**HIST 2110 TRACING YOUR FAMILY**

[3 hours] Designed to guide students in researching their families and presenting their findings, the class builds on basic genealogical skills. A series of written exercises culminates in a social history of the family. Offered as a writing intensive course.

**HIST 2170 GREAT BRITAIN TO 1714**

[3 hours] An introductory course on British history from the Roman conquest to 1714. Emphasis on Anglo-Saxon and Norman invasions, the rise of Parliament, common law, and Puritan Revolution.

**HIST 2180 GREAT BRITAIN FROM 1714 TO THE PRESENT**

[3 hours] An introductory course on British history from the Hanoverian dynasty to the present. Emphasis on English maritime power, the industrial revolution and two world wars.

**HIST 2190 BRITAIN AND IRELAND**

[3 hours] From the 17th to the 20th century, the mutual influences in literature and history of colony and colonizer are examined.

**HIST 2250 WORLD WAR I**

[3 hours] World War I from origins to conclusion and its effect on the course of the 20th century. Political and diplomatic background, conduct, termination, technology, and the war's effect on society and the 20th century.

**HIST 2260 WORLD WAR II ON FILM**

[3 hours] Analysis of contemporary and retrospective documentary film treatments of major aspects of World War II, with emphasis on their historical accuracy and authenticity.

**HIST 2280 TOLEDO: EMERGENCE OF A CITY, 1750-1880**

[3 hours] Early history of Toledo and the Maumee River Valley, including Indian settlement, imperial rivalries, Maumee Valley towns, economic growth, immigrant arrivals and the creation of neighborhoods.

**HIST 2290 TOLEDO: METROPOLITAN ERA, 1880-1980**

[3 hours] The growth of Toledo in the 20th century, including suburbanization, the city's leadership in the national Progressive Movement, Depression and New Deal, organized labor, individual suburbs, and recent problems.

**HIST 2340 AMERICAN INDIAN HISTORY**

[3 hours] An introduction to Indian-White relations from pre-Columbian times to present. Emphasizes tribes of the United States, Mexico and Canada. U.S. multicultural course

**HIST 2450 CANADA TO 1867**

[3 hours] Canadian history from before European contact to Confederation. Considers European-Native contact, Canada as an extension of Europe and the beginnings of Canadian identities.

**HIST 2460 CANADA SINCE 1867**

[3 hours] Canadian history since Confederation. Considers expansion westward, constitutional development, continuing British vs. French, and European vs. Native tensions. Canada and the U.S., modern society, economy, politics.

**HIST 2640 MEDIEVAL RUSSIA**

[3 hours] Russia from the 9th century to 1700, including Kievan and Moscovite Russia. Non-western multicultural course

**HIST 2650 MODERN RUSSIA**

[3 hours] Russia from 1700 to the present, including Imperial and Soviet Russia. Non-western multicultural course

**HIST 2700 JAPAN AND WORLD WAR II**

[3 hours] A study of the factors behind Japan's entry into World War II with the United States and the Allied Powers and an in-depth treatment of Japan at war. Non-western multicultural course

**HIST 2710 POSTWAR JAPAN**

[3 hours] This course examines the development of Japan since the war. It focuses on the political, economic, social and cultural changes since 1945 and relates these factors to Japan's international relations. Non-western multicultural course

**HIST 2720 HISTORY OF TOKYO**

[3 hours] An examination of Japanese urban social and cultural history. Treats the foundations of Edo, transition to Tokyo, the modern rise, the great earthquake, the war, the Olympics and the present. Non-western multicultural course

**HIST 2730 THE CHINESE REVOLUTION**

[3 hours] This course examines the process by which Mao Zedong and the Chinese Communist Party came to power. It treats the political, economic and social forces behind the Chinese revolution (1900-49). Non-western multicultural course

**HIST 2980 SPECIAL TOPICS**

[1-4 hours] Topics selected by various instructors. May be repeated when the topic varies.

**HIST 3100 EUROPEAN MIDDLE AGES I**

[3 hours] The history of Western Europe from its beginnings to the eve of the First Crusade.

**HIST 3110 EUROPEAN MIDDLE AGES II**

[3 hours] Europe from the First Crusade to the late 13th century.

**HIST 3130 TUDOR ENGLAND**

[3 hours] Tudor England from 1485 to the end of the reign of Elizabeth I, emphasizing political, economic and social developments.

**HIST 3140 STUART ENGLAND**

[3 hours] Stuart England from 1603 to the end of the reign of Anne, emphasizing political, economic and social developments.

**HIST 3160 THE AMERICAN WEST**

[3 hours] Settlement since the Civil War; mining rushes and Indian wars; violence and outlaws; farming and cattle ranching. Twentieth-century politics; ethnicity; and economics. Growth of California and the Sunbelt states. U.S. multicultural course

## 408 Course Descriptions

### **HIST 3190 BRITAIN FROM 1763 TO 1832**

[3 hours] An intensive examination of the slave trade, factory system, radicalism, Parliamentary Reform, insurrection, by means of reading primary sources such as Tom Paine.

### **HIST 3200 COLONIAL LATIN AMERICA**

[3 hours] Latin American history to 1825. Covers pre-Columbian Indian civilizations; Spanish and Portuguese conquests, colonial policies and institutions; colonial life and independence movements. Non-western multicultural course

### **HIST 3210 MODERN LATIN AMERICA**

[3 hours] Major economic, political and social developments from independence to the present. In spite of the region's tremendous diversity, there is a shared "Latin American" experience. Non-western multicultural course

### **HIST 3220 ARGENTINA AND CHILE**

[3 hours] An in-depth study of Argentina and Chile since independence.

### **HIST 3250 AFRICAN-AMERICAN HISTORY TO 1865**

[3 hours] An examination of the historical experiences of African-Americans in the United States from 1619 to 1865. U.S. multicultural course

### **HIST 3260 AFRICAN-AMERICAN HISTORY FROM 1865**

[3 hours] An examination of the historical experiences of African-Americans in the United States since 1865. U.S. multicultural course

### **HIST 3270 THE CITY IN AMERICAN HISTORY, 1607-1850**

[3 hours] Urbanization and the city in world history. The growth, planning and problems of American cities from colonial times until the mid-19th century.

### **HIST 3280 CITY AND METROPOLIS IN MODERN AMERICA, 1850 TO THE PRESENT**

[3 hours] The growth of the 19th-century city and the emergence of the 20th-century American metropolis. Urban problems of the 20th century.

### **HIST 3290 OHIO HISTORY**

[3 hours] From colonial times to the present.

### **HIST 3310 ETHNIC AMERICA**

[3 hours] American ethnic diversity from the colonial era to recent decades. A study of individuals and groups. Topics include American identity and Americanization, migration, legislation, nativism. U.S. multicultural course

### **HIST 3320 INDIANS IN EASTERN NORTH AMERICA**

[3 hours] Native Americans in Eastern North America from prehistoric times through Jacksonian Indian Removal. Emphasis on intercultural interactions. U.S. multicultural course

### **HIST 3330 WESTERN AMERICAN INDIANS**

[3 hours] Native Americans of the Far West from prehistoric times through recent years. Emphasis on European contact and governmental policies. U.S. multicultural course

### **HIST 3350 THE EARLY FRONTIER**

[3 hours] An examination of intercultural conflict and accommodation in frontier communities in Eastern North America to 1776. U.S. multicultural course

### **HIST 3360 AMERICAN INTELLECTUAL HISTORY I**

[3 hours] Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.

### **HIST 3370 AMERICAN INTELLECTUAL HISTORY II**

[3 hours] Major developments in American thought from 1865, including Social Darwinism, pragmatism, ideological conflict, modern science, education.

### **HIST 3380 BUSINESS AND AMERICAN SOCIETY**

[3 hours] The growth of American business enterprise and its relationship to culture, politics, technological developments and economic change.

### **HIST 3400 AMERICAN SOCIAL AND CULTURAL HISTORY TO 1850**

[3 hours] American social and cultural patterns, institutions and forces from the colonial period to the mid-19th century.

### **HIST 3410 AMERICAN SOCIAL AND CULTURAL HISTORY, 1850-THE PRESENT**

[3 hours] American social and cultural patterns, institutions and forces from the mid-19th century to the present.

### **HIST 3420 AMERICAN MILITARY HISTORY**

[3 hours] The development of the strategy, tactics, organization, operation and policies of the armed forces of the U.S.; the interaction with technological factors, foreign policy goals, international problems and American society.

### **HIST 3430 AMERICAN MILITARY HISTORY IN THE 20TH CENTURY**

[3 hours] Intensive examination of the history of land, sea, air and intelligence factors. Emphasizes the historical development of the strategy and tactics of wars, peacetime planning, technological developments and military-societal relationships.

### **HIST 3440 AMERICAN RADICALISM**

[3 hours] Origins and development of radical social movements and their ideologies from the American Revolution to the New Left of the 1960s. Abolitionism, Feminism, Communitarianism, Marxism, Anarchism, Populism, Communism and the Peace Movement are among the topics to be studied.

### **HIST 3480 AMERICAN LABOR AND WORKING CLASS HISTORY**

[3 hours] Development of working class communities, cultures, organizations and ideology from colonial era to the present. Topics include industrialization, unionization, labor law, gender and race constructions. U.S. multicultural course

### **HIST 3500 EUROPEAN DIPLOMACY 1648-1815**

[3 hours] The foreign policies and foreign relations of the great powers from 1648 to the Congress of Vienna, 1815.

### **HIST 3510 EUROPEAN DIPLOMACY, 1815 TO THE PRESENT**

[3 hours] The foreign policies and foreign relations of the great powers from the Congress of Vienna until the present.

### **HIST 3520 DEVELOPMENT OF MODERN GERMANY TO 1918**

[3 hours] Development of modern German history from the late Middle Ages to the end of World War I with emphasis on the emergence of German nationalism and a united German state in the 18th-19th centuries.

### **HIST 3530 20TH CENTURY GERMANY**

[3 hours] Germany's development from the end of World War I to the present with emphasis on the rise of Nazism, World War II, and the division and new unification of Germany.

### **HIST 3540 HISTORY OF THE MIDDLE EAST FROM 600 TO 1500**

[3 hours] A survey of Middle East history from the emergence of Islam and the formation of Islamic states until the establishment of the Ottoman and Persian empires in the 15th-16th centuries. Non-western multicultural course

### **HIST 3550 HISTORY OF THE MIDDLE EAST SINCE 1500**

[3 hours] History of the Middle East from the collapse of the Medieval Muslim States and the rise of the Ottoman Empire in the 16th century through the period of European intervention to the development of independent Middle Eastern states in the 20th century. Non-western multicultural course

### **HIST 3560 EARLY MODERN FRANCE**

[3 hours] A survey of early modern French history from c. 1600-1789.

### **HIST 3570 HISTORY OF MODERN FRANCE**

[3 hours] A survey of modern French history since 1789.

### **HIST 3600 WOMEN IN AMERICAN HISTORY**

[3 hours] This course presents American history from early settlement to the present by examining the contributions of women, in interaction with men, to the immensely complex fabric of American life. U.S. multicultural course

### **HIST 3630 AFRICA TO 1800**

[3 hours] Africa south of the Sahara from antiquity to 1800. Topics include the peopling of the continent, growth of centralized political institutions, stateless societies, Islamic penetration, African slave trade. Non-western multicultural course

### **HIST 3640 AFRICA SINCE 1800**

[3 hours] Africa south of the Sahara from 1800 to the present. Subjects include 19th century, colonial and independent Africa. Specific topics: the rise of South Africa, imperialism, African resistance and nationalism and independent African political, cultural and economic systems. Non-western multicultural course

### **HIST 3770 AMERICAN FOREIGN RELATIONS TO THE EARLY 20TH CENTURY**

[3 hours] The foreign policy and international relations of the U.S. from the founding of the republic to the early 20th century.

### **HIST 3780 AMERICAN FOREIGN RELATIONS FROM THE LATE 19TH CENTURY TO THE PRESENT**

[3 hours] The foreign policy and international relations of the U.S. from the late 19th century to the present

**HIST 3870 JUNIOR HONORS RESEARCH I**

[3 hours] Independent research on specific historical topics. Prerequisite: Honors students only.

**HIST 3880 JUNIOR HONORS RESEARCH II**

[3 hours] Independent research on specific historical topics. Prerequisite: Honors students only.

**HIST 3980 SPECIAL TOPICS**

[1-4 hours] Topics selected by various instructors. May be repeated when the topic varies.

**HIST 4000 CAPSTONE IN HISTORY**

[4 hours] Research or historiography course offered in a seminar setting. Topics and interdisciplinary aspects at the discretion of individual faculty and will change from year to year. Prerequisite: HIST 2000 or permission of instructor

**HIST 4010 GREEK HISTORY**

[3 hours] Selected topics on the political and social institutions of Greece in the classical and Hellenistic periods. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4020 ROMAN HISTORY**

[3 hours] Selected topics on the political and social institutions of Rome during the Republic and Empire. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4030 EUROPE IN THE 14TH-15TH CENTURIES**

[3 hours] The waning of the Middle Ages and the development of the Renaissance in Western Europe with emphasis on Italy. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4040 EUROPE IN THE 16TH-17TH CENTURIES**

[3 hours] Society, culture and politics in early modern Europe with emphasis on culture north of the Alps, the Reformation and the nation-state. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4060 AGE OF ABSOLUTISM**

[3 hours] The growth and decline of the absolute monarchies in Europe and the development of a world market economy, c.1550-1715. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4070 AGE OF ENLIGHTENMENT**

[4 hours] The intellectual revolution of the years c. 1715-1789 and the challenge to the absolute monarchies of Europe. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4080 AGE OF REVOLUTION**

[4 hours] The age of the French Revolution and Napoleon, c.1785-1848. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4090 EUROPE, 1850-1918**

[3 hours] Internal and international development of the major European states from the mid-19th century to World War I with emphasis on nationalism, industrialization, imperialism, the origins and course of war. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4100 EUROPE SINCE WORLD WAR I**

[3 hours] Internal and international development of the major European states from World War I to the end of the twentieth century. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4150 CRITICS OF VICTORIAN SOCIETY**

[3 hours] Principal critics of society like Ruskin, Carlyle, Cobbett, Marx, Engels, Morris, Mill are read with a view to understanding capitalism, industrialism and England. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4170 THE BRITISH EMPIRE: FOR AND AGAINST**

[3 hours] The emergence of England as a maritime power, as an empire, and as a financial force, with emphasis upon resistances and decolonization. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4180 TOPICS IN ENGLISH SOCIAL AND ECONOMIC HISTORY**

[3 hours] Selected topics of modern English society and economy will be covered, such as urbanization, family and gender relations, enclosures, work and crafts. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4200 COLONIAL FOUNDATIONS OF U.S.**

[3 hours] This course analyzes the colonial experience of the United States prior to 1763. It stresses the various cultures and social groups in America and how they related with one another. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4210 WOMEN IN EARLY AMERICA**

[3 hours] A survey of the history of women in America up to 1860. Special focus on the divergent experiences of Native American, European American and African American women, including the forced and voluntary migrations of women to and across North America. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor U.S. multicultural course

**HIST 4220 THE AMERICAN REVOLUTION**

[3 hours] The background and progress of the War for Independence. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4230 THE EARLY REPUBLIC**

[3 hours] American politics and culture in the Federalist and Jeffersonian periods, 1789-1819. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4240 THE AGE OF JACKSON**

[3 hours] Jacksonian democracy in politics and as a reform movement; the sectional controversy; the Mexican-American War. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4250 CIVIL WAR AND RECONSTRUCTION**

[3 hours] Slavery and the Constitution in the sectional controversy, the political and military events of the Civil War, and the impact of the war on American society, 1848-1876. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4260 EMERGENCE OF MODERN AMERICA, 1876-1919**

[3 hours] American society in the late 19th and early 20th centuries including industrialization, urbanization, immigration, agrarian and labor revolts, politics, economic expansion, overseas initiatives, Progressive reform and involvement in World War I. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4270 20TH CENTURY AMERICA, 1920-1945**

[3 hours] Social, political and economic development of the United States, 1920-1945. The Republican ascendancy, the car culture, Great Depression, New Deal and World War II. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4280 U.S. SINCE 1945: AFFLUENCE AND ANXIETY**

[3 hours] Social, economic and political development of the United States since 1945. The Cold War, McCarthyism, Eisenhower Equilibrium, the New Frontier and the Great Society, civil rights, Watergate and the Reagan Revolution. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4290 THE OLD SOUTH**

[3 hours] The American South from colonization to secession, with emphasis on the society, economy and culture of the antebellum period, 1820-1860. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4310 HISTORY OF NATIVE AMERICAN RELIGIOUS MOVEMENTS**

[3 hours] History of Native American revitalization movements as a response to European colonization and Indian dispossession. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor U.S. multicultural course

**HIST 4340 FAR WESTERN FRONTIER**

[3 hours] Native Americans; Spanish conquistadors and missionaries; American scientific and military exploration; mountain men and fur trade; international rivalries and Mexican War; gold rush of '49. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor U.S. multicultural course

**HIST 4410 TOPICS IN AMERICAN CONSTITUTIONAL HISTORY**

[3 hours] Subject varies. Among those treated are origins of the American constitutional system, judicial review, slavery and the constitution, liberal constitutionalism. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

**HIST 4420 SELECTED TOPICS IN AFRICAN-AMERICAN HISTORY**

[3 hours] Subject varies. Among those treated are slavery, racism, Black reconstruction, modes of protest, Black nationalism, key leaders and Black migration. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor U.S. multicultural course

**HIST 4430 SLAVERY IN AMERICA**

[3 hours] Stresses the African continuum among slaves within the context of variations in goals and policies of slaveowners, slave trade, slave economics, demographics, slave labor and formation of slave culture. U.S. multicultural course

## 410 Course Descriptions

### **HIST 4470 PEOPLE AND POLITICS IN MEXICO**

[3 hours] Mexican history from pre-Hispanic times to the present. Emphasis on the political, social and economic changes imposed by the Spaniards; the legacy of colonialism on the modern nation; the Mexican Revolution and the "Mexican Miracle." Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4490 WITCHCRAFT AND MAGIC IN MEDIEVAL AND EARLY MODERN EUROPE**

[3 hours] Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraze and its decline. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4590 CULTURE AND HISTORY OF THE PEOPLE OF EASTERN AFRICA**

[3 hours] Study of the culture, history and society of the people of eastern Africa. Each term different peoples will be considered. Areas include present day Ethiopia, Kenya and the East Africa coast. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4620 CENTRAL EUROPE**

[3 hours] Central Europe from medieval times to the present. The Habsburg Empire, Poland, the Balkans, twentieth-century changes. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4660 IMPERIAL RUSSIA, 1700-1917**

[3 hours] Rise and fall of the Russian Empire. Politics and society from the time of Peter the Great to the 1917 Revolution. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4680 20TH CENTURY RUSSIA**

[3 hours] Russia from the 1917 Revolution to the present. Topics include Marxism, Communism, Stalinism, Cold War. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4720 MODERN CHINESE HISTORY**

[3 hours] China in transition under the impact of the West; forces leading to the revolution of 1911, the Nationalists' struggle, the emergence of the People's Republic of China and aspects of post-revolutionary China. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4740 MODERN JAPANESE HISTORY**

[3 hours] Japan in transition under Western influence, forces leading to the Meiji Restoration, the modernization of Japan, Japan's rise as a world power, war and postwar developments. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4750 EUROPE AND ASIA: EXPLORATION AND EXCHANGE, 1415-1800**

[3 hours] Motivation and process of European expansion to Africa and Asia from 1415-1800. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4760 COLONIALISM AND IMPERIALISM IN THE 19TH-20TH CENTURIES**

[3 hours] The imposition of European political, cultural and economic hegemony over Africa and Asia in the 19th and 20th centuries; the resistance and reaction of indigenous non-western people to colonialism. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor Non-western multicultural course

### **HIST 4790 THE HOLOCAUST**

[3 hours] This advanced course deals with selected aspects of the history and memory of Nazi genocide against the Jews of Europe, with special emphasis on visual and survivor sources. Prerequisite: 9 credits of humanities or social science courses, or permission of instructor

### **HIST 4830 THEORY OF PUBLIC HISTORY**

[3 hours] The definition, philosophy and evolution of public history as well as the current literature and debates within the field. Public history is the application of historical knowledge and methodology beyond academe. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4840 PUBLIC HISTORY PRACTICUM**

[3 hours] Course provides students with hands-on experience in the practice of public history by completing a project using specialized techniques, client-oriented research and teamwork. May be repeated for credit. Prerequisite: Junior standing

### **HIST 4860 HISTORIC PRESERVATION**

[3 hours] Examines the field of historic preservation via a worldwide approach to its problems, methods and development. Students participate in resource survey field work. Individual projects analyze local preservation activities. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4870 SENIOR HONORS RESEARCH I**

[3 hours] Open to College Honors students, to History Honors students and to Honors students from other departments. Independent research in specific topics.

### **HIST 4880 SENIOR HONORS RESEARCH II**

[3 hours] Open to College Honors students, to History Honors students and to Honors students from other departments. Independent research in specific topics.

### **HIST 4940 PUBLIC HISTORY INTERNSHIP**

[2-4 hours] Supervised practical experience in the field of public history. Prerequisite: Junior standing; HIST 2000, 4830 (may be taken concurrently)

### **HIST 4950 ARCHIVES ADMINISTRATION**

[3 hours] Emphasizes theory and practice of archival work, administrative operations and historical research in archives. The course will acquaint students with the skills necessary to function in a local history archive. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4980 SPECIAL TOPICS**

[1-4 hours] Topics selected by various instructors. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 4990 INDEPENDENT STUDIES**

[1-4 hours] Research and writing on topics designed to meet individual needs. Prerequisite: 9 credits of humanities or social sciences courses, or permission of instructor

### **HIST 5010 GREEK HISTORY**

[3 hours] Selected topics on the political and social institutions of Greece in the classical and Hellenistic periods.

### **HIST 5020 ROMAN HISTORY**

[3 hours] Selected topics on the political and social institutions of Rome during the Republic and Empire.

### **HIST 5030 EUROPE IN THE 14TH-15TH CENTURIES**

[3 hours] The waning of the Middle Ages and the development of the Renaissance in Western Europe with emphasis on Italy.

### **HIST 5040 EUROPE IN THE 16TH-17TH CENTURIES**

[3 hours] Society, culture and politics in early modern Europe with emphasis on culture north of the Alps, the Reformation and the nation-state.

### **HIST 5060 AGE OF ABSOLUTISM**

[3 hours] The growth and decline of the absolute monarchies in Europe and the development of a world market economy, c. 1550-1715.

### **HIST 5070 AGE OF ENLIGHTENMENT**

[4 hours] The intellectual revolution of the years c. 1715-1789 and the challenge to the absolute monarchies of Europe.

### **HIST 5080 AGE OF REVOLUTION**

[4 hours] The age of the French Revolution and Napoleon, c. 1785-1848.

### **HIST 5090 EUROPE, 1850-1918**

[3 hours] Internal and international development of the major European states from the mid-19th century to World War I with emphasis on nationalism, industrialization, imperialism, and the origins and course of war.

### **HIST 5100 EUROPE SINCE WORLD WAR I**

[3 hours] Internal and international development of the major European states from World War I to the end of the twentieth century.

### **HIST 5130 TUDOR ENGLAND**

[3 hours] Tudor England from 1485 to the end of the reign of Elizabeth I, emphasizing political, economic and social developments.

### **HIST 5140 STUART ENGLAND**

[3 hours] Stuart England from 1603 to the end of the reign of Anne, emphasizing political, economic and social developments.

### **HIST 5150 CRITICS OF VICTORIAN SOCIETY**

[3 hours] Principal critics of society like Ruskin, Carlyle, Cobbett, Marx, Engels, Morris and Mill are read with a view to understanding capitalism, industrialism and England.

### **HIST 5170 THE BRITISH EMPIRE: FOR AND AGAINST**

[3 hours] The emergence of England as a maritime power, as an empire, and as a financial force, with emphasis upon resistances and decolonization.

### **HIST 5180 TOPICS IN ENGLISH SOCIAL AND ECONOMIC HISTORY**

[3 hours] Selected topics of modern English society and economy will be covered, such as urbanization, family, and gender relations, enclosures, work and crafts.

**HIST 5190 BRITAIN FROM 1763 TO 1832**

[3 hours] An intensive examination of the slave trade, factory system, radicalism, Parliamentary Reform, insurrection, by means of reading primary sources such as Tom Paine.

**HIST 5200 COLONIAL FOUNDATIONS OF THE U.S.**

[3 hours] This course analyzes the colonial experience of the United States prior to 1763. It stresses the various cultures and social groups in America and how they related with one another.

**HIST 5220 THE AMERICAN REVOLUTION**

[3 hours] The background and progress of the War for Independence.

**HIST 5230 THE EARLY REPUBLIC**

[3 hours] American politics and culture in the Federalist and Jeffersonian periods, 1789-1819.

**HIST 5240 THE AGE OF JACKSON**

[3 hours] Jacksonian democracy in politics and as a reform movement; the sectional controversy; the Mexican-American War.

**HIST 5250 CIVIL WAR AND RECONSTRUCTION**

[3 hours] Slavery and the Constitution in the sectional controversy, the political and military events of the Civil War, and the impact of the war on American society, 1848-1876.

**HIST 5260 EMERGENCE OF MODERN AMERICA, 1876-1919**

[3 hours] American society in the late 19th and early 20th centuries, including industrialization, urbanization, immigration, agrarian and labor revolts, politics, economic expansion, overseas initiatives, Progressive reform and involvement in World War I.

**HIST 5270 20TH CENTURY AMERICA, 1920-1945**

[3 hours] Social, political and economic development of the United States, 1920-1945. The Republican ascendancy, the car culture, Great Depression, New Deal and World War II.

**HIST 5280 U.S. SINCE 1945: AFFLUENCE AND ANXIETY**

[3 hours] Social, economic and political development of the United States since 1945. The Cold War, McCarthyism, Eisenhower Equilibrium, the New Frontier and the Great Society, civil rights, Watergate and the Reagan Revolution.

**HIST 5290 THE OLD SOUTH**

[3 hours] The American South from colonization to secession, with emphasis on the society, economy and culture of the antebellum period, 1820-1860.

**HIST 5300 GREAT AMERICANS**

[3 hours] The careers of selected Americans in politics, business, science, religion and literature.

**HIST 5310 HISTORY OF NATIVE AMERICAN RELIGIOUS MOVEMENTS**

[3 hours] History of Native American revitalization movements as a response to European colonization and Indian dispossession.

**HIST 5320 INDIANS IN EASTERN NORTH AMERICA**

[3 hours] Native Americans in Eastern North America from prehistoric times through Jacksonian Indian Removal. Emphasis on intercultural interactions.

**HIST 5330 WESTERN AMERICAN INDIANS**

[3 hours] Native Americans of the Far West from prehistoric times through recent years. Emphasis on European contact and governmental policies.

**HIST 5340 FAR WESTERN FRONTIER**

[3 hours] Native Americans; Spanish conquistadors and missionaries; American scientific and military exploration; mountain men and fur trade; international rivalries and Mexican War; gold rush of '49.

**HIST 5350 THE AMERICAN WEST**

[3 hours] Settlement since the Civil War; mining rushes and Indian wars; violence and outlaws; farming and cattle ranching. Twentieth-century politics; ethnicity; and economics. Growth of California and the Sunbelt states.

**HIST 5360 AMERICAN INTELLECTUAL HISTORY I**

[3 hours] Development and influence of major ideas from the colonial period to 1865. Topics include Puritanism, the Enlightenment, Democracy and Transcendentalism.

**HIST 5370 AMERICAN INTELLECTUAL HISTORY II**

[3 hours] Major developments in American thought from 1865, including Social Darwinism, pragmatism, ideological conflict, modern science, education.

**HIST 5380 BUSINESS AND AMERICAN SOCIETY**

[3 hours] The growth of American business enterprise and its relationship to culture, politics, technological developments and economic change.

**HIST 5390 AMERICAN FOREIGN RELATIONS TO THE EARLY 20TH CENTURY**

[3 hours] The foreign policy and international relations of the U.S. from the founding of the republic to the early 20th century.

**HIST 5400 AMERICAN FOREIGN RELATIONS FROM THE LATE 19TH CENTURY TO THE PRESENT**

[3 hours] The foreign policy and international relations of the U.S. from the late 19th century to the present.

**HIST 5410 TOPICS IN AMERICAN CONSTITUTIONAL HISTORY**

[3 hours] Subject varies. Among those treated are origins of the American constitutional system, judicial review, slavery and the constitution, liberal constitutionalism.

**HIST 5420 SELECTED TOPICS IN AFRICAN-AMERICAN HISTORY**

[3 hours] Subject varies. Among those treated are slavery, racism, Black reconstruction, modes of protest, Black nationalism, key leaders and Black migration.

**HIST 5430 SLAVERY IN AMERICA**

[3 hours] Stresses the African continuum among slaves within the context of variations in goals and policies of slaveowners, slave trade, slave economics, demographics, slave labor and formation of slave culture.

**HIST 5460 WOMEN IN AMERICAN HISTORY**

[3 hours] This course presents American history from early settlement to the present by examining the contributions of women, in interaction with men, to the immensely complex fabric of American life.

**HIST 5470 MEXICO**

[3 hours] Mexican history from pre-Hispanic times to the present. Emphasis on the political, social and economic changes imposed by the Spaniards; the legacy of colonialism on the modern nation; the Mexican Revolution and the "Mexican Miracle."

**HIST 5480 AMERICAN LABOR AND WORKING CLASS HISTORY**

[3 hours] Development of working class communities, cultures, organizations and ideology from colonial era to the present. Topics include industrialization, unionization, labor law, gender and race constructions.

**HIST 5490 WITCHCRAFT AND MAGIC IN MEDIEVAL AND EARLY MODERN EUROPE**

[3 hours] Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraze and its decline.

**HIST 5500 EUROPEAN DIPLOMACY, 1648-1815**

[3 hours] The foreign policies and foreign relations of the great powers from 1648 to the Congress of Vienna, 1815.

**HIST 5510 EUROPEAN DIPLOMACY, 1815 TO THE PRESENT**

[3 hours] The foreign policies and foreign relations of the great powers from the Congress of Vienna until the present.

**HIST 5520 HISTORY OF THE MIDDLE EAST FROM 600 TO 1500**

[3 hours] A survey of Middle East history from the emergence of Islam and the formation of Islamic states until the establishment of the Ottoman and Persian empires in the 15th-16th centuries.

**HIST 5530 HISTORY OF THE MIDDLE EAST SINCE 1500**

[3 hours] History of the Middle East from the collapse of the Medieval Muslim States and the rise of the Ottoman Empire in the 16th century through the period of European intervention to the development of independent Middle Eastern States in the 20th century.

**HIST 5570 AFRICA TO 1800**

[3 hours] Africa south of the Sahara from antiquity to 1800. Topics include the peopling of the continent, growth of centralized political institutions, stateless societies, Islamic penetration, African slave trade.

**HIST 5580 AFRICA SINCE 1800**

[3 hours] Africa south of the Sahara from 1800 to the present. Subjects include 19th century, colonial and independent Africa. Specific topics: the rise of South Africa, imperialism, African resistance and nationalism and independent African political, cultural and economic systems.

**HIST 5620 CENTRAL EUROPE**

[3 hours] Central Europe from medieval times to the present. The Habsburg Empire, Poland, the Balkans, twentieth-century changes.

**HIST 5660 IMPERIAL RUSSIA, 1700-1917**

[3 hours] Rise and fall of the Russian Empire. Politics and society from the time of Peter the Great to the 1917 Revolution.

## 412 Course Descriptions

### **HIST 5680 20TH CENTURY RUSSIA**

[3 hours] Russia from the 1917 Revolution to the present. Topics include Marxism, Communism, Stalinism, Cold War.

### **HIST 5720 MODERN CHINESE HISTORY**

[3 hours] China in transition under the impact of the West; forces leading to the revolution of 1911, the Nationalists' struggle, the emergence of the People's Republic of China and aspects of post-revolutionary China.

### **HIST 5740 MODERN JAPANESE HISTORY**

[3 hours] Japan in transition under Western influence, forces leading to the Meiji Restoration, the modernization of Japan, Japan's rise as a world power, war and postwar developments.

### **HIST 5750 EUROPE AND ASIA: EXPLORATION AND EXCHANGE, 1415-1800**

[3 hours] Motivation and process of European expansion to Africa and Asia from 1415-1800.

### **HIST 5760 COLONIALISM AND IMPERIALISM IN THE 19TH-20TH CENTURIES**

[3 hours] The imposition of European political, cultural and economic hegemony over Africa and Asia in the 19th and 20th centuries; the resistance and reaction of indigenous non-western people to colonialism.

### **HIST 5790 THE HOLOCAUST**

[3 hours] This advanced course deals with selected aspects of the history and memory of Nazi genocide against the Jews of Europe, with special emphasis on visual and survivor sources. Prerequisite: Graduate status

### **HIST 5830 THEORY OF PUBLIC HISTORY**

[3 hours] The definition, philosophy and evolution of public history as well as the current literature and debates within the field. Public history is the application of historical knowledge and methodology beyond academe.

### **HIST 5840 PUBLIC HISTORY PRACTICUM**

[3 hours] Course provides students with hands-on experience in the practice of public history by completing a project using specialized techniques, client-oriented research and teamwork. May be repeated for credit.

### **HIST 5860 HISTORIC PRESERVATION**

[3 hours] Examines the field of historic preservation via a worldwide approach to its problems, methods and development. Students participate in resource survey field work. Individual projects analyze local preservation activities.

### **HIST 5940 PUBLIC HISTORY INTERNSHIP**

[2-4 hours] Supervised practical experience in the field of public history.

### **HIST 5950 ARCHIVES ADMINISTRATION**

[3 hours] Emphasizes theory and practice of archival work, administrative operations and historical research in archives. The course will acquaint students with the skills necessary to function in a local history archive.

### **HIST 5980 SPECIAL TOPICS**

[1-4 hours] Topics selected by various instructors.

### **HIST 6600 HISTORIOGRAPHY**

[4 hours] The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present. 01: America 02: Asia 03: Europe 04: Latin America 05: Africa 06: Special Topics

### **HIST 6920 PROSEMINAR**

[4 hours] Focus on readings of secondary and primary sources in preparation for original research in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U.S. Bibliography to 1865, 18: U.S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics

### **HIST 6930 SEMINAR**

[4 hours] Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics

### **HIST 6950 WORKSHOPS**

[2 hours] Methods of teaching history in college. Supervised teaching of sections in World Civilizations sequence.

### **HIST 6960 THESIS**

[1-16 hours] M.A. thesis topic to be selected by the student with the approval of the thesis adviser.

### **HIST 6990 INDEPENDENT STUDY**

[1-4 hours] Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title

### **HIST 7980 SPECIAL TOPICS**

[1-4 hours] Study of secondary and primary sources in various fields: 01: Colonial and Revolutionary, 02: 19th century America, 03: 20th century America, 04: American South, 05: American West, 06: American Intellectual, 07: American Foreign Relations, 08: American Constitutional, 09: American Labor, 10: American Urban, 11: American Social, 12: American Urban Progressive Reform, 13: Public History, 16: American Business, 17: Peace Movements, 18: Ethnic, 19: Ancient, 20: Medieval Europe, 21: Renaissance and Reformation, 22: Europe, 1648-1815, 23: Europe, 1815-present, 24: Russia, 25: Great Britain, 26: Traditional East Asia to 1800, 27: Modern East Asia, 1800 to present, 28: Latin America, 29: Middle East, 30: Africa, 99: Any Title

### **HIST 8600 HISTORIOGRAPHY**

[4 hours] The nature of historical writing. Concepts of the historical method. The history of the writing of history from the beginning to the present: 01: America 02: Asia 03: Europe 04: Latin America 05: Africa 06: Special Topics

### **HIST 8920 PROSEMINAR**

[4 hours] Focus on readings of secondary and primary sources in preparation for original research in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U.S. Bibliography to 1865, 18: U.S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics

### **HIST 8930 SEMINAR**

[4 hours] Focus on primary research and writing in various fields: 01: 17th and 18th century America, 05: 19th century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 15: 20th century America, 16: Public History, 17: U. S. Bibliography to 1865, 18: U. S. Bibliography since 1865, 35: Latin America, 39: Ancient, 40: Medieval Europe, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Africa, 90: Special Topics

### **HIST 8950 WORKSHOPS**

[2 hours] Methods of teaching history in college. Supervised teaching of sections in World Civilizations sequence.

### **HIST 8960 DISSERTATION**

[1-16 hours] Ph.D. dissertation topic to be selected by the student with the approval of the dissertation adviser.

### **HIST 8990 INDEPENDENT STUDY**

[1-4 hours] Readings: 01: 17th and 18th Century America, 05: 19th Century America, 06: American Urban, 07: American West, 08: American Intellectual, 10: Local History, 11: American Labor, 12: American Foreign Relations, 13: Public History, 15: 20th Century America, 16: Business, 17: Peace Movements, 18: Social, 35: Latin America, 40: Medieval Europe, 41: Renaissance and Reformation, 45: Early Modern Europe, 50: Modern Europe, 55: Central Europe and Balkans, 60: England, 65: British Empire, 70: Russia, 75: Modern East Asia, 80: Ancient Greece, 90: Ancient Rome, 92: Africa, 99: Any Title

## HON - Honors

### Honors Program (ARS)

### **HON 1010 HONORS READINGS CONFERENCE I**

[3 hours] This reading, writing and discussion course examines Great Books and formative ideas, primarily from the Western tradition. Readings Conference 1010 focuses on selected works from ancient times through the Middle Ages. English core course



**HON 1020 HONORS READINGS CONFERENCE II**

[3 hours] This reading, writing and discussion course examines Great Books and formative ideas, primarily from the Western tradition. Readings Conference 1020 focuses on selected works from the Renaissance through the 20th Century. English core course

**HON 2010 CULTURAL HISTORY**

[3 hours] This course examines the creative arts of Western Civilization. Humanities core course

**HON 2020 MULTICULTURAL LITERATURES: THE NORTH AMERICAN EXPERIENCE**

[3 hours] This reading, writing and discussion course examines selected literatures of the North American experience: for example, texts by African American, Arab American, Asian American, Hispanic or Native American authors. Humanities core course U.S. multicultural course

**HON 2030 MULTICULTURAL LITERATURES: THE NON-EUROPEAN WORLD**

[3 hours] This reading, writing and discussion course examines selected non-European literatures. Humanities core course Non-western multicultural course

**HON 2990 INDEPENDENT STUDY**

[1-5 hours] Supervised independent study.

**HON 4950 HONORS SEMINAR**

[3 hours] These interdisciplinary seminars are organized around a variety of subjects and intellectual concerns.

**HON 4960 HONORS SEMINAR**

[3 hours] These interdisciplinary seminars are organized around a variety of subjects and intellectual concerns.

**HON 4990 INDEPENDENT STUDY**

[1-5 hours] Supervised independent study.

## HUM - Humanities

### Humanities Institute (ARS)

**HUM 1010 CLASSICAL HUMANITIES**

[3 hours] An introduction to the civilization of the Greeks and Romans in which history, literature, mythology, art and philosophy are interrelated and interpreted. Humanities core course

**HUM 1200 FRAMING CULTURES, BUILDING COMMUNITIES**

[3 hours] This interdisciplinary course examines cultures and community difference and group identity through reading and discussing major texts from various world traditions, mainly Western civilization from antiquity to the present. Humanities core course

**HUM 2010 WORLD HUMANITIES TRADITIONS I**

[3 hours] Study of major works of world literature, philosophy and the arts from ancient times to c. 1600. Inter-relationships among history, ideas and the arts are explored in lectures and discussions. Humanities core course

**HUM 2020 WORLD HUMANITIES TRADITIONS II**

[3 hours] Study of major works of world-literature, philosophy and the arts from c. 1600 to the present day. Inter-relationships among history, ideas and the arts will be explored in lectures and discussions. Humanities core

**HUM 2220 TELLING STORIES, VALUING LIVES**

[3 hours] Drawing connections between literature and philosophy, this course examines issues of self-representation, human values in literature, canon formation and the cultural contexts of literature. Humanities core course

**HUM 2980 SPECIAL TOPICS IN THE HUMANITIES**

[1-4 hours] This course is devoted to any topic or topics in the humanities that the instructor sees fit. The instructor and topic will alternate from semester to semester according to student and departmental interest in certain topics.

**HUM 3000 THE LITERATURE OF LITERACY**

[3 hours] This course examines narratives and theories of literacy which illustrate differing definitions, constructions and practices, including those which have excluded specific cultural groups according to gender, race and class.

**HUM 3010 THE TRANSFORMATION OF MEMORY**

[3 hours] This course explores a range of private, public and professional memory and how these contribute to a sense of historical literacy and to the structures of the larger American experience.

**HUM 3020 REASON'S CULTURE**

[3 hours] An examination of what education has meant and can mean in our present context. Topics will include the nature of culture, how it is evaluated and what the cultivation of critical reasoning involves.

**HUM 3100 CLASSICAL MYTHOLOGY**

[3 hours] A survey of Greek and Roman mythology in classical literature, sculpture and art.

**HUM 3200 ENGLISH DERIVATIVE GREEK AND LATIN**

[3 hours] Study of the origin and development of words in current use in a variety of fields for those with little or no previous language study in Latin or Greek.

**HUM 3250 GREEK AND ROMAN DRAMA IN ENGLISH**

[3 hours] A study in the origin and development of classical tragedy and comedy with extensive readings in English of the major dramatists from Aeschylus to Seneca.

**HUM 4950 HUMANITIES SENIOR THESIS I**

[4 hours] This seminar provides senior humanities majors with an opportunity to pursue creative/research projects and to discuss them with their adviser and their peers.

**HUM 4960 HUMANITIES SENIOR THESIS II**

[4 hours] This seminar provides senior humanities majors with the opportunity to pursue creative/research projects and to discuss them with their adviser and their peers.

## HURM - Human Resource Management

### Department of Management (BUS)

**HURM 3220 HUMAN RESOURCE MANAGEMENT**

[3 hours] Introduction to the field of human resource management. It is designed for students planning careers in human resources or those who simply wish to supplement their skills in personnel matters commonly of concern to all managers. Prerequisite: BUAD 3030

**HURM 3630 CONFLICT RESOLUTION AND NEGOTIATIONS**

[3 hours] Course is designed to develop individual negotiation and labor management skills. Students will learn to apply these skills in collective bargaining, contract negotiation and conflict resolution using cases, role-plays and exercises. Prerequisite: BUAD 3030

**HURM 4640 BENEFITS, HEALTH & WELLNESS**

[3 hours] Includes planning and administering mandatory and voluntary benefit programs, cost containment strategies and benefit communication programs. Development and administration of Employee Assistance Programs and employee wellness programs are also covered. Prerequisite: HURM 3220

**HURM 4650 COMPENSATION**

[3 hours] Design and administration of compensation systems, including job evaluation, skill-based pay, salary surveys, pay level decisions, pay structures, executive and special employee group compensation programs, and budget and administrative issues. Prerequisite: HURM 3220

**HURM 4660 PLANNING, SELECTION, AND RECRUITMENT**

[3 hours] Covers aspects of human resource planning, including Affirmative Action and succession planning, developing legally defensible selection and recruitment methods, and career development. Prerequisite: HURM 3220

**HURM 4710 TRAINING AND EVALUATION**

[3 hours] Theory, research, and practice related to the design and implementation of employee training programs and formal performance evaluation systems. Includes development of specific training programs. Prerequisite: HURM 3220

**HURM 6700 HUMAN RESOURCE MANAGEMENT**

[3 hours] A survey of the functions and current trends in human resources management. Special emphasis on research methods, tools and techniques for in-depth understanding of problems and challenges faced by medium-sized firms.

**HURM 6710 EMPLOYMENT AND LABOR LAW**

[3 hours] This course introduces the objectives, activities and practices involved in employment and labor law. It is designed for those pursuing careers in human resources or managers wishing to understand their responsibilities in this area.

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### **HURM 6720 ADVANCED NEGOTIATION AND CONFLICT RESOLUTION**

[3 hours] The objective of this course is to improve students' skills in all phases of negotiation and conflict resolution strategies and techniques. The course is based on a series of simulated negotiations in a variety of contexts.

### **HURM 6730 PERFORMANCE MANAGEMENT**

[3 hours] This course is designed to provide practical working knowledge of the processes of setting expectations, monitoring performance, coaching and developing employees, and assessing and rewarding good performance in rapidly changing organizations. Prerequisite: HURM 6700 or equivalent

### **HURM 6740 HUMAN RESOURCE STRATEGY AND METRICS**

[3 hours] This course focuses on the integration of human resource strategies with the strategies of the firm. Students will learn how to assess and measure human resource processes, programs and outcomes. Prerequisite: HURM 6700 or equivalent

### **HURM 6750 CURRENT TOPICS IN HUMAN RESOURCE MANAGEMENT**

[3 hours] This course is designed to provide students with current viewpoints, challenges, practices and theories in human resource management. Conducted in a seminar format, the course will emphasize different aspects of HR management each time it is offered. Prerequisite: HURM 6700 or equivalent

### **HURM 6800 TOOLS AND TECHNIQUES IN HUMAN RESOURCE MANAGEMENT**

[3 hours] Course covers issues and techniques related to human resource planning, identifying and predicting HRM problems, and demonstrating the relationship between effective HRM practices and the bottom-line of the organization. Prerequisite: MGMT 5110, HURM 6700

## **IBUS - International Business**

### **Department of Marketing (BUS)**

### **IBUS 3150 UNDERSTANDING CULTURAL DIFFERENCES FOR BUSINESS**

[3 hours] Course focuses on understanding cultures and managing cultural differences for competitive advantage. Prerequisite: Junior standing Non-western multicultural course

### **IBUS 3600 INTERNATIONAL MANAGEMENT**

[3 hours] An overview of management in different geographic regions of the world. Case studies will be used to compare and contrast national models of management. Prerequisite: BUAD 3030, junior standing

### **IBUS 3940 INTERNSHIP IN INTERNATIONAL BUSINESS I**

[3 hours] A course in which the student receives practical business experience working in a organization involved in International Business. Prerequisite: Permission of chair

### **IBUS 4100 STUDY ABROAD PROGRAM**

[3 hours] Program includes travel abroad, study and written report of an industry, company, or issues of interest, cultural immersion, and visits to manufacturing, service and government organizations. Prerequisite: Permission of chair and faculty

### **IBUS 4180 NORTH AMERICAN BUSINESS PRACTICES**

[3 hours] This course will examine the business environment in North America and compare business practices and trade relationships between Canada, Mexico and the United States. Prerequisite: Junior standing

### **IBUS 4360 GLOBAL BUSINESS**

[3 hours] Students will learn to integrate international business functions, develop strategies that respond to environmental changes, and understand the challenges faced by small, mid-sized and multinational firms operating in a global environment. Prerequisite: Senior standing

### **IBUS 4490 GLOBAL MANAGEMENT SYSTEMS**

[3 hours] A study of how management systems in various world regions evolve in response to the emerging global context. Focus will be on analyzing the determinants of similarities and contrasts in management systems. Prerequisite: BUAD 3030; senior standing

### **IBUS 4940 INTERNSHIP IN INTERNATIONAL BUSINESS II**

[3 hours] A course in which the student receives practical International Business experience working in a global organization either within the U.S. or overseas. Prerequisite: Senior standing; permission of chair

### **IBUS 4980 SPECIAL TOPICS IN INTERNATIONAL BUSINESS**

[3 hours] Analysis of current issues in International Business. Prerequisite: Permission of faculty

### **IBUS 4990 INDEPENDENT STUDY**

[1-3 hours] An individually supervised study in International Business. Students must submit a proposal to be approved by a department faculty member prior to enrolling in the course. Prerequisite: Permission of faculty

### **IBUS 6100 STUDY ABROAD PROGRAM**

[3 hours] Program includes travel abroad, study and written report of an industry, company, or issues of interest, cultural immersion, and visits to manufacturing, service and government organizations.

### **IBUS 6360 MANAGEMENT OF MULTINATIONAL FIRMS**

[3 hours] Analysis of the multinational firm, emphasizing the differences with domestic enterprises, with respect to strategic planning and capital allocation, marketing, production, supply, personnel and contract negotiation.

### **IBUS 6490 GLOBAL MANAGEMENT SYSTEMS**

[3 hours] Compares the management philosophies, systems and methods of U.S. firms with those of firms from other countries, particularly the management systems of Japanese, German and other nationality firms that are competitors of U.S. firms. Prerequisite: MGMT 5110 or equivalent

### **IBUS 6980 SPECIAL TOPICS**

[3 hours] Current issues/developments in international business are discussed. Prerequisite: Faculty permission

### **IBUS 6990 INDEPENDENT STUDY**

[1-3 hours] Independent study in international business. A proposal for the independent study must be approved by faculty member and department chair. Prerequisite: Faculty and chair permission

## **IDS - Interdisciplinary Studies**

### **Interdisciplinary Studies (ARS)**

### **IDS 2010 INTERDISCIPLINARY STUDIES**

[1-4 hours] Prerequisite: To be determined by the constituencies contributing to each course.

### **IDS 2020 INTERDISCIPLINARY STUDIES**

[1-4 hours] Multilevel designations which permit the offering of interdisciplinary courses. Participation from at least two departments is required. Prerequisite: To be determined by the constituencies contributing to each course.

### **IDS 3010 INTERDISCIPLINARY STUDIES**

[1-4 hours] Multilevel designations which permit the offering of interdisciplinary courses. Participation from at least two departments is required. Prerequisite: To be determined by the constituencies contributing to each course

### **IDS 3020 INTERDISCIPLINARY STUDIES**

[1-4 hours] Multilevel designations which permit the offering of interdisciplinary courses. Participation from at least two departments is required. Prerequisite: To be determined by the constituencies contributing to each course.

### **IDS 4010 INTERDISCIPLINARY STUDIES**

[1-4 hours] Multilevel designations which permit the offering of interdisciplinary courses. Participation from at least two departments is required. Prerequisite: To be determined by the constituencies contributing to each course.

### **IDS 4020 INTERDISCIPLINARY STUDIES**

[1-4 hours] Multilevel designations which permit the offering of interdisciplinary courses. Participation from at least two departments is required. Prerequisite: To be determined by the constituencies contributing to each course.

# INFS - Information Systems

## Department of Information Operations and Technology Management (BUS)

### INFS 3150 PRINCIPLES OF STRUCTURED COMPUTER PROGRAMMING AND PROBLEM SOLVING

[3 hours] Major topics include problem solving, event driven programming, control structures, data types, data structures, objects, properties, events and methods. Subroutines, functions, file processing, menu and application development will also be covered. Prerequisite: Junior standing; basic business computing proficiency

### INFS 3160 OBJECT ORIENTED PROGRAMMING

[3 hours] Programming language hierarchy, classes and objects, object oriented terminology, development of business application both stand-alone and networked. Sorting and searching, creation and use of objects. A contemporary OOP language will be needed for projects. Prerequisite: INFS 3150

### INFS 3240 DECISION SUPPORT AND KNOWLEDGE BASED SYSTEMS

[3 hours] Major topics include: development of business decision support systems, applications of mathematical models, data and knowledge bases in constructing decision support and expert systems. Prerequisite: INFS 3150

### INFS 3250 SOFTWARE APPLICATIONS IN BUSINESS

[3 hours] This course is designed to acquaint students with the application of integrated software to business decisions, report writing and presentations. Student will gain hands-on experience with popular business software packages. Prerequisite: Junior standing; basic business computing proficiency

### INFS 3370 BUSINESS DATA COMMUNICATIONS

[3 hours] An introduction to data communications in business. Topics include local-area and wide-area networks, including the Internet; hardware and media; network topologies; client-server networks; and network operating system software. Prerequisite: INFS 3050

### INFS 3380 PROCEDURAL PROGRAMMING LANGUAGES

[3 hours] An introduction to application program development using procedural programming languages. Topics include the data environment and file organizations types, sequential and random file processing methods. Prerequisite: INFS 3150

### INFS 3770 APPLICATION DEVELOPMENT USING DATABASE MANAGEMENT SYSTEMS

[3 hours] The design and implementation of computer applications employing database management systems are studied. Students will work in teams to develop a database application using a database management software package. Prerequisite: BUAD 1020 or CMPT 1100

### INFS 3980 CONTEMPORARY TOPICS IN INFORMATION SYSTEMS

[3 hours] Selected current topics in Information Systems practice, trends and technology. Prerequisite: INFS 3150

### INFS 4300 DISTRIBUTED SYSTEMS AND WEB DEVELOPMENT

[3 hours] Distributed architecture of business systems. Brief discussion on Object Request Broker-related protocols. Design and develop two tier, three tier and multi-tier business systems. HTTP and IP protocols, and security issues, client side scripting, server side scripting implementing component-based design in Web environment. Students will do an implementation project together with numerous hands-on assignments. Prerequisite: INFS 3160, 3770

### INFS 4320 INFORMATION SYSTEMS PLANNING AND MANAGEMENT

[3 hours] An in-depth study of the problems in managing computer-based information systems. Issues of planning and control, as well as the organizational impact of computer systems are stressed. System resource allocation will also be discussed. Prerequisite: INFS 4310

### INFS 4510 SYSTEMS ANALYSIS, DESIGN AND DEVELOPMENT

[3 hours] The analysis, design and implementation of information systems are studied. Students will work in teams to carry a project through all of the steps required for system building. Prerequisite: INFS 3370, 3770

### INFS 4620 INFORMATION STORAGE, RETRIEVAL AND DATA STRUCTURES

[3 hours] Information structures and their implementation are studied. Data and file design methodologies to assist in information systems development is emphasized. Data structure implementation on contemporary computing platforms is covered. Prerequisite: INFS 3150

### INFS 4810 INSTALLATION OF COMPUTER SYSTEMS

[3 hours] Contemporary microcomputer and LAN operating systems. Use of utilities and device drivers. Installation of memory, disk drives, expansion cards, LAN hardware and software. Client server architecture and implementation issues. Prerequisite: BUAD 1020

### INFS 4940 INFS INTERNSHIP

[1-3 hours] A prearranged work-study program where students specializing in computer systems, operations management or decision sciences obtain on-the-job experience while learning and applying the basic concepts and techniques of their respective areas. Prerequisite: Approval

### INFS 4990 INDEPENDENT STUDY: READINGS AND RESEARCH

[1-3 hours] Individual student study of a topic of interest to both the faculty member and student. Students are responsible for finding a faculty member to sponsor readings and research. Prerequisite: Approval

### INFS 5400 INFORMATION TECHNOLOGY AND COMPUTER PROGRAMMING

[3 hours] Intensive exposure to technologies and concepts of business oriented information systems. Computer programming in a contemporary programming language. Applications development through programming projects.

### INFS 6460 MANAGEMENT INFORMATION SYSTEMS

[3 hours] This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user's role in the management of this technology in organizations.

### INFS 6470 INFORMATION TECHNOLOGY

[3 hours] Discussion topics will be: Fundamentals of Information Technology, decision support systems, knowledge based/expert systems, data communication, database management and their applications in manufacturing. Will include implementation issues of Information Technology in manufacturing.

### INFS 6560 SYSTEMS ANALYSIS AND DESIGN

[3 hours] Concepts, tools, and techniques for information systems analysis, design and development will be discussed. Contemporary methodologies for systems development including CASE tools, prototyping and RAD project work will be included. Prerequisite: INFS 6460 or equivalent

### INFS 6570 INFORMATION SYSTEMS POLICY AND ADMINISTRATION

[3 hours] This course is designed for those who aspire to become managers of Information Technology (IT). Various aspects of IT management will be discussed with real world examples/cases. Prerequisite: INFS 6560

### INFS 6610 INFORMATION STORAGE AND RETRIEVAL STRUCTURES

[3 hours] This course will analyze the concepts and methods used in the management of organizational data resources. Covers data modeling, database design, administration and architecture. Hands-on applications of database development are provided. Prerequisite: INFS 6460

### INFS 6750 RESEARCH IN INFORMATION SYSTEMS, OPERATIONS MANAGEMENT OR DECISION SCIENCES

[1-3 hours] Individual study of topics of common interest to both student and faculty member. Prerequisite: Permission of instructor

### INFS 6810 NETWORK COMMUNICATIONS

[3 hours] Applications of business data communication, basic electronic communications concepts, public networks, computer networks, the Internet, network management, regulatory environment. Prerequisite: INFS 6460 or equivalent

### INFS 6930 CONTEMPORARY TOPICS SEMINAR

[3 hours] This seminar will focus on current topics in the fields of Information Systems and Operations Management. Prerequisite: Permission of instructor

### INFS 8460 MANAGEMENT INFORMATION SYSTEMS

[3 hours] This course is designed for end-users of computers to understand and appreciate the role of information technology and end-user's role in the management of this technology in organizations. Prerequisite: Ph.D. student status

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### **INFS 8470 INFORMATION TECHNOLOGY**

[3 hours] Discussion topics will be: Fundamentals of Information Technology, decision support systems, knowledge based/expert systems, data communication, database management and their applications in manufacturing. Will include implementation issues of Information Technology in manufacturing. Prerequisite: Ph.D. student status

### **INFS 8480 INFORMATION SYSTEMS ISSUES IN MANUFACTURING**

[4 hours] This course examines theoretical frameworks and recent empirical research of information and manufacturing technology. Emphasis will be on developing an integrative perspective of both technologies. Prerequisite: Ph.D. student status; permission of instructor

## **JAPN - Japanese**

### **Department of Foreign Languages (ARS)**

#### **JAPN 1080 JAPANESE CULTURE AND COMMERCE**

[3 hours] Study of Japanese culture and society with emphasis on business and economics. Taught in English. (not for major credit). Humanities core course Non-western multicultural course

#### **JAPN 1090 INTRODUCTION TO JAPANESE CULTURE**

[3 hours] An introduction to principal social, artistic and literary aspects of modern Japanese culture. Taught in English. (Not for major credit.) Humanities core course Non-western multicultural course

#### **JAPN 1110 ELEMENTARY JAPANESE I**

[4 hours] An introduction to Japanese language and culture through aural comprehension, speaking, reading and writing. Laboratory practice required. (not for major credit)

#### **JAPN 1120 ELEMENTARY JAPANESE II**

[4 hours] An introduction to Japanese language and culture through listening, speaking, reading and writing. Laboratory practice required. (not for major credit) Prerequisite: JAPN 1110 or satisfactory score on placement test. Humanities core course

#### **JAPN 2140 INTERMEDIATE JAPANESE I**

[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (not for major credit) Prerequisite: JAPN 1120 or satisfactory score on placement test. Humanities core course

#### **JAPN 2150 INTERMEDIATE JAPANESE II**

[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (not for major credit) Prerequisite: JAPN 2140 or satisfactory score on placement test. Humanities core course

#### **JAPN 2190 STUDY ABROAD**

[1-3 hours] The course permits beginning students of Japanese to spend time in a country where Japanese is spoken. Credit awarded in accordance with established departmental procedures. Prerequisite: JAPN 2150 & permission of instructor.

#### **JAPN 3010 CONVERSATION AND COMPOSITION I**

[3 hours] Work on advanced aural comprehension, speaking, reading and writing skills through intensive work with authentic texts dealing with contemporary issues relating to Japan. Laboratory practice required. Prerequisite: JAPN 2150 or consent of instructor

#### **JAPN 3020 CONVERSATION AND COMPOSITION II**

[3 hours] Further work on advanced aural comprehension, speaking, reading and writing skills through intensive work with authentic texts dealing with contemporary issues relating to Japan. Laboratory practice required. A writing-intensive course. Prerequisite: JAPN 3010 or consent of instructor

#### **JAPN 3170 BUSINESS JAPANESE**

[3 hours] An introduction to the language and practices of Japanese business and commerce.

#### **JAPN 3410 SURVEY OF JAPANESE CIVILIZATION I**

[3 hours] A study of different aspects of Japanese culture and civilization such as fine arts, history, science and philosophy. Prerequisite: JAPN 2150 or consent of instructor

#### **JAPN 3420 SURVEY OF JAPANESE CIVILIZATION II**

[3 hours] A study of different aspects of Japanese culture and civilization such as fine arts, history, science and philosophy. Prerequisite: JAPN 2150 or consent of instructor

#### **JAPN 4010 JAPANESE SYNTAX AND STYLISTICS I**

[3 hours] A review of Japanese stylistic structures through the analysis of texts and written and oral exercises in Japanese. Prerequisite: JAPN 3020 or consent of instructor

#### **JAPN 4020 JAPANESE SYNTAX AND STYLISTICS II**

[4 hours] Further review of Japanese stylistic structures through the analysis of texts and written and oral exercises in Japanese. The course includes an introduction to Japanese calligraphy. A writing-intensive course. Prerequisite: JAPN 4010

#### **JAPN 4050 ADVANCED CONVERSATION I**

[3 hours] Practice in speaking idiomatic Japanese.

#### **JAPN 4060 ADVANCED CONVERSATION II**

[3 hours] Continued practice in speaking idiomatic Japanese.

#### **JAPN 4070 JAPANESE TRANSLATION**

[3 hours] Practice in translation of texts from Japanese into English and English into Japanese. Subject matter area will include commerce, natural, physical and social sciences, and the humanities. Prerequisite: Two 3000-level courses

#### **JAPN 4190 STUDY ABROAD**

[1-12 hours] The course permits the student minoring in Japanese to spend time in a country where Japanese is spoken. Credit awarded in accordance with established departmental procedures. Prerequisite: JAPN 3020 & consent of instructor

#### **JAPN 4980 SPECIAL TOPICS IN JAPANESE STUDIES**

[1-3 hours] Study of a selected topic in Japanese language, literature, or culture. May be repeated for credit when topic varies. Prerequisite: Two 3000-level courses

#### **JAPN 4990 INDEPENDENT STUDY IN JAPANESE**

[1-3 hours] Independent research on special topics. May be repeated once for additional credit.

## **KINE - Kinesiology**

### **Department of Kinesiology (HHS)**

#### **KINE 1080 EXERCISE AND HEALTH**

[2 hours] The scientific basis and the health benefits of exercise and wellness activities are presented in lecture. Students undertake individualized exercise programs designed to improve physical fitness.

#### **KINE 1110 INTRODUCTION TO CLINICAL ATHLETIC TRAINING**

[2 hours] This course familiarizes students with the clinical components of the athletic trainer education program. Students will learn the modular clinical program, staff athletic trainers, policies, procedures and introductory taping.

#### **KINE 1650 FOUNDATIONS OF ATHLETIC TRAINING**

[3 hours] Injury prevention; inflammation and tissue repair, physical conditioning; injury recognition; emergency procedures; athletic nutrition; protective equipment; psychological, ethical and legal considerations; and environmental problems relating to athletic training. Prerequisite: KINE 1110 Corequisite: KINE 2510, 2520 and HEAL 1500

#### **KINE 1700 INTRODUCTION TO EXERCISE SCIENCE**

[2 hours] An introduction to the professions involving exercise science; sports science, rehabilitation therapy and physical education. Emphasis is on basic concepts of physiological, biomechanical and psychological function in human movement. Programmatic and career opportunities are discussed.

#### **KINE 2510 HUMAN ANATOMY**

[3 hours] An integrated study of both regional anatomy and musculoskeletal, cardiovascular, lymphatic, respiratory, neurologic, digestive, renal, endocrine and reproductive systems. Required for students in exercise science and allied health professional programs. Corequisite: KINE 2520 Natural Sciences core course

#### **KINE 2520 HUMAN ANATOMY LABORATORY**

[1 hour] Laboratory exercises in musculoskeletal, neurological, cardiovascular and respiratory anatomy. Corequisite: KINE 2510 Natural Sciences core course

#### **KINE 2530 HUMAN PHYSIOLOGY**

[3 hours] An integrated study of physiology with emphasis on musculoskeletal, cardiovascular, lymphatic, respiratory, neurologic, digestive, renal, endocrine and reproductive systems. Required for students in exercise science and allied health professional program. Prerequisite: CHEM 1090; BIOL 2150; KINE 2510

#### **KINE 2540 HUMAN PHYSIOLOGY LABORATORY**

[1 hour] Laboratory exercises in musculoskeletal, neurological, cardiovascular and respiratory physiology. Corequisite: KINE 2530

**KINE 2560 ANATOMY AND PHYSIOLOGY I**

[3 hours] Structure and function of the human body. Study of cells, tissues, and the skeletal, muscular and nervous systems. Includes lecture and lab. Natural Sciences core course

**KINE 2570 HUMAN ANATOMY AND PHYSIOLOGY II**

[3 hours] Structure and function of human endocrine, blood, cardiovascular, lymphatic, respiratory, digestive, urinary and electrolyte, and reproductive systems. Prerequisite: KINE 2560

**KINE 2580 HUMAN PATHOPHYSIOLOGY FOR HEALTH CARE**

[3 hours] Topics include the cellular perspective and fluid environment, genetic disorders, and pathophysiology of organ systems, concentrating on cardiovascular, respiratory, renal-urinary, endocrine, gastrointestinal and nervous. Prerequisite: KINE 2560 and 2570, or equivalent, or permission of instructor

**KINE 2610 EVALUATION OF LOWER EXTREMITY INJURIES**

[3 hours] Study of the pathology, etiology and physiology of lower extremity injuries common in athletics as well as life-threatening head and neck injuries. Signs, symptoms and specific tests will be discussed. Prerequisite: KINE 1650, admission to the athletic training program

**KINE 2620 EVALUATION OF UPPER EXTREMITY INJURIES**

[3 hours] Study of the pathology, etiology and physiology of Upper extremity injuries common in athletics as well as non-life-threatening head and neck injuries. Signs, symptoms and specific tests for the upper extremity and trunk will be discussed. Prerequisite: KINE 2610

**KINE 2710 CLINICAL SKILLS DEVELOPMENT I**

[2 hours] Laboratory experience to review and test the clinical skills taught during the first year of the athletic training curriculum and clinical skill development experiences provided in the athletic training room with intercollegiate athletic teams. Prerequisite: KINE 1650 and admission to the athletic training education program

**KINE 2720 CLINICAL SKILLS DEVELOPMENT II**

[2 hours] Laboratory experience to review and test the clinical skills taught during the lower extremity evaluation course in the athletic training curriculum and clinical skill development experiences provided in the athletic training room with intercollegiate athletic teams. Prerequisite: KINE 2610

**KINE 2960 GROWTH, DEVELOPMENT AND MOTOR LEARNING**

[4 hours] Lecture, discussion and laboratory based course concerning growth and development characteristics spanning birth through elderly life. Theory and practical applications of motor skill acquisition will be stressed. Prerequisite: KINE 1700

**KINE 3510 INTRODUCTION TO KINESIOTHERAPY**

[3 hours] This course is designed to introduce the student to the scope of practice for kinesiotherapy. Emphasis will be placed on standards of practice for the registered kinesiotherapist. Practicum hours included. Prerequisite: KINE 1700, 2510, 2520 and HEAL 1500

**KINE 3520 APPLIED EXERCISE PHYSIOLOGY**

[3 hours] This course will provide information related to the physiological responses of the human organism to exercise and exercise training. Emphasis will also be placed on the role exercise plays in health and disease prevention. Prerequisite: KINE 2510, 2530 or 2570

**KINE 3530 APPLIED EXERCISE PHYSIOLOGY LABORATORY**

[1 hour] This course is the laboratory component of the applied exercise physiology course. Emphasis will be placed on the concepts learned in lecture. This will occur through hands-on activities and experiments involving various forms of exercise testing and the use of standardized equipment. Prerequisite: KINE 2510 or 2530 or 2570 Corequisite: KINE 3520

**KINE 3610 GENERAL MEDICAL CONDITIONS FOR ATHLETIC TRAINERS**

[2 hours] Knowledge and skills that entry-level athletic trainers must possess to recognize, treat and refer, when appropriate, the general medical conditions and disabilities of people involved in physical activity. Prerequisite: KINE 2620

**KINE 3630 THERAPEUTIC MODALITIES FOR ATHLETIC TRAINERS**

[3 hours] Physiological, mechanical and bio-electrical principles and techniques of application for electrical, thermal, high frequency radiation and traction modalities used in the treatment of athletic injuries. Prerequisite: KINE 2620

**KINE 3640 MODALITIES FOR ATHLETICS TRAINING LABORATORY**

[1 hour] Techniques of application for electrical, thermal, high frequency radiation and mechanical modalities used in the treatment of injuries to physically active individuals. Prerequisite: KINE 1650 Corequisite: KINE 3630

**KINE 3660 REHABILITATION OF ATHLETIC INJURIES**

[3 hours] A systematic approach to exercise program development, techniques, indications and contraindications of exercise, and exercise progression as related to athletic injuries, prevention, reconditioning and return to play guidelines. Prerequisite: KINE 3630

**KINE 3670 REHABILITATION OF ATHLETIC INJURIES LABORATORY**

[1 hour] Application of rehabilitation techniques for injuries to physically active individuals. Prerequisite: KINE 2680

**KINE 3710 CLINICAL SKILLS DEVELOPMENT III**

[3 hours] Laboratory experience to review and test the clinical skills taught during the upper extremity evaluation course in the athletic training curriculum and clinical skill development experiences provided in the athletic training room with intercollegiate athletic teams. Prerequisite: KINE 2620

**KINE 3720 CLINICAL SKILLS DEVELOPMENT IV**

[3 hours] Laboratory experience to review and test the clinical skills taught during the therapeutic modalities course in the athletic training curriculum and clinical skill development experiences provided in the athletic training room with intercollegiate athletic teams. Prerequisite: KINE 3610 and 3630

**KINE 3730 FITNESS ASSESSMENT AND PROGRAMMING**

[2 hours] This course is designed to provide students with the knowledge and skills used in the development and implementation of fitness programming for school and community environments. Prerequisite: KINE 1700

**KINE 3820 SPORTS MEDICINE FOR COACHES**

[3 hours] Survey of athletic training dealing with the care and prevention, evaluation and treatment, of athletic injuries. Emphasis on orthopedic evaluation and physician involvement. Preventive taping techniques. Prerequisite: KINE 2510 or 2570

**KINE 3900 SEMINAR IN ATHLETIC TRAINING**

[1 hour] Psychomotor skill development and assessment of NATA required student athletic trainer competencies in the athletic training room.

**KINE 4540 APPLIED BIOMECHANICS**

[3 hours] This course focuses on the application of biomechanics concepts to the acquisition and refinement of fundamental movement patterns, basic functional skills and sport activities. Such topics as locomotion, balance and the biomechanical basis of injury are examined through lecture and lab activities. Prerequisite: KINE 1700, 2510 or 2530

**KINE 4550 APPLIED BIOMECHANICS LABORATORY**

[1 hour] This course is the laboratory component of the applied biomechanics course. Emphasis will be placed on the application of the concepts learned in lecture to rehabilitation and sport situations. This will occur through hands-on activities and experiments involving contemporary forms of biomechanical instrumentation. Prerequisite: KINE 1700, 2500 or 2530

**KINE 4570 THEORY AND PRACTICE OF KINESIOTHERAPY**

[3 hours] Kinesiotherapy principles underlying exercise prescription for those with physical disabilities. Emphasis will be placed on manual and active exercise and physical assessment of the musculoskeletal system. Prerequisite: KINE 1700, 2510

**KINE 4580 KINESIOTHERAPY LAB**

[1 hour] The focus of this course is on gaining hands-on experience by assessment of a range of motion, strength, joint stabilization and functional movement of the musculoskeletal system. Students will emphasize manual exercise programming. Prerequisite: KINE 2510 Corequisite: KINE 4570

**KINE 4620 THERAPEUTIC KINESIOLOGY**

[3 hours] A lecture, discussion and laboratory course designed to prepare students to work with patients on land and in the water. Emphasis will be placed on the rehabilitation and geriatric populations. Prerequisite: KINE 2510, 2530

**KINE 4640 NEUROLOGICAL AND PATHOLOGICAL FOUNDATIONS OF REHABILITATION**

[3 hours] Study of neurological control of normal movement and the implications of various medical pathologies for rehabilitation. Emphasis on inflammatory processes, metabolic and vascular disturbances, traumatic injuries, nutritional deficiencies, neoplasms, degenerative conditions and congenital disorders. Prerequisite: KINE 2510 Corequisite: KINE 2530

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### **KINE 4650 ORGANIZATION AND ADMINISTRATION OF ATHLETIC TRAINING PROGRAMS**

[3 hours] Administration of athletic training programs including athletic training room management, budgeting, staffing, insurance, medical records, emergency care planning, preparticipation physical examinations, athletic training room design, legal issues and public relations. Prerequisite: KINE 3660

### **KINE 4680 PHYSIOLOGICAL PSYCHOLOGY OF MOTOR BEHAVIOR**

[3 hours] Study of the relationship of sensory input and motor activities, motor learning and other aspects of movement behavior through an integration of physiological and psychological principles. Prerequisite: KINE 2510 and senior standing Corequisite: KINE 2530

### **KINE 4710 CLINICAL SKILLS DEVELOPMENT V**

[3 hours] Laboratory experience to review and test the clinical skills taught during the rehabilitation of sports injuries course in the athletic training curriculum and clinical skill development experiences provided in the athletic training room with intercollegiate athletic teams. Prerequisite: KINE 3660

### **KINE 4720 CLINICAL SKILLS DEVELOPMENT VI**

[4 hours] Emphasis on clinical experience in athletic training off-campus. Also includes a laboratory experience to review clinical skills. Prerequisite: KINE 4650

### **KINE 4850 CLINICAL EXERCISE TESTING AND PROGRAMMING**

[3 hours] The design and conduct of clinical testing and fitness programs for healthy subjects and those with pathologies will be the subject matter of the course. Prerequisite: KINE 3520 Corequisite: KINE 4860

### **KINE 4860 CLINICAL EXERCISE TESTING AND PROGRAMMING LABORATORY**

[1 hour] The practical techniques for administering tests and developing fitness programs for healthy subjects and those with pathologies will be the subject matter of the course. Prerequisite: KINE 3520 Corequisite: KINE 4850

### **KINE 4900 HUMAN PERFORMANCE SEMINAR**

[1-3 hours] Classroom and laboratory analysis of current research in varied topic areas. Prerequisite: Senior/junior standing

### **KINE 4910 SENIOR RESEARCH PROJECT**

[4 hours] Senior level students in exercise science will, with the assistance of their adviser, develop, plan and conduct a research project on a current problem in exercise science. Prerequisite: Senior standing

### **KINE 4940 INTERNSHIP/PRACTICUM**

[2-15 hours] Clinical experience in locations both inside and outside the university setting. Placement depends on area of study. Prerequisite: Senior standing

### **KINE 4990 INDEPENDENT STUDY IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-3 hours] Directed individual study. Specialty title, seminar sheet and permission of instructor required. Prerequisite: Senior/junior standing

### **KINE 5010 FITNESS AND CONDITIONING PROGRAMS**

[3 hours] Theory and practice in development and administration of comprehensive fitness programs with special emphasis on the use of exercise as a health maintenance strategy.

### **KINE 5110 MEASUREMENT AND STATISTICAL INFERENCE IN HUMAN PERFORMANCE**

[3 hours] Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.

### **KINE 5950 WORKSHOP IN EXERCISE SCIENCE**

[1-4 hours] Topical workshops developed around areas of interest and concern to those involved in academic programs and careers that relate to exercise science. May not be included in a graduate plan of study without prior approval of the student's adviser.

### **KINE 6100 PHYSIOLOGY OF EXERCISE**

[3 hours] This course is designed to provide an understanding of the mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease. Prerequisite: KINE 2510, 2530, 3520

### **KINE 6130 BIOMECHANICS OF HUMAN MOTION**

[3 hours] This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.

### **KINE 6200 BIOMECHANICAL INSTRUMENTATION**

[3 hours] Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.

### **KINE 6230 SCIENTIFIC WRITING AND RESEARCH METHODS**

[3 hours] Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.

### **KINE 6300 HUMAN LOCOMOTION**

[3 hours] This course focuses on an examination of the characteristics of normal locomotion and the effects on locomotion of common pathologies and disabilities. The role of biomechanics in evaluating locomotion, and the appropriate techniques for accomplishing this will be discussed, with respect to sport, surgical and rehabilitative applications. Prerequisite: KINE 6130/8130

### **KINE 6310 CLINICAL EXERCISE TESTING**

[3 hours] The theoretical and practical aspects of clinical exercise testing for assessing functional capacity and risk for chronic disease will be the subject matter of this course. Prerequisite: KINE 6100/8100

### **KINE 6380 CLINICAL EXERCISE PROGRAMMING**

[3 hours] The design and conduct of physical activity and exercise programs to maintain fitness and reduce the risk of chronic disease will be the subject matter of the course. Prerequisite: KINE 6310/8310

### **KINE 6400 KINESIOLOGICAL ELECTROMYOGRAPHY**

[3 hours] This focus of this course is on the principles involved in the generation and control of muscle contraction, and the electromyographical techniques used to evaluate muscle function. Emphasis is placed on gaining hands-on experience with contemporary EMG technology and analysis techniques. Prerequisite: KINE 6130/8130

### **KINE 6410 CARDIOVASCULAR EXERCISE PHYSIOLOGY**

[3 hours] The responses and adaptations of the cardiovascular system to exercise in healthy subjects and those with pathological conditions will be the subject matter of the course. Prerequisite: KINE 6100/8100

### **KINE 6430 PHYSIOLOGY AND METABOLISM**

[3 hours] This course is designed to provide advanced instruction in the physiology of human systems and metabolic function. Emphasis will be placed on selected physiological systems to provide background for study in exercise physiology and biochemistry. Prerequisite: KINE 2510, 2530, 3520

### **KINE 6480 PULMONARY EXERCISE PHYSIOLOGY**

[3 hours] The responses and adaptations of the pulmonary system to exercise in healthy subjects and those with pathological conditions will be the subject matter of the course. Prerequisite: KINE 6100/8100

### **KINE 6500 BIOMECHANICS OF POSTURE AND BALANCE**

[3 hours] Focus on the mechanical and sensory-motor factors involved in the control of balance and posture. Emphasis on the theories, the influence of pathology and techniques for the assessment of balance. Prerequisite: KINE 6130/8130

### **KINE 6520 CLINICAL KINESIOLOGY**

[3 hours] Kinesiological principles underlying the assessment and treatment of individuals with normal and pathological conditions. Emphasis will be placed on clinical applications of mechanical principles, motor control and muscle activity to improve performance and prevent further injury.

### **KINE 6530 PREVENTION, EVALUATION, AND EMERGENCY CARE OF ATHLETIC INJURIES**

[3 hours] Advanced study of prevention, evaluation and care of athletic injuries with an emphasis on orthopedic and neurological problems and guidelines for return to competition.

### **KINE 6540 LABORATORY TECHNIQUES IN EXERCISE PHYSIOLOGY**

[3 hours] This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.

**KINE 6550 ADVANCED LABORATORY TECHNIQUES IN EXERCISE PHYSIOLOGY**

[3 hours] This course provides students with theoretical and practical knowledge of laboratory techniques in applied physiology. Emphasis will be placed on laboratory safety, reagent preparation, instrumentation, cell culture and histology techniques. Prerequisite: KINE 6100 and 6540

**KINE 6590 TREATMENT, REHABILITATION AND RECONDITIONING OF ATHLETIC INJURIES**

[3 hours] Psychological, mechanical and bioelectrical principles for modifying the inflammatory response in athletic injuries. Various rehabilitation techniques to return an athlete to competition and the relationship with modalities.

**KINE 6600 ISSUES AND MANAGEMENT IN ATHLETIC TRAINING**

[3 hours] This course addresses current issues that affect the profession of Athletic Training. Topics cover issues that influence clinical practice as well as political issues related to the profession.

**KINE 6660 PHYSIOLOGY OF REHABILITATION: AN EVIDENCE-BASED APPROACH**

[3 hours] An examination of the scientific literature on topics germane to rehabilitation, emphasizing the physiological principles that provide the basis for the rehabilitation techniques used with musculoskeletal injury.

**KINE 6670 PATHOMECHANICS OF MUSCULOSKELETAL INJURY**

[3 hours] An in-depth investigation into the basic structure and mechanisms of injury of various musculoskeletal tissue applied to the recognition and prevention of specific orthopedic injuries and conditions.

**KINE 6710 ORGANIZATION AND ADMINISTRATION OF ATHLETIC TRAINING PROGRAMS**

[3 hours] Administration of athletic training programs including legal issues, athletic training room management, budgeting, staffing, insurance, medical records, emergency care planning, preparticipation physical examinations, athletic training room design and public relations.

**KINE 6930 HUMAN PERFORMANCE SEMINAR**

[1-4 hours] Seminar course on a selected topic in exercise physiology. Course will typically involve a review of current research and will include laboratory experiences/assignments.

**KINE 6940 INTERNSHIP IN EXERCISE SCIENCE**

[1-12 hours] A field internship designed to supplement classroom experience by providing participation in the area of exercise science through participant-observer experience.

**KINE 6960 MASTERS THESIS IN EXERCISE SCIENCE**

[1-4 hours] Independence research in Exercise Science completed as part of the requirements for the Master of Science in Exercise Science degree.

**KINE 6990 INDEPENDENT STUDY IN EXERCISE SCIENCE**

[1-4 hours] Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.

**KINE 7010 FITNESS AND CONDITIONING PROGRAMS**

[3 hours] Theory and practice in development and administration of comprehensive fitness programs with special emphasis on the use of exercise as a health maintenance strategy.

**KINE 7110 MEASUREMENT AND STATISTICAL INFERENCE IN HUMAN PERFORMANCE**

[3 hours] Application of measurement and statistical inference to human performance testing and research. Includes descriptive and inferential statistics, principles of test construction and introduction to authentic assessment in public schools.

**KINE 7950 WORKSHOP IN EXERCISE SCIENCE**

[1-4 hours] Topical workshops developed around areas of interest and concern to those involved in academic programs and careers that relate to exercise science. May not be included in a graduate plan of study without prior approval of the student's adviser.

**KINE 8100 PHYSIOLOGY OF EXERCISE**

[3 hours] This course is designed to provide an understanding mechanisms of the physiological responses to exercise. Emphasis will be placed on adaptations to exercise training and the role of exercise in health and disease. Prerequisite: KINE 2510, 2530, 3520

**KINE 8130 BIOMECHANICS OF HUMAN MOTION**

[3 hours] This course provides a basic overview of the principles of biomechanics as they apply to human movement. In-depth discussion and lab activities focus on the application of these principles to such topics as muscle function, locomotion, balance, mechanisms of injury and ergonomics.

**KINE 8200 BIOMECHANICAL INSTRUMENTATION**

[3 hours] Provides students with experience in the research and clinical use of videography, force and pressure plates, electromyography and other systems in applied biomechanics. Emphasis on hands-on lab experience and topics related to data collection and signal processing.

**KINE 8230 SCIENTIFIC WRITING AND RESEARCH METHODS**

[3 hours] Principles and issues involved in the design and conduct of research in exercise science: critical evaluation, research design, development of a research proposal, grant acquisition, and compliance with institutional and federal guidelines on the use of humans and animals.

**KINE 8300 HUMAN LOCOMOTION**

[3 hours] This course focuses on an examination of the characteristics of normal locomotion and the effects on locomotion of common pathologies and disabilities. The role of biomechanics in evaluating locomotion, and the appropriate techniques for accomplishing this will be discussed, with respect to sport, surgical, and rehabilitative applications. Prerequisite: KINE 6130/8130

**KINE 8310 CLINICAL EXERCISE TESTING**

[3 hours] The theoretical and practical aspects of clinical exercise testing for assessing functional capacity and risk for chronic disease will be the subject matter of this course. Prerequisite: KINE 6100/8100

**KINE 8380 CLINICAL EXERCISE PROGRAMMING**

[3 hours] The design and conduct of physical activity and exercise programs to maintain fitness and reduce the risk of chronic disease will be the subject matter of the course. Prerequisite: KINE 6310/8310

**KINE 8400 KINESIOLOGICAL ELECTROMYOGRAPHY**

[3 hours] This focus of this course is on the principles involved in the generation and control of muscle contraction, and the electromyographical techniques used to evaluate muscle function. Emphasis is placed on gaining hands-on experience with contemporary EMG technology and analysis techniques. Prerequisite: KINE 6130/8130

**KINE 8410 CARDIOVASCULAR EXERCISE PHYSIOLOGY**

[3 hours] The responses and adaptations of the cardiovascular system to exercise in healthy subjects and those with pathological conditions will be the subject matter of the course. Prerequisite: KINE 6100/8100

**KINE 8430 PHYSIOLOGY AND METABOLISM**

[3 hours] This course is designed to provide advanced instruction in the physiology of human systems and metabolic function. Emphasis will be placed on selected physiological systems to provide background for study in exercise physiology and biochemistry. Prerequisite: KINE 2510, 2530, 3520

**KINE 8480 PULMONARY EXERCISE PHYSIOLOGY**

[3 hours] The responses and adaptations of the pulmonary system to exercise in healthy subjects and those with pathological conditions will be the subject matter of the course. Prerequisite: KINE 6100/8100

**KINE 8500 BIOMECHANICS OF POSTURE AND BALANCE**

[3 hours] Focus on the mechanical and sensory-motor factors involved in the control of balance and posture. Emphasis on the theories, the influence of pathology, and techniques for the assessment of balance. Prerequisite: KINE 6130/8130

**KINE 8520 CLINICAL KINESIOLOGY**

[3 hours] Kinesiological principles underlying the assessment and treatment of individuals with normal and pathological conditions. Emphasis will be placed on clinical applications of mechanical principles, motor control and muscle activity to improve performance and prevent further injury.

**KINE 8540 LABORATORY TECHNIQUES IN EXERCISE PHYSIOLOGY**

[3 hours] This course covers theoretical and practical knowledge for the assessment of exercise metabolism, cardiorespiratory function, body composition, thermoregulation and skeletal muscle function. Hands-on data collection will be emphasized.

## 420 Course Descriptions

### **KINE 8550 ADVANCED LABORATORY**

#### **TECHNIQUES IN EXERCISE PHYSIOLOGY**

[3 hours] This course provides students with theoretical and practical knowledge of laboratory techniques in applied physiology. Emphasis will be placed on laboratory safety, reagent preparation, instrumentation, cell culture and histology techniques. Prerequisite: KINE 8100 and 8540

### **KINE 8930 HUMAN PERFORMANCE**

#### **SEMINAR**

[1-4 hours] Seminar course on a selected topic in exercise physiology. Course will typically involve a review of current research and will include laboratory experiences/assignments.

### **KINE 8940 INTERNSHIP IN EXERCISE**

#### **SCIENCE**

[1-12 hours] A field internship designed to supplement classroom experience by providing participation in the area of exercise science through participant-observer experience.

### **KINE 8960 DOCTORAL DISSERTATION IN**

#### **EXERCISE SCIENCE**

[1-12 hours] Directed research towards completion of the doctoral degree. Students may register for credit in more than one semester. Total dissertation credit toward the degree may not exceed 16 hours.

### **KINE 8990 INDEPENDENT STUDY IN**

#### **EXERCISE SCIENCE**

[1-4 hours] Faculty supervised independent reading, laboratory research, field experience and other activities not suited for class instruction.

## LAT - Latin

### Department of Foreign Languages (ARS)

### **LAT 1110 ELEMENTARY LATIN I**

[4 hours] Study of the fundamentals of Latin vocabulary, grammar and syntax. Translation of elementary readings. (not for major credit)

### **LAT 1120 ELEMENTARY LATIN II**

[4 hours] Continued study of fundamental Latin vocabulary, grammar and syntax. Translation of elementary readings. (not for major credit) Prerequisite: LAT 1110 or satisfactory score on placement test. Humanities core course

### **LAT 2140 INTERMEDIATE LATIN I**

[3 hours] Brief review of vocabulary, grammar and syntax. Readings in Latin prose by such authors as Sallust, Livy and Cicero. (not for major credit) Prerequisite: LAT 1120 or satisfactory score on placement test. Humanities core course

### **LAT 2150 INTERMEDIATE LATIN II**

[3 hours] Intermediate level Latin poetry of the Republic and Augustan periods. (not for major credit) Prerequisite: LAT 2140 or satisfactory score on placement test. Humanities core course

### **LAT 3050 SURVEY OF LATIN**

#### **LITERATURE I**

[3 hours] Literature of the Ciceronian and Augustan period. Prerequisite: LAT 2150 or consent of instructor

### **LAT 3100 SURVEY OF LATIN**

#### **LITERATURE II**

[3 hours] Literature of the early empire. Prerequisite: LAT 2150 or consent of instructor

### **LAT 3150 MEDIEVAL LATIN LITERATURE**

[3 hours] Selections from representative works in various fields. Prerequisite: LAT 2150 or consent of instructor

### **LAT 4980 SPECIAL TOPICS IN LATIN**

[1-3 hours] Reading and study of Latin literature not covered in other courses. May be repeated for credit when topic varies. Prerequisite: LAT 2150 & consent of instructor

### **LAT 5210 LATIN FOR READING**

#### **KNOWLEDGE I**

[3 hours] Elements of grammar and vocabulary appropriate to preparing graduate students to read effectively in Latin.

### **LAT 5220 LATIN FOR READING**

#### **KNOWLEDGE II**

[3 hours] Elements of pronunciation, structure and vocabulary most appropriate to preparing graduate students to read effectively in Latin.

## LAWA - Law

### Upper Level Required (LAW)

### **LAWA 9000 LEGAL ETHICS AND**

#### **PROFESSIONAL RESPONSIBILITY**

[2-3 hours] An introduction to legal and ethical principles governing lawyers, the legal profession and the practice of law. The course considers the principal ways in which lawyers are regulated through bar admission, professional codes, lawyer disciplinary actions and civil liability. The course explores the lawyer-client relationship and the scope and limits of duties to the client, the legal system and third parties. Prerequisite: Completion of basic first-year courses

### **LAWA 9120 CONSTITUTIONAL LAW II**

[3 hours] Constitutional Law II will cover issues of individual rights protected by the Equal Protection Clause of the Fourteenth Amendment. It will also cover First Amendment protections against governmental restrictions of speech and the press, with some coverage of First Amendment protections of religion.

### **LAWA 9310 EVIDENCE**

[3-4 hours] The rules and policies governing a trial court's fact-finding process, as exemplified by the Federal Rules of Evidence. Topics cover the full range of evidentiary issues at trial, including the content of admissible proof, the matter of presenting it and the respective roles of the judge and jury.

## LAWC - Law

### Skills (LAW)

### **LAWC 9010 INTERNATIONAL/DOMESTIC**

#### **ARBITRATION**

[3 hours] Arbitration permeates domestic dispute resolution and is the principal means of international commercial dispute resolution. To prepare students as advocates and/or arbitrators in the domestic and international arena, this course conveys a thorough understanding of the law and practice of arbitration. Students will learn the law of arbitration, participate in a mock international commercial arbitration, and be exposed to the emerging subject of online arbitration.

## LAWD - Law

### Basic First Year Required (LAW)

### **LAWD 9010 CIVIL PROCEDURE --**

#### **JURISDICTION**

[2-4 hours] The rules controlling the jurisdiction of courts and forum selection for civil litigation in state and federal systems are covered.

### **LAWD 9020 CIVIL PROCEDURE --**

#### **PLEADING AND PRACTICE**

[2-4 hours] The rules controlling conduct and management of civil litigation in federal and state courts from the complaint to final judgment as well as issues involving the effect of judgments on subsequent litigation are covered.

### **LAWD 9110 CONSTITUTIONAL LAW I**

[3 hours] Constitutional Law I will cover structural issues focusing on the Supreme Court's interpretation of the nature and distribution of power within the federal government, the relationship between the federal government and the states in regulating commerce, and the meaning and scope of the due process and equal protection clauses of the fourteenth amendment. Constitutional Law II will cover Equal Protection and First Amendment.

### **LAWD 9210 CONTRACTS I**

[3 hours] A survey of the law of contracts including the creation, modification and termination of contract rights and obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.

### **LAWD 9220 CONTRACTS II**

[3 hours] A continued survey of the law of contracts including the creation, modification and termination of contract rights and obligations, the roles of reliance and restitution, capacity, conditions, third party rights and duties, and the effect of changed circumstances or mistake. Performance and breach of contractual obligations and remedies for breach are also examined in detail. The course includes a survey of the law relating to sales of goods under Article 2 of the Uniform Commercial Code.



**LAWD 9300 CRIMINAL LAW**

[3 hours] Substantive criminal law, focusing on general principles of liability and defenses, the definitional elements of certain crimes, particularly homicide, and principles of accessory liability.

**LAWD 9410 PROPERTY I**

[2-4 hours] An introduction to the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land and public controls upon property use.

**LAWD 9420 PROPERTY II**

[2-4 hours] Continued study of the law of personal property and comprehensive coverage of the law of real property as it relates to estates and interests in land, landlord-tenant relationships, real estate transactions, private agreements respecting the use of land and public controls upon property use. Prerequisite: Property I

**LAWD 9510 TORTS**

[4 hours] Torts explores civil claims for a variety of intentional harms and offenses to people and property, negligent harms and theories of strict liability (including products liability). The course studies both traditional principles and modern concepts.

**LAWD 9750 LEGAL RESEARCH, WRITING AND APPELLATE ADVOCACY I**

[2-3 hours] A foundation course providing intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings and individual conferences.

**LAWD 9760 LEGAL RESEARCH, WRITING AND APPELLATE ADVOCACY II**

[1-2 hours] A continuation of Legal Research, Writing and Appellate Advocacy I, this course provides intensive instruction in three major areas: using research resources and techniques of research; developing skills of legal analysis; presenting legal analysis in predictive and persuasive formats, both written and oral. Instruction is through class meetings, small group meetings and individual conferences. Prerequisite: LAWD 9750

**LAWG - Law****Standard (LAW)****LAWG 9010 BUSINESS ASSOCIATIONS**

[3-4 hours] Business Associations focuses on the legal entities commonly used to operate business enterprises, with an emphasis on closely held businesses. The course explores the major issues involved in formation and operation of agency relationships, corporations and limited liability companies. These include creation of business entities; financing for the small business; sharing in earnings; the roles of corporate officers, directors and shareholders; roles of LLC managers and members; doctrines of limited liability; fiduciary duties; and special statutory treatment of closely held corporations.

**LAWG 9030 ADMINISTRATIVE LAW**

[3 hours] The law and operation of administrative agencies, including agency adjudication, rulemaking and other forms of policy implementation. The course covers agencies' place in the constitutional structure, legislative and executive controls on agency action, and judicial review of agency fact-finding, statutory interpretation, and exercise of discretion. The course examines state agencies as well as federal agencies and the federal Administrative Procedure Act.

**LAWG 9110 COMMERCIAL PAPER**

[2-3 hours] A study of payment systems. Initial emphasis is upon commercial paper (Article 3 of the Uniform Commercial Code) and bank deposits and collections (Article 4 of the Uniform Commercial Code), followed by credit cards (Truth in Lending, Consumer Credit Protection, and Fair Credit Billing Acts), commercial funds transfer (Article 4A of the Uniform Commercial Code) and consumer electronic funds transfer (Electronic Funds Transfers Act). Prerequisite: There are no prerequisites for this course.

**LAWG 9210 CRIMINAL PROCEDURE- INVESTIGATIONS**

[2-3 hours] A study of the constitutional and statutory limitations on the conduct of criminal investigations and related matters. Includes a discussion of the Fourth Amendment prohibition against unreasonable searches and seizures, the Fifth Amendment privilege against self-incrimination and the Sixth Amendment right to counsel.

**LAWG 9500 FEDERAL INCOME TAXATION**

[4 hours] After a brief consideration of the federal income taxation system, this course examines the conceptual problems in defining "income." A detailed treatment of the more significant personal and business deductions, exemptions and credits follows. Statutory methodology and policy considerations (including the "tax expenditure" concept) are developed integrally with substantive topics. In addition, the course considers the tax treatment of gains and losses from the disposition of property, including the capital gains preference and deferral of taxation. Tax shelters and attempts by Congress and the Internal Revenue Service to limit their utilization may be explored as well.

**LAWG 9610 SECURED TRANSACTIONS**

[3 hours] The creation, enforcement, perfection and priority of security interests in personal property under Article Nine of the Uniform Commercial Code and the federal Bankruptcy Code.

**LAWG 9710 TRUSTS AND ESTATES**

[3-4 hours] The study of decedents' estates and trust law. Intestate succession, the law of wills, estate administration, formation and administration of trusts and future interests are studied. Common law approaches are contrasted with Ohio and Uniform Probate Code practices. Prerequisite: It is recommended that students complete Property I and II before enrolling in this course

**LAWI - Law****Electives (LAW)****LAWI 9000 INTERNATIONAL COMPARATIVE LAW**

[2-3 hours] This course introduces students to the major legal systems of the world. The first third of the course provides an overview of the major families of law encountered in various nations of the world today: common law (as exemplified by California and England); civil law (France and Germany); religious law (Egypt); traditional/tribal law (Botswana); and the extra-legal approach seen in various Asian countries (China). The rest of the course examines how each of these systems handles the same types of common legal situation: inheritance and succession, criminal behavior and contracts.

**LAWI 9010 ACCOUNTING AND FINANCIAL STATEMENTS**

[2-3 hours] An introduction for students without prior accounting experience to the terms and concepts necessary to an understanding of the financial affairs of a client and to the variety of legal contexts in which the lawyer is likely to encounter accounting problems. Students will learn to perform basic financial analysis.

**LAWI 9020 E-COMMERCE**

[1-3 hours] This course will examine critical information technologies that provide a basis for electronic commerce. Topics include problems surrounding electronic commerce such as security, privacy, content selection and rating, intellectual property rights, authentication, encryption, acceptable use policies, UETA, UCITA and E-Sign.

**LAWI 9040 CIVIL AND POLITICAL RIGHTS**

[2-3 hours] Civil and Political Rights focuses on a broad array of legal issues and rights in this area of law. Beginning with a history of the area, the course includes topics such as voting rights, religion, education, discrimination, police misconduct and prisoners' rights. Current issues are discussed using news articles and videos.

**LAWI 9060 SALES AND LEASES OF GOODS**

[2-3 hours] A detailed study of sales of goods under Article 2 of the Uniform Commercial Code and a survey of both Article 2A of the Uniform Commercial Code (leases of goods) and the U.N. Convention on Contracts for the International Sale of Goods. Topics include contract formation and interpretation, warranties, express and implied terms, risk of loss, performance obligations and breach, and remedies for breach. Consideration may also be given to other state and federal laws affecting sales and leases of goods. Prerequisite: Contracts I and II

**LAWI 9070 ANTITRUST**

[2-3 hours] This course will cover the role of competition in a modern market economy, federal antitrust law, regulation and policies. Topics covered include horizontal restraints (price fixing, conspiracy, data dissemination, concerted refusals to deal, etc.); monopolization, attempts to monopolize, and oligopoly; problems concerning the relationship of antitrust to patent law; vertical restraints (restricted distribution, tying arrangements, exclusive dealing, etc); mergers (horizontal, vertical and conglomerate); selected Robinson-Patman Act problems, remedies and enforcement.

## 422 Course Descriptions

### **LAWI 9080 GENDER AND THE LAW**

[2-3 hours] This course covers issues of gender and the law with a primary focus on how the law addresses sex discrimination. Students will discuss constitutional and statutory protections against sex discrimination from a doctrinal and theoretical perspective. Subjects covered in this class include employment discrimination, family law, public benefits, domestic violence and sexual orientation and the law.

### **LAWI 9100 INTERNATIONAL LAW**

[2-3 hours] This course focuses on the legal processes of the international community. The creation of law among nation states, the law-making activities of international organizations, the enforcement (and non-enforcement) of international law in both national and international forums, the limits of national jurisdiction, the responsibility of states for the injuries to the persons or property of aliens and the rules governing international agreements are surveyed. Particular attention is given to the law of treaties and the role of lawyers in foreign policy decision making.

### **LAWI 9120 ENGLISH LEGAL HISTORY**

[2-3 hours] A survey of the roots of American law, procedures, and such doctrines as real property, descents, contracts and corporations in the history of the English Common Law.

### **LAWI 9130 BUSINESS ENTERPRISE TAX**

[2-3 hours] An examination of the federal income tax treatment of business enterprises (including corporations, partnerships and limited liability companies) and their owners. The course considers the tax consequences of entity-owner transactions (formation and property contributions, distributions, redemptions and liquidations) as well as entity-level transactions (business operations, mergers, acquisitions and other business combinations). Prerequisite: Federal Income Tax or consent of the instructor Tax or consent of the instructor.

### **LAWI 9140 BUSINESS PLANNING**

[2-3 hours] The course considers problems and transactions of business enterprises in a practical fashion. Projects requiring planning, drafting and negotiating, principally on behalf of smaller and closely held businesses, are an integral part of the course. Contractual arrangements typically examined include buy-sell agreements, close corporation/shareholder agreements and limited liability company operating agreements. Recommended: A prior course in federal taxation Prerequisite: Business Associations or permission of the instructor

### **LAWI 9150 BIOETHICS AND LAW**

[2-3 hours] This course addresses the evolving relationship between medicine, law and ethics. The course focuses on individual topics including the definition of death, decision-making about death and dying, physician-assisted suicide, access to health care, research involving human subjects and genetic engineering.

### **LAWI 9160 REAL ESTATE FINANCE**

[2-3 hours] The legal problems related to private financing and development of land. Emphasis is on the structuring of real estate transactions, tax considerations and problems of developers, lenders and other participants.

### **LAWI 9170 CONFLICT OF LAWS**

[2-3 hours] The problems encountered when a transaction or occurrence has a significant relationship to two or more states or countries. The jurisdiction of courts, the effect to be given to out-of-state judgments and the rules of decision in multi-state cases are studied. Both traditional rules and theories and modern developments are analyzed.

### **LAWI 9180 COMMUNICATIONS LAW**

[2-3 hours] The class explores in detail legal and practical issues arising in connection with various media: newspaper, television and radio stations, cable television and other video providers, and the Internet, including Internet service providers, Web-hosting companies, and Web-publishing. The class will identify, analyze, and critique the legal doctrines – constitutional, statutory, and common-law – that apply to these media, either individually or collectively. The class will also study how those doctrines have evolved and will continue to change, as the means of mass communication evolve and converge.

### **LAWI 9200 JURISPRUDENCE**

[2-3 hours] Jurisprudence is the philosophy of law. The two primary goals of this class are 1) to give students a basic background and understanding of important legal thinkers and theory and 2) to stimulate critical thinking through assigned readings and rollicking in-class discussions about concepts of law from Plato to present day. The class will philosophically analyze concepts of precedence, interpretation, rights, civil disobedience, semantics, and virtues such as justice, desert and compassion.

### **LAWI 9210 COPYRIGHT LAW**

[2-3 hours] A substantive examination of the Copyright Act. This course will cover the fundamentals of copyright law and practice and the challenges to the existing copyright regime by new technologies. Recommended: Patent, Trademark and Copyright Law.

### **LAWI 9230 CORPORATE FINANCE**

[1-3 hours] An advanced exploration of the legal and financial problems encountered in financing corporations, with emphasis on the corporate capital structure, including the rights of holders of various equity and debt securities; the valuation of businesses, as well as corporate equity and debt securities; and mergers and acquisitions, including tender offers. Prerequisite: Business Associations or consent of the instructor.

### **LAWI 9240 LAW AND ECONOMICS**

[2-3 hours] This course applies economic reasoning to legal problems. Topics include a modern economic analysis of contract, tort, property and other areas of law depending on student interest and available time. This course does not require an economics background.

### **LAWI 9260 RACE & THE LAW**

[2-3 hours] Primarily focuses on cases that have helped shape the law and history of race in the U.S., from early 19th century cases concerning slave law to recent United States Supreme Court decisions. The topics will include slavery, citizenship, segregation, voting, marriage, education, housing and criminal justice. The material and the discussion will move beyond the legal decisions to explore the culture that helped to produce and shape the decisions.

### **LAWI 9270 CREDITOR/DEBTOR LAW**

[2-3 hours] Explores creditors' rights under state law including judgment liens, execution liens, fraudulent conveyances, set off, assignments to benefit creditors and statutory liens. Debtor defenses under state and federal law including constitutional protections, exemptions and counterclaims are evaluated. Following this overview of general creditor execution, the majority of the course is devoted to resolution of claims in federal bankruptcy law. Recommended: Completion of or concomitant enrollment in Secured Transactions

### **LAWI 9280 CRIMINAL PROCEDURE-ADJUDICATIONS**

[2-3 hours] A study of the criminal processes from arrest through sentencing and appeal. Topics covered include bail, preliminary hearing, grand jury, plea bargaining and guilty pleas, discovery, fair trial-free press, jury trial, sentencing and double jeopardy. Recommended: Criminal Procedure-Investigations and Evidence.

### **LAWI 9290 CYBERSPACE LAW**

[2-3 hours] This course will explore issues related to the regulation of cyberspace. It is not a course in computer law, copyright, trademark, patent, or other forms of intellectual property law, except as intellectual property law is sui generis in cyberspace. Instead, it is an effort to understand the peculiar problems of Internet regulation. Subject areas will vary as the field develops, but will include such areas as tort liability, freedom of expression, crime and security, privacy, intellectual property rights and protection, regulation, jurisdiction and standards of ethics and propriety. A technical or scientific background is not required. Recommended: Patent, Trademark and Copyright Law.

### **LAWI 9300 EMPLOYMENT**

#### **DISCRIMINATION**

[2-3 hours] This course focuses on the main federal statutes prohibiting employment discrimination and the policies underlying these laws, with the majority of time spent on Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act and the Americans With Disabilities Act. Additional topics and subtopics include sexual harassment, discrimination based on sexual orientation, defenses and reasonable accommodation of religion.

#### **LAWI 9310 EMPLOYMENT LAW**

[2-3 hours] This course focuses on the major state and federal employment laws affecting individual employees, excluding laws on unions and employment discrimination. Coverage includes the legal regulation of the hiring and firing process, testing and privacy issues, wage and hour laws, occupational health and safety, workers' compensation, unemployment insurance, covenants not to compete, and related topics.

**LAWI 9320 ENVIRONMENTAL LAW****PRACTICUM**

[2-4 hours] The environmental law practicum allows students to choose their own semester-long, environmental law work project. Students are encouraged to find projects that allow them to participate directly in a legal or policy matter pending before an administrative agency. The class has two parts. The first part involves identifying and developing the project concept, and preparing a formal written document for submission to the appropriate agencies. The second part involves explaining their projects to other members of the class and brainstorming ideas for effective participation. Several substantive classes on the art of commenting and on the laws and rules relevant to the various student projects will also be held throughout the semester.

**LAWI 9330 ENVIRONMENTAL LAW**

[2-4 hours] This course introduces students to U.S. environmental law by examining common law environmental standards, major federal statutes and the policy goals underlying such statutes. Statutes to be examined include the Clean Air Act, the Clean Water Act, the Clean Air Act; the Comprehensive Environmental Response, Compensation and Liability Act; and the Resource Conservation and Recovery Act. By comparing and contrasting different environmental statutes, students will obtain an understanding of the current environmental framework as well as alternative approaches that may be employed to protect the environment. Students will also have an opportunity to hone their skills in legal research and to advise the client of their choice - industry, environmental interest group or government regulator - regarding compliance options and liabilities.

**LAWI 9340 INTELLECTUAL PROPERTY****RESEARCH**

[1 hour] This course introduces students to print and digital information resources for researching patent, copyright, trademark and trade secret law. Recommended: Trust and Estates.

**LAWI 9350 ESTATE PLANNING**

[1-3 hours] This course focuses on the practical aspects of will and trust drafting. Emphasis is placed on the application of estate planning and wealth preservation techniques to commonly encountered estate planning problems. Recommended: Trust and Estates. Prerequisite: Estate and Gift Tax

**LAWI 9360 ESTATE AND GIFT TAX**

[2-3 hours] A study of the federal estate and gift tax structure and its impact on the transfer of property and of income taxation of trusts and estates. The redistribution of wealth through taxation, whether or not stated as a goal, is also studied.

**LAWI 9370 FAMILY LAW**

[3 hours] The interaction of law and the family and the consequences of state intervention in family relationships. Some of the subjects surveyed are the marriage relationship, de facto marriage, adoption, the termination of marital status, economic consequences of divorce, child custody after divorce and the role of the lawyer as counselor.

**LAWI 9380 FEDERAL JURISDICTION**

[2-4 hours] An intensive examination of the jurisdiction of federal courts, the role of the federal courts within the federal government, and within our federalist system. Topics surveyed include the law applied by federal courts in civil actions, the original and removal jurisdiction of federal courts, the relationship of the federal courts to state courts, congressional power over federal courts, the enforceability of federal law against states, and states' sovereign immunity.

**LAWI 9390 NATURAL RESOURCES LAW**

[2-3 hours] This course will provide an introduction to natural resource law, including public lands issues (forestry, mining, grazing, recreation and preservation), cultural resources (historic and sacred sites), wildlife, water rights and energy resources. Policies governing resource use and protection will be explored by looking at case law, federal statutes and regulations, news articles, scholarly works and book excerpts. Students will have an opportunity to engage in "hands-on" application of the law by developing case strategy and motions related to an administrative agency's decision.

**LAWI 9400 AMERICAN LEGAL HISTORY**

[2-3 hours] (The American Legal Profession) This seminar/course (students may elect either to write a paper or to take an examination) follows the profession's development from the American Revolution through the 1920's and the emergence of university-based professional education, the advent of new client constituencies including corporations, labor organizations, and anti-slavery and other social action groups, the development of standards of professional ethics and racial minorities. The teaching approach emphasizes comparisons with current practice, critical use of original source materials and development of research and writing skills.

**LAWI 9410 REAL ESTATE TRANSACTIONS****AND DEVELOPMENT**

[2-3 hours] This course emphasizes aspects of real estate law, such as real estate brokers, lawyers' professional responsibility, land contract remedies, time of performance, tender, assignment, contract contingencies, equitable conversion, escrows and closings. In addition, this course explores various aspects of real estate development, including obtaining entitlements for development, controlling subdivisions, paying for infrastructure, zoning, vested rights and project management. Prerequisite: Property I and II

**LAWI 9420 TRANSACTIONAL HEALTH LAW**

[1-2 hours] This course, taught by a medical doctor with a J.D., addresses the issues involved in providing legal services and counsel for a medical practice. Included among the issues are selection of the practice entity, selecting the legal structure for the practice as a business and the elements and options for the operating/partnership agreement, including provisions for dissolution and the question of terminating a partner/member's involvement in the practice.

**LAWI 9430 LEGISLATION**

[2-3 hours] This course explores the legislative process, statutory construction and the role of statutes as a source of public policy. Students will systematically examine principles and techniques used by courts and agencies to interpret statutes.

**LAWI 9440 IMMIGRATION LAW**

[2-3 hours] A study of United States citizenship and the admission and removal of noncitizens, including the bases for legal immigration, temporary presence, and the refugee and asylum system. Prerequisite: Constitutional Law

**LAWI 9450 INTERNATIONAL INTELLECTUAL PROPERTY**

[2-3 hours] This course reviews: the main international intellectual property instruments (such as TRIPS, Paris Convention, Patent Cooperation Treat, European Patent Convention; Madrid Agreement, Berne and Rome conventions, WIPO treaties), and European main legislative texts (mainly regulations and directives) and main case law on patent, trademark and copyright. We also review the principal differences between the common law based system of copyright and the civil law system based on "droit d'auteur" (author's rights), with a special focus on electronic and Internet issues. Recommended: One Basic Intellectual Property Course.

**LAWI 9460 INSURANCE LAW**

[2-3 hours] A study of property, liability and life insurance, and the insurer-insured relationship from a legal vantage point. Numerous concepts are examined during the course, including insurable interest, concealment and misrepresentation, the duty of good faith and fair dealing, scope of coverage, policy interpretation, change of beneficiary, duty to defend, bad faith refusal to settle, measures of recovery, multiple interests coverage, subrogation and other insurance clauses. Several insurance policies are examined in detail.

**LAWI 9470 INTELLECTUAL PROPERTY/ LICENSING**

[2-3 hours] This course focuses on the commercialization of intellectual property through the use of assignments and licenses. The course will cover intellectual property assignments and licenses, including express and implied licenses, the scope of licenses, bankruptcy issues, anti-trust issues and international licensing. The course will also cover intellectual property audits and patent, trade secret, copyright and trademark law to the extent an understanding of the rights and obligations inherent in such intellectual property classifications are necessary to effectively assign or license intellectual property. Students will analyze several licenses. Prerequisite: Intellectual Property Survey; Patent, Trademark, and Copyright Law; or permission of instructor

**LAWI 9480 INTERNATIONAL BUSINESS TRANSACTIONS**

[2-3 hours] This course introduces students to the issues, problems and legal norms applicable to International Business Transactions. The course will examine various problems that occur in international business as a means of discerning that pitfalls for the unwary, as well as the matters that must be considered to protect one's client. The course will begin with an examination of the issues arising in a basic international sale and will progress through increasingly complex types of business interaction, including distributorships, franchising, licensing, joint ventures and incorporating abroad. Throughout the course, there will be an emphasis on the U.S., foreign and international laws and standards that may affect the transaction. The course will culminate in a contract negotiation. Students will have to meet with their partners to negotiate a deal and to draft a contract embodying the terms of the deal.

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### **LAWI 9490 JUVENILE LAW**

[2-3 hours] An examination of the relationship among children, the family and the state in the lives of delinquent, neglected, and abused children. The course includes consideration of the history and theory of the juvenile court system and the role of the attorney in representing juveniles.

### **LAWI 9500 JEWISH LAW**

[2-3 hours] Jewish law is a dynamic, vibrant legal system that includes many of the specialties of modern law. It developed through over three millennia from the days of the Hebrew Bible and has areas that are still operative. It passed through every historic era and matured in various jurisdictions. It has had a profound influence on European and Anglo-American legal systems. The course will focus on the political background and legal response in each historic period, the character of the literary and legal sources and examples of characteristic features of the substantive law.

### **LAWI 9510 LABOR LAW**

[2-3 hours] This course focuses on the law governing and policy issues surrounding the major facets of union-management relations in the private sector under the National Labor Relations Act (NLRA). These include union organizing, collective bargaining, contract enforcement, picketing and the economic weapons of both sides, including strikes. The course also covers the procedural mechanisms by which rights under the NLRA are enforced and remedies for NLRA violations.

### **LAWI 9560 LAND TRANSACTIONS**

[2-4 hours] Negotiating, structuring, performing, and closing the real estate transaction, remedies, methods of title assurance, the condominium and other forms of ownership. Course includes exercises in drafting, negotiating and closing a contract for the sale of land.

### **LAWI 9580 ENVIRONMENTAL AND DEVELOPMENTAL LAND USE LAW**

[2-3 hours] This course covers both the conservation and preservation-oriented environmental land use regulations that have emerged in the recent years as well as the more traditional, developmentally-oriented controls that have been with us for some time. The environmental land use component of the course covers the regulation of: wetlands, coastal zones, floodplains, farmland, open space, critical areas, and groundwater. The developmental land use regulations component includes: zoning, flexible land use controls, subdivision controls, growth controls, aesthetic regulations, historic preservation, and transfer of developmental rights. Prerequisite: Property I and Property II

### **LAWI 9600 LAW AND LITERATURE**

[2-3 hours] A study of the relationship between literary development and criticism and the law. The class studies great works of literature and examines their meaning for the law in general and the lawyer in particular.

### **LAWI 9680 STATE AND LOCAL GOVERNMENT LAW AND TAXATION**

[2-3 hours] An overview of the law relating to the administration of municipalities and their dealings with other local governmental units. Topics include the powers and problems of urban governmental units, federalism, corporate powers and police powers. Coverage includes the basic law and rules relating to the financing of local government and the various sources of tax revenue for local governments.

### **LAWI 9700 PATENT PRACTICE AND PROCEDURE**

[2-3 hours] A hands-on course focusing on both regulatory requirements and attorney skills relating to representation of investors before the Patent and Trademark Office. The course will follow a patent attorney's relationship with an inventor and the written PTO, responses, appeals and finally patent grant. There are no prerequisites.

### **LAWI 9710 PATENT LAW**

[2-3 hours] A survey of the legal protection of inventions. This course covers the requirements for obtaining and enforcing a patent and the rights of a patentee with respect to licensing, assignment and patent misuse. Recommended: Intellectual Property Survey

### **LAWI 9720 INTELLECTUAL PROPERTY SURVEY**

[2-3 hours] A preparatory course covering Copyright, Patent, Trademark and Trade Secret Law. A broad coverage of intellectual property law is useful for those students who want to learn the fundamentals of intellectual property law either as basis for more advanced courses or to integrate intellectual property law into other substantive courses.

### **LAWI 9730 PENSION AND EMPLOYEE BENEFITS**

[2-3 hours] A study of the law regarding employment benefits, such as ERISA, focusing on various forms of pension plans, and health and welfare plans. The law will address issues of plan qualification under the tax code and also applicable labor laws and regulations. Some familiarity with tax concepts would be helpful but is not required.

### **LAWI 9740 PUBLIC SECTOR LABOR LAW**

[2-3 hours] This course covers various models of public sector labor relations laws, including but not limited to the Ohio public sector labor statute. It focuses on the differing degrees to which public sector unions in different jurisdictions can bargain, resolve bargaining impasses (through strikes or mediation and arbitration), and enforce contracts with employers. This course also stresses issues unique to the public sector, including constitutional rules, civil service statutes and the rights of individual public employees.

### **LAWI 9750 PRODUCTS LIABILITY**

[2-3 hours] Essential elements of common law and statutory theories of recovery pertinent to product liability claims for both personal injury and economic loss. Some attention given to the integration of substantive law and the rules of procedure controlling the litigation of product liability claims.

### **LAWI 9760 PUBLICLY HELD CORPORATIONS**

[2-3 hours] This course focuses on legal issues that are commonly faced by larger corporations, and the special concerns involved in protecting widely scattered shareholder constituencies. Topics covered include directors' role in large corporations, social responsibility of large businesses, the growing prominence of institutional investors, securities fraud, insider trading, shareholder meetings, proxy solicitations, shareholder litigation, mergers and tender offers. Prerequisite: Business Associations

### **LAWI 9780 REMEDIES**

[2-3 hours] The course in Remedies is about the bottom line. It is about what a court can do for a litigant who has been wronged or is about to be wronged. The two most common remedies are judgments for money and injunctions against defendants to prevent them from wronging plaintiffs or to require them to undo wrongs. The course takes up questions such as the measure of relief, the relationship between legal and equitable remedies, declaratory remedies, benefit to the defendant as the measure of relief in restitution, punitive remedies, enforcing judgments, equitable defenses, immunities and federal interference with state law enforcement.

### **LAWI 9800 SECURITIES REGULATION**

[2-3 hours] This course focuses on the disclosure requirements of the federal securities laws which apply when businesses raise capital and when their shares are publicly traded. It examines the requirements of the Securities Act of 1933, selected provisions of the Securities Exchange Act and state blue sky laws. It covers extensively the structuring of exempt transactions for small businesses. The course is taught primarily from a transactional, rather than a litigation, focus. Prerequisite: Business Associations

### **LAWI 9810 SENTENCING**

[2-3 hours] A survey of the law relating to the disposition of individuals convicted of crimes. Topics include sentencing authority, ex post facto laws, factual bases for sentencing, probation, parole, the death penalty and state and federal sentencing guidelines. Prerequisite: Criminal Law and Constitutional Law

### **LAWI 9830 ADVANCED TOPICS IN EMPLOYMENT LAW**

[1-3 hours] This course is an opportunity for students to take a closer look at current topics facing employment law practitioners and their clients. Several current and recurring issues will be addressed in class sessions. Additional topics of interest and relevance will be chosen by the students for their individual research and study.

### **LAWI 9850 SHAKESPEARE AND THE LAW**

[1-3 hours] This course looks at the legal issues presented in seven of Shakespeare's plays. These issues are considered from both the standpoint of Elizabeth English Common Law and how these issues would be treated in the United States at this time. Shakespeare's "legal" plays are of particular relevance to lawyers. Shakespeare, by a magnitude, is the most commonly quoted author in judicial opinions in the United States.

### **LAWI 9860 SPORTS AND ENTERTAINMENT LAW**

[2-3 hours] A substantive examination of concepts and cases from legal disciplines which affect professional sports including antitrust law, labor law, contracts, tax and civil procedure. Course includes exercises in negotiating, drafting and tax planning.

**LAWI 9890 TOXIC SUBSTANCES**

[2-3 hours] This course addresses policies and law governing toxic substances and wastes. We will analyze federal statutes dealing with pesticides, chemical wastes and other toxic substances, as well as alternatives to the use of toxics, such as biotechnology and the regulation of genetically modified organisms. Common law theories arising in toxic tort litigation (such as the cases addressed in *A Civil Action* and *Erin Brockovich*) will also be explored. Students will gain familiarity with risk assessment, the health sciences and environmental science in order to assess and understand legislative and regulatory goals and choices in controlling toxic substances.

**LAWI 9900 TRADEMARK-TRADESECRET UNFAIR COMPETITION LAW**

[2-3 hours] A survey of business torts covering such topics as trademark infringement, trade secret misappropriation, product disparagement, right to publicity and false advertising. This course will also study the regulation of advertising by the Federal Trade Commission. Recommended: Intellectual Property Survey

**LAWI 9930 WATER LAW**

[2-3 hours] The study of surface and ground water allocation systems throughout the United States, including allocation issues that arise among states, and between the United States and other countries. This course will also address federal authority over water resources and federal acquisition of water rights.

**LAWI 9940 WHITE COLLAR CRIME**

[2-3 hours] A survey of the federal criminal law relating to crimes committed by corporations and non-traditional criminals. Topics include corporate criminal liability, wire and mail fraud, RICO, money laundering, false claims and false statements, tax crimes, environmental crimes, perjury and obstruction of justice. Prerequisite: Criminal Law

**LAWL - Law****Law Review and Moot Court (LAW)****LAWL 9110 LAW REVIEW I**

[2 hours] Course is graded on a Satisfactory/Unsatisfactory basis. Course requires the successful completion of a publishable manuscript as determined by the editor-in-chief and faculty adviser of the Law Review. With the approval of the faculty member assigned to the manuscript, it also counts as 2 writing units which include a research component toward the student's Upper Level Writing Requirement.

**LAWL 9120 LAW REVIEW II**

[2 hours] Only students who have successfully completed Law Review I and who are serving as editors of the Law Review will be permitted to register for Law Review II. Enrollment is selective. Prerequisite: Law Review I

**LAWL 9150 MOOT COURT I**

[1-2 hours] Students participate in interscholastic Moot Court and Trial Advocacy competitions, each of which deals with a particular area of law, such as: international law, family law, corporate law, sports law, tax, intellectual property, criminal law and constitutional law. Those participating on moot court teams will prepare a brief for and present an appellate argument at a competition at another school. Students on the trial advocacy team will conduct trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses. Prerequisite: Enrollment is based on try-outs held in the fall, and each team requires enrollment in other courses based on the subject matter of the competition.

**LAWL 9160 MOOT COURT II**

[1-2 hours] Students participate in interscholastic Moot Court and Trial Advocacy competitions, each of which deals with a particular area of law, such as: international law, family law, corporate law, sports law, tax, intellectual property, criminal law and constitutional law. Those participating on moot court teams will prepare a brief for and present an appellate argument at a competition at another school. Students on the trial advocacy team will conduct trial against counsel from other schools; including making opening and closing statements, introducing evidence and examining and cross-examining witnesses. Prerequisite: Enrollment is based on try-outs held in the fall, and each team requires enrollment in other courses based on the subject matter of the competition.

**LAWN - Law****Clinics and Skills (LAW)****LAWN 9000 TRIAL PRACTICE**

[3 hours] Simulated exercises and trials, including such matters as pretrial motions, jury selection, opening statement, presentation of evidence, cross-examination, witness impeachment, closing argument and jury instructions. Emphasis is given to developing and proving a theory of the case. Prerequisite: Evidence

**LAWN 9010 ARBITRATION**

[2-3 hours] This course explores the theory and practice of arbitration from the standpoint of both the arbitrator and the attorney-advocate with specific emphasis on arbitration advocacy. The course includes arbitration simulations that require preparation of arbitration awards with opinions and pre-arbitration hearing briefs.

**LAWN 9020 ADVANCED LEGAL RESEARCH**

[2-3 hours] An in-depth view of legal bibliography in both print and electronic formats. Detailed attention given to encyclopedias, treatises, and various general and topical indexes, digests, and citators as well as web based compilations of legal materials.

**LAWN 9030 LAW PRACTICE**

[1-3 hours] An introduction to management of a law practice. This course will develop concepts related to four areas: Business Management, Practice Management, Client Management and Life Management. In the area of Business Management, students will be exposed to business start-up considerations, including choice of entity, financing, bookkeeping and trust accounting. In the area of Practice Management, the students will cover administrative and substantive systems, including conflicts of interest, docket management, form files and employee management. In Client Management, the students will be exposed to issues related to client acceptance, declination, disengagement, client satisfaction and malpractice to name a few. Quality Management rounds out the course with quality of life issues such as succession planning, contingency arrangements, substance abuse and maintaining a balance in life. Grading for this course is a satisfactory/unsatisfactory basis only.

**LAWN 9040 MEDIATION AND SETTLEMENT**

[2-3 hours] This course explores the theory and practice of mediation from the standpoint of both the mediator and the attorney-advocate. The course includes several mediation simulations that require preparation of post-mediation evaluations. Other topics include mediator roles and functions, agenda setting, issue identification, communication skills, power balancing, the caucus, ethical issues and the place of mediation in the larger context of Alternative Dispute Resolution.

**LAWN 9050 NEGOTIATION AND SETTLEMENT**

[2-3 hours] This course focuses on developing an analytical framework for preparing, conducting and evaluating negotiations. A variety of negotiation strategies and tactics are explored including cooperative, problem-solving and competitive, positional approaches. Students conduct approximately ten negotiations that explore a variety of deal-making and dispute resolution fact situations.

**LAWN 9060 LITIGATION STRATEGIES**

[2-3 hours] Practical aspects of lawyering with an emphasis on trial skills and on the theories of strategies and tactics of litigation. Students interview clients, analyze their problems and recommend solutions. In this practical course, students also learn how to establish a law practice. Recommended courses: Civil Procedure, Evidence.

**LAWN 9070 PRETRIAL PRACTICE -- DISCOVERY**

[1-3 hours] One-half of the course concentrates on learning the rules of discovery and developing practical skill in drafting interrogatories, requests for production, requests for admission and requests for physical examination. The other half focuses on the practical aspects of preparing for, taking and defending depositions.

**LAWN 9080 PRETRIAL PRACTICE - MOTIONS**

[2-3 hours] This course teaches students to "talk to the judge" in legal writing by using plain, persuasive language. Topics include the rules and practice of many types of motions from the usually mundane motion for extension of time to motions in limine and for summary judgment. A large portion of the course will be spent writing and editing a persuasive motion for summary judgment.

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### **LAWN 9090 ALTERNATIVE DISPUTE RESOLUTION**

[2-3 hours] This survey course starts with a comparison of various adjudicatory and non-adjudicatory methods of dispute resolution and then proceeds to an in-depth study of negotiation, mediation and arbitration as well as various hybrid dispute resolution processes such as the mini-trial, the summary jury trial, early neutral evaluation, mediation-arbitration and ombudsmen. Attention is also given to client interviewing and counseling.

### **LAWN 9190 INTERVIEWING AND COUNSELING**

[2-3 hours] Most lawyers in both litigation and transactional practice spend substantial amounts of their time interviewing and counseling clients. The goals of this course are to develop understanding of theories and techniques of client interviewing and counseling and to assist students to develop skills in performance of interviewing and counseling. Readings and class discussion impart knowledge of theory and techniques. Mere understanding, however, is insufficient to develop performance competence. To develop competence in performance of these skills, students participate in simulations based on case files that will be distributed. Simulations will be recorded on videotape and will be evaluated by the performer, classmates and the instructor.

### **LAWN 9310 PROSECUTOR CLINIC**

[3-7 hours] The Prosecutor Clinic trains law students in basic prosecutorial skills and values. Students serve externships in local prosecutor offices trying cases, plea-bargaining and interviewing witnesses. The clinic may be taken for either six or four credit hours. Recommended: Criminal Procedure Prerequisite: Evidence

### **LAWN 9330 ADVANCED PROSECUTOR CLINIC**

[3-4 hours] The Advanced Prosecutor Clinic trains students in advanced skills of prosecution. Students undertake more challenging tasks than those typically undertaken in the basic clinic. For example, students may conduct jury trials, make appellate arguments, or draft clinical training manuals. Prerequisite: Prosecutor Clinic

### **LAWN 9410 DISPUTE RESOLUTION CLINIC**

[2-4 hours] In the Dispute Resolution Clinic, second and third year students have the unique opportunity to learn mediation skills and apply those skills mediating in the Lucas County Juvenile Court and Toledo Municipal Court. This fieldwork experience provides hands-on training in the area of alternative dispute resolution. Skills such as listening, communication and negotiation are stressed in both the fieldwork and weekly classroom component. Students are taught theoretical techniques and are exposed to a variety of topics and speakers in the Alternative Dispute Resolution field. This clinical program is designed to teach practical skills and give the students an opportunity to interact in the legal community in a new and emerging area of law. Prerequisite: Permission of instructor

### **LAWN 9420 ADVANCED DISPUTE RESOLUTION CLINIC**

[2-4 hours] The Advanced Dispute Resolution Clinic emphasizes development of skills beyond those achieved in the basic clinic. The course provides students with the opportunity to become involved in mediations in a number of courts throughout Lucas County and Northwest Ohio. Prerequisite: Permission of instructor

### **LAWN 9610 PUBLIC SERVICE EXTERNSHIP**

[1-6 hours] The Public Service Externship Clinic is a field placement program in which students are placed in structured legal settings with public service attorneys and programs. There is a required classroom component in which issues relating to learning from experience are explored. The program is available year round with out-of-town placements available in the summer term.

### **LAWN 9910 LEGAL CLINIC**

[2-7 hours] The clinic focuses on development of legal skills such as interviewing, counseling, negotiation, drafting, trial and appellate work and the application of those skills to the problems of individuals. Typical practice includes probate, domestic relations, administrative law, landlord and tenant, consumer and civil rights cases. Students in the clinic are given responsibility for work on all aspects of the case, under the close supervision of clinic faculty. Classroom meetings focus on substantive, procedural and ethical aspects of the cases handled by the clinic. Admission is by the permission of the co-directors. In considering admission of those students with 59 or more hours, preference will be given to those who are certified as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar. It is recommended that students be enrolled in or have completed Evidence.

### **LAWN 9930 ADVANCED LEGAL CLINIC**

[2-4 hours] The advanced clinic emphasizes development of skills beyond those achieved in the basic clinic in the context of complex litigation or other more involved representation. Prerequisite: Legal Clinic, permission of instructor

### **LAWN 9940 DOMESTIC VIOLENCE CLINIC**

[3-7 hours] The Domestic Violence Clinic is a criminal practice clinic in which students assist with domestic violence prosecutions in the Toledo Municipal Court. Students receive two hours of classroom instruction per week and spend ten hours per week working on real domestic violence cases under the supervision of local prosecutors. Admission is by the permission of the director. It is recommended, but not required, that students complete at least 59 credit hours and apply for certification as legal interns under Rule II of the Ohio Supreme Court Rules for the Governance of the Bar.

### **LAWN 9950 ADVANCED DOMESTIC VIOLENCE CLINIC**

[2-4 hours] The advanced clinic development of skills beyond those achieved in the basic clinic in the context of complex domestic violence prosecution.

## **LAWP - Law**

### **Writing Courses and Independent Research (LAW)**

#### **LAWP 9000 ADVANCED SEMINAR**

[3 hours] Seminars are offered in a wide variety of subject areas. In addition to class work, seminars require a substantial research project.

#### **LAWP 9010 HONORS RESEARCH PROGRAM I**

[2 hours] A student who has completed 32 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior

to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides how many Upper Level Writing Requirement units and what grade will be awarded to the project.

#### **LAWP 9020 HONORS RESEARCH PROGRAM II**

[2 hours] A student who has completed 32 semester hours in the College of Law and who has a cumulative grade point average of 3.0 or higher may apply to undertake honors research. The student must submit a topic and detailed research proposal four weeks prior to enrollment to a faculty member who agrees to take primary responsibility to supervise the student's work. Two other faculty members are appointed by the Dean to serve on the student's advisory committee. The research and writing take place over two semesters and culminate in a written thesis intended for publication. The student must orally defend his or her thesis before the advisory committee and interested members of the University community. The purpose of the program is to provide an opportunity for students to make a contribution to the professional literature through concentrated study in an area of interest. The advisory committee decides how many Upper Level Writing Requirement units and what grade will be awarded to the project.

#### **LAWP 9030 ADVANCED APPELLATE ADVOCACY**

[2-3 hours] The course focuses on teaching advanced advocacy skills for practice before the appellate courts. It covers advanced persuasive writing, the rules of appellate court procedure, as well as advanced research and oral argument techniques.

#### **LAWP 9040 ADVANCED LEGAL WRITING**

[2-3 hours] This is a practicum course that develops the theory and practice of cognitive legal writing, i.e., legal writing that is well-organized, precise, effective and persuasive. This approach to legal writing is applicable to briefs, memoranda, opinion letters and letters to clients.

#### **LAWP 9050 INDEPENDENT RESEARCH PROGRAM**

[2 hours] A student who has completed at least 32 semester hours in the College of Law and who has a grade point average of 2.0 or higher may undertake and complete individual research and writing for credit under an Independent Research Program. To enroll in the program, a student must submit a written proposal to the faculty member agreeing to take primary responsibility for that student. If the faculty member and the Dean approve the proposal, the student may then enroll for two hours of credit for one semester. The supervising faculty member decides how many Upper Level Writing Requirement units and what grade will be awarded to the project.

**LAWP 9060 PRACTICAL LEGAL WRITING**

[1-3 hours] This course focuses on writing skills necessary for the legal practitioner, including client letters, complaints, answers, interrogatories and motions. It is aimed at those students interested in learning the nuts and bolts of practice and how to prepare essential litigation documents.

**LAWP 9210 WRITING FOR LAW REVIEW**

[1 hour] This is a practicum course that develops the theory and practice of cognitive legal writing, i.e. legal writing that is well-organized, precise, effective, persuasive, and reader-centered. This approach to legal writing is applicable to law review notes and comments as well as briefs, memoranda, opinion letters, and letters to clients.

**LAWP 9400 DRAFTING WILLS AND TRUSTS**

[2-3 hours] The course's primary goals are to improve student drafting skills in general and to provide practical experience in will and trust drafting. Students design drafting solutions to a series of particular exercises. A final, comprehensive drafting project is required.

**LAWP 9460 LEGAL DRAFTING**

[2-3 hours] This is a practicum course that develops the theory and practice of preparing clear, consistent, well-organized and readable legal instruments (e.g., contracts, leases, regulations and statutory provisions). Prerequisite: Advanced Legal Writing

## LAWT - Law

### Special Topics (LAW)

**LAWT 9070 COMPLEX LITIGATION**

[2-3 hours] A study of selected problems of complexity in litigation, in relation to subject matter, parties, forums, and pre-trial and trial procedures.

**LAWT 9090 ELDERLAW**

[2-3 hours] This course surveys a variety of substantive areas with particular reference to how those impact elderly persons: legal ethics, property management, guardianship of the person, health care and housing. Research and practical writing projects are often part of this course.

**LAWT 9120 EUROPEAN UNION**

[2-3 hours] This course will begin with an examination of the history of and legal foundations for the European Union. It will then explore the relationship between individual sovereign states and the EU. Finally, the course will look at various particular bodies of EU law such as free movement of capital, goods and labor; freedom of establishment; harmonization of laws; antitrust and competition policy; currency unification; environmental protection; intellectual property protection; rights to privacy; and women's rights.

**LAWT 9150 HEALTH CARE REGULATIONS**

[2-3 hours] Examines the legal structures that regulate the organization, delivery and financing of health care. Topics include Medicare and Medicaid, Antitrust and the structure of health care enterprises. Discussion includes the public policy objectives and effects of current regulatory schemes, as well as enacted and proposed reforms at state and federal levels.

**LAWT 9250 GREAT LAKES' WATER POLICY**

[2-3 hours] This interdisciplinary course integrates topics and speakers from different disciplines to examine problems facing the Great Lakes Region, such as water pollution, use and development, Brownfields remediation, wetlands and biodiversity. Students may work in teams with graduate students, and may draw upon their own research and the speakers' expertise to devise proposals on relevant topics.

**LAWT 9260 HEALTH CARE FINANCE**

[1-3 hours] This course will cover the different problems presented by government regulation versus the private market model focusing on managed care (risk allocation, standard of care, consumer information), insurance (basic models of insurance and underwriting), health care licensing, and related ERISA issues as they affect the delivery of health care services.

**LAWT 9270 LEGISLATIVE PROCESS AND DRAFTING**

[2-3 hours] The Legislative Drafting course focuses on legislative drafting techniques and surveys legal drafting, limitations on legislation, statutory interpretation, legislative procedure and professional responsibility. Students will draft a bill for an actual client and write a scholarly paper in support of the bill.

**LAWT 9350 MENTAL HEALTH LAW**

[2-3 hours] Mental Health Law deals with the rights of persons with mental disabilities. Topics considered are: civil commitment, right to treatment, right to refuse treatment, Americans with Disabilities Act, competence to stand trial, the doctrine of "not guilty by reason of insanity," and dangerous offender statutes.

**LAWT 9360 MEDICINE FOR LAWYERS**

[1-2 hours] This course, taught by a medical doctor with a JD, addresses practical litigation issues involved in health care law. It focuses on the use and interpretation by the lawyer of the medical record. Regardless of the nature of the action brought, negligence, malpractice, toxic tort, worker's compensation or medical fraud and abuse claims, the medical record is a foundation document in the preparation of the case for both plaintiff and defendant. The attorney must understand both the medical content and meaning of the record, including anatomy and pathophysiology, as well as the documentation of the duty and delivery of care in the record to effectively sustain an argument.

**LAWT 9370 MEDICAL LIABILITY**

[2-3 hours] This advanced torts course covers quality control in health care, medical malpractice (including tort reform), informed consent and institutional liability, including insurance and managed care responsibility for medical injury.

**LAWT 9380 NATIVE AMERICAN LAW**

[2-3 hours] This course will initially examine the legal concepts of "Native American" individual and tribe. The study of unique (and not so unique) aspects of the treatment of Native American individuals and tribes under the U.S. Constitution; treaties; and national, tribal and state law will form the heart of the course. Attention will be given to issues relating to tribal government and tribal courts, criminal and civil jurisdiction over Indians and non-Indians, environmental regulation on reservation lands, commercial trade in Indian art, casino gaming, the American Indian Religious Freedom Act and the Native American Graves Protection and Repatriation Act.

**LAWT 9400 NAFTA**

[2-3 hours] This course will begin with an overview of free trade in North America. Then it will turn to an in-depth examination of different areas of commerce affected by the North American Free Trade Agreement (NAFTA): the movement of goods, the cross border provision of services, the treatment of foreign investments, the protection of intellectual property and dispute settlement procedures. Next, it will consider the labor and environmental side agreements. Finally, it will explore how the NAFTA may be expanded in the future.

**LAWT 9600 SPECIAL TOPICS**

[1-4 hours] Courses covering special topics and current events.

**LAWT 9630 TAX PROCEDURE AND TAX FRAUD**

[2-3 hours] This course first considers civil tax cases, with emphasis upon negotiation between taxpayers' counsel and Internal Revenue Service personnel, and upon Tax Court procedure. The course then takes up criminal tax prosecutions, with emphasis upon the interaction of IRS civil and criminal investigatory powers, and upon defense of the typical tax prosecution. Recommended: Federal Income Taxation I and II, and Criminal Procedure I

**LAWT 9790 ADVANCED CRIMINAL PROCEDURE**

[2-3 hours] This course will combine in-depth study of the most important and current issues in criminal procedure with direct experience in oral and written advocacy. In the post 9/11 world, criminal procedure is in a state of change not seen in the last thirty years. We will therefore focus on issues that have arisen in the War on Terrorism: the USA PATRIOT Act, detentions of individuals as "enemy combatants," the use of immigration violations and material witness warrants as pretexts for terrorism investigation, profiling of potential terrorists, and the gathering of evidence under Foreign Intelligence Surveillance Act warrants. Students will brief and argue two Fourth, Fifth or Sixth Amendment problems. Both writing and oral arguments will be extensively critiqued. Prerequisite: Criminal Procedure-Investigations or Criminal

**LAWT 9800 INTERNATIONAL ENVIRONMENTAL LAW**

[2-3 hours] This course introduces students to issues, problems and legal norms applicable to environmental concerns in the international arena. The course begins with an examination of the various sources of international law and the applicability and affect that international legal norms have on domestic law (an introduction to basic international law). Next the course will consider the unique nature of environmental problems in the international context. The course will then explore the various norms, treaties and other sources of international law that exist to protect the environment in the context of various problems.

**LAWT 9900 FORENSIC EVIDENCE LAW**

[2-3 hours] A review of the law of scientific evidence and the underlying science employed in detecting and solving crimes and in the reconstruction of accidents. Topics include, accident and injury reconstruction, DNA matching, the identification and toxicology of drugs and alcohol, fingerprint identification, dental matching, the reconstruction of computer files, basics of forensic accounting and hair, fiber and similar matching techniques. Prerequisite: Evidence

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### **LAWT 9910 DEATH PENALTY**

[3 hours] This course addresses legal and policy aspects of state and federal death penalty practice. Both prosecutor and defense strategies will be explored. Students will take a final exam or write a paper in lieu of the exam.

## **LGL - Undergraduate Legal Specialties**

### **Department of Undergraduate Legal Studies (HHS)**

#### **LGL 1010 INTRODUCTION TO LAW FOR LEGAL ASSISTANTS**

[3 hours] The course is designed to improve oral and written communication skills through the study of contracts, real property, torts and criminal law. The course includes the structure and operation of the state and federal court systems, as well as the status and uses of paralegals.

#### **LGL 1150 TORT LAW**

[3 hours] This course covers the traditional areas of tort law, including negligence, trespass, mental distress and conversion as well as the defenses to these claims. The course is taught through the case study method.

#### **LGL 1160 LEGAL RESEARCH, WRITING AND CASE ANALYSIS**

[3 hours] Designed to provide the student with an understanding of the function of the law library and to develop research techniques and legal analysis and writing skills through use of traditional law library materials and computerized legal research techniques such as Lexis and Anderson CD-ROM Law on Disk. Prerequisite: LGL 1010 or approval of the academic adviser

#### **LGL 1720 LAW PRACTICE MANAGEMENT**

[3 hours] This course exposes students to various management structures within and the administration of the law office and other legal environments. Critical thinking will be applied to management theories and applications.

#### **LGL 2020 CIVIL PROCEDURE**

[3 hours] An in-depth study of the Rules of Civil Procedure, including application of rules of fact patterns. Students will draft litigation documents including complaint, answer and discovery pleadings. Prerequisite: LGL 1010 and 1150, or approval of academic adviser

#### **LGL 2110 ESTATE & PROBATE ADMINISTRATION**

[3 hours] Study of the common forms of wills and trusts and a survey of the fundamental principles of law applicable to each; study of the organization and jurisdiction of the probate court, analysis of the administration of estates in probate court and a review of estate and inheritance taxes.

#### **LGL 2120 REAL ESTATE TRANSACTIONS**

[3 hours] The law of real property and common types of real estate transactions and conveyances, such as deeds, land installment contracts, sales contracts and leases, with emphasis on researching, drafting and recording of documents related thereto.

#### **LGL 2130 FAMILY LAW**

[3 hours] Study of the law and practice of divorce, dissolution and all matters relating to the termination of a marriage. Students will be trained to conduct client interviews, draft pleadings and associated court forms, and calculate support under state-mandated guidelines. Prerequisite: LGL 1010 and 1160, or approval of academic adviser

#### **LGL 2210 PRACTICES AND PROCEDURES IN ADMINISTRATIVE LAW**

[3 hours] This course takes a look at the substantive and procedural aspects of various administrative law agencies with emphasis on providing skills to practice in administrative law.

#### **LGL 2700 ADVOCACY: MOCK TRIAL**

[3 hours] An in-depth survey of the trial process which exposes students to each step of a trial in a hands-on fashion. The course will be taught utilizing traditional lecture, reading and actual mock trial experience.

#### **LGL 2940 LEGAL ASSISTING INTERNSHIP**

[3 hours] Field experience in law offices. Students will be placed in various legal assisting positions by the program director. Students will meet for job-related seminar once a week and will work at their assigned law office for 180 hours during the semester. Prerequisite: Permission of program director and attendance at preregistration seminar

#### **LGL 2990 INDEPENDENT STUDY**

[1-3 hours] This course is used for faculty-assisted independent study in the area of legal assisting. Prerequisite: Permission of instructor; admission to the paralegal studies program.

#### **LGL 3010 LAW OF BUSINESS ASSOCIATIONS**

[3 hours] Study of business entities: sole proprietorships, partnerships and corporations. Critical analysis of business entities, de factor and de jure entities. Students will complete articles of incorporation, bylaws and minute books.

Prerequisite: LGL 1010, 1720

#### **LGL 3030 ADVANCED LEGAL RESEARCH & WRITING**

[3 hours] Focus on advanced legal writing. Students will be challenged to master computer assisted legal research methods. Prerequisite: LGL 1010, 1160

#### **LGL 3050 BANKRUPTCY PRACTICES & CONSUMER APPLICATIONS**

[3 hours] An analysis of consumer laws including landlord-tenant relationships, consumer sales practices, uniform commercial code transactions, credit card law, garnishment, fair debt collection practices act and the United States Bankruptcy Code. Prerequisite: LGL 1010, 1160

#### **LGL 3110 PERSONAL LAW**

[3 hours] Through critical reasoning/collaborative learning, students will examine personal law issues and legal rights/responsibilities, enabling them to formulate analytical models readily transferable to legal issues in their present and future lives. Prerequisite: Junior standing

#### **LGL 3120 PERSONAL LAW II**

[3 hours] An analysis of current legal decisions on topics such as same sex marriage, home forced entry and theology studies subsidies through analogizing/distinguishing related fact patterns and criticizing judicial exposition/logic. Prerequisite: LGL 3110

#### **LGL 3330 LITIGATION**

[3 hours] Focus on evidence and investigation, applying critical thinking skills to actual litigation cases. Analysis of court pleadings for appropriateness and alternative mechanisms. Study of post trial and appellate matters. Prerequisite: LGL 1150, 2020

#### **LGL 3350 ALTERNATIVE DISPUTE RESOLUTION**

[3 hours] Students will overview conflict theory, resolution and its history. Students will focus on skills necessary for alternative dispute resolution: negotiation, mediation, arbitration, summary jury trial and mini trial. Prerequisite: LGL 1010, 1150, 2020

#### **LGL 4030 CONTRACT LAW**

[3 hours] Focus on the laws concerning creation and termination of contracts. Students will analyze contractual terms including reliance, capacity, unconscionability, conditions, assignments, third-party beneficiaries and the effect of changed circumstances. Prerequisite: LGL 1010, 1160

#### **LGL 4130 CLINIC EXPERIENCE**

[3 hours] Students will work in a clinical environment, such as: Court Appointed Special Advocates, the UT Center for Mediation and Legal Rights, the Toledo Bar Association's Pro Se Family Law Program. Prerequisite: LGL 1010, 1160; permission of instructor

#### **LGL 4230 HEALTH CARE AND THE LAW**

[3 hours] An analysis of health care laws and legal issues, including treatment relationships, medical malpractice, the right to die, reproductive rights, bioethics, health care financing, public health, delivery systems and regulations. (Not for major credit) Prerequisite: Junior standing

#### **LGL 4940 ADVANCED PARALEGAL INTERNSHIP**

[3 hours] Field experience for seniors, placement within their specialty. Students meet for 1 hour seminar and work at assigned law office for 12 hours per week. Prerequisite: Permission of program director

#### **LGL 4990 INDEPENDENT STUDY**

[1-3 hours] This course is used for faculty-assisted independent study in this area of studies. Prerequisite: Permission of instructor

## **LING - Linguistics**

### **Department of English Language & Literature (ARS)**

#### **LING 3000 HUMAN LANGUAGE**

[3 hours] A non-technical overview of the nature of human language, including issues relating to spoken and written language, language change and language development, and other aspects of language use in a variety of contexts.

#### **LING 3150 LINGUISTIC PRINCIPLES**

[3 hours] An introduction to modern linguistic theories about the nature and structure of language. Data from English as well as other languages will be used.

#### **LING 3160 PHONOLOGY**

[3 hours] Introduction to the study of patterns and rules which govern the production of human speech, including a review of phonetics and a study of various explanatory theories. Prerequisite: LING or ENGL 3150



**LING 3170 SYNTAX**

[3 hours] Introduction to syntax within the transformational-generative framework. Emphasis on data from a variety of languages as a basis for evaluating competing theories. Prerequisite: LING or ENGL 3150

**LING 3180 MORPHOLOGY**

[3 hours] Theories of how morphemes combine to form structurally complex words; word formation rules; the relationship between word structure and how words sound. Recommended: LING 3160 and/or 3170. Prerequisite: LING or ENGL 3150

**LING 3190 SOCIOLINGUISTICS**

[3 hours] Combines linguistic and societal concerns through empirical research; includes issues of language variation and related larger constructs such as speech community, communicative competence, dialect and language change. Prerequisite: LING or ENGL 3150

**LING 4100 THE HISTORY OF ENGLISH**

[3 hours] Description of the changes that have taken place in the English language from the earliest days to the present. Prerequisite: LING or ENGL 3150

**LING 4110 OLD ENGLISH**

[3 hours] A study of phonology, morphology and syntax with representative readings in verse and prose. Prerequisite: Consent of instructor

**LING 4120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose. Prerequisite: Consent of instructor

**LING 4130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: LING or ENGL 3150

**LING 4140 LANGUAGE IN THE AFRICAN AMERICAN COMMUNITY**

[3 hours] Focuses on the distinctive elements of African American Vernacular English, its historical origins, its sociocultural development and its implications for pedagogy and language policy. U.S. multicultural course

**LING 4150 APPLIED LINGUISTICS I**

[3 hours] Focus on methods of applied linguistics in the broad sense, including their use in studies of first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas. Prerequisite: LING or ENGL 3150, or permission of instructor

**LING 4170 APPLIED LINGUISTICS II**

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: LING or ENGL 4150

**LING 4180 THE REPRESENTATION OF LANGUAGE IN THE BRAIN**

[3 hours] An investigation of the various sorts of linguistic deficits that result from brain damage; what this and various imaging studies reveal about how language is represented in the brain. Prerequisite: LING or ENGL 3150

**LING 4940 INTERNSHIP IN LINGUISTICS**

[1-4 hours] Internship with an approved program, company or agency employing research, writing editing or linguistics expertise. Student must submit proposal for approval by advisory and a departmental committee. (Repeatable for a maximum of 4 hours credit.) Prerequisite: Junior or senior standing, 2.5 minimum GPA, major or minor in English or Linguistics, approval of instructor

**LING 4980 SPECIAL TOPICS**

[3 hours] An undergraduate course on a special topic. Consult Time Schedules for topic to be studied, prerequisite(s) and semester offered.

**LING 4990 INDEPENDENT STUDY**

[1-3 hours] An opportunity for students to concentrate on areas of interest or weakness.

**LING 5100 HISTORY OF THE ENGLISH LANGUAGE**

[3 hours] Study of the origins and development of the English language. Prerequisite: LING or ENGL 5/7150, 5/7110, 5/7120 or consent of instructor

**LING 5110 OLD ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.

**LING 5120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose.

**LING 5130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: LING or ENGL 5150/7150

**LING 5150 FUNDAMENTALS OF LINGUISTICS**

[3 hours] Formal techniques required for the synchronic and diachronic study of language.

**LING 5160 PHONOLOGY**

[3 hours] Fundamentals of phonological description, phonetics, phonemics, distinctive features, generative phonology, with study of formulations basic to phonological theory. Prerequisite: LING or ENGL 5150/7150

**LING 5170 SYNTAX**

[3 hours] Formal theories of syntactic analysis, the relationship between semantics and syntax and the evaluation of current approaches. Prerequisite: LING or ENGL 5150/7150

**LING 5180 MORPHOLOGY**

[3 hours] The theory of word structure within the framework of generative grammar. Prerequisite: LING or ENGL 5150/7150, LING 5160/7160

**LING 5190 SOCIOLINGUISTICS**

[3 hours] Combines linguistic and societal concerns through empirical research. Prerequisite: LING or ENGL 5150/7150

**LING 5980 SPECIAL TOPICS**

[3 hours] A graduate course on a special topic. Consult Time Schedule for topic to be studied, prerequisite(s), and semester offered.

**LING 6150 APPLIED LINGUISTICS I**

[3 hours] Focus on the methods of applied linguistics in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas. Prerequisite: LING or ENGL 5150/7150 or permission of instructor. Corequisite: LING or ENGL 6160/8160

**LING 6160 APPLIED LINGUISTICS LAB**

[1 hour] Computer lab work for Applied Linguistics Research and Theory I. Corequisite: LING or ENGL 6150/8150

**LING 6170 APPLIED LINGUISTICS RESEARCH AND THEORY II**

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: LING or ENGL 6150/8150

**LING 6180 LANGUAGE AND THE BRAIN**

[3 hours] An investigation of the areas of the brain that control language.

**LING 6990 INDEPENDENT STUDY**

[1-3 hours] An opportunity for students to concentrate on areas of interest or weakness.

**LING 7100 HISTORY OF THE ENGLISH LANGUAGE**

[3 hours] Study of the origins and development of the English language. Prerequisite: LING or ENGL 5/7150, 5/7110, 5/7120 or consent of instructor

**LING 7110 OLD ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Old English, with special attention to literary and cultural backgrounds. Representative readings in verse and prose.

**LING 7120 MIDDLE ENGLISH**

[3 hours] Study of the phonology, morphology and syntax of Middle English, with special attention to literary and cultural background. Representative readings in verse and prose.

**LING 7130 AMERICAN DIALECTS**

[3 hours] A study of the major regional and social dialects of the United States, their origins and the methods of modern dialectology. Prerequisite: LING or ENGL 5150/7150

**LING 7150 FUNDAMENTALS OF LINGUISTICS**

[3 hours] Formal techniques required for the synchronic and diachronic study of language.

**LING 7160 PHONOLOGY**

[3 hours] Fundamentals of phonological description, phonetics, phonemics, distinctive features, generative phonology, with study of formulations basic to phonological theory. Prerequisite: LING or ENGL 5150/7150

**LING 7170 SYNTAX**

[3 hours] Formal theories of syntactic analysis, the relationship between semantics and syntax and the evaluation of current approaches. Prerequisite: LING or ENGL 5150/7150

**LING 7180 MORPHOLOGY**

[3 hours] The theory of word structure within the framework of generative grammar. Prerequisite: LING or ENGL 5150/7150, LING 5160/7160

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### LING 7190 SOCIOLINGUISTICS

[3 hours] Combines linguistic and societal concerns through empirical research. Prerequisite: LING or ENGL 5150/7150

### LING 7980 SPECIAL TOPICS

[3 hours] A graduate course on a special topic. Consult Time Schedule for topic to be studied, prerequisite(s), and semester offered.

### LING 8150 APPLIED LINGUISTICS I

[3 hours] Focus on the methods of applied linguistics in the broad sense, through case studies including research on first and second language acquisition, language teaching, the teaching of reading and writing, and other related areas. Prerequisite: LING or ENGL 5150/7150 or permission of instructor. Corequisite: LING or ENGL 6160/8160

### LING 8160 APPLIED LINGUISTICS LAB

[1 hour] Computer lab work for Applied Linguistics Research and Theory I. Corequisite: LING or ENGL 6150/8150

### LING 8170 APPLIED LINGUISTICS RESEARCH AND THEORY II

[3 hours] Focuses on theories of second/foreign language acquisition, especially, but not exclusively, as they relate to English as a Second Language. Prerequisite: LING or ENGL 6150/8150

### LING 8180 LANGUAGE AND THE BRAIN

[3 hours] An investigation of the areas of the brain that control language.

### LING 8990 INDEPENDENT STUDY

[1-3 hours] An opportunity for students to concentrate on areas of interest or weakness.

## LST - Law and Social Thought

### Department of Philosophy (ARS)

#### LST 2010 LAW AND SOCIAL THOUGHT

[3 hours] Examines the function and force of law in society in an interdisciplinary context. Course includes texts from philosophy, literature, psychology, sociology, history, anthropology and opinions of the court.

#### LST 2030 CULTURAL GEOGRAPHY

[3 hours] A learning-through-writing course. Systematic applications of the concept of cultural to geographic themes: culture areas, cultural landscapes, culture history, cultural ecology and cultural diversity. Non-western multicultural course

#### LST 2500 PROSEMINAR I

[1 hour] For sophomore and junior majors in LST: discussion among faculty and students of the interdisciplinary study of law and LST program development. Topics vary, may be repeated for credit. Prerequisite: LST 2010

#### LST 2640 RACE, CLASS, AND GENDER

[3 hours] Introduction to the study of race, class and gender as factors in American satisfaction. Social Sciences core course U.S. multicultural course

#### LST 2800 CULTURAL ANTHROPOLOGY

[3 hours] Introduction to culture patterns and processes and their relationship to human society and language. Social Sciences core course Non-western multicultural course

#### LST 2980 SPECIAL TOPICS

[3 hours] Special topics in Law and Social Thought. Topics vary by instructor, may be repeated for credit. Prerequisite: LST 2010

#### LST 3050 ECONOMICS OF GENDER

[3 hours] Analysis of labor market outcomes and income distribution characteristics resulting from gender differences; Gender-related economic outcomes: the "feminization of poverty," persistent male-female wage differential, expanding proportion of female headed households. U.S. multicultural course

#### LST 3070 ECONOMICS AND LAW

[3 hours] Methodologies of Law and Economics; Legal institutions; Economic Theory of Property; Property Rights; Contract Theory; Economic Theory of Torts and Tort Law, Common Law Process; Economics of Crime and Punishment.

#### LST 3080 ECONOMICS OF CRIME

[3 hours] Study of crime as an economic activity; costs of crime to the community; economic approach to crime reduction.

#### LST 3180 MASS COMMUNICATION LAW

[4 hours] Case studies and readings in libel, privacy, access and other legal issues arising from constitutional, judicial and administrative laws that affect mass communication.

#### LST 3500 PROSEMINAR II

[1 hour] For Junior and Senior majors in LST: discussion among faculty and students of the interdisciplinary study of law and LST program development. Topics vary, may be repeated for credit. Prerequisite: LST 2010

#### LST 3510 CONSTITUTIONAL LAW I

[3 hours] The development of the American legal system and the implications of judicial decisions affecting the institutions and powers of government, the federal system and the relationship of the individual to government. Prerequisite: PSC 1200

#### LST 3520 CONSTITUTIONAL LAW II

[3 hours] The development of the American legal system and the implications of judicial decisions affecting the institutions and powers of government, the federal system and the relationship of the individual to government. Prerequisite: PSC 1200.

#### LST 3550 PRINCIPLES OF LAW

[3 hours] An overview of law, legal procedures and the legal professions.

#### LST 3710 PSYCHOLOGY AND THE LAW

[3 hours] Emphasizes the utilization of theoretical and empirical notions of psychological science as they apply to both civil and criminal law.

#### LST 3720 PHILOSOPHY OF LAW

[3 hours] A study of philosophical issues raised by law such as the relation of law to morality, obligation to obey the law, paternalism, censorship and free speech.

#### LST 3750 SOCIAL AND POLITICAL PHILOSOPHY

[3 hours] A study of classic and contemporary treatments of justice, authority, the relations between individual and community, the meaning of freedom and equality, power and violence, and race and gender.

#### LST 3760 CRIME AND PUNISHMENT

[3 hours] A philosophical study of topics such as crime, responsibility, justice and punishment. Special attention is paid to current practices in the criminal justice system.

#### LST 3800 SEXUAL POLITICS

[3 hours] This course examines sexual politics through studying canonical literature of Western political theory, feminism and postmodern theory.

#### LST 3810 POLITICAL GEOGRAPHY

[3 hours] An examination of geopolitical and geostrategic issues at the nation-state and international level.

#### LST 3820 CONTEMPORARY POLITICAL IDEAS

[3 hours] Surveys trends in 20th century political and social thought, including critical theory, post-structuralist theory, feminism and anti-racist politics. Particular issues addressed include bureaucracy, mass society, state and civil violence, and identity politics. Prerequisite: Recommended: PSC 2800

#### LST 3860 GENDER AND GEOGRAPHY

[3 hours] Traces the development and institutionalization of gender roles and how these influence spatial decisions and the formation of perceptual landscapes.

#### LST 3980 SPECIAL TOPICS

[3 hours] Special topics relating to issues in Law and Social Thought. Topics vary by instructor, may be repeated for credit. Prerequisite: LST 2010

#### LST 4170 LAW AND SOCIETY

[3 hours] Dynamics of law and legal institutions; the relationship of sociocultural changes in substantive and procedural aspects of law to the concept of justice, and to the social control of deviance. Prerequisite: 6 hours of sociology or 9 hours of social science

#### LST 4240 ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS

[3 hours] The economics of the environment and natural resources. Examination of economic instruments for solving environmental problems. Analyzed policies include direct regulation, user charges, taxes on polluting products and marketable permits. Prerequisite: ECON 1150 or 1200 or permission of instructor

#### LST 4490 WITCHCRAFT AND MAGIC IN MEDIEVAL AND EARLY MODERN EUROPE

[3 hours] Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraze and its decline.

#### LST 4530 CIVIL RIGHTS

[3 hours] A study of judicial policy-making and administrative implementation of decisions affecting racial issues, freedom of expressions, national security and criminal procedures.

**LST 4550 ISSUES IN CONTEMPORARY LAW**

[3 hours] Examination of contemporary approaches to the analyses of law and the judicial system with special focus on current issues facing the courts.

**LST 4570 LEGAL ISSUES**

[3 hours] Topics may include abortion, three strikes sentencing, homosexual rights, hate speech and decriminalizing narcotics. Emphasizes liberal/conservative ideology.

**LST 4580 INTERNATIONAL LAW**

[3 hours] An examination of the legal status of nation states and dependencies and the rules concerning international diplomacy, treatment of persons and peaceful settlement of disputes.

**LST 4710 CRIMINOLOGY**

[3 hours] Crime and criminal behavior: nature, types and extent of crime, societal reactions; problems in research and theory, prevention, control and treatment.

**LST 4740 ISSUES IN CRIME**

[3 hours] Topics may include legalizing drugs, police violence, plea bargaining, death sentence and mandatory sentencing. Emphasizes liberal/conservative ideology.

**LST 4750 POLITICAL PHILOSOPHY SEMINAR**

[3 hours] Selected topics or philosophers in political philosophy. Course may be repeated as topics vary.

**LST 4820 ANTHROPOLOGY OF RELIGION**

[3 hours] A cross-cultural approach to the description and aliases of magical and religious beliefs and practices in Asia, Africa, Latin America and Indigenous North America. Non-western multicultural course

**LST 4830 THEORY OF PUBLIC HISTORY**

[3 hours] The definition, philosophy and evolution of public history as well as the current literature and debates within the field. Public history is the application of historical knowledge and methodology beyond academe.

**LST 4900 SEMINAR IN LAW AND SOCIAL THOUGHT**

[3 hours] Advanced seminar for the interdisciplinary study of law in society. Topics vary by instructor, may be repeated for credit. Required of LST majors. Prerequisite: LST 2010

**LST 4940 FIELD EXPERIENCE**

[1-6 hours] Community work, internship, or field study relating to law and society. May be repeated for credit. Prerequisite: LST 2010

**LST 4980 SPECIAL TOPICS**

[3 hours] Advanced seminar in Law and Social Thought. Topics vary by instructor, may be repeated for credit. Required of LST majors. Prerequisite: LST 2010

**MARS - Marketing & Sales Technology****Department of Business Technology (UNV)****MARS 1010 MARKETING PRINCIPLES**

[3 hours] A theoretical and practical understanding of marketing issues from both a micro and macro perspective: environmental forces, ethical and social responsibility, consumer buying behavior, target market analysis, market segmentation, branding and packaging, promotion, advertising, personal selling and pricing decisions.

**MARS 1110 PERSONAL SELLING**

[3 hours] Emphasis is placed on the effective techniques of personal selling. These include: prospecting, qualifying customers, building product knowledge, understanding presentation techniques, overcoming customer objections, closing sales and customer follow-up. Special emphasis is placed on selling as a persuasive marketing activity.

**MARS 1720 SALES FORCE MANAGEMENT**

[3 hours] Analysis and examination of the sales management function in the consumer and industrial markets. Organizing, recruiting, selecting, hiring, staffing, training, compensating and evaluating an outside sales force.

**MARS 2010 MARKETING COMMUNICATION**

[3 hours] Focuses on developing integrated marketing communications plan. Includes role of advertising strategy, audience analysis, development of media plans, creative execution, coordination of sales promotion techniques and publicity tools. Prerequisite: MARS 1010

**MARS 2110 MARKETING MANAGEMENT**

[3 hours] Primary focus is on development of marketing strategies. Students required to develop a marketing plan based on marketing opportunity of personal choice. Prerequisite: MARS 1010

**MARS 2120 INDUSTRIAL MARKETING MANAGEMENT**

[3 hours] Primary focus on development of strategies for business-to-business markets. Case approach used to study distinctions between industrial and consumer demand and general characteristics that influence industrial buying behavior. Prerequisite: MARS 1010

**MARS 2210 SERVICES MARKETING**

[3 hours] Focuses on framework for understanding key issues/differences of services marketing. Nature of services marketing presented through traditional 4 Ps supplemented by issues unique to service encounters. Brings together principles of service marketing, human resources management and operations management. Prerequisite: MARS 1010

**MARS 2940 MARKETING AND SALES FIELD EXPERIENCE**

[3 hours] Independent field experience is designed to provide a student the opportunity to observe marketing and/or sales and retail management activities first-hand in an appropriate employment setting. Students meet with the instructor at prearranged times to discuss progress and learning outcomes. Prerequisite: MARS 1010

**MARS 2990 INDEPENDENT STUDY**

[1-3 hours] Students will study a marketing/retail-related subject mutually agreed upon between the student and instructor. The format may include lecture, computer lab and/or practical experience. Prerequisite: permission of instructor

**MATH - Mathematics****Department of Mathematics (ARS)****MATH 0910 ELEMENTARY ALGEBRA I**

[4 hours] This course covers a review of operations with whole numbers, fractions, decimals, ratios and percents. Also covered are integer operations, variables, algebraic expressions, graphs and solving linear equations. Problem solving techniques are emphasized. No credit toward graduation. Grades do not apply to student's GPA.

**MATH 0950 ELEMENTARY ALGEBRA II**

[4 hours] This course introduces the student to functions, solving systems of linear equations, graphing, polynomials, rational and quadratic functions, rational numbers and mathematics modeling. Problem solving techniques are emphasized. No credit toward graduation. Grades do not apply to student's GPA. Prerequisite: MATH 0910 or placement

**MATH 0970 GEOMETRY CONCEPTS**

[3 hours] This course covers lines, angles, similarity and congruence of polygons, areas of polygons, volumes of solids and constructions. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 0950 or placement

**MATH 0980 INTERMEDIATE ALGEBRA**

[4 hours] Review of algebra, linear and quadratic equations, graphs, exponents and radicals, exponential and log functions, simultaneous equations. No credit toward graduation. Course is not applicable toward the undergraduate major in mathematics. Prerequisite: Satisfactory placement test score, or satisfactory ACT score, or MATH 0950

**MATH 0990 INDEPENDENT STUDY**

[1-4 hours] Course for students needing to complete only a portion of a developmental math class (MATH 0900 - 0980).

**MATH 1010 APPLIED BUSINESS MATHEMATICS**

[3 hours] Mathematics used in solving business problems related to simple and compound interest, annuities, payroll, taxes, promissory notes, consumer credit, insurance, markup and markdown, mortgage loans, discounting, financial statement ratios and break-even analysis. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 0900 or placement

**MATH 1180 MATHEMATICS FOR LIBERAL ARTS**

[3 hours] A general liberal arts course for non-science students designed to acquaint students with the nature of mathematics and applications such as probability, statistics, functions and graphs. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: College entrance requirements (Algebra I, Algebra II and Geometry) and satisfactory placement test, or MATH 0980. Math core course

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### **MATH 1210 MATHEMATICS FOR EDUCATION MAJORS I**

[3 hours] Principles of elementary number theory, base systems, development of the rational numbers and problem solving techniques. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: Satisfactory placement test score or MATH 0980 Math core course

### **MATH 1220 MATHEMATICS FOR EDUCATION MAJORS II**

[3 hours] Development of the real numbers, probability, statistics, informal geometry, geometric figures and measurements. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1210 Math core course

### **MATH 1260 MODERN BUSINESS MATHEMATICS I**

[3 hours] Equations and their graphs, linear systems, vectors and matrices, introduction to linear optimization, exponentials and logs, elementary probability, limits, functions, introductions to differential calculus. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: Satisfactory placement test score or satisfactory ACT score or MATH 0980. Math core course

### **MATH 1270 MODERN BUSINESS MATHEMATICS II**

[3 hours] Continuation of differential calculus and integral calculus with business applications. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1260 Math core course

### **MATH 1320 COLLEGE ALGEBRA**

[3 hours] Number system; elementary theory of equations and inequalities; functions and relations; exponentials and logarithms; systems of equations and topics in analytic geometry. Course is not applicable toward the undergraduate Mathematics major requirements. No credit given for students who have credit for MATH 1340. Prerequisite: Satisfactory placement test score or satisfactory ACT score or MATH 0980. Math core course

### **MATH 1330 TRIGONOMETRY**

[3 hours] Definitions and graphs of trigonometric functions and their inverses, solving trigonometric equations, applications and topics in analytic geometry. Course is not applicable toward the undergraduate Mathematics major requirements. No credit given for students who have credit for MATH 1340. Prerequisite: Satisfactory placement test or satisfactory ACT score or MATH 0980. Math core course

### **MATH 1340 COLLEGE ALGEBRA AND TRIGONOMETRY**

[4 hours] Functions and graphs, exponential and logarithmic functions, trigonometric functions and applications, systems of equations and topics in analytic geometry. No credit for students who have credit for MATH 1320 or 1330. Prerequisite: Three years of high school math and a course in trigonometry and either satisfactory placement test score or satisfactory ACT score or MATH 0980. Math core course

### **MATH 1750 MATHEMATICS FOR THE LIFE SCIENCES I**

[4 hours] Definitions of trigonometric functions, solving trigonometric equations, functions, limits and derivatives, exponential and logarithmic functions, and applications. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: Satisfactory placement test score or satisfactory ACT score or MATH 1320 Math core course

### **MATH 1760 MATHEMATICS FOR THE LIFE SCIENCES II**

[3 hours] Indefinite and definite integrals, probability, functions of several variables, least squares, differential equations. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1750 or MATH 1850 or MATH 1920 Math core course

### **MATH 1780 INTRODUCTION TO MAPLE**

[1 hour] Brief review of the computer algebra system Maple; graphing; simplifying algebraic expressions; finding solutions of equations symbolically, graphically and numerically; various typical problems from precalculus and beginning calculus. Prerequisite: MATH 1340 or MATH 1320 and 1330 or 4 years of high school math and passing score on the placement exams

### **MATH 1830 CALCULUS I FOR MATHEMATICIANS, SCIENTISTS AND EDUCATORS**

[4 hours] Limits of sequences and functions, derivatives, Mean Value Theorem, curve sketching, definite and indefinite integral, Fundamental Theorem of Calculus. Of interest to students requiring a conceptual understanding of calculus. Not for major credit. Prerequisite: MATH 1340 or MATH 1320 and 1330 or placement test scores Math core course

### **MATH 1840 CALCULUS II FOR MATHEMATICIANS, SCIENTISTS AND EDUCATORS**

[4 hours] Techniques of integration, polar coordinates and calculus of plane curves, infinite series and Taylor series. Of interest to students requiring a conceptual understanding of calculus. Prerequisite: MATH 1830 or 1850 or 1920 Math core course

### **MATH 1850 SINGLE VARIABLE CALCULUS I**

[4 hours] Limits, differentiation, Fundamental Theorem of Calculus, Mean Value Theorem, curve sketching, maxima/minima, definite and indefinite integrals, applications. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1340, or 1320 & 1330 or a satisfactory placement test score

### **MATH 1860 SINGLE VARIABLE CALCULUS II**

[4 hours] Inverse functions, techniques and applications of integration, polar coordinates, sequences and series. Prerequisite: MATH 1830 or 1850 or 1920 Math core course

### **MATH 1880 SINGLE VARIABLE CALCULUS II USING MAPLE**

[4 hours] Inverse functions, techniques and applications of integration, polar coordinates, sequences and series. Maple is used to visualize concepts and to analyze, solve and interpret problems graphically, symbolically and numerically. Prerequisite: MATH 1830 or 1850 or 1920 Corequisite: MATH 1780

### **MATH 1890 ELEMENTARY LINEAR ALGEBRA**

[3 hours] Matrix algebra, systems of linear equations, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, and applications. Prerequisite: MATH 1830 or 1860 or 1930 Math core course

### **MATH 1920 HONORS CALCULUS I AND II**

[4 hours] Theory and applications of derivatives and integrals of a function of one variable. Prerequisite: Satisfactory ACT score and satisfactory trigonometry placement score Math core course

### **MATH 1930 HONORS CALCULUS II**

[4 hours] Theory and applications of derivatives and integrals of a function of one variable. Prerequisite: MATH 1920 Math core course

### **MATH 1980 TOPICS IN MATHEMATICS**

[1-4 hours] Selected topics in mathematics. Prerequisite: Varies with topic

### **MATH 2280 INTRODUCTION TO COMPUTING**

[3 hours] An overview of the role of microcomputers and information systems. Provides training in word processing, presentation graphics, and spreadsheets or problem solving. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1180 or equivalent

### **MATH 2450 CALCULUS FOR ENGINEERING TECHNOLOGY I**

[4 hours] Differential calculus of algebraic and trigonometric functions, including limits, curve sketching, motion, maxima/minima, related rates, integral calculus of algebraic functions. Prerequisite: Satisfactory placement test, or MATH 1320 and 1330

### **MATH 2460 CALCULUS FOR ENGINEERING TECHNOLOGY II**

[4 hours] Transcendental functions, methods of integration, applications of the integral, polar coordinates, vectors and vector operation, lines and planes, parametric equations. Prerequisite: MATH 2450 or 1850 or 1920, passing the Prerequisite Skills Test

### **MATH 2600 INTRODUCTION TO STATISTICS**

[3 hours] An introduction to descriptive and inferential statistical methods including point and interval estimation, hypothesis testing and regression. No credit allowed if taken after MATH 3610 or 4680; credit not allowed if taken after MATH 2600 and 2630. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 0980, 1180 or equivalent Math core course

### **MATH 2620 DISCRETE PROBABILITY**

[3 hours] Sample spaces, events, counting techniques, probability distributions and their applications. No credit if taken after 4680. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 0980, 1180, or equivalent

**MATH 2630 STATISTICS FOR BUSINESS AND ECONOMICS**

[3 hours] An introduction to descriptive and inferential statistical methods, including numerical and graphical data description, basic probability concepts and distributions, point and interval estimation and hypothesis testing. Credit not allowed for both MATH 2600 & 2630. Course is not applicable toward the undergraduate Mathematics major requirements. Prerequisite: MATH 1270

**MATH 2850 ELEMENTARY MULTIVARIABLE CALCULUS**

[4 hours] Geometry of functions of several variables, partial differentiation, multiple integrals, vector algebra and calculus (including Theorems of Green, Gauss and Stokes), and applications. Prerequisite: MATH 1840 or 1860 or 1930

**MATH 2880 ELEMENTARY MULTIVARIABLE CALCULUS USING MAPLE**

[4 hours] Geometry of functions of several variables, partial differentiation, multiple integrals, vector algebra, and calculus (including Theorems of Green, Gauss and Stokes) and applications. Maple is used to solve problems graphically, symbolically and numerically. Prerequisite: MATH 1840 or 1860 or 1880 or 1930 Corequisite: MATH 1780

**MATH 2890 NUMERICAL METHODS AND LINEAR ALGEBRA**

[3 hours] Topics include: matrices, characteristic roots, solution of linear and nonlinear equations, curve fitting, integration, differentiation and numerical solution of ordinary differential equations. MATLAB is introduced and used to analyze problems. Prerequisite: MATH 1830 or 1850 or 1920 Corequisite: MATH 1840 or 1860 or 1930

**MATH 2950 HONORS CALCULUS III**

[4 hours] Theory and applications of the calculus of functions of two or more variables. The fundamental theorems of vector calculus. Prerequisite: MATH 1930 or permission of instructor

**MATH 3000 SYMBOLIC LOGIC**

[3 hours] A study of propositional and predicate logic, the symbolic techniques used to evaluate deductive arguments. Topics may include computability, set theory, Bayesianism and other formal systems with mathematical or philosophical relevance. Prerequisite: MATH 1180 or PHIL 1100

**MATH 3190 INTRODUCTION TO MATHEMATICAL ANALYSIS**

[3 hours] This course is intended to introduce students to higher mathematics. The techniques of proving theorems, including proofs by induction, will be emphasized. The course will include elementary set theory and equivalence relations and a discussion of the real number system. Proofs of some basic theorems from algebra, calculus or number theory will be studied. Prerequisite: MATH 1840 or 1860 or 1930

**MATH 3200 NUMBER THEORY**

[3 hours] Divisibility, congruences, diophantine equations, numerical functions, quadratic reciprocity. Prerequisite: MATH 3190

**MATH 3320 INTRODUCTION TO ABSTRACT ALGEBRA**

[3 hours] Sets and mappings, integers, groups, rings and applications. Prerequisite: MATH 3190

**MATH 3440 FUNDAMENTALS OF MODERN GEOMETRY I**

[3 hours] Primarily for students in secondary education. Euclidean geometry from a modern viewpoint, constructions and transformations. Prerequisite: MATH 1840 or 1860 or 1930

**MATH 3450 FUNDAMENTALS OF MODERN GEOMETRY II**

[3 hours] Primarily for students in secondary education. Euclidean geometry from a modern viewpoint, constructions and transformations. Prerequisite: MATH 3440

**MATH 3510 HISTORY OF MATHEMATICS**

[3 hours] Contributions to the development of mathematics by various groups and individuals from the earliest history to the present, with special emphasis on the elementary branches: arithmetic, algebra, geometry and calculus. Prerequisite: MATH 1840 or 1860 or 1930

**MATH 3610 STATISTICAL METHODS I**

[3 hours] Basic probability, sampling, descriptive statistics, statistical inference, regression, correlation, analysis of variance, goodness of fit, model formulation and testing. Prerequisite: MATH 1840 or 1860 or 1930 or 3190, or permission of instructor

**MATH 3620 STATISTICAL METHODS II**

[3 hours] Multiple regression, analysis of covariance, standard experimental designs, contingency tables, nonparametric methods and methods for sample surveys. Prerequisite: MATH 3610

**MATH 3820 HONORS ELEMENTARY DIFFERENTIAL EQUATIONS**

[3 hours] Theory, applications and systems of ordinary differential equations. Prerequisite: MATH 2950 or permission of instructor

**MATH 3860 ELEMENTARY DIFFERENTIAL EQUATIONS**

[3 hours] An introduction to the analysis and solution of ordinary differential equations with emphasis on the fundamental techniques for solving linear differential equations. Prerequisite: MATH 2850

**MATH 3880 ELEMENTARY DIFFERENTIAL EQUATIONS USING MAPLE**

[3 hours] An introduction to the analysis and solution of ordinary differential equations with emphasis on the fundamental techniques for solving linear equations. Maple is used to solve problems graphically, symbolically and numerically. Prerequisite: MATH 2850 or MATH 2880 Corequisite: MATH 1780

**MATH 3920 JUNIOR READINGS**

[1-3 hours] Selected subjects in mathematics of special interest to students and the professor. Prerequisite: Permission of department

**MATH 4290 INTRODUCTION TO SET THEORY**

[3 hours] Sets, relations, functions, axiom of choice, Zorn's lemma, well-ordering theorem, cardinal and ordinal numbers, construction of the real numbers. Prerequisite: MATH 3190

**MATH 4300 LINEAR ALGEBRA I**

[3 hours] Theory of vector spaces and linear transformations, including such topics as matrices, determinants, inner products, eigenvalues and eigenvectors, and rational and Jordan canonical forms. Prerequisite: MATH 3190

**MATH 4310 LINEAR ALGEBRA II**

[3 hours] Hermitian and normal operators, multilinear forms, spectral theorem and other topics. Prerequisite: MATH 4300

**MATH 4330 ABSTRACT ALGEBRA I**

[3 hours] Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups. Prerequisite: MATH 3190

**MATH 4340 ABSTRACT ALGEBRA II**

[3 hours] Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions. Prerequisite: MATH 4330

**MATH 4350 APPLIED LINEAR ALGEBRA**

[3 hours] Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science. Prerequisite: MATH 1890

**MATH 4380 DISCRETE STRUCTURES AND ANALYSIS OF ALGORITHMS**

[3 hours] Discrete mathematical structures for applications in computer science such as graph theory, combinatorics, and groups theory, asymptotics, recurrence relations and analysis of algorithms. Prerequisite: MATH 3320 or 4330

**MATH 4390 THEORY OF COMPUTATION**

[3 hours] Theory of automata and formal languages, computability by Turing machines and recursive functions, uncomputability, NP-Hard and NP-Complete problems. Prerequisite: MATH 4380

**MATH 4450 INTRODUCTION TO TOPOLOGY I**

[3 hours] Metric spaces, topological spaces, continuous maps, bases and subbases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness. Prerequisite: MATH 3190

**MATH 4460 INTRODUCTION TO TOPOLOGY II**

[3 hours] Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem. Prerequisite: MATH 4450, 3320 or 4330

**MATH 4540 CLASSICAL DIFFERENTIAL GEOMETRY I**

[3 hours] Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium. Prerequisite: MATH 3860

**MATH 4550 CLASSICAL DIFFERENTIAL GEOMETRY II**

[3 hours] Tensors, vector fields, and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics parallel transport, and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow. Prerequisite: MATH 4540

## 434 Course Descriptions

### **MATH 4600 APPLICATIONS OF STATISTICS I**

[3 hours] Real data applications of statistical methods. Emphasis is placed on exploratory data analysis and the use of computing facilities to analyze data and produce statistical reports. Statistical packages used include: MINITAB, SAS, and/or S-PLUS; programming is performed in C or Fortran. Prerequisite: Permission of instructor

### **MATH 4610 APPLICATIONS OF STATISTICS II**

[3 hours] Continuation of Applications of Statistics I. Prerequisite: MATH 4600

### **MATH 4620 THEORY OF INTEREST**

[3 hours] This course covers the measurement of interest, certain annuities, yield rates, amortization and sinking funds, bonds and other securities and application of interest theory. Prerequisite: Permission of instructor

### **MATH 4630 THEORY AND METHODS OF SAMPLE SURVEYS**

[3 hours] The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling. Prerequisite: MATH 4680 or permission of instructor  
Corequisite: MATH 4690

### **MATH 4640 STATISTICAL COMPUTING**

[3 hours] Error analysis of statistical algorithms. Numerical linear algebra for linear models. Approximation methods for distribution function probabilities and quantiles. Uniform and non-uniform random number generation. Introduction to simulation methods. Prerequisite: Permission of instructor

### **MATH 4660 APPLIED PROBABILITY**

[3 hours] The basic probability models of applied mathematics and physics, including random walks, Markov chains, branching processes, renewal processes, random graphs and queuing. Prerequisite: MATH 4680 and 4300, or 4350

### **MATH 4680 INTRODUCTION TO THEORY OF PROBABILITY**

[3 hours] Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions. Prerequisite: MATH 3190 or permission of instructor, and MATH 4350

### **MATH 4690 INTRODUCTION TO MATHEMATICAL STATISTICS**

[3 hours] Sampling distributions, point and interval estimation, hypothesis testing, regression and analysis of variance. Prerequisite: MATH 4680

### **MATH 4710 METHODS OF NUMERICAL ANALYSIS I**

[3 hours] Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method. Prerequisite: MATH 3860 and a computer programming course, or permission of instructor

### **MATH 4720 METHODS OF NUMERICAL ANALYSIS II**

[3 hours] Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations. Prerequisite: MATH 4710

### **MATH 4740 ADVANCED APPLIED MATHEMATICS I**

[3 hours] Series and numerical solutions to ordinary differential equations, special functions, orthogonal functions, Sturm-Liouville problems, self-adjointness, vector analysis. Prerequisite: MATH 3860

### **MATH 4750 ADVANCED APPLIED MATHEMATICS II**

[3 hours] Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals. Prerequisite: MATH 4740

### **MATH 4760 ACTUARIAL MATHEMATICS I**

[3 hours] Survival distributions and life tables, life insurance, life annuities, benefit premiums and reserves and multiple life functions are some topics covered in this course. Prerequisite: MATH 4680

### **MATH 4770 ACTUARIAL MATHEMATICS II**

[3 hours] Continuation of Actuarial Mathematics I. Multiple decrement models, collective risk models and applications of risk theory. Prerequisite: MATH 4760

### **MATH 4780 ADVANCED CALCULUS**

[3 hours] Extrema for functions of one or more variables, Lagrange multipliers, indeterminate forms, inverse and implicit function theorems, uniform convergences, power series, transformations, Jacobians, multiple integrals. Prerequisite: MATH 2850

### **MATH 4790 APPLIED OPTIMIZATION**

[3 hours] An introduction to finite-dimensional combined optimization as it relates to business and economics. Linear and non-linear programming. Prerequisite: MATH 3860, 1890

### **MATH 4800 ORDINARY DIFFERENTIAL EQUATIONS**

[3 hours] Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics. Prerequisite: MATH 3860

### **MATH 4810 PARTIAL DIFFERENTIAL EQUATIONS**

[3 hours] First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics. Prerequisite: MATH 3860 and permission of instructor

### **MATH 4820 INTRODUCTION TO REAL ANALYSIS I**

[3 hours] A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann Integral. Prerequisite: MATH 3190

### **MATH 4830 INTRODUCTION TO REAL ANALYSIS II**

[3 hours] Differentiable functions on  $\mathbb{R}^n$ ; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arzela-Ascoli Theorem; introduction to measure theory; Lebesgue integration; the Lebesgue Dominated Convergence Theorem. Prerequisite: MATH 4820

### **MATH 4850 OPERATIONAL MATHEMATICS**

[3 hours] Theory of Laplace, Fourier and other transforms; use of complex variable theory for inversions; applications. Prerequisite: MATH 4880 or equivalent

### **MATH 4860 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL I**

[3 hours] Conditions for an extrema (Euler's equations, Erdman corner conditions, conditions of Legendre, Jacobi, and Weierstrass, fields of extremals, Hilbert's invariant integral); Raleigh-Ritz method; isoperimetric problems; Lagrange, Mayer-Bolza problems. Recommended: MATH 4820. Prerequisite: MATH 1890

### **MATH 4870 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL II**

[3 hours] Pontryagin's maximum principle; necessary and sufficient conditions for optimal control, controllability, time optimal control, existence of optimal controls, relationship to the calculus of variations. Prerequisite: MATH 4860

### **MATH 4880 COMPLEX VARIABLES**

[3 hours] Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications. Prerequisite: MATH 3860

### **MATH 4900 SENIOR SEMINAR**

[1-3 hours] Seminar on a topic not usually covered in a course. Library research and paper to be expected. Prerequisite: Permission of department

### **MATH 4920 SENIOR READINGS**

[1-3 hours] Selected subjects in mathematics of special interest to students and the professor. (By arrangement with professor and student.) Prerequisite: Permission of instructor

### **MATH 4960 ACTUARIAL SCIENCE PROBLEM SEMINAR**

[1-3 hours] The primary activity will be student solution and presentation of problems of a type given on actuarial exams. Prerequisite: Permission of actuarial adviser

### **MATH 5020 ANALYSIS WITH TECHNOLOGY I**

[4 hours] This course offers a rigorous introduction to the analysis of functions in a single real variable. Theoretical concepts are complemented by computer-based illustrative examples. Primarily directed toward students in the M.A. program for teachers. Prerequisite: Admission to program

### **MATH 5030 ANALYSIS WITH TECHNOLOGY II**

[4 hours] This course offers a rigorous introduction to the calculus of multi-variable functions using computer-based experiments to illustrate concepts. Primarily directed toward practicing mathematics teachers in high school. Prerequisite: MATH 5020

**MATH 5050 ALGEBRA WITH TECHNOLOGY**

[4 hours] This course covers various topic in linear and abstract algebra. Topics are chosen so that they are particularly amenable to computer illustrations. Directed toward high school teachers. Prerequisite: Admission into program

**MATH 5220 THEORY OF INTEREST**

[3 hours] This course covers the measurement of interest, certain annuities, yield rates, amortization and sinking funds, bonds and other securities and application of interest theory. Prerequisite: Permission of instructor

**MATH 5260 ACTUARIAL MATHEMATICS I**

[3 hours] Survival distributions and life tables, life insurance, life annuities, benefit premiums and reserves and multiple life functions are some topics covered in this course. Prerequisite: MATH 5680

**MATH 5270 ACTUARIAL MATHEMATICS II**

[3 hours] Continuation of Actuarial Mathematics I. Multiple decrement models, collective risk models, applications of risk theory and application of these models to insurance problems. Prerequisite: MATH 5260

**MATH 5300 LINEAR ALGEBRA I**

[3 hours] Theory of vector spaces and linear transformations, including such topics as matrices, determinants, inner products, eigenvalues and eigenvectors, and rational and Jordan canonical forms.

**MATH 5310 LINEAR ALGEBRA II**

[3 hours] Hermitian and normal operators, multilinear forms, spectral theorem and other topics. Prerequisite: MATH 5300

**MATH 5330 ABSTRACT ALGEBRA I**

[3 hours] Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups. Prerequisite: MATH 3190

**MATH 5340 ABSTRACT ALGEBRA II**

[3 hours] Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions. Prerequisite: MATH 5330

**MATH 5350 APPLIED LINEAR ALGEBRA**

[3 hours] Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science. Prerequisite: MATH 1890

**MATH 5380 DISCRETE STRUCTURES AND ANALYSIS ALGORITHMS**

[3 hours] Discrete mathematical structures for applications in computer science such as graph theory, combinatorics, groups theory, asymptotics, recurrence relations and analysis of algorithms. Prerequisite: MATH 3320 or 5330

**MATH 5390 THEORY OF COMPUTATION**

[3 hours] Theory of automata and formal languages, computability by Turing machines and recursive functions, uncomputability, NP-Hard and NP-Complete problems. Prerequisite: MATH 5380

**MATH 5450 INTRODUCTION TO TOPOLOGY I**

[3 hours] Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness. Prerequisite: MATH 3190

**MATH 5460 INTRODUCTION TO TOPOLOGY II**

[3 hours] Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem. Prerequisite: MATH 5450  
Corequisite: MATH 3320 or 5330

**MATH 5520 THE GEOMETRY OF TWO, THREE AND FOUR DIMENSIONS**

[3 hours] This course presents an introduction to the logical foundations of mathematics. The geometry of two, three and four dimensional space is examined starting from the axioms of Euclid. The course culminates with an investigation of hyperbolic and projective geometries. Of interest to high school teachers. Prerequisite: MATH 5050 or 5330

**MATH 5540 CLASSICAL DIFFERENTIAL GEOMETRY I**

[3 hours] Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium. Prerequisite: MATH 3860

**MATH 5550 CLASSICAL DIFFERENTIAL GEOMETRY II**

[3 hours] Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow. Prerequisite: MATH 5540

**MATH 5560 GEOMETRY AND TOPOLOGY OF SURFACES**

[3 hours] Geometrical and topological aspects of curves and surfaces in Euclidean space. The concepts are to be highlighted by the study of specific examples as in minimal surface theory and in "soap bubble" geometry. Prerequisite: MATH 5030, 5050

**MATH 5600 APPLICATIONS OF STATISTICS I**

[2 hours] Real data applications of statistical methods. Emphasis is placed on exploratory data analysis and the use of computing facilities to analyze data and produce statistical reports. Statistical packages used include MINITAB, SAS and S-Plus. Prerequisite: Permission of instructor

**MATH 5610 APPLICATIONS OF STATISTICS II**

[2 hours] Continuation of Applications of Statistics II. Prerequisite: MATH 5600

**MATH 5620 LINEAR STATISTICAL MODELS**

[3 hours] Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs. Prerequisite: MATH 6650 or permission of instructor

**MATH 5630 THEORY AND METHODS OF SAMPLE SURVEYS**

[3 hours] The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed. Prerequisite: MATH 5680 or permission of instructor  
Corequisite: MATH 5690 or 6650

**MATH 5640 STATISTICAL COMPUTING**

[3 hours] Error analysis of statistical algorithms. Numerical linear algebra for linear models. Approximation methods for distribution function probabilities and quantiles. Uniform and non-uniform random number generation. Introduction to simulation methods. Prerequisite: Permission of instructor

**MATH 5660 APPLIED PROBABILITY**

[3 hours] The basic probability models of applied mathematics and physics, including random walks, Markov chains, branching processes, renewal processes, random graphs and queuing. Prerequisite: MATH 5680 and 5300 or 5350

**MATH 5670 DESIGN OF EXPERIMENTS**

[3 hours] Confounding, fractional replication, complex designs, response surface designs. Prerequisite: MATH 5620

**MATH 5680 INTRODUCTION TO THEORY OF PROBABILITY**

[3 hours] Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions. Prerequisite: MATH 3190 or permission of instructor and MATH 5350

**MATH 5690 INTRODUCTION TO MATHEMATICAL STATISTICS**

[3 hours] Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance. Prerequisite: MATH 5680

**MATH 5710 METHODS OF NUMERICAL ANALYSIS I**

[3 hours] Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method. Prerequisite: MATH 3860 and a computer programming course or permission of instructor

**MATH 5720 METHODS OF NUMERICAL ANALYSIS II**

[3 hours] Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations. Prerequisite: MATH 5710

**MATH 5740 ADVANCED APPLIED MATHEMATICS I**

[3 hours] Series and numerical solutions to ordinary differential equations, special functions, orthogonal functions, Sturm-Liouville Problems, self-adjointness, vector analysis. Prerequisite: MATH 3860

**MATH 5750 ADVANCED APPLIED MATHEMATICS II**

[3 hours] Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals. Prerequisite: MATH 5740

## 436 Course Descriptions

### **MATH 5760 DYNAMICS AND CHAOS**

[3 hours] Introduction to contemporary ideas of dynamics and the chaotic behavior that occurs when a simple function of one variable is iterated. Prerequisite: MATH 5030 or 5820

### **MATH 5770 COMPUTER EXPERIMENTS IN CHAOS**

[1 hour] This course is a supplement to MATH 5760 and may be taken concurrently with or after completion of that course. Students will demonstrate the theory in a number of computer-based experiments. Prerequisite: MATH 5760

### **MATH 5780 ADVANCED CALCULUS**

[3 hours] Extrema for functions of one or more variables, Lagrange multipliers, indeterminate forms, inverse and implicit function theorems, uniform convergences, power series, transformations, Jacobians, multiple integrals. Prerequisite: MATH 2850

### **MATH 5790 APPLIED OPTIMIZATION**

[3 hours] An introduction to finite-dimensional combined optimization as it relates to business and economics. Linear and non-linear programming. Prerequisite: MATH 3860, 1890

### **MATH 5800 ORDINARY DIFFERENTIAL EQUATIONS**

[3 hours] Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics. Prerequisite: MATH 3860

### **MATH 5810 PARTIAL DIFFERENTIAL EQUATIONS**

[3 hours] First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics. Prerequisite: MATH 3860 and permission of instructor

### **MATH 5820 INTRODUCTION TO REAL ANALYSIS I**

[3 hours] A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann Integral. Prerequisite: MATH 3190

### **MATH 5830 INTRODUCTION TO REAL ANALYSIS II**

[3 hours] Differentiable functions on  $\mathbb{R}^n$ ; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arselà-Ascoli Theorem; introduction to measure theory; Lebesgue integration; the Lebesgue Dominated Convergence Theorem. Prerequisite: MATH 5820

### **MATH 5850 OPERATIONAL MATHEMATICS**

[3 hours] Theory of Laplace, Fourier and other transforms; use of complex variable theory for inversions; applications. Prerequisite: MATH 5880

### **MATH 5860 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL THEORY I**

[3 hours] Conditions for an extreme (Euler's equations, Erdman corner conditions, conditions of Legendre, Jacobi and Weierstrass, fields of extremals, Hilbert's invariant integral); Raleigh-Ritz method; isoperimetric problems; Lagrange, Mayer-Bolza problems. Recommended: MATH 5820. Prerequisite: MATH 1890

### **MATH 5870 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL THEORY II**

[3 hours] Pontryagin's maximum principle; necessary and sufficient conditions for optimal control, controllability, time optimal control, existence of optimal controls, relationship to the calculus of variations. Prerequisite: MATH 5860

### **MATH 5880 COMPLEX VARIABLES**

[3 hours] Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications. Prerequisite: MATH 3860

### **MATH 5960 ACTUARIAL SCIENCE PROBLEM SEMINAR**

[1-3 hours] The primary activity will be student solution and presentation of problems of a type given on actuarial exams to be run as a problem seminar.

### **MATH 5970 INDUSTRIAL MATH PRACTICUM**

[1 hour] Students must submit for approval by their adviser a report on the solution of a practical problem involving mathematics. The problem must be drawn from a company, university department of government unit. Prerequisite: Admission into program MATH 5980 TOPICS IN MATHEMATICS [3 hours] Special topics in mathematics.

### **MATH 5990 MA (TECHNOLOGY TRACK) PRACTICUM**

[1 hour] Students will complete a project devised jointly by student and advisor. The project will have significant mathematical content and might originate from courses taken in the program or some aspect of lesson preparation, in the case of practicing high school teachers. Required in the MA technology track Prerequisite: MATH 5020, 5030, 5050

### **MATH 6150 APPLIED FUNCTIONAL ANALYSIS**

[3 hours] Normed linear spaces, Banach and Hilbert spaces, linear operators and their spectrum, spectral analysis, illustrative examples from science and engineering. Prerequisite: MATH 5300

### **MATH 6180 LINEAR AND NONLINEAR PROGRAMMING**

[3 hours] Simplex algorithm, ellipsoidal algorithm, Karmarkar's method, interior point methods, elementary convex analysis, optimality conditions and duality for smooth problems, convex programming, algorithms and their convergence. Prerequisite: MATH 5820

### **MATH 6190 INFINITE DIMENSIONAL OPTIMIZATION**

[3 hours] Introduction to nonlinear analysis, abstract optimization problems on abstract spaces, applications to calculus of variations, optimal control theory and game theory. Prerequisite: MATH 6150 or MATH 6810 or equivalent

### **MATH 6300 ALGEBRA I**

[3 hours] Groups, Sylow's theorems, permutation groups, nilpotent and solvable groups, Abelian groups, rings, unique factorization domains, fields and field extensions, Galois theory, separable extensions of fields, modules, Noetherian and Artinian rings, tensor products, primitive and semisimple rings. Wedderburn-Artin theorem. Prerequisite: MATH 5340 or equivalent

### **MATH 6310 ALGEBRA II**

[3 hours] Groups, Sylow's theorems, permutation groups, nilpotent and solvable groups, Abelian groups, rings, unique factorization domains, fields and field extensions, Galois theory, separable extensions of fields, modules, Noetherian and Artinian rings, tensor products, primitive and semisimple rings. Wedderburn-Artin theorem. Prerequisite: MATH 5340 or equivalent

### **MATH 6320 RING THEORY I**

[3 hours] Topics in ring theory chosen from among radical theory, rings of quotients, Goldie's Theorem, chain conditions, dimensions of rings, module theory, topics in commutative rings, group rings, enveloping algebras, almost split sequences, PI-rings, division rings, self injective rings and ordered rings. Prerequisite: MATH 6310

### **MATH 6330 RING THEORY II**

[3 hours] Topics in ring theory chosen from among radical theory, rings of quotients, Goldie's Theorem, chain conditions, dimensions of rings, module theory, topics in commutative rings, group rings, enveloping algebras, almost split sequences, PI-rings, division rings, self injective rings and ordered rings. Prerequisite: MATH 6310

### **MATH 6340 GROUP THEORY I**

[3 hours] Topics in group theory of wide applicability and of fundamental importance. Topics chosen from among presentations, free products amalgams, permutation groups, trees and graphs, solvability, nilpotence, linear representations, homological algebra, cohomology, character theory, classical groups, Lie rings, Sylow systems, Schur-Zassenhaus theorem, linear methods, local analysis, finiteness conditions. Prerequisite: MATH 6310

### **MATH 6350 GROUP THEORY II**

[3 hours] Topics in group theory of wide applicability and of fundamental importance. Topics chosen from among presentations, free products amalgams, permutation groups, trees and graphs, solvability, nilpotence, linear representations, homological algebra, cohomology, character theory, classical groups, Lie rings, Sylow systems, Schur-Zassenhaus theorem, linear methods, local analysis, finiteness conditions. Prerequisite: MATH 6310

### **MATH 6400 TOPOLOGY I**

[3 hours] Topological spaces, continuous functions, compactness, product spaces, Tychonov theorem, quotient spaces, local compactness, homotopy, fundamental group, covering spaces, homology theory, excision, homological algebra, Brouwer fixed point theorem, cohomology, smooth manifolds, orientation, tangent bundles, Sard's theorem, degree theory. Prerequisite: MATH 5450 or equivalent

### **MATH 6410 TOPOLOGY II**

[3 hours] Topological spaces, continuous functions, compactness, product spaces, Tychonov theorem, quotient spaces, local compactness, homotopy, fundamental group, covering spaces, homology theory, excision, homological algebra, Brouwer fixed point theorem, cohomology, smooth manifolds, orientation, tangent bundles, Sard's theorem, degree theory. Prerequisite: MATH 5450 or equivalent

### **MATH 6420 GENERAL TOPOLOGY I**

[3 hours] Categorical properties of and constructions in topological spaces, compactness, connectedness, dimension theory, metrization, compactification and proximity spaces, uniform spaces, completeness and completions, rings of continuous functions. Prerequisite: MATH 6400



**MATH 6430 GENERAL TOPOLOGY II**

[3 hours] Categorical properties of and constructions in topological spaces, compactness, connectedness, dimension theory, metrization, compactification and proximity spaces, uniform spaces, completeness and completions, rings of continuous functions. Prerequisite: MATH 6400

**MATH 6440 DIFFERENTIAL GEOMETRY I**

[3 hours] Differentiable structures on manifolds, vector fields and flows, tensor bundles, distributions and Frobenius theorem, metric geometry, differential forms, Stokes theorem, Lie groups, connections on manifolds, geodesics, geometry of tangent bundle, curvature, torsion, exponential map, Riemannian geometry, geometry of submanifolds and submersion, relative Gauss-Bonnet theorem, homogeneous and symmetric spaces, topics in differential geometry. Prerequisite: MATH 6410

**MATH 6450 DIFFERENTIAL GEOMETRY II**

[3 hours] Differentiable structures on manifolds, vector fields and flows, tensor bundles, distributions and Frobenius theorem, metric geometry, differential forms, Stokes theorem, Lie groups, connections on manifolds, geodesics, geometry of tangent bundle, curvature, torsion, exponential map, Riemannian geometry, geometry of submanifolds and submersion, relative Gauss-Bonnet theorem, homogeneous and symmetric spaces, topics in differential geometry. Prerequisite: MATH 6410

**MATH 6460 ALGEBRAIC TOPOLOGY I**

[3 hours] Simplicial and cellular complexes, simplicial and cellular homology, universal coefficient theorem, Kunnet theorem, cohomology theories, cohomology operations, duality on manifolds, general homotopy theory, fibration and cofibration, higher homotopy groups, weak homotopy equivalence, Hurewicz theorem, Eilenberg-MacLane spaces, classifying spaces, spectral sequences. Prerequisite: MATH 6410

**MATH 6470 ALGEBRAIC TOPOLOGY II**

[3 hours] Simplicial and cellular complexes, simplicial and cellular homology, universal coefficient theorem, Kunnet theorem, cohomology theories, cohomology operations, duality on manifolds, general homotopy theory, fibration and cofibration, higher homotopy groups, weak homotopy equivalence, Hurewicz theorem, Eilenberg-MacLane spaces, classifying spaces, spectral sequences. Prerequisite: MATH 6410

**MATH 6500 ORDINARY DIFFERENTIAL EQUATIONS**

[3 hours] Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory. Prerequisite: MATH 5830 or equivalent

**MATH 6510 PARTIAL DIFFERENTIAL EQUATIONS**

[3 hours] First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.

Prerequisite: MATH 5830 or equivalent

**MATH 6520 DYNAMICAL SYSTEMS I**

[3 hours] Flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant manifolds, Hamiltonian systems and symplectic manifolds, local bifurcations of vector fields, homoclinic orbits, symmetries and integrals, integrable systems, symbolic dynamics, chaos. Prerequisite: MATH 6500

**MATH 6530 DYNAMICAL SYSTEMS II**

[3 hours] Flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant manifolds, Hamiltonian systems and symplectic manifolds, local bifurcations of vector fields, homoclinic orbits, symmetries and integrals, integrable systems, symbolic dynamics, chaos. Prerequisite: MATH 6500

**MATH 6540 PARTIAL DIFFERENTIAL EQUATIONS I**

[3 hours] Sobolev spaces, Sobolev embedding theorem, distribution theory, weak solution to partial differential equations, existence, uniqueness and regularity of solutions, potential theory and harmonic functions, Hopf maximum principle, fundamental solutions and the parametrix, representation theorems, Cauchy-Kovalevskaya Theorem, topics in partial differential equations. Prerequisite: MATH 6510

**MATH 6550 PARTIAL DIFFERENTIAL EQUATIONS II**

[3 hours] Sobolev spaces, Sobolev embedding theorem, distribution theory, weak solution to partial differential equations, existence, uniqueness and regularity of solutions, potential theory and harmonic functions, Hopf maximum principle, fundamental solutions and the parametrix, representation theorems, Cauchy-Kovalevskaya Theorem, topics in partial differential equations. Prerequisite: MATH 6510

**MATH 6600 STATISTICAL CONSULTING I AND II**

[2 hours] Real data applications of various statistical methods, project design and analysis including statistical consulting experience. Prerequisite: Permission of instructor

**MATH 6610 STATISTICAL CONSULTING I AND II**

[2 hours] Real data applications of various statistical methods, project design and analysis including statistical consulting experience. Prerequisite: Permission of instructor

**MATH 6620 CATEGORICAL DATA ANALYSIS**

[3 hours] Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling. Prerequisite: MATH 5680 Corequisite: MATH 6650

**MATH 6630 DISTRIBUTION FREE AND ROBUST STATISTICAL METHODS**

[3 hours] Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification. Prerequisite: MATH 5680 Corequisite: MATH 5690 or MATH 6650

**MATH 6640 TOPICS IN STATISTICS**

[3 hours] Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.

**MATH 6650 STATISTICAL INFERENCE**

[3 hours] Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models. Prerequisite: MATH 5680

**MATH 6670 MEASURE THEORETIC PROBABILITY**

[3 hours] Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a  $\sigma$ -algebra, martingales. Prerequisite: MATH 5680 Corequisite: MATH 6800 recommended

**MATH 6680 THEORY OF STATISTICS**

[3 hours] Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals. Prerequisite: MATH 5960 or 6650 and 6670

**MATH 6690 MULTIVARIATE STATISTICS**

[3 hours] Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis. Prerequisite: MATH 5690 or 6650

**MATH 6720 METHODS OF MATHEMATICAL PHYSICS I**

[3 hours] Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, special functions, real and complex vector spaces, matrix groups, Hilbert spaces, orthogonal polynomials, self-adjoint operators and eigenvalue problems, partial differential equations, coordinate transformations and separation of variables, boundary value problems, Green's functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.

**MATH 6730 METHODS OF MATHEMATICAL PHYSICS II**

[3 hours] Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, special functions, real and complex vector spaces, matrix groups, Hilbert spaces, orthogonal polynomials, self-adjoint operators and eigenvalue problems, partial differential equations, coordinate transformations and separation of variables, boundary value problems, Green's functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.

**MATH 6800 REAL ANALYSIS I**

[3 hours] Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov and Lusin theorem, derivatives, functions of bounded variation, Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, Banach spaces,  $L_p$ -spaces, abstract measures, Radon-Nikodym Theorem, measures on locally compact Hausdorff spaces. Prerequisite: MATH 5840 or equivalent

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### **MATH 6810 REAL ANALYSIS II**

[3 hours] Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov and Lusin theorem, derivatives, functions of bounded variation, Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, Banach spaces,  $L_p$ -spaces, abstract measures, Radon-Nikodym Theorem, measures on locally compact Hausdorff spaces. Prerequisite: MATH 5840 or equivalent

### **MATH 6820 FUNCTIONAL ANALYSIS I**

[3 hours] Topological vector spaces, seminorms, Banach spaces, open mapping and closed graph theorem, convexity, weak topologies, Hahn-Banach theorem, Banach-Alaoglu theorems, duality,  $L_p$  spaces, Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, spectral theorem for bounded and unbounded operators, topics in functional analysis. Prerequisite: MATH 6810

### **MATH 6830 FUNCTIONAL ANALYSIS II**

[3 hours] Topological vector spaces, seminorms, Banach spaces, open mapping and closed graph theorem, convexity, weak topologies, Hahn-Banach theorem, Banach-Alaoglu theorems, duality,  $L_p$  spaces, Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, spectral theorem for bounded and unbounded operators, topics in functional analysis. Prerequisite: MATH 6810

### **MATH 6840 COMPLEX ANALYSIS I**

[3 hours] Elementary analytic functions, complex integration, residue theorem and argument principle, sequences of analytic functions, Laurent expansions, entire functions, meromorphic functions, conformal mapping, Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic and modular functions. Prerequisite: MATH 6800

### **MATH 6850 COMPLEX ANALYSIS II**

[3 hours] Elementary analytic functions, complex integration, residue theorem and argument principle, sequences of analytic functions, Laurent expansions, entire functions, meromorphic functions, conformal mapping, Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic and modular functions. Prerequisite: MATH 6800

### **MATH 6890 PROBLEMS IN ALGEBRA, TOPOLOGY, AND ANALYSIS**

[1 hour] Practicum in solving problems in graduate algebra, topology and analysis. Supplements 6300-10, 6400-10 and 6800-10 and prepares students for doctoral qualifying examination.

### **MATH 6930 COLLOQUIUM**

[1 hour] Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.

### **MATH 6940 PROSEMINAR**

[1-5 hours] Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.

### **MATH 6960 MASTER'S THESIS**

[3-6 hours]

### **MATH 6980 TOPICS IN MATHEMATICAL SCIENCES**

[3 hours] Special topics in Mathematics or Statistics.

### **MATH 6990 READINGS IN MATHEMATICS**

[1-5 hours] Readings in areas of Mathematics of mutual interest to the student and the professor.

### **MATH 7300 LINEAR ALGEBRA I**

[3 hours] Theory of vector spaces and linear transformations, including such topics as matrices, determinants, inner products, eigenvalues and eigenvectors, and rational and Jordan canonical forms.

### **MATH 7310 LINEAR ALGEBRA II**

[3 hours] Hermitian and normal operators, multilinear forms, spectral theorem and other topics. Prerequisite: MATH 5300

### **MATH 7330 ABSTRACT ALGEBRA I**

[3 hours] Arithmetic of the integers, unique factorization and modular arithmetic; group theory including normal subgroups, factor groups, cyclic groups, permutations, homomorphisms, the isomorphism theorems, abelian groups and p-groups. Prerequisite: MATH 3190

### **MATH 7340 ABSTRACT ALGEBRA II**

[3 hours] Ring theory including integral domains, field of quotients, homomorphisms, ideals, Euclidean domains, polynomial rings, vector spaces, roots of polynomials and field extensions. Prerequisite: MATH 5330

### **MATH 7350 APPLIED LINEAR ALGEBRA**

[3 hours] Matrices, systems of equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, generalized inverses, rank, numerical methods and applications to various areas of science. Prerequisite: MATH 1890

### **MATH 7380 DISCRETE STRUCTURES AND ANALYSIS ALGORITHMS**

[3 hours] Discrete mathematical structures for applications in computer science such as graph theory, combinatorics, groups theory, asymptotics, recurrence relations and analysis of algorithms. Prerequisite: MATH 3320 or 5330

### **MATH 7390 THEORY OF COMPUTATION**

[3 hours] Theory of automata and formal languages, computability by Turing machines and recursive functions, uncomputability, NP-Hard and NP-Complete problems. Prerequisite: MATH 5380

### **MATH 7450 INTRODUCTION TO TOPOLOGY I**

[3 hours] Metric spaces, topological spaces, continuous maps, bases and sub-bases, closure and interior operators, products, subspaces, sums, quotients, separation axioms, compactness and local compactness. Prerequisite: MATH 3190

### **MATH 7460 INTRODUCTION TO TOPOLOGY II**

[3 hours] Connectedness and local connectedness, convergence, metrization, function spaces. The fundamental groups and its properties, covering spaces, classical applications, e.g. Jordan Curve Theorem, Fundamental Theorem of Algebra, Brouwer's Fixed Point Theorem. Prerequisite: MATH 5450 Corequisite: MATH 3320 or 5330

### **MATH 7540 CLASSICAL DIFFERENTIAL GEOMETRY I**

[3 hours] Smooth curves in Euclidean space including the Frenet formulae. Immersed surfaces with the Gauss map, principal curvatures and the fundamental forms. Special surfaces including ruled surfaces and minimal surfaces. Intrinsic Geometry including the Gauss Theorem Egregium. Prerequisite: MATH 3860

### **MATH 7550 CLASSICAL DIFFERENTIAL GEOMETRY II**

[3 hours] Tensors, vector fields and the Cartan approach to surface theory, Bonnet's Theorem and the construction of surfaces via solutions of the Gauss Equation. Geodesics, parallel transport and Jacobi Fields. Theorems of a global nature such as Hilbert's Theorem or the Theorem of Hopf-Rinow. Prerequisite: MATH 5540

### **MATH 7600 APPLICATIONS OF STATISTICS I**

[2 hours] Real data applications of statistical methods. Emphasis is placed on exploratory data analysis and the use of computing facilities to analyze data and produce statistical reports. Statistical packages used include MINITAB, SAS and S-Plus. Prerequisite: Permission of instructor

### **MATH 7610 APPLICATIONS OF STATISTICS II**

[2 hours] Continuation of Applications of Statistics II. Prerequisite: MATH 5600

### **MATH 7620 LINEAR STATISTICAL MODELS**

[3 hours] Multiple regression, analysis of variance and covariance, general linear models and model building for linear models. Experimental designs include one-way, randomized block, Latin square, factorial and nested designs. Prerequisite: MATH 6650 or permission of instructor

### **MATH 7630 THEORY AND METHODS OF SAMPLE SURVEYS**

[3 hours] The mathematical basis to estimation in various sampling contexts, including probability proportional to size sampling, stratified sampling, two-stage cluster sampling and double sampling, is developed. Prerequisite: MATH 5680 or permission of instructor Corequisite: MATH 5690 or 6650

### **MATH 7640 STATISTICAL COMPUTING**

[3 hours] Error analysis of statistical algorithms. Numerical linear algebra for linear models. Approximation methods for distribution function probabilities and quantiles. Uniform and non-uniform random number generation. Introduction to simulation methods. Prerequisite: Permission of instructor

### **MATH 7660 APPLIED PROBABILITY**

[3 hours] The basic probability models of applied mathematics and physics, including random walks, Markov chains, branching processes, renewal processes, random graphs and queuing. Prerequisite: MATH 5680 and 5300 or 5350

### **MATH 7670 DESIGN OF EXPERIMENTS**

[3 hours] Confounding, fractional replication, complex designs, response surface designs. Prerequisite: MATH 5620

**MATH 7680 INTRODUCTION TO THEORY OF PROBABILITY**

[3 hours] Probability spaces, random variables, probability distributions, moments and moment generating functions, limit theorems, transformations and sampling distributions. Prerequisite: MATH 3190 or permission of instructor and MATH 5350

**MATH 7690 INTRODUCTION TO MATHEMATICAL STATISTICS**

[3 hours] Sampling distributions, point estimation, interval estimation, hypothesis testing, regression and analysis of variance. Prerequisite: MATH 5680

**MATH 7710 METHODS OF NUMERICAL ANALYSIS I**

[3 hours] Floating point arithmetic; polynomial interpolation; numerical solution of nonlinear equations; Newton's method. Likely topics include: numerical differentiation and integration; solving systems of linear equations; Gaussian elimination; LU decomposition; Gauss-Seidel method. Prerequisite: MATH 3860 and a computer programming course or permission of instructor.

**MATH 7720 METHODS OF NUMERICAL ANALYSIS II**

[3 hours] Likely topics include: Computation of eigenvalues and eigenvectors; solving systems of nonlinear equations; least squares approximations; rational approximations; cubic splines; fast Fourier transforms; numerical solutions to initial value problems; ordinary and partial differential equations. Prerequisite: MATH 5710

**MATH 7740 ADVANCED APPLIED MATHEMATICS I**

[3 hours] Series and numerical solutions to ordinary differential equations, special functions, orthogonal functions, Sturm-Liouville Problems, self-adjointness, vector analysis. Prerequisite: MATH 3860

**MATH 7750 ADVANCED APPLIED MATHEMATICS II**

[3 hours] Continuation of vector analysis, introduction to complex analysis, partial differential equations, Fourier series and integrals. Prerequisite: MATH 5740

**MATH 7780 ADVANCED CALCULUS**

[3 hours] Extrema for functions of one or more variables, Lagrange multipliers, indeterminate forms, inverse and implicit function theorems, uniform convergences, power series, transformations, Jacobians, multiple integrals. Prerequisite: MATH 2850

**MATH 7790 APPLIED OPTIMIZATION**

[3 hours] An introduction to finite-dimensional combined optimization as it relates to business and economics. Linear and non-linear programming. Prerequisite: MATH 3860, 1890

**MATH 7800 ORDINARY DIFFERENTIAL EQUATIONS**

[3 hours] Modern theory of differential equations; transforms and matrix methods; existence theorems and series solutions; and other selected topics. Prerequisite: MATH 3860

**MATH 7810 PARTIAL DIFFERENTIAL EQUATIONS**

[3 hours] First and second order equations; numerical methods; separation of variables; solutions of heat and wave equations using eigenfunction techniques; and other selected topics. Prerequisite: MATH 3860 and permission of instructor

**MATH 7820 INTRODUCTION TO REAL ANALYSIS I**

[3 hours] A rigorous treatment of the Calculus in one and several variables. Topics to include: the real number system; sequences and series; elementary metric space theory including compactness, connectedness and completeness; the Riemann Integral. Prerequisite: MATH 3190

**MATH 7830 INTRODUCTION TO REAL ANALYSIS II**

[3 hours] Differentiable functions on  $\mathbb{R}^n$ ; the Implicit and Inverse Function Theorems; sequences and series of continuous functions; Stone-Weierstrass Theorem; Arselà-Ascoli Theorem; introduction to measure theory; Lebesgue integration; the Lebesgue Dominated Convergence Theorem. Prerequisite: MATH 5820

**MATH 7850 OPERATIONAL MATHEMATICS**

[3 hours] Theory of Laplace, Fourier and other transforms; use of complex variable theory for inversions; applications. Prerequisite: MATH 5880

**MATH 7860 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL THEORY I**

[3 hours] Conditions for an extreme (Euler's equations, Erdman corner conditions, conditions of Legendre, Jacobi and Weierstrass, fields of extremals, Hilbert's invariant integral); Raleigh-Ritz method; isoperimetric problems; Lagrange, Mayer-Bolza problems. Prerequisite: MATH 1890; recommended MATH 5820

**MATH 7870 CALCULUS OF VARIATIONS AND OPTIMAL CONTROL THEORY II**

[3 hours] Pontryagin's maximum principle; necessary and sufficient conditions for optimal control, controllability, time optimal control, existence of optimal controls, relationship to the calculus of variations. Prerequisite: MATH 5860

**MATH 7880 COMPLEX VARIABLES**

[3 hours] Analytic functions; Cauchy's theorem; Taylor and Laurent series; residues; contour integrals; conformal mappings, analytic continuation and applications. Prerequisite: MATH 3860

**MATH 7980 TOPICS IN MATHEMATICS**

[3 hours] Special topics in mathematics.

**MATH 8150 APPLIED FUNCTIONAL ANALYSIS**

[3 hours] Normed linear spaces, Banach and Hilbert spaces, linear operators and their spectrum, spectral analysis, illustrative examples from science and engineering. Prerequisite: MATH 5300

**MATH 8180 LINEAR AND NONLINEAR PROGRAMMING**

[3 hours] Simplex algorithm, ellipsoidal algorithm, Karmarkar's method, interior point methods, elementary convex analysis, optimality conditions and duality for smooth problems, convex programming, algorithms and their convergence. Prerequisite: MATH 5820

**MATH 8190 INFINITE DIMENSIONAL OPTIMIZATION**

[3 hours] Introduction to nonlinear analysis, abstract optimization problems on abstract spaces, applications to calculus of variations, optimal control theory and game theory. Prerequisite: MATH 6150 or MATH 6810 or equivalent

**MATH 8300 ALGEBRA I**

[3 hours] Groups, Sylow's theorems, permutation groups, nilpotent and solvable groups, Abelian groups, rings, unique factorization domains, fields and field extensions, Galois theory, separable extensions of fields, modules, Noetherian and Artinian rings, tensor products, primitive and semisimple rings. Wedderburn-Artin theorem. Prerequisite: MATH 5340 or equivalent

**MATH 8310 ALGEBRA II**

[3 hours] Groups, Sylow's theorems, permutation groups, nilpotent and solvable groups, Abelian groups, rings, unique factorization domains, fields and field extensions, Galois theory, separable extensions of fields, modules, Noetherian and Artinian rings, tensor products, primitive and semisimple rings. Wedderburn-Artin theorem. Prerequisite: MATH 5340 or equivalent

**MATH 8320 RING THEORY I**

[3 hours] Topics in ring theory chosen from among radical theory, rings of quotients, Goldie's Theorem, chain conditions, dimensions of rings, module theory, topics in commutative rings, group rings, enveloping algebras, almost split sequences, PI-rings, division rings, self injective rings and ordered rings. Prerequisite: MATH 6310

**MATH 8330 RING THEORY II**

[3 hours] Topics in ring theory chosen from among radical theory, rings of quotients, Goldie's Theorem, chain conditions, dimensions of rings, module theory, topics in commutative rings, group rings, enveloping algebras, almost split sequences, PI-rings, division rings, self injective rings and ordered rings. Prerequisite: MATH 6310

**MATH 8340 GROUP THEORY I**

[3 hours] Topics in group theory of wide applicability and of fundamental importance. Topics chosen from among presentations, free products amalgams, permutation groups, trees and graphs, solvability, nilpotence, linear representations, homological algebra, cohomology, character theory, classical groups, Lie rings, Sylow systems, Schur-Zassenhaus theorem, linear methods, local analysis, finiteness conditions. Prerequisite: MATH 6310

**MATH 8350 GROUP THEORY II**

[3 hours] Topics in group theory of wide applicability and of fundamental importance. Topics chosen from among presentations, free products amalgams, permutation groups, trees and graphs, solvability, nilpotence, linear representations, homological algebra, cohomology, character theory, classical groups, Lie rings, Sylow systems, Schur-Zassenhaus theorem, linear methods, local analysis, finiteness conditions. Prerequisite: MATH 6310

**MATH 8400 TOPOLOGY I**

[3 hours] Topological spaces, continuous functions, compactness, product spaces, Tychonov theorem, quotient spaces, local compactness, homotopy, fundamental group, covering spaces, homology theory, excision, homological algebra, Brouwer fixed point theorem, cohomology, smooth manifolds, orientation, tangent bundles, Sard's theorem, degree theory. Prerequisite: MATH 5450 or equivalent

## 440 Course Descriptions

### **MATH 8410 TOPOLOGY I**

[3 hours] Topological spaces, continuous functions, compactness, product spaces, Tychonov theorem, quotient spaces, local compactness, homotopy, fundamental group, covering spaces, homology theory, excision, homological algebra, Brouwer fixed point theorem, cohomology, smooth manifolds, orientation, tangent bundles, Sard's theorem, degree theory. Prerequisite: MATH 5450 or equivalent

### **MATH 8420 GENERAL TOPOLOGY I**

[3 hours] Categorical properties of and constructions in topological spaces, compactness, connectedness, dimension theory, metrization, compactification and proximity spaces, uniform spaces, completeness and completions, rings of continuous functions. Prerequisite: MATH 6400

### **MATH 8430 GENERAL TOPOLOGY II**

[3 hours] Categorical properties of and constructions in topological spaces, compactness, connectedness, dimension theory, metrization, compactification and proximity spaces, uniform spaces, completeness and completions, rings of continuous functions. Prerequisite: MATH 6400

### **MATH 8440 DIFFERENTIAL GEOMETRY I**

[3 hours] Differentiable structures on manifolds, vector fields and flows, tensor bundles, distributions and Frobenius theorem, metric geometry, differential forms, Stokes theorem, Lie groups, connections on manifolds, geodesics, geometry of tangent bundle, curvature, torsion, exponential map, Riemannian geometry, geometry of submanifolds and submersion, relative Gauss-Bonnet theorem, homogeneous and symmetric spaces, topics in differential geometry. Prerequisite: MATH 6410

### **MATH 8450 DIFFERENTIAL GEOMETRY II**

[3 hours] Differentiable structures on manifolds, vector fields and flows, tensor bundles, distributions and Frobenius theorem, metric geometry, differential forms, Stokes theorem, Lie groups, connections on manifolds, geodesics, geometry of tangent bundle, curvature, torsion, exponential map, Riemannian geometry, geometry of submanifolds and submersion, relative Gauss-Bonnet theorem, homogeneous and symmetric spaces, topics in differential geometry. Prerequisite: MATH 6410

### **MATH 8460 ALGEBRAIC TOPOLOGY I**

[3 hours] Simplicial and cellular complexes, simplicial and cellular homology, universal coefficient theorem, Kunnet theorem, cohomology theories, cohomology operations, duality on manifolds, general homotopy theory, fibration and cofibration, higher homotopy groups, weak homotopy equivalence, Hurewicz theorem, Eilenberg-Maclane spaces, classifying spaces, spectral sequences. Prerequisite: MATH 6410

### **MATH 8470 ALGEBRAIC TOPOLOGY II**

[3 hours] Simplicial and cellular complexes, simplicial and cellular homology, universal coefficient theorem, Kunnet theorem, cohomology theories, cohomology operations, duality on manifolds, general homotopy theory, fibration and cofibration, higher homotopy groups, weak homotopy equivalence, Hurewicz theorem, Eilenberg-Maclane spaces, classifying spaces, spectral sequences. Prerequisite: MATH 6410

### **MATH 8500 ORDINARY DIFFERENTIAL EQUATIONS**

[3 hours] Existence, uniqueness and dependence on initial conditions and parameter, nonlinear planar systems, linear systems, Floquet theory, second order equations, Sturm-Liouville theory. Prerequisite: MATH 5830 or equivalent

### **MATH 8510 PARTIAL DIFFERENTIAL EQUATIONS**

[3 hours] First order quasi-linear systems of partial differential equations, boundary value problems for the heat and wave equation, Dirichlet problem for Laplace equation, fundamental solutions for Laplace, heat and wave equations.

Prerequisite: MATH 5830 or equivalent

### **MATH 8520 DYNAMICAL SYSTEMS I**

[3 hours] Flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant manifolds, Hamiltonian systems and symplectic manifolds, local bifurcations of vector fields, homoclinic orbits, symmetries and integrals, integrable systems, global dynamics, chaos. Prerequisite: MATH 6500

### **MATH 8530 DYNAMICAL SYSTEMS II**

[3 hours] Flow-box theorem, Poincare maps, attractors, w limit sets, Lyapunov stability, invariant manifolds, Hamiltonian systems and symplectic manifolds, local bifurcations of vector fields, homoclinic orbits, symmetries and integrals, integrable systems, global dynamics, chaos. Prerequisite: MATH 6500

### **MATH 8540 PARTIAL DIFFERENTIAL EQUATIONS I**

[3 hours] Sobolev spaces, Sobolev embedding theorem, distribution theory, weak solution to partial differential equations, existence, uniqueness and regularity of solutions, potential theory and harmonic functions, Hopf maximum principle, fundamental solutions and the parametrix, representation theorems, Cauchy-Kovalevskaya Theorem, topics in partial differential equations. Prerequisite: MATH 6510

### **MATH 8550 PARTIAL DIFFERENTIAL EQUATIONS II**

[3 hours] Sobolev spaces, Sobolev embedding theorem, distribution theory, weak solution to partial differential equations, existence, uniqueness and regularity of solutions, potential theory and harmonic functions, Hopf maximum principle, fundamental solutions and the parametrix, representation theorems, Cauchy-Kovalevskaya Theorem, topics in partial differential equations. Prerequisite: MATH 6510

### **MATH 8600 STATISTICAL CONSULTING I AND II**

[2 hours] Real data applications of various statistical methods, project design and analysis including statistical consulting experience. Prerequisite: Permission of instructor

### **MATH 8610 STATISTICAL CONSULTING I AND II**

[2 hours] Real data applications of various statistical methods, project design and analysis including statistical consulting experience. Prerequisite: Permission of instructor

### **MATH 8620 CATEGORICAL DATA ANALYSIS**

[3 hours] Important methods and modeling techniques using generalized linear models and emphasizing loglinear and logit modeling. Prerequisite: MATH 5680 Corequisite: MATH 6650

### **MATH 8630 DISTRIBUTION FREE AND ROBUST STATISTICAL METHODS**

[3 hours] Statistical methods based on counts and ranks; methods designed to be effective in the presence of contaminated data or error distribution misspecification. Prerequisite: MATH 5680 Corequisite: MATH 5690 or MATH 6650

### **MATH 8640 TOPICS IN STATISTICS**

[3 hours] Topics selected from an array of modern statistical methods such as survival analysis, nonlinear regression, Monte Carlo methods, etc.

### **MATH 8650 STATISTICAL INFERENCE**

[3 hours] Estimation, hypothesis testing, prediction, sufficient statistics, theory of estimation and hypothesis testing, simultaneous inference, decision theoretic models. Prerequisite: MATH 5680

### **MATH 8670 MEASURE THEORETIC PROBABILITY**

[3 hours] Real analysis, probability spaces and measures, random variables and distribution functions, independence, expectation, law of large numbers, central limit theorem, zero-one laws, characteristic functions, conditional expectations given a  $\sigma$ -algebra, martingales. Prerequisite: MATH 5680 Corequisite: MATH 6800 recommended

### **MATH 8680 THEORY OF STATISTICS**

[3 hours] Exponential families, sufficiency, completeness, optimality, equivariance, efficiency. Bayesian and minimax estimation. Unbiased and invariant tests, uniformly most powerful tests. Asymptotic properties for estimation and testing. Most accurate confidence intervals. Prerequisite: MATH 5960 or 6650 and 6670

### **MATH 8690 MULTIVARIATE STATISTICS**

[3 hours] Multivariate normal sampling distributions, T tests and MANOVA, tests on covariance matrices, simultaneous inference, discriminant analysis, principal components, cluster analysis and factor analysis. Prerequisite: MATH 5690 or 6650

### **MATH 8720 METHODS OF MATHEMATICAL PHYSICS I**

[3 hours] Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, special functions, real and complex vector spaces, matrix groups, Hilbert spaces, orthogonal polynomials, self-adjoint operators and eigenvalue problems, partial differential equations, coordinate transformations and separation of variables, boundary value problems, Green's functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.

### **MATH 8730 METHODS OF MATHEMATICAL PHYSICS II**

[3 hours] Analytic functions, residues, method of steepest descent, complex differential equations, regular singularities, integral representation, special functions, real and complex vector spaces, matrix groups, Hilbert spaces, orthogonal polynomials, self-adjoint operators and eigenvalue problems, partial differential equations, coordinate transformations and separation of variables, boundary value problems, Green's functions, integral equations, tensor analysis, metrics and curvature, calculus of variations, finite groups and group representations.

### **MATH 8800 REAL ANALYSIS I**

[3 hours] Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov and Lusin theorem, derivatives, functions of bounded variation, Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, Banach spaces,  $L_p$ -spaces, abstract measures, Radon-Nikodym Theorem, measures on locally compact Hausdorff spaces. Prerequisite: MATH 5840 or equivalent

**MATH 8810 REAL ANALYSIS II**

[3 hours] Completeness, connectedness and compactness in metric spaces, continuity and convergence, Stone-Weierstrass Theorem, Lebesgue measure and integration on the real line, convergence theorems, Egorov and Lusin theorem, derivatives, functions of bounded variation, Vitali covering theorem, absolutely continuous functions, Lebesgue-Stieltjes integration, Banach spaces,  $L_p$ -spaces, abstract measures, Radon-Nikodym Theorem, measures on locally compact Hausdorff spaces. Prerequisite: MATH 5840 or equivalent

**MATH 8820 FUNCTIONAL ANALYSIS I**

[3 hours] Topological vector spaces, seminorms, Banach spaces, open mapping and closed graph theorem, convexity, weak topologies, Hahn-Banach theorem, Banach-Alaoglu theorems, duality,  $L_p$  spaces, Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, spectral theorem for bounded and unbounded operators, topics in functional analysis. Prerequisite: MATH 6810

**MATH 8830 FUNCTIONAL ANALYSIS II**

[3 hours] Topological vector spaces, seminorms, Banach spaces, open mapping and closed graph theorem, convexity, weak topologies, Hahn-Banach theorem, Banach-Alaoglu theorems, duality,  $L_p$  spaces, Mackey-Ahrens Theorem, Banach algebras, spectra in Banach algebras, commutative Banach algebras, unbounded operators, spectral theorem for bounded and unbounded operators, topics in functional analysis. Prerequisite: MATH 6810

**MATH 8840 COMPLEX ANALYSIS I**

[3 hours] Elementary analytic functions, complex integration, residue theorem and argument principle, sequences of analytic functions, Laurent expansions, entire functions, meromorphic functions, conformal mapping, Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic and modular functions. Prerequisite: MATH 6800

**MATH 8850 COMPLEX ANALYSIS II**

[3 hours] Elementary analytic functions, complex integration, residue theorem and argument principle, sequences of analytic functions, Laurent expansions, entire functions, meromorphic functions, conformal mapping, Riemann mapping theorem, monodromy, algebraic functions, Riemann surfaces, elliptic and modular functions. Prerequisite: MATH 6800

**MATH 8890 PROBLEMS IN ALGEBRA, TOPOLOGY, AND ANALYSIS**

[1 hour] Practicum in solving problems in graduate algebra, topology and analysis. Supplements 6300-10, 6400-10 and 6800-10 and prepares students for doctoral qualifying examination.

**MATH 8930 COLLOQUIUM**

[1 hour] Lectures by visiting mathematicians and staff members on areas of current interest in mathematics.

**MATH 8940 PROSEMINAR**

[1-5 hours] Problems and techniques of teaching elementary college mathematics, supervised teaching, seminar in preparation methods.

**MATH 8960 DISSERTATION**

[3-6 hours]

**MATH 8980 TOPICS IN MATHEMATICAL SCIENCES**

[3 hours] Special topics in Mathematics or Statistics.

**MATH 8990 READINGS IN MATHEMATICS**

[1-5 hours] Readings in areas of Mathematics of mutual interest to the student and the professor.

## MBC – Medicinal and Biological Chemistry

### Department of Medicinal and Biological Chemistry (PHM)

**MBC 3310 MEDICINAL CHEMISTRY I: DRUG ACTION AND DESIGN**

[3 hours] An introductory course presenting the basic chemical principles governing the behavior of drugs and the design of new therapeutics. Prerequisite: CHEM 2420 Corequisite: MBC 3550

**MBC 3320 MEDICINAL CHEMISTRY II: DRUG TARGETING TO RECEPTORS**

[3 hours] A course presenting basic chemical principles governing the design and behavior of therapeutics targeted to receptors in physiologic systems which are key to the integrated control of human metabolism. Prerequisite: MBC 3310 and MBC 3550 Corequisite: MBC 3560

**MBC 3550 PHYSIOLOGICAL CHEMISTRY I: STRUCTURE AND FUNCTION OF BIOLOGICAL MACROMOLECULES**

[3 hours] An examination of the levels of structure of proteins, nucleic acids, other biomolecules and biomolecular assemblies. Prerequisite: CHEM 2420 or completion of one year of Organic Chemistry

**MBC 3560 PHYSIOLOGICAL CHEMISTRY II: CHEMICAL REGULATION OF CELLS AND ORGANISMS**

[3 hours] An examination of the chemistry and regulation of metabolic processes in cells, interacting cells and tissues. Prerequisite: MBC 3550 or equivalent

**MBC 3800 MICROBIOLOGY AND IMMUNOLOGY**

[3 hours] A lecture course with emphasis on how the immune system protects the body against bacterial, viral and parasitic invaders. Medically important human infectious diseases are described as well as chemotherapeutic intervention. Prerequisite: MBC 3550 Corequisite: MBC 3560

**MBC 3850 MICROBIOLOGY AND IMMUNOLOGY LABORATORY**

[1 hour] A laboratory course that follows the course material presented in MBC 3800. Both immunology and microbiology experiments that are medically useful and clinically important will be performed. Prerequisite: MBC 3800; admission to pharmacy professional division

**MBC 3880 MEDICINAL AND BIOLOGICAL CHEMISTRY LABORATORY**

[1-4 hours] Research and lecture teaching fundamental laboratory skills in medicinal and biological chemistry. Prerequisite: Permission of instructor

**MBC 4300 MEDICINAL CHEMISTRY III: CHEMOTHERAPY AND IMMUNOTHERAPY**

[3 hours] The chemical bases for actions of drugs that counter infectious disease and cancer, including use and modulation of the immune system and its products to target infectious disease and cancer. Prerequisite: MBC 3800 or BIOL 4030 & BIOL 4050

**MBC 4340 CONTEMPORARY NATURAL REMEDIES**

[2 hours] An introduction to natural remedies, their history, source, chemical constituents, documented therapeutic utility and toxicity. Prerequisite: MBC 3320 or permission of instructor

**MBC 4380 MEDICINAL PLANTS**

[2 hours] A lecture/field course emphasizing medicinal and poisonous plants of this locale. Prerequisite: Admission to professional division BS program in pharmacy

**MBC 4390 GENES AND PROTEINS IN THERAPY**

[2 hours] Consideration of the symptoms, molecular nature, current treatment and amelioration by gene therapy of diseases caused by gene and protein defects. Prerequisite: MBC 3550

**MBC 4410 NUTRITION IN HEALTH AND DISEASE**

[2 hours] A comprehensive examination of the role of carbohydrates, lipids, proteins, vitamins and minerals in maintaining good health, as well as our current understanding of the interplay between nutrition and disease. Prerequisite: MBC 3560

**MBC 4420 NEUROSCIENCE**

[2 hours] An examination of the basic anatomy, chemistry and physiology of neural systems. The organization of the brain and its role in behavior and in disease states are presented in an interdisciplinary way. Prerequisite: MBC 3560

**MBC 4430 BIOCHEMISTRY OF DISEASE**

[2 hours] Mechanisms of pathogenesis and pathophysiological consequences in diseases already well-understood at a biochemical level. Emphasis is placed on the logic behind existing and future drug therapies in disease. Prerequisite: MBC 3560

**MBC 4450 NEW DRUG DEVELOPMENT**

[2 hours] An examination of all phases of drug discovery and development from conception to marketing: case histories from pharmaceutical research and development. Prerequisite: MBC 3560

**MBC 4470 ADVANCED IMMUNO-THERAPEUTICS**

[2 hours] This course emphasizes the development of methods for immunotherapeutic intervention in cancer and autoimmune and infectious disease. The course has a seminar/discussion/student presentation format. Prerequisite: MBC 4300

**MBC 4480 CHEMICAL DEFENSE MECHANISMS IN PLANTS**

[2 hours] A study of the effects on plant predators of secondary metabolites in plants as a basis for the novel development of therapeutics. Prerequisite: MBC 3560

**MBC 4710 TARGETED DRUG DESIGN**

[3 hours] A survey of novel macromolecular targeting approaches to drug design in important human disorders. The course has a seminar/discussion/student presentation format. Prerequisite: MBC 3320

**MBC 4720 ADVANCES IN DRUG DESIGN**

[3 hours] A survey of novel approaches to drug design and development. The course has a seminar/discussion/student presentation format. Prerequisite: MBC 3320

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**MBC 4760 BIOCHEMICAL TOXICOLOGY**  
[2 hours] The biochemical principles underlying toxicological phenomena, including biotransformation, host and environmental modulation, and target organs. Prerequisite: MBC 3550 Corequisite: MBC 3560

**MBC 4770 MOLECULAR MODELING IN DRUG DESIGN**  
[3 hours] Theoretical and graphical approaches to the geometry of drug interactions with their receptors. Methods of determining and predicting conformation at drug receptor sites are examined. Prerequisite: MBC 3320

**MBC 4780 PRACTICUM IN MEDICINAL & BIOLOGICAL CHEMISTRY**  
[6-12 hours] An experiential course in which students acquire practical knowledge through hands-on experience in an area of medicinal and biological chemistry by working in an academic, private or government laboratory or professional site. Prerequisite: PHCL 3720; MBC 3320, 3560

**MBC 4800 QUANTITATIVE STRUCTURE ACTIVITY RELATIONSHIPS**  
[2 hours] Linear free energy relationships and substituent effects in pharmacologically related agents are considered in the quantitative description of structure vs. drug activity. Prerequisite: MBC 3320

**MBC 4850 ADVANCED IMMUNOLOGY AND TISSUE CULTURE LABORATORY**  
[1-10 hours] Research experience in medicinally related immunology including literature investigations, tissue culture, cell sorting and sterile biotechniques and culminating with a seminar and written report. Prerequisite: Permission of instructor

**MBC 4870 BIOMEDICINAL CHEMISTRY LABORATORY**  
[1-10 hours] Research experience in biomedical chemistry including literature investigations and chemical synthesis of medicinally important compounds and culminating with a seminar and written report. Prerequisite: Permission of instructor

**MBC 4880 MEDICINAL BIOTECHNOLOGY LABORATORY**  
[1-10 hours] Research experience in medicinally related biotechnology including literature investigations, informatics, DNA and protein methodologies, and biological activity assays; and culminating with a seminar and written report. Prerequisite: Permission of instructor

**MBC 4900 HONORS SEMINAR IN MEDICINAL AND BIOLOGICAL CHEMISTRY**  
[1-3 hours] An examination of a specific question in the context of the primary literature in medicinal or biological chemistry. Prerequisite: Permission of College of Pharmacy Honors Program Adviser

**MBC 4910 PROBLEMS IN BIOMEDICINAL CHEMISTRY**  
[1-3 hours] Selected study of topics in biomedical chemistry. New chemical and biochemical strategies in drug design are examined in detail. Prerequisite: 4th year status (professional division -BS Pharm Prog)

**MBC 4950 RESEARCH IN MEDICINAL CHEMISTRY**  
[6-8 hours] Selected research and study in medicinal chemistry. Prerequisite: Permission of instructor

**MBC 4960 HONORS THESIS IN MEDICINAL AND BIOLOGICAL CHEMISTRY**  
[2-5 hours] An examination of a specific research question in medicinal or biological chemistry that can be answered through experimental work. Prerequisite: Permission of College of Pharmacy Honors Program Adviser

**MBC 4980 SPECIAL TOPICS IN DRUG DESIGN**  
[1-4 hours] A detailed examination of new chemical and biochemical strategies in drug design. Prerequisite: MBC 3320, 3560

**MBC 5100 RESEARCH PRACTICES IN MEDICINAL CHEMISTRY**  
[1 hour] Consideration of the scientific, ethical and legal obligations of the graduate student researcher. Prerequisite: Admission to the graduate program in medicinal chemistry, chemistry, biology, pharmaceutical sciences, or permission of instructor.

**MBC 5380 MEDICINAL AND POISONOUS PLANTS**  
[3 hours] Lecture/field course examining medicinal and harmful properties of herbals and plants using pharmacognosy, clinical trials and local plant examples.

**MBC 5620 BIOCHEMICAL TECHNIQUES**  
[2 hours] A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis. Prerequisite: Admission to the graduate program in medicinal chemistry, chemistry, biology, pharmaceutical sciences or permission of instructor.

**MBC 5900 MEDICINAL CHEMISTRY SEMINAR**  
[1 hour] Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing to test hypotheses. Prerequisite: Admission to graduate program in medicinal chemistry, chemistry, biology, or pharmaceutical sciences or permission of instructor

**MBC 6100 ADVANCED IMMUNOLOGY**  
[2 hours] Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy. Prerequisite: Admission to Ph.D. program in chemistry, medicinal chemistry, or biology, and permission of the instructor.

**MBC 6190 ADVANCED MEDICINAL CHEMISTRY**  
[4 hours] Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined. Prerequisite: Admission to the graduate program in medicinal chemistry, biology, or pharmaceutical sciences, or permission of instructor.

**MBC 6200 BIOMEDICINAL CHEMISTRY**  
[4 hours] Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared. Prerequisite: MBC 6190/8190 or permission of instructor

**MBC 6300 BIOMEDICINAL CHEMISTRY LABORATORY I**  
[4 hours] Experimental research problems in biomedical chemistry. Prerequisite: MBC 6190, 6550/8550

**MBC 6310 BIOMEDICINAL CHEMISTRY LABORATORY II**  
[4 hours] Additional experimental research problems in biomedical chemistry (see MBC 6300/8300). Prerequisite: MBC 6190 and 6550/8550 or permission of course director

**MBC 6420 PROTEIN CHEMISTRY**  
[4 hours] A detailed analysis of the structure and function of proteins: current methodology for the analysis of structure, the basis for molecular associations, and relationships between structure and biological function. Prerequisite: MBC 6550/8550 or equivalent

**MBC 6430 NUCLEIC ACID CHEMISTRY**  
[4 hours] The chemical basis for storage and transmission of genetic information. Prerequisite: MBC 6550/8550 or equivalent

**MBC 6440 ENZYMOLOGY**  
[4 hours] The principles of chemical catalysis applied to molecular enzymology. Prerequisite: MBC 6550 or equivalent

**MBC 6550 BIOCHEMISTRY**  
[4 hours] A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells. Prerequisite: Admission to Graduate Program in medicinal chemistry, chemistry, biology, or pharmaceutical sciences, or permission of instructor; Undergraduate course in Organic Chemistry

**MBC 6750 BIOORGANIC CHEMISTRY: CHEMICAL APPROACHES TO ENZYMES**  
[2 hours] An advanced course in the application of organic chemistry, stereochemistry, synthesis and kinetics to the study of enzymes, enzyme inhibition and enzyme mechanisms. Prerequisite: MBC 6550/8550; and a graduate course in Organic Chemistry, or permission of instructor

**MBC 6800 METHODS IN BIOTECHNOLOGY**  
[3 hours] Experimental investigations of current techniques in biochemistry and molecular biology that involve DNA or protein amplification, modification and interactions relevant to drug research. Prerequisite: MBC 6550/8550

**MBC 6960 M.S. THESIS RESEARCH IN MEDICINAL CHEMISTRY**  
[1-15 hours] Development and pursuit of research leading to an M.S. thesis in medicinal chemistry. Prerequisite: Admission to M.S. program in medicinal chemistry

**MBC 6980 SPECIAL TOPICS IN BIOMEDICINAL CHEMISTRY**  
[1-5 hours] Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail. Prerequisite: Admission to graduate program in medicinal chemistry, chemistry, biology, or pharmaceutical sciences, or permission of instructor.

**MBC 7100 RESEARCH PRACTICES IN MEDICINAL CHEMISTRY**

[1 hour] Consideration of the scientific, ethical and legal obligations of the graduate student researcher. Prerequisite: Admission to the graduate program in medicinal chemistry, chemistry, biology, pharmaceutical sciences, or permission of instructor.

**MBC 7620 BIOCHEMICAL TECHNIQUES**

[2 hours] A detailed study of biochemical laboratory techniques necessary for the development of novel therapeutics, including bioassays and data analysis. Prerequisite: Admission to the graduate program in medicinal chemistry, chemistry, biology, pharmaceutical sciences or permission of instructor.

**MBC 7900 MEDICINAL CHEMISTRY SEMINAR**

[1 hour] Presentation and discussion of advanced research topics in medicinal chemistry, with an emphasis on evaluating and criticizing emerging data as a way of testing to test hypotheses. Prerequisite: Admission to graduate program in medicinal chemistry, chemistry, biology, or pharmaceutical sciences or permission of instructor

**MBC 8100 ADVANCED IMMUNOLOGY**

[2 hours] Readings in and critical analysis of the recent literature in immunology and basic immunologic responses, especially as considered in immunotherapy. Prerequisite: Admission to Ph.D. program in chemistry, medicinal chemistry, or biology, and permission of the instructor

**MBC 8190 ADVANCED MEDICINAL CHEMISTRY**

[4 hours] Discussion of the qualitative and quantitative aspects of the design of new therapeutic agents. Approaches to the design of drugs and new therapeutic modalities directed at enzymes, receptors, membrane transport proteins and nucleic acids are examined. Prerequisite: Admission to the graduate program in medicinal chemistry, biology, or pharmaceutical sciences, or permission of instructor

**MBC 8200 BIOMEDICINAL CHEMISTRY**

[4 hours] Examination of the primary literature on approaches to the design of new therapeutic agents. Recent novel directions in the design of drugs will be examined and compared. Prerequisite: MBC 6190/8190 or permission of instructor

**MBC 8300 BIOMEDICINAL CHEMISTRY LABORATORY I**

[4 hours] Experimental research problems in biomedical chemistry. Prerequisite: MBC 6190, 6550/8550

**MBC 8310 BIOMEDICINAL CHEMISTRY LABORATORY II**

[4 hours] Additional experimental research problems in biomedical chemistry (see MBC 6300/8300). Prerequisite: MBC 6190 and 6550/8550 or permission of course director

**MBC 8420 PROTEIN CHEMISTRY**

[4 hours] A detailed analysis of the structure and function of proteins: current methodology for the analysis of structure, the basis for molecular associations, and relationships between structure and biological function. Prerequisite: MBC 6550/8550 or equivalent

**MBC 8430 NUCLEIC ACID CHEMISTRY**

[4 hours] The chemical basis for storage and transmission of genetic information. Prerequisite: MBC 6550/8550 or equivalent

**MBC 8440 ENZYMOLOGY**

[4 hours] The principles of chemical catalysis applied to molecular enzymology. Prerequisite: MBC 6550 or equivalent

**MBC 8550 BIOCHEMISTRY**

[4 hours] A consideration of the structure and function of biological macromolecules as well as the basic and regulated metabolism of cells. Prerequisite: Admission to Graduate Program in medicinal chemistry, chemistry, biology, or pharmaceutical sciences, or permission of instructor; Undergraduate course in Organic Chemistry

**MBC 8750 BIOORGANIC CHEMISTRY: CHEMICAL APPROACHES TO ENZYMES**

[2 hours] An advanced course in the application of organic chemistry, stereochemistry, synthesis and kinetics to the study of enzymes, enzyme inhibition and enzyme mechanisms. Prerequisite: MBC 6550/8550; and a graduate course in Organic Chemistry, or permission of instructor

**MBC 8800 METHODS IN BIOTECHNOLOGY**

[3 hours] Experimental investigations of current techniques in biochemistry and molecular biology that involve DNA or protein amplification, modification and interactions relevant to drug research. Prerequisite: MBC 6550/8550

**MBC 8960 PH.D. DISSERTATION RESEARCH IN MEDICINAL CHEMISTRY**

[1-15 hours] Development and pursuit of research leading to a Ph.D. dissertation in medicinal chemistry. Prerequisite: Admission to Ph.D. program in medicinal chemistry

**MBC 8980 SPECIAL TOPICS IN BIOMEDICINAL CHEMISTRY**

[1-5 hours] Selected study of topics in medicinal chemistry. New chemical and biochemical strategies in drug design are examined in detail. Prerequisite: Admission to Ph.D. program in medicinal chemistry, chemistry, or biology, or permission of instructor.

## MCOE - Allied Health

### Department of Kinesiology (HHS)

**MCOE 4000 GROSS ANATOMY**

[5 hours] The study of the structure and functional implications of the musculoskeletal, cardiovascular and respiratory systems of the human, and an introduction to the peripheral nervous system. An emphasis is placed on the biomechanisms of spine and extremity movement as it applies to the study of anatomy. Prerequisite: Admission to PT program

**MCOE 4070 NEUROSCIENCES AND CLINICAL CORRELATIONS**

[3 hours] An integrated study of structure and function of the central and peripheral nervous systems. Principles of neurophysiological and neuropathological motor and sensory function and related basic assessment skills will be emphasized. Prerequisite: MCOE 4000

**MCOE 4090 ANALYSIS OF MOVEMENT**

[3 hours] An integrated study of applied biomechanics, kinesiology and anatomy as they relate to the study of human movement. Focus will be placed on the observation skills associated with the analysis of human movement, with an emphasis on gait. Prerequisite: Admission to PT program Corequisite: MCOE 4000

**MCOE 4110 CLINICAL PATHOPHYSIOLOGY**

[3 hours] The integrated study of the physiology of various systems of the human body throughout the lifespan. The focus will be on the pathophysiology of the various systems with emphasis on clinical manifestations and their influence on client examination and strategies for health promotion.

**MCOE 4150 FOUNDATIONS OF PHYSICAL THERAPY**

[3 hours] This course addresses the professional socialization process. Professional codes and guides of behavior will be discussed as they relate to expectations of the graduate in the delivery of competent, ethical, legal and sensitive health care services. Prerequisite: Admission into PT program

**MCOE 4180 SCIENTIFIC INQUIRY**

[2 hours] Exploration of the use of the scientific inquiry process as a means to enhance learning and clinical reasoning skills. Emphasis on reviewing the literature critically, using the principles of research design and applied statistics as a foundation. Prerequisite: Admission into PT program

**MCOE 4200 HEALTH PROMOTION**

[3 hours] Health and wellness as they relate to able-bodied clients and clients with disability. The mind-body interaction will be explored as it relates to the role of the physical therapist as health educator. Principles of nutritional and pharmacological management will be discussed in the content of maintenance of health.

**MCOE 4250 INTRODUCTION TO EXAMINATION**

[3 hours] An introduction to the physical examination process. Includes the integration of anatomy, analysis of movement, health and observation skills. Emphasis on basic examination skills. Prerequisite: MCOE 4000, 4090 Corequisite: MCOE 4110, 4200

**MCOE 4400 CLINICAL REASONING I**

[1 hour] Introduction to the basic concepts of problem solving and critical thinking used in the delivery of physical therapy services. Includes an overview of professional decision-making models and an examination of the steps associated with making clinical decisions.

**MCOE 4450 TEACHING & LEARNING I**

[1 hour] The first of 2 courses designed to enhance the physical therapy student's role as an independent learner and as an educator peer instruction and community-based education. Emphases to include: theories of learning, instructional methods and evaluation of learning. Prerequisite: Admission into PT program

**MCOE 4600 INTEGRATED CONTROL OF MOVEMENT**

[3 hours] Integration of the organizing principles of biomechanics, neurosciences and exercise physiology as they relate to an understanding of how voluntary, coordinated human movement is controlled. The implications on the management of movement dysfunction will be discussed.

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### **MCOE 4800 ELECTIVE SEMINAR**

[1-2 hours] In-depth exploration of selected clinical topics (Physical Therapy). Prerequisite: MCOE 3000 level courses; others/relative to topic

## **MDAS - Medical Assisting Technology**

### **Department of Health Professions (HHS)**

#### **MDAS 1230 MEDICAL TRANSCRIPTION**

[2 hours] Development of medical transcription and word processing skills. Course content includes medical reports in various specialty areas such as physical exams, discharge summaries and other medical reports. Prerequisite: 25 wpm Corequisite: MDAS 1210

#### **MDAS 1240 LAW AND ETHICS IN MEDICINE**

[2 hours] Basic ethical and legal concepts relating to health care delivery. The importance of documentation is stressed. Confidentiality, professionalism, informed consent, drug regulations and related issues are examined in detail.

#### **MDAS 1250 MEDICAL CODING**

[3 hours] In-depth examination of ICD and CPT codes. Current ICD and CPT Code Books will be used. The impact of coding on reimbursement will be discussed. Prerequisite: Permission; MDAS 1120

#### **MDAS 2110 MEDICATIONS**

[3 hours] This course is a study of the actions, uses and side effects of the most common medications prescribed in a medical office. Patient teaching is emphasized. Clinical competency of injection techniques is taught and practiced. Prerequisite: TSBS 1110, 1130 Corequisite: MDAS 1210

#### **MDAS 2120 MEDICAL LABORATORY PROCEDURES**

[3 hours] This course presents basic principles of POC testing. OSHA and CLIA regulations and QC/QA methods are stressed. The student learns specimen collection and processing, patient education and procedures for urinalysis, hematology, and blood chemistry, bacteriology and immunology techniques. Prerequisite: TSBS 1110, 1130

#### **MDAS 2130 ASSESSMENT IN MEDICAL OFFICE**

[4 hours] This course addresses the basic clinical procedures used in physician's offices. It includes patient education, vital signs, positioning and draping and measuring visual acuity. Course coverage will also include nutrition and diet therapy, radiography and professionalism. Prerequisite: TSBS 1110, 1130 Corequisite: MDAS 1210

#### **MDAS 2140 CLINICAL OFFICE PROCEDURES**

[4 hours] Lectures and laboratory experiences emphasizing all phases of responsibilities of the medical assistant in the medical office. This course must be completed the semester directly preceding the clinical externship. Prerequisite: MDAS 1210, 1220; TSBS 1110, 1130 Corequisite: MDAS 1230, 1240, 2139, 2110, 2120

### **MDAS 2990 INDEPENDENT STUDY**

[1-3 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

## **MED - Music Education**

### **Department of Music and Dance (ARS)**

#### **MED 3000 FOUNDATIONS OF MUSIC EDUCATION**

[2 hours] General overview of music education. Addresses history and philosophy of music education, music in a diverse society, classroom observation skills, analysis of music teaching, classroom communication and educational theories.

#### **MED 3030 MUSIC FOR THE EARLY CHILDHOOD TEACHER**

[2 hours] Topics: Children's voices, music literacy, appreciation, creativity, classroom instruments. Analysis of music books, comparative methodology, curriculum integration. May include field experience. Prerequisite: C or better in MUS 2200 or exemption examination

#### **MED 3300 ELEMENTARY AND SECONDARY SCHOOL INSTRUMENT METHODS FOR MUSIC MAJORS**

[3-4 hours] Choral/Gen cluster 3 cr.; Inst cluster 4 cr. A study of the techniques and teaching procedures used in the presentation of the instrumental music program in elementary and secondary schools. Field experience required. Includes participation in MUS 1000:002. Prerequisite: Admittance to Professional Education and successful completion of Music Teaching Competency Exam

#### **MED 3310 MUSIC FOR CHILDREN**

[3 hours] Topics: Children's voices, music reading readiness and music reading, appreciation, creativity, use of classroom instruments. Projects: Analysis of music books for children, a comparative review of Orff, Kodaly, Dalcroze, & Gordon. Field experience required. Prerequisite: Admittance to Professional Education and successful completion of Music Teaching Competency Exam.

#### **MED 3320 SECONDARY SCHOOL VOCAL METHODS FOR MUSIC MAJORS**

[3-4 hours] Choral/General cluster 4 cr.; Instrumental cluster 3 cr. An overview of secondary school problems of vocal music education. Field experience required. Includes participation in MUS 1000:002. Prerequisite: Admittance to Professional Education and successful completion of Music Teaching Competency Exam

#### **MED 3330 EARLY CHILDHOOD MUSIC METHODS FOR MUSIC MAJORS**

[3 hours] Topics include children's voices, music readiness skills, appreciation, creativity, use of classroom instruments. Projects include keyboard technology, analysis of basic series, a comparative review of Orff, Kodaly, Dalcroze and Gordon. Includes computer and keyboard technology and field experience. Prerequisite: Admittance to Professional Education and successful completion of Music Teaching Competency Exam

### **MED 3340 VOCAL LITERATURE FOR GRADES 4-12 FOR MUSIC MAJORS**

[2 hours] Survey, analysis and preparation of appropriate vocal music for solo, small and large ensembles. Includes keyboard proficiency component and keyboard technology. Prerequisite: MUS 2580 or proficiency

#### **MED 3350 MIDDLE GRADES MUSIC METHODS FOR MUSIC MAJORS**

[3 hours] Topics: Adolescent voices, advanced music literacy, appreciation, composition, classroom instruments. Projects: Accompanying proficiency, basic series analysis, comparative methodology, curriculum integration. Field experience required. Prerequisite: Completion of Music Education second year criteria.

#### **MED 4230 INTEGRATING AESTHETIC EXPERIENCE**

[3 hours] This course will provide students majoring in education an overview of the role of music and art in educational curriculum development. Students will learn about the history of art and music through lecture, discussion and participation in art and music activities and develop methods of teaching art and music in the classroom. Interdisciplinary teaching and curriculum planning methods will be a focus of the course, affording students methods of incorporating the historical, cultural and social aspects of art and music in a general curriculum. (Students may enroll in either the Music or Art Education Sections)

#### **MED 4900 STUDENT TEACHING SEMINAR**

[2 hours] This course is required for all music education majors. This course focuses reflectivity on common experiences in student teaching. Attention is also given to resume preparation, portfolio use and job interviews. Prerequisite: Completion of pre-student teaching requirements, MED 4930

#### **MED 4930 STUDENT TEACHING**

[6-12 hours] This course is required for all music education majors. Planned field experiences in public school classrooms under the direction of University supervisors. Observation of teaching of experienced teachers; gradual acceptance of full teaching responsibility by student teacher. Must register for 6 hours elementary and 6 hours secondary. Prerequisite: EDP 3230; SPED 4020; TSOC 4000; EDP 3200; MED 3300, 3310, 3320 (all), and MED 3330 and 3340 for choral/general cluster only. Also completion of concert/recital attendance and performance of Senior Recital

#### **MED 4950 WORKSHOP IN MUSIC EDUCATION**

[1-6 hours] A workshop developed around topics of interest and concern for preservice teachers and other education personnel. Practical application of workshop topics will be emphasized. Students have the option of receiving P/NC for workshops.

#### **MED 4990 INDIVIDUAL STUDY IN MUSIC EDUCATION FOR UNDERGRADUATE STUDENTS**

[1-3 hours] Individual study is designed to provide a student with the opportunity to work individually on professional interests and concerns under the direction of the faculty of the department of music.

#### **MED 5330 ADVANCED INSTRUMENTAL METHODS**

[3 hours] Rehearsal techniques and teaching strategies for the public school instrumental music teacher. Designed to enhance the effective teaching of fundamental musical skills through hands-on experiences. Prerequisite: Consent of the instructor



**MED 5340 CURRICULUM DEVELOPMENT IN MUSIC EDUCATION**

[3 hours] The impact of historical, sociological and philosophical influences on various music curricula, past and present. Integration of skill development and content learning for designing comprehensive and sequential objectives for school music programs. Prerequisite: Consent of the instructor

**MED 5360 PEDAGOGY OF AURAL PERCEPTION**

[3 hours] Theory and techniques for teaching of musical skills. Sequences for development of tonal and rhythm skills, techniques and materials for instruction plus measurement and evaluation of music learning. Prerequisite: Consent of the instructor

**MED 5370 PSYCHOLOGY OF MUSIC**

[3 hours] Study of theories of musical behavior and pattern perception. Prerequisite: Consent of instructor

**MED 5990 INDEPENDENT STUDY IN MUSIC EDUCATION**

[1-3 hours] Individual study is designed to provide a student the opportunity to work independently on professional problems under the direction of the faculty of the Department of Music. Prerequisite: Permission of graduate committee of the Department of Music

**MED 6920 MASTER'S RESEARCH PROJECT IN MUSIC EDUCATION**

[1-3 hours] Open to the graduate student who elects a research project to fulfill the research requirement of the master's degree program. Prerequisite: Permission of graduate committee of the department of music

**MED 6930 SEMINAR - SELECTED TOPICS IN MUSIC EDUCATION**

[1-3 hours] Critical inquiry into specific topics through lectures, class seminar reports and discussion. Seminar topics announced in schedule of classes.

**MED 6960 MASTER'S RESEARCH THESIS IN MUSIC EDUCATION**

[1-3 hours] Open to the graduate student who elects a master's thesis to fulfill the research requirement of the master's degree program. Prerequisite: Permission of the graduate committee of the department of music

**MED 6980 MUSIC EDUCATION: SPECIAL TOPICS**

[1-3 hours] The area of study will be announced at the time the course is offered.

## MET - Mechanical Engineering Technology

### Department of Engineering Technology (ENG)

**MET 1020 TECHNICAL DRAWING**

[3 hours] Essentials of dimensioning, size, position and form tolerancing and their application in shop processes. Pictorial drawings are created freehand and with the use of drawing instruments.

**MET 1110 METAL MACHINING AND PROCESSES**

[3 hours] Material and machining processes dealing with production methods, machining capabilities, tolerances. Metal working with lathe, mill, etc., along with processes such as molding, stamping, forging, etc.

**MET 1120 METAL MACHINING & PROCESSES LAB**

[1 hour] Provides students with an opportunity to gain hands-on experience with machine tools and gauging measurement instruments. Corequisite: MET 1110

**MET 1250 CADD**

[4 hours] Introduction to two-dimensional and three-dimensional Computer Aided Drafting. Laboratory based experiences with creating and dimensioning working drawings, part libraries, entity insertion, graphics manipulation and customization. Prerequisite: ENGT 1050; MET 1020

**MET 2050 FLUID AND HYDRAULIC MECHANICS**

[4 hours] Application of physical principles for the design of systems to transport liquids in closed hydraulic or process piping systems; friction, pumping, flow meters and gauges. Prerequisite: PHYS 2010 Corequisite: MATH 1850

**MET 2100 STATICS FOR TECHNOLOGY**

[3 hours] Review and extension of static force analysis: free-body diagrams, forces, moments, dry friction and static equilibrium applied to machines, mechanisms, trusses and frames.

**MET 2110 MACHINE DESIGN**

[3 hours] A course in machinery component design with emphasis on the selection of commercial components on the basis of forces and stresses involved. Prerequisite: CET 1200

**MET 2120 STRENGTH OF MATERIALS FOR TECHNOLOGY**

[4 hours] Introduction to the study of stress distribution and deformation of elastic materials due to applied loads. Consideration of stress, strain, compression, tension, shear, torsion, moments and combined loading in basic machine elements. Prerequisite: MET 2100

**MET 2150 NUMERICAL CONTROL APPLICATIONS**

[4 hours] Survey of tooling and production activities adaptable to numerical control equipment and processes. Includes terminology, definitions and functions. Students will learn how to create part programs for CNC machinery. Prerequisite: MATH 1340; ENGT 1050; MET 1250

**MET 2210 TECHNICAL THERMODYNAMICS**

[4 hours] Analysis of thermodynamic concepts as they apply to heating and power production; conservation of energy, work and heat, engines and refrigeration. Includes laboratory experiences. Prerequisite: MATH 1850; PHYS 2010; ENGT 1050

**MET 2350 ADVANCED CADD**

[4 hours] Continuation of MET 1250. Topics covered include attributes, with attention to geometric tolerancing and true dimensioning. Application of three-dimensional modeling techniques and the preparation of detail drawings from the model.

**MET 2980 SPECIAL TOPICS**

[1-4 hours] Student performs work on a specialized project of an advanced nature under the supervision of a Mechanical Engineering Technology faculty member.

**MET 3100 APPLIED THERMODYNAMICS**

[4 hours] Basic principles and laws of classical thermodynamics, equations of state, reversibility and entropy applied to processes and cycles for ideal and non-ideal substances. Prerequisite: ENGT 3020

**MET 3200 MECHANICAL DESIGN I**

[3 hours] Introduction to the engineering design process. Analysis of stress, strain, deflection and fatigue in mechanical design. Design of beams, columns, springs and machine elements. Prerequisite: MET 3400

**MET 3300 APPLIED CIRCUIT ANALYSIS AND ELECTRONICS FOR MET**

[4 hours] Investigation of DC and AC circuits using basic circuit analysis techniques. Study of the characteristics and applications of electronic devices, including transistors and integrated circuits.

**MET 3400 APPLIED DYNAMICS**

[3 hours] Static force and moment analysis using vector methods. Applications of dry friction. Analysis of structures and machines. Dynamic analysis using force and acceleration, energy and momentum methods. Prerequisite: MATH 1860 Corequisite: ENGT 3020

**MET 4100 APPLIED FLUID MECHANICS**

[4 hours] Fundamentals of fluid statics and dynamics including differential analysis, dimensional analysis and similitude, laminar and turbulent flow, viscosity and boundary layer concepts, and compressible flow. Prerequisite: MET 3100

**MET 4150 THERMO-FLUID LABORATORY**

[2 hours] Pipe flow, determination of drag coefficients, flow visualization and force-momentum experiments, performance characteristics of pumps, compressors and fans, steam power plant performance analysis, refrigeration cycles, air conditioning processes.

**MET 4200 MECHANICAL DESIGN II**

[3 hours] Design and application of mechanical components and machine elements including shafts, gears, gear drives, belt drives, chain drives, fasteners, power screws, clutches, brakes and machine frames. Prerequisite: MET 3200

**MET 4300 APPLIED CONTROL SYSTEMS FOR MET**

[3 hours] Introduction to control system language, with emphasis on sensors, signal conditioning and instrument characteristics. Includes entry level design, selection and specification of continuous process control systems. Prerequisite: MET 3300

**MET 4400 APPLIED HEAT TRANSFER**

[4 hours] Fundamentals of applied heat transfer by conduction, laminar and turbulent convection, condensation and boiling, radiation exchange between surfaces, and heat exchangers. Prerequisite: MET 3100

**MET 4500 COMPUTER-AIDED DESIGN (CAD)**

[3 hours] A project is used to demonstrate the engineering design process in a real-world setting. Teams use Engineering College Computing facilities to conduct product analysis and prepare working drawings and presentation documentation. Prerequisite: Junior standing

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### **MET 4600 ENGINEERING SAFETY**

[3 hours] Application of human factors and engineering practices toward accident prevention and elimination of hazards. Topics include liability, standards, OSHA, hazard control, accident investigation and safety management. Prerequisite: Junior standing

### **MET 4700 QUALITY CONTROL**

[3 hours] Introduction to statistical quality control, including sampling, statistical inference, control charts, specifications and tolerances, and acceptance sampling by attributes and variables. Prerequisite: ENGT 3010

## **MFGM - Manufacturing Management**

### **Department of Management (BUS)**

#### **MFGM 8630 MANAGEMENT SCIENCE**

[4 hours] This course is an applied study of mathematical programming and stochastic processes. After discussing the notions of Markov and Renewal processes, we introduce a variety of applications with emphasis on manufacturing. Prerequisite: Ph.D. status; permission of instructor

#### **MFGM 8830 ORGANIZATIONAL THEORY AND BEHAVIOR FOR IMPLEMENTING ADVANCED MANUFACTURING TECHNOLOGIES**

[4 hours] This seminar examines theoretical models and research findings concerning the organizational structures and behavioral processes associated with the successful implementation of advanced manufacturing technologies. Based upon organization theory and organization behavior, this course develops a behavioral science framework for managing the factory of the future. Prerequisite: MGMT 5110 or ORGD 7110

#### **MFGM 8840 MANUFACTURING STRATEGY**

[4 hours] The seminar examines the theory and research related to the formulation and implementation of manufacturing strategy including the strategic planning process and techniques for industry and competitive analysis. Prerequisite: MGMT 5110 or ORGD 7110

#### **MFGM 8850 READINGS AND RESEARCH IN MANUFACTURING MANAGEMENT**

[1-12 hours] This individually designed course will provide advanced readings in areas needed by a doctoral student. Prerequisite: Ph.D. student status; permission of instructor

#### **MFGM 8860 ADVANCED STATISTICS**

[4 hours] This course discusses multivariate data analysis. Topics include: principal components analysis, factor analysis, multidimensional scaling, cluster analysis, multiple regression analysis and multivariate analysis of variance. Statistical software packages are used. Prerequisite: OPMT 5510

#### **MFGM 8880 RESEARCH METHODS AND THEORY BUILDING**

[4 hours] The course seeks to frame and discuss key issues that arise as social scientists conduct theoretically-relevant empirical research. In the course, the theory building in manufacturing management as well as research process and the literature, tools and techniques associated with each phase of the process will be introduced. Prerequisite: Ph.D. student status; permission of instructor

### **MFGM 8890 ADVANCED MANUFACTURING SYSTEM DESIGN**

[4 hours] Doctoral Seminar for advanced readings in design and implementation of manufacturing systems. Topics vary depending on the current state of the technology. Prerequisite: Ph.D. student status; permission of instructor

### **MFGM 8900 FIELD RESEARCH**

[1-8 hours] This course provides students with the opportunity to experience a realistic manufacturing problem and to develop approaches to solving that problem under the supervision of a faculty member. Prerequisite: Ph.D. student status; permission of instructor

### **MFGM 8960 DISSERTATION**

[1-8 hours] Dissertation Prerequisite: Ph.D. student status; permission of instructor

### **MFGM 8980 SPECIAL TOPICS SEMINAR**

[4 hours] This seminar focuses on current topics relating to manufacturing management. The specific seminar topic will change each semester. Prerequisite: Ph.D. student status; permission of instructor

## **MGMT - Management**

### **Department of Management (BUS)**

#### **MGMT 3910 RESEARCH IN MANAGEMENT**

[3 hours] In-depth independent research work under the supervision of a faculty member. Prerequisite: Senior standing

#### **MGMT 3940 JUNIOR ACHIEVEMENT INTERNSHIP**

[1-3 hours] This internship experience is designed for JA students who plan to combine their business education with prior Junior Achievement experience. Prerequisite: Junior standing; prior approval

#### **MGMT 4900 SEMINAR ON CONTEMPORARY ISSUES IN MANAGEMENT**

[3 hours] This seminar is designed to facilitate applications of managerial skills, tools and techniques in meeting contemporary challenges in organizations. Prerequisite: BUAD 3030

#### **MGMT 4910 RESEARCH IN HUMAN RESOURCE MANAGEMENT**

[1-3 hours] Students have the opportunity to conduct an intensive investigation in a Human Resource Management area, supervised by a departmental faculty member. A formal paper is expected at the study's end. Prerequisite: HURM 3220, BLAW 3550; senior standing

#### **MGMT 4940 MANAGEMENT INTERNSHIP**

[1-3 hours] A supervised work experience for outstanding students. The internship involves practical experience. A written report is required of the student. Prerequisite: Senior standing; permission of department chair

### **MGMT 5110 INTRODUCTION TO MANAGEMENT**

[3 hours] Course is designed to provide a comprehensive, accurate and up-to-date picture of the field of management. This course focuses on organizational behavior (individual and small group) and organizational theory (large group and total organization). Also included is a review of the key functions of management; (1) planning, (2) organizing, (3) leading, (4) staffing and (5) controlling. Prerequisite: Graduate standing

### **MGMT 6110 LONG RANGE STRATEGIC PLANNING**

[3 hours] Detailed understanding to the basic processes and techniques for analysis of dynamic changes in the internal and external environment of complex organizations. The course generally involves the writing of research papers and case analyses.

### **MGMT 6930 INDEPENDENT RESEARCH**

[1-3 hours] Independent research opportunities are provided to advanced students for pursuing topics in depth under the faculty supervision. Prerequisite: Prior approval

## **MIME - Mechanical, Industrial and Manufacturing Engineering**

### **Department of Mechanical, Industrial and Manufacturing Engineering (ENG)**

#### **MIME 1000 ORIENTATION TO ME & IE**

[3 hours] The mechanical and industrial engineering professions are discussed with emphasis on career opportunities. Orientation to the university campus, study skills and time management. Word processing, spreadsheets, e-mail and MATLAB programming are studied.

#### **MIME 1010 PROFESSIONAL DEVELOPMENT**

[1 hour] Social protocol and ethics in industry are reviewed. Resume writing and interview skills are developed. Course assists in preparing the student for the co-op experience in industry. Prerequisite: MIME 1000

#### **MIME 1100 INTRODUCTION TO CAD**

[2 hours] Techniques for visualization and representation of machine components using solid modeling and projection. Section views, orthographic projection, dimensioning and tolerancing. CAD techniques for solving vector problems.

#### **MIME 1650 MATERIALS SCIENCE & ENGINEERING**

[3 hours] Engineering properties of materials, the effect of atomic bonding and crystalline structure on the mechanical properties of metals, ceramics and polymers. Common measurement, testing and comparison techniques to aid in selection of materials. Laboratory experiences include compressive and tensile strength testing, the effects of heat upon strength, hardness and micro-structure, the effects of combining certain materials in a composite to improve overall mechanical properties. Corequisite: CHEM 1230

**MIME 2000 STATISTICS AND MEASUREMENTS LABORATORY**

[2 hours] How to write engineering laboratory reports. Statistical analysis of experimental data, uncertainty analysis, general characteristics of measurement systems, static and dynamic measurements, computer data acquisition, applications to thermal, mechanical and electrical systems. Prerequisite: ENGL 1930 or equivalent

**MIME 2300 ENGINEERING DYNAMICS**

[3 hours] Kinematics of particles and rigid bodies. Thorough study of kinetics of particles and rigid bodies using Newton's laws of motion, work-energy methods, and impulse and momentum methods. Prerequisite: CIVE 1150

**MIME 2600 ENGINEERING ECONOMICS**

[3 hours] The study of micro-economic and macro-economic theories. Methods of economic analysis, including the time value of money, are described. Economic decision criteria are used to select best alternatives with emphasis in engineering. Impact of economic decisions on various sectors of society are discussed. Prerequisite: Sophomore standing

**MIME 2650 MANUFACTURING PROCESSES**

[3 hours] Manufacturing processes discussed include metal casting and forming such as forging, rolling, extrusion, stamping and drawing. Metal cutting processes such as turning, boring, drilling, milling, sawing and broaching are discussed. Polymer processes including injection molding and extrusion as well as ceramic part production are covered. Laboratory experiences include creating parts using many of these processes. Prerequisite: MIME 1650

**MIME 2920 SPECIAL PROJECTS**

[1-3 hours] A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for students interested in mechanical, industrial or manufacturing engineering early in their undergraduate program. Instructor will specify scope of project to correspond to credit hours. Prerequisite: Consent of MIME faculty member

**MIME 2980 SPECIAL TOPICS**

[1-3 hours] A special topic at the undergraduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member. Credits will correspond to regular class meetings of one lecture hour per week per credit hour. Prerequisite: Consent of MIME faculty member

**MIME 2990 INDEPENDENT STUDY**

[1-3 hours] An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for engineering students early or midway through their program of study. Instructor will specify scope of project to correspond to credit hours. Prerequisite: Consent of MIME faculty member

**MIME 3300 DESIGN AND ANALYSIS OF MECHANICAL SYSTEMS**

[3 hours] Design and analysis of mechanisms, gear trains, planetary gear trains, cam-and-follower devices with application to mechanical systems. Motion, force, torque and vibration analysis. Balancing of rotating and reciprocating components in machines. Prerequisite: MIME 2300

**MIME 3310 MECHANICAL DESIGN I**

[3 hours] Applications of mechanics of materials to analysis and design of mechanical components; introduction to fracture mechanics; applications of failure theories to design of machine elements subjected to static and cyclic loadings. Prerequisite: CIVE 1160; MIME 2000, 1650

**MIME 3320 MECHANICAL DESIGN II**

[3 hours] Application of failure theories in static and fatigue loading to the design and analysis of mechanical elements including fasteners, power screws, welded joints, springs, bearings, gears, clutches, brakes and shafts. Prerequisite: MIME 3310

**MIME 3370 VIBRATION AND CONTROL**

[3 hours] Modeling mechanical systems, mechanical elements, equations of motion for single-DOF and multi-DOF systems, linearization of equations of motion, free and forced response, electrical systems, frequency response, feedback control systems. Prerequisite: MIME 2300; MATH 3860

**MIME 3390 MECHANICS AND VIBRATIONS LABORATORY**

[2 hours] This laboratory course consists of experiments in solid mechanics including mechanical testing, stress and deflection analysis, fatigue, stability and mechanical vibrations. Prerequisite: MIME 3310, 3370

**MIME 3400 THERMODYNAMICS I**

[3 hours] Introduction to thermal sciences with an emphasis on the first and second law of thermodynamics. Topics include conservation of energy for closed and open systems, thermodynamic properties and cycles and entropy production. Prerequisite: PHYS 2140

**MIME 3410 THERMODYNAMICS II**

[3 hours] Review of open and closed systems in thermodynamics, the Carnot principle and cycle efficiency concepts. Application to gas and vapor power cycles and refrigeration cycles. Thermodynamic property relations, gaseous mixtures and combustion. Prerequisite: MIME 3400

**MIME 3430 FLUID MECHANICS**

[3 hours] Fluid mechanics for mechanical engineers. Topics include fluid statics and dynamics, equations of motion, dimensional analysis, boundary layer theory, flow in pipes, turbulence, fluid machinery, potential flow, CFD and aerodynamics. Prerequisite: MIME 3400

**MIME 3440 HEAT TRANSFER**

[3 hours] A comprehensive study of conduction, convection and radiation. Derivation and solution of differential equations related to heat transfer. Analysis of forced and free convection and heat exchangers. Dimensional analysis related to heat transfer. Prerequisite: MIME 3430

**MIME 3470 THERMAL SCIENCE LABORATORY**

[2 hours] Determination of transition Reynolds number, measurement of basic fluid properties, buoyancy, calibration of flow measuring devices, pipe flow, determination of drag coefficients, study of fluid flow by use of aerodynamic smoke tunnel, performance characteristics of pumps and fans, internal combustion engines, refrigeration cycles, solar collection, heat exchangers, determination of free and forced convection heat transfer coefficients. Prerequisite: MIME 3400  
Corequisite: MIME 3430

**MIME 3710 WORK DESIGN AND MEASUREMENT**

[3 hours] A study of the methods used to analyze, design and specify the human performance in operation/production systems for the purpose of improving productivity. Computerized predetermined time systems, robots and material handling equipment are utilized in the laboratory environment to design production systems. Prerequisite: MIME 4060 and 4080  
Corequisite: MIME 4060

**MIME 3780 ENGINEERING MANAGEMENT**

[3 hours] The development of the fundamentals required in an engineering and manufacturing environment where technical competency is considered standard and an appreciation of the human behavioral responses to managerial policies and rules is essential. This course covers the basics of planning organizing, leading and control from the subordinates' as well as the manager's perspective. Prerequisite: MIME 3710

**MIME 3940 CO-OP EXPERIENCE**

[1 hour] Students in the Industrial and Mechanical Engineering programs are to enroll in this course during each of their approved Co-Op experiences. Prerequisite: MIME 1010

**MIME 4000 ENGINEERING STATISTICS I**

[3 hours] This course introduces the student to the areas of probability theory and statistical inferences. Topics include sample spaces, the concepts of random variables, probability distributions; functions of random variables, transformation of variables, moment generating functions, sampling and estimation theory; T, F and chi-square distribution. Prerequisite: MATH 2850

**MIME 4010 ENGINEERING STATISTICS II**

[3 hours] This course continues the student's development of statistical tools and techniques. Topics include test of hypothesis, nonparametric statistics, simple linear regression and correlation, multiple linear regression, analysis of variance and factorial experiments. Prerequisite: MIME 4000

**MIME 4020 STATISTICAL QUALITY CONTROL AND MANAGEMENT**

[3 hours] Students learn fundamental statistical process control, including control charting and sampling using variables and attributes. Also covered are the fundamentals of implementing and managing a continuous quality improvement program. Prerequisite: MIME 4010

**MIME 4050 HUMAN FACTORS ENGINEERING**

[3 hours] Characteristics of the human as an operator in human-machine systems. Human abilities to process information and perform physical tasks within the constraints of environmental conditions - temperature, illumination, noise, etc. Prerequisite: PSY 1010; MIME 4000

**MIME 4060 MANUFACTURING ENGINEERING**

[3 hours] Students apply machine tools and fabrication processes to optimize the manufacture of a product. Emphasis is on engineering design integrated with economic principles and fabricating methods. Prerequisite: MIME 2650, MATH 3860

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### **MIME 4070 COMPUTER-AIDED MANUFACTURING**

[3 hours] The study of machining processes using numerical control machine tools and controllers. Development of programs to machine parts on mills and lathes. Conversion of CAD models to programs through software interfaces. Prerequisite: MIME 2650

### **MIME 4080 OPERATIONS RESEARCH I**

[3 hours] This course focuses on the mathematical methods of Operations Research and their applications in engineering. Topics include the optimal solution of deterministic and stochastic mathematical models, modeling process, linear programming, the simplex method, duality theory and sensitivity analysis. Prerequisite: MIME 4000, MATH 2890 and 3860 or 3820

### **MIME 4090 OPERATIONS RESEARCH II**

[3 hours] This course extends the mathematical methods of Operations Research I and their application. Topics include transportation and assignment problems, network analysis, PERT-CPM, Markov chains and queuing theory. Prerequisite: MIME 4080

### **MIME 4100 MANUFACTURING SYSTEMS SIMULATION**

[3 hours] Discrete and continuous simulation models are used to study queuing, networks, manufacturing and related engineering systems. Simulation languages and animation are covered. Statistical inference is used to draw conclusions and to identify the best system. Prerequisite: MIME 2650 Corequisite: MIME 4010

### **MIME 4110 PRODUCTION PLANNING AND INVENTORY CONTROL**

[3 hours] The planning, scheduling and control of inventory and production. Critical path methods, PERT, applications of mathematical and computer methods. Prerequisite: MIME 3710

### **MIME 4160 FACILITIES PLANNING AND DESIGN**

[3 hours] Planning, design, development, management and control of production and distribution systems to effectively distribute goods and services from the producer to the user. Aspects of facilities for manufacturing, material handling, packaging and distribution; concepts of group technology and computer-aided facility design and utilization of optimal plant design are covered. Prerequisite: MIME 3710

### **MIME 4200 SENIOR DESIGN PROJECTS**

[3 hours] Students work in teams using knowledge gained in earlier courses to solve real design, manufacturing and operational problems relevant to industry. Oral and written communications with participating companies as well as teamwork are stressed. Other topics include patents, product liability, safety, ethics and design for manufacturing. Prerequisite: MIME 3320 or 3710

### **MIME 4210 VEHICLE DYNAMICS**

[3 hours] Analytic mechanics are applied to automotive structures. This includes the forces, time dependent motions including bounce and pitch modes, suspension kinematics, limitations imposed by the human body, and how the automotive structure must be designed to accommodate these. Corequisite: MIME 3370

### **MIME 4230 DYNAMICS OF HUMAN MOVEMENT**

[3 hours] The study of human movement including muscle mechanics, kinematics, kinetics and energetics of human gait, anthropometry and application to bioengineering and orthopedics. Prerequisite: MIME 2300

### **MIME 4270 CAD - GEOMETRIC MODELING**

[3 hours] Principles of CAD systems and their relationship to the design process. Topics include CAD hardware as well as geometric modeling of curves, surfaces and solids. Prerequisite: MIME 3320

### **MIME 4280 CAD-FINITE ELEMENT METHODS**

[3 hours] An introduction to the basic concepts of the finite element method. Topics include engineering analysis of continuous systems, numerical solutions of boundary value problems, method of weighted residuals and the principle of minimum potential energy, applications of commercially available finite element programs. Prerequisite: MIME 3320 Corequisite: MIME 3440

### **MIME 4300 ADVANCED MECHANICS OF MATERIALS**

[3 hours] Theory of elasticity, plane stress and plane problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetric bending, torsion, shear center and axisymmetrically loaded members. Prerequisite: CIVE 1160; MATH 3860

### **MIME 4310 MECHANICS OF COMPOSITE MATERIALS**

[3 hours] Review of elasticity of anisotropic solids, determination of mechanical properties of fiber-reinforced lamina, analysis and performance of laminated composites. Prerequisite: CIVE 1160; MIME 1650

### **MIME 4320 FATIGUE OF MATERIALS & STRUCTURES**

[3 hours] Fatigue design methods; fatigue fracture mechanisms; cyclic deformation behavior and material cyclic properties; stress-based, and fracture mechanics-based methodologies to fatigue life prediction of smooth and notched members subjected to constant or variable amplitude loadings. Prerequisite: CIVE 1160

### **MIME 4330 OCCUPATIONAL ERGONOMICS**

[3 hours] An introduction to the science and practice related to the musculoskeletal problems of work. This course includes some of the methodologies that define occupational biomechanics including anthropometry, work-capacity evaluation, bioinstrumentation, biomechanical models, and work classification and time prediction. Prerequisite: CIVE 1160

### **MIME 4340 EXPERIMENTAL MECHANICS**

[3 hours] Application of experimental techniques to stress analysis, comparison of experimental and analytical methods, theory of electrical resistance gages, methods of photoelasticity including photostress, data acquisition systems and their use. Prerequisite: CIVE 1160; MATH 3860

### **MIME 4510 TURBOMACHINERY**

[3 hours] Theory of energy transfer between fluid and rotor in turbomachines. Design of turbomachine components. Applications to pumps, compressors and turbines. Prerequisite: MIME 3410, 3430

### **MIME 4520 HEATING, VENTILATING AND AIR CONDITIONING**

[3 hours] Control of the thermal environment within enclosed spaces including psychometric properties of air heating and cooling, loads and factors affecting human comfort. Analysis of basic heating and refrigeration systems, heat pumps, heaters, utilization of solar energy, humidifiers, energy conservation and controls for systems. Prerequisite: MIME 3410

### **MIME 4530 INTERNAL COMBUSTION ENGINES**

[3 hours] Study of Carnot, Otto, Diesel and Brayton Cycles, performance characteristics, combustion engines and construction details of internal combustion engines. Analysis of problems associated with carburetion, fuel injection, combustion, cooling, supercharging, emissions and emission control. Prerequisite: MIME 3410

### **MIME 4540 JET PROPULSION**

[3 hours] Mechanics and thermodynamics of jet propulsion. Fundamentals of high-speed flow. Analysis of gas turbine engine components: diffuser, compressor, turbine and nozzle. Investigation of characteristics of ramjets, turbojets, turbofans and turboprops. Introduction to solid and liquid rockets. Prerequisite: MIME 3410

### **MIME 4550 AERODYNAMICS**

[3 hours] Fundamentals of aerodynamics, potential flow theory, aerodynamic forces and moments, introduction to numerical analysis, application to internal flows, theory of lift for infinite and finite wings, induced drag. Prerequisite: MIME 3430

### **MIME 4560 GAS DYNAMICS**

[3 hours] Analysis of compressible flow phenomena including shock and detonation waves. Internal flow with friction and heat addition. Analysis and application to supersonic airfoil theory, inlet nacelles, nozzles to generate supersonic thrust and jet engine combustors. Prerequisite: MIME 3430

### **MIME 4580 DESIGN OF THERMAL SYSTEMS**

[3 hours] Design of thermal systems, analysis and design of systems involving energy transfer due to fluid flow and heat transfer. The analogy between fluid mechanics, heat transfer and electrical circuits will be developed and used. Methods for determining on-design and off-design performance and estimating the performance of existing designs. Prerequisite: MIME 3400

### **MIME 4590 LUBRICATION TECHNOLOGY AND BEARING DESIGN**

[3 hours] Development of the generalized Reynolds equation. Study of hydrodynamic and hydrostatic forms of lubrication. Slider and journal bearing problems. Analysis of cavitation. Gas bearings. Stability and thermal effects. Bearing design considerations. Analysis of seals. Effects of wear. Prerequisite: MIME 3430

### **MIME 4640 RANDOM PROCESSES**

[3 hours] An introduction to the basic theory of stochastic processes, Markov chains, Markov processes, renewal theory, ergodicity, stationarity, applications in queuing, inventory and reliability. Prerequisite: MATH 3860; MIME 4010

**MIME 4690 RELIABILITY**

[3 hours] Reliability of components and multicomponent systems. Static and dynamic reliability models for both independent and dependent failures. Effects of hot and cold redundancy. Reliability testing consideration and renewal theory. Prerequisite: MIME 4010

**MIME 4730 FORECASTING**

[3 hours] Mathematical methods used in forecasting and time series analysis. Brown's exponential smoothing, Winter's seasonal forecasting and Box-Jenkins methods are introduced and used in forecasting. Applications include forecasting demand to aid production planning, inventory control, short and long range planning. Prerequisite: MIME 4010

**MIME 4780 ADVANCED ENGINEERING ECONOMY AND DECISION THEORY**

[3 hours] Decision analysis of economic and multi-objective projects under conditions of risk and uncertainty. Use of wealth building approaches, decision trees, statistical decision analysis and decision techniques for capital investment and multiple attribute problems. Prerequisite: MIME 2600

**MIME 4800 DESIGN FOR MANUFACTURABILITY**

[3 hours] Design considerations for economic manufacturing including overview of design process, design for assembly, design for material handling, design for recyclability and design of experiments including Taguchi Analysis. Prerequisite: MIME 2650

**MIME 4810 MATERIAL REMOVAL PROCESSES**

[3 hours] This course analyzes the major manufacturing material removal processes including machining, flame cutting, electro-discharge machining, etc. Analysis of tool wear, mechanics, cutting fluids, chip control and thermal effects are discussed. Prerequisite: Senior standing and MIME 2650

**MIME 4920 SPECIAL PROJECTS**

[1-3 hours] A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for students interested in mechanical, industrial or manufacturing engineering nearing completion of their undergraduate degree. Instructor will specify scope of project to correspond to credit hours. Prerequisite: Consent of MIME faculty member

**MIME 4980 SPECIAL TOPICS**

[1-3 hours] A special topic at the undergraduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member. This is intended for students nearing graduation. Credits will correspond to regular class meeting of one lecture hour per week per credit hour. Prerequisite: Consent of MIME faculty member

**MIME 4990 INDEPENDENT STUDY**

[1-3 hours] An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for engineering students nearing graduation. Instructor will specify scope of study to correspond to credit hours. Prerequisite: Consent of MIME faculty member

**MIME 5010 ENGINEERING STATISTICS II**

[3 hours] This course continues the students' development of statistical tools and techniques. Topics include test of hypothesis, nonparametric statistics, simple linear regression and correlation, multiple linear regression, analysis of variance and factorial experiments. Not available for credit to IE students. Prerequisite: MIME 5000

**MIME 5020 STATISTICAL QUALITY CONTROL AND MANAGEMENT**

[3 hours] Students learn fundamental statistical process control including control charting and sampling using variables and attributes. Also covered are the fundamentals of implementing and managing a continuous quality improvement program. Prerequisite: Graduate standing

**MIME 5050 HUMAN FACTORS ENGINEERING**

[3 hours] Characteristics of the human as an operator in human-machine systems. Human abilities to process information and perform physical tasks within the constraints of environmental conditions - temperature, illumination, noise, etc. Lecture and lab experiences. Prerequisite: Graduate standing

**MIME 5060 MANUFACTURING ENGINEERING**

[3 hours] Students integrate machine tools and fabrication processes to optimize the manufacture of a product. Emphasis is on engineering design integrated with economic principles and fabricating methods. Prerequisite: Graduate standing

**MIME 5070 COMPUTER-AIDED MANUFACTURING**

[3 hours] The study of machining processes using numerical control machine tools and controllers. Development of programs to machine parts on mills and lathes. Conversion of CAD models to programs through software interfaces. Prerequisite: Graduate standing

**MIME 5080 OPERATIONS RESEARCH I**

[3 hours] This course focuses on the mathematical methods of Operations Research and their applications in engineering. Topics include the optimal solution of deterministic and stochastic mathematical models, modeling process, linear programming, the simplex method, duality theory and sensitivity analysis. Prerequisite: Graduate standing

**MIME 5090 OPERATIONS RESEARCH II**

[3 hours] This course extends the mathematical methods of Operations Research I and their application. Topics include transportation and assignment problems, network analysis, PERT-CPM, Markov chains and queuing theory. Prerequisite: Graduate standing, MIME 5080

**MIME 5100 MANUFACTURING SYSTEMS SIMULATION**

[3 hours] Discrete and continuous simulation models are used to study queuing networks, manufacturing and related engineering systems. Simulation languages and animation are covered. Statistical inference is used to draw conclusions and to identify the best system. Prerequisite: Graduate standing

**MIME 5110 PRODUCTION PLANNING AND INVENTORY CONTROL**

[3 hours] The planning, scheduling and control of inventory and production. Critical path methods, PERT, applications of mathematical and computer methods. Prerequisite: Graduate standing

**MIME 5160 FACILITIES PLANNING AND DESIGN**

[3 hours] Planning, design, development, management and control of production and distribution systems to effectively distribute goods and services from the producer to the user. Aspects of facilities for manufacturing, material handling, packaging and distribution; concepts of group technology and computer-aided facility design and utilization of optimal plant design are covered. Prerequisite: Graduate standing

**MIME 5210 VEHICLE DYNAMICS**

[3 hours] Analytic mechanics are applied to automotive structures. This includes the forces, time dependent motions including bounce and pitch modes, suspension kinematics, limitations imposed by the human body, and how the automotive structure must be designed to accommodate these. Prerequisite: Graduate standing

**MIME 5230 DYNAMICS OF HUMAN MOVEMENT**

[3 hours] The study of human movement including muscle mechanics, kinematics, kinetics and energetics of human gait, anthropometry and application to bioengineering and orthopedics. Prerequisite: Graduate standing

**MIME 5280 CAD - FINITE ELEMENT METHODS**

[3 hours] Numerical solutions of boundary value problems, variational calculus and the principle of minimum potential energy, finite element formulation of two dimensional field and elasticity problems, axisymmetric elements, finite element programming. Prerequisite: Graduate standing

**MIME 5300 ADVANCED MECHANICS OF MATERIALS**

[3 hours] Theory of elasticity, plane stress and plane strain problems, yield criteria and failure theories, bending of beams, energy methods, curved flexural members, unsymmetric bending, torsion, shear center and axisymmetrically loaded members. Prerequisite: Graduate standing

**MIME 5310 MECHANICS OF COMPOSITE MATERIALS**

[3 hours] Review of elasticity of anisotropic solids, determination of mechanical properties of fiber-reinforced lamina, analysis and performance of laminated composites. Prerequisite: Graduate standing

**MIME 5320 FATIGUE OF MATERIALS & STRUCTURES**

[3 hours] Fatigue design methods; fatigue mechanisms; cyclic deformation behavior and material cyclic properties; stress-based and fracture mechanics-based methodologies to fatigue life prediction of smooth and notched members subjected to constant or variable amplitude loadings. Prerequisite: Graduate standing

**MIME 5330 OCCUPATIONAL ERGONOMICS**

[3 hours] Methodologies that define musculoskeletal problems of work including anthropometry, work capacity evaluation, bioinstrumentation, biomechanical models, and work classification and time prediction. Some applications in occupational biomechanics are presented including manual material handling. Prerequisite: Graduate standing

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### **MIME 5340 EXPERIMENTAL MECHANICS**

[3 hours] Application of experimental techniques to stress analysis, comparison of experimental and analytical methods, theory of electrical resistance gages, methods of photoelasticity including photostress, data acquisition systems and their use. Prerequisite: Graduate standing

### **MIME 5500 APPLICATIONS OF ENGINEERING ANALYSIS**

[3 hours] A course in analysis for engineers. Topics include: linear differential equation, continuous and discrete series representations, Laplace transforms, matrix methods, eigenvalues and eigenvectors, systems of equations and partial differential equations. Prerequisite: Graduate standing

### **MIME 5510 TURBOMACHINERY**

[3 hours] Theory of energy transfer between fluid and rotor in turbomachines. Design of turbomachine components. Applications to pumps, compressors and turbines. Prerequisite: Graduate standing

### **MIME 5520 HEATING, VENTILATING & AIR CONDITIONING**

[3 hours] Control of the thermal environment within enclosed spaces including psychometric properties of air heating and cooling, loads and factors affecting human comfort. Analysis of basic heating and refrigeration systems, heat pumps, heaters, utilization of solar energy, humidifiers, energy conservation and controls for systems. Prerequisite: Graduate standing

### **MIME 5530 INTERNAL COMBUSTION ENGINES**

[3 hours] Study of Carnot, Otto, Diesel and Brayton Cycles, performance characteristics, combustion engines and construction details of internal combustion engines. Analysis of problems associated with carburetion, fuel injection, combustion, cooling, supercharging, emissions and emission controls. Prerequisite: Graduate standing

### **MIME 5540 JET PROPULSION**

[3 hours] Mechanics and thermodynamics of jet propulsion. Fundamentals of high-speed flow. Analysis of gas turbine engine components: diffuser, compressor, turbine and nozzle. Investigation of characteristics of ramjets, turbojets, turbofans and turboprops. Introduction to solid and liquid rockets. Prerequisite: Graduate standing

### **MIME 5550 AERODYNAMICS**

[3 hours] Fundamentals of aerodynamics, potential flow theory, aerodynamic forces and moments, introduction to numerical analysis, application to internal flows, theory of lift for infinite and finite wings, induced drag. Prerequisite: Graduate standing

### **MIME 5560 GAS DYNAMICS**

[3 hours] Analysis of compressible flow phenomena including shock and detonation waves. Internal flow with friction and heat addition. Analysis and application to supersonic airfoil theory, inlet nacelles, nozzles to generate supersonic thrust and jet engine combustors. Prerequisite: Graduate standing

### **MIME 5580 DESIGN OF THERMAL SYSTEMS**

[3 hours] Design of thermal systems, analysis and design of systems involving energy transfer due to fluid flow and heat transfer. The analogy between fluid mechanics, heat transfer and electrical circuits will be developed and used. Methods for determining on-design and off-design performance and estimating the performance of existing designs. Prerequisite: Graduate standing

### **MIME 5590 LUBRICATION TECHNOLOGY AND BEARING DESIGN**

[3 hours] Development of the generalized Reynolds equation. Study of hydrodynamic and hydrostatic forms of lubrication. Slider and journal bearing problems. Analysis of cavitation. Gas bearings. Stability and thermal effects. Bearing design considerations. Analysis of seals. Effects of wear. Prerequisite: Graduate standing

### **MIME 5640 RANDOM PROCESSES**

[3 hours] An introduction to the basic theory of stochastic processes, Markov chains, Markov processes, renewal theory, ergodicity, stationarity, applications in queuing, inventory and reliability. Prerequisite: Graduate standing

### **MIME 5690 RELIABILITY**

[3 hours] Reliability of components and multicomponent systems. Static and dynamic reliability models for both independent and dependent failures. Effects of hot and cold redundancy. Reliability testing consideration and renewal theory. Prerequisite: Graduate standing

### **MIME 5730 FORECASTING**

[3 hours] Mathematical methods used in forecasting and time series analysis. Brown's exponential smoothing, Winter's seasonal forecasting and Box-Jenkins methods are introduced and used in forecasting. Applications include forecasting demand to aid production planning, inventory control, short and long range planning. Prerequisite: Graduate standing

### **MIME 5750 WORK MEASUREMENT & MANUFACTURING SYSTEMS**

[3 hours] A study of the methods used to analyze, design and specify the human performance in operation/production systems for the purpose of improving productivity. Computerized predetermined time systems, robots and material handling equipment are utilized in the laboratory environment to design production systems. Prerequisite: Graduate standing

### **MIME 5780 ADVANCED ENGINEERING ECONOMY AND DECISION THEORY**

[3 hours] Decision analysis of economic and multi-objective projects under conditions of risk and uncertainty. Use of wealth building approaches, decision trees, statistical decision analysis, and decision techniques for capital investment and multiple attribute problems. Prerequisite: Graduate standing

### **MIME 5800 DESIGN FOR MANUFACTURABILITY**

[3 hours] Design considerations for economic manufacturing including overview of design process, design for assembly, design for material handling, design for recyclability and design of experiments including Taguchi Analysis. Prerequisite: Graduate standing

### **MIME 5810 MATERIAL REMOVAL PROCESSES**

[3 hours] This course analyzes the major manufacturing material removal processes including machining, flame cutting, electro-discharge machining, etc. Analysis of tool wear, mechanics, cutting fluids, chip control and thermal effects are discussed. Prerequisite: Graduate standing

### **MIME 5920 SPECIAL PROJECTS**

[1-6 hours] A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering. Prerequisite: Consent of MIME faculty member

### **MIME 5980 SPECIAL TOPICS**

[1-6 hours] A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member. Prerequisite: Consent of MIME faculty member

### **MIME 6000 ADVANCED ENGINEERING MATHEMATICS I**

[3 hours] An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications. Prerequisite: Graduate standing

### **MIME 6100 ADVANCED ENGINEERING MATHEMATICS II**

[3 hours] Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods. Prerequisite: MIME 6000 or consent of instructor

### **MIME 6120 ADVANCED MEASUREMENT SYSTEMS**

[3 hours] Sensor selection, data acquisition system selection, evaluation of system response, digital sampling theory, statistical data analysis, space-time correlations, spectral analysis, analog and digital signal conditioning, and static and dynamic measurements. Prerequisite: Graduate standing

### **MIME 6150 APPLIED NUMERICAL METHODS**

[3 hours] An advanced course in mathematical analysis for engineers. Topics include real and complex solutions to polynomial and transcendental equations, approximate interpolation and integration procedures, matrix methods, solutions of systems of nonlinear equations, ordinary and partial differential equations. Prerequisite: Graduate standing

### **MIME 6180 MICRO ELECTRO MECHANICAL SYSTEMS**

[3 hours] Current design and methods in micromachining mechanical and electrical components on silicon wafers with an emphasis on mechanical as well as the LIGA Microcasting techniques. Both prototyping and mass production practices will be covered. Prerequisite: Graduate standing

**MIME 6190 MECHATRONICS**

[3 hours] Design, analysis, and synthesis of integrated electromechanical systems. Transducer models, signal conditioning and power amplification, and analog-to-digital interfaces. Topics will focus on mechanical engineering applications of process control and data acquisition. Prerequisite: Graduate standing

**MIME 6200 ADVANCED DYNAMICS**

[3 hours] Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability. Prerequisite: Graduate standing

**MIME 6210 ADVANCED MECHANICAL VIBRATIONS**

[3 hours] Advanced concepts in normal mode theory for discrete systems and vibration of continuous systems such as bars, beams and plates. Prerequisite: Graduate standing

**MIME 6230 CAD-SURFACE MODELING**

[3 hours] Theory and implementation of contemporary parametric sculptured surface modeling technology. Non-uniform rational B-spline [NURBS] curves and surfaces. Fundamental computational algorithms, construction techniques and advanced modeling topics. Prerequisite: Graduate standing and programming experience in Matlab or C.

**MIME 6300 CONTINUUM MECHANICS**

[3 hours] A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids. Prerequisite: Graduate standing

**MIME 6320 ADVANCED FINITE ELEMENT METHODS**

[3 hours] Formulation of isoperimetric elements, coordinate transformation, solids of revolution, bending of flat plates, general shell elements, dynamics, vibrations and time dependent problems, geometric and material nonlinearity. Prerequisite: MIME 5280 or CIVE 6310

**MIME 6350 ELASTICITY**

[3 hours] Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates. Prerequisite: Graduate standing

**MIME 6360 PLASTICITY**

[3 hours] Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes. Prerequisite: Graduate standing

**MIME 6380 FRACTURE MECHANICS**

[3 hours] Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastic-plastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation. Prerequisite: Graduate standing

**MIME 6410 VISCOUS FLOW**

[3 hours] An advanced course in viscous fluid flow. Topics include relationships between boundary layer and viscous flow, laws of conservation of mass and momentum, exact solutions, similarity solutions, creeping flow, boundary layer concept, stability of laminar flows, small-disturbance stability, linearized stability of parallel flows and transition to turbulence. Prerequisite: Graduate standing

**MIME 6420 CONDUCTION**

[3 hours] Theoretical analysis of problems in steady-state and transient heat conduction with constant and variable material properties, heat-source systems, Laplace transform techniques, numerical and computer solutions, analogies. Prerequisite: Graduate standing

**MIME 6430 ADVANCED THERMODYNAMICS**

[3 hours] Second law of thermodynamics based on statistical mechanics. Prediction of properties from microscopic data based on statistical mechanics. General thermodynamic relations to include Maxwell relations and the Clapeyron equation, prediction of unmeasurable property changes from equations of state for condensed phases and real gases. Thermodynamic equilibrium of chemical reacting species. Single and multiphase equilibria in ideal and real solutions.

**MIME 6440 COMPUTATIONAL FLUID DYNAMICS I**

[3 hours] Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations. Prerequisite: MIME 6170 or consent of instructor

**MIME 6450 EXPERIMENTAL FLUID MECHANICS**

[3 hours] Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow. Prerequisite: Graduate standing

**MIME 6510 BOUNDARY LAYER THEORY**

[3 hours] This course covers laminar and turbulent boundary layer theory. Topics include boundary layer equations, separation, similarity, 2-D and 3D, control, integral methods, turbulence, stability, transition and heat transfer. Prerequisite: Graduate standing

**MIME 6520 CONVECTION**

[3 hours] Study of convection processes involving the transfer of heat, mass and momentum. Boundary layer theory. Analogy between heat and momentum transfer. Condensation and boiling, two-phase flow, diffusion, mass transfer between phases. Prerequisite: MIME 6000/8000

**MIME 6540 COMPUTATIONAL FLUID DYNAMICS II**

[3 hours] Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications. Prerequisite: MIME 6440

**MIME 6550 TURBULENT FLOW**

[3 hours] Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow. Prerequisite: MIME 6150 or consent of instructor

**MIME 6560 COMBUSTION**

[3 hours] Physics and chemistry of combustion processes; chemical thermodynamics; chemical kinetics; heat and mass transfer in the combustion of gas, liquid and solid fuels; flame speed determination; applications to combustion efficiency, pollutant formation and combustor design. Prerequisite: Graduate standing

**MIME 6630 APPLIED STATISTICAL METHODS**

[3 hours] Techniques of statistical analysis which are applicable in a modern day manufacturing environment. Course is meant to provide the student having little or no background in the statistical areas with a sufficiently disciplined course to use statistical methods. Prerequisite: Graduate standing

**MIME 6640 INVENTORY THEORY**

[3 hours] Mathematical models of inventory and production systems. Consideration of static and dynamic problems under the influence of deterministic probabilistic demand. Demand forecasting using Box-Jenkins models of adaptive forecasting. Consideration of echelon inventory problems. Prerequisite: Graduate standing

**MIME 6670 QUEUING THEORY**

[3 hours] Single channel and multichannel queuing problems with Poisson arrivals and negative exponential service times. Single and multichannel systems with general service disciplines. Priority queues, busy period and waiting time distributions. Prerequisite: Graduate standing

**MIME 6720 DESIGN OF EXPERIMENTS**

[3 hours] Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests. Prerequisite: Graduate standing

**MIME 6740 OPTIMIZATION THEORY AND APPLICATIONS**

[3 hours] A consideration of general systems optimization techniques: classical calculus methods, Lagrange multipliers, linear and nonlinear programming, penalty functions, search methods and dynamic programming. Applications to design and manufacturing problems. Prerequisite: Graduate standing

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### **MIME 6780 ADVANCED ENGINEERING MANAGEMENT**

[3 hours] Classical analysis of the theories of organization and management applied to engineering and high technology management. Prerequisite: Graduate standing

### **MIME 6790 HUMAN-MACHINE SYSTEMS**

[3 hours] Measures of effectiveness for a human-machine system. Design of the system to effect the optimum operation. Emphasis on quantitative models for studying information processing, control and decision making aspects of human performance in human-machine system. Prerequisite: MIME 5050

### **MIME 6800 ADVANCED MANUFACTURING SYSTEMS ENGINEERING**

[3 hours] Advanced studies of traditional manufacturing processes and advanced manufacturing systems with emphasis on manufacturing engineering processes and equipment, machine tools, process planning, design and operation of manufacturing systems. Prerequisite: Graduate standing

### **MIME 6810 ASSEMBLY AND JOINING PROCESSES**

[3 hours] This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example. Prerequisite: Graduate standing

### **MIME 6900 INDEPENDENT RESEARCH**

[1-16 hours] Research credit hours toward the Master of Science degree in Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their thesis/dissertation adviser. Prerequisite: Graduate standing

### **MIME 6920 SPECIAL PROJECTS**

[1-6 hours] A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering. Prerequisite: Consent of MIME Faculty Member

### **MIME 6930 GRADUATE SEMINAR**

[1 hour] This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree. Prerequisite: Graduate standing

### **MIME 6960 GRADUATE RESEARCH AND THESIS**

[1-9 hours] Masters thesis research. Prerequisite: Graduate standing

### **MIME 6980 SPECIAL TOPICS**

[1-6 hours] A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member. Prerequisite: Consent of MIME Faculty Member

### **MIME 6990 INDEPENDENT STUDY**

[1-6 hours] An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering. Prerequisite: Consent of MIME Faculty Member

### **MIME 8000 ADVANCED ENGINEERING MATHEMATICS I**

[3 hours] An advanced course in mathematical analysis for engineers. Topics include matrix methods, eigenvalues and eigenvectors, systems of equations, series representations including FFT, ordinary differential equations and Bessel functions. This course will make use of computer-aided-mathematics techniques and include engineering applications. Prerequisite: Graduate standing

### **MIME 8100 ADVANCED ENGINEERING MATHEMATICS II**

[3 hours] Partial differential equations for engineering applications including elliptic, parabolic, hyperbolic differential and non-linear systems of equations. Solution procedures include separation of variables, Laplace transform methods, solutions using complex analysis including conformal mapping and numerical methods. Prerequisite: MIME 8000 or consent of instructor

### **MIME 8120 ADVANCED MEASUREMENT SYSTEMS**

[3 hours] Sensor selection, data acquisition system selection, evaluation of system response, digital sampling theory, statistical data analysis, space-time correlations, spectral analysis, analog and digital signal conditioning, and static and dynamic measurements. Prerequisite: Graduate standing.

### **MIME 8150 APPLIED NUMERICAL METHODS**

[3 hours] An advanced course in mathematical analysis for engineers. Topics include real and complex solutions to polynomial and transcendental equations, approximate interpolation and integration procedures, matrix methods, solutions of systems of nonlinear equations, ordinary and partial differential equations. Prerequisite: Graduate standing

### **MIME 8180 MICRO ELECTRO MECHANICAL SYSTEMS**

[3 hours] Current design and methods in micromachining mechanical and electrical components on silicon wafers with an emphasis on mechanical as well as the LIGA Microcasting techniques. Both prototyping and mass production practices will be covered. Prerequisite: Graduate standing

### **MIME 8190 MECHATRONICS**

[3 hours] Design, analysis and synthesis of integrated electromechanical systems. Transducer models, signal conditioning and power amplification, and analog-to-digital interfaces. Topics will focus on mechanical engineering applications of process control and data acquisition. Prerequisite: Graduate standing

### **MIME 8200 ADVANCED DYNAMICS**

[3 hours] Study of dynamics of a system of particles and rigid bodies using Newtonian and Lagrangian Mechanics including multi-body systems. Principles of nonlinear system dynamics and stability. Prerequisite: Graduate standing

### **MIME 8210 ADVANCED MECHANICAL VIBRATIONS**

[3 hours] Advanced concepts in normal mode theory for discrete systems and vibration of continuous systems such as bars, beams and plates. Prerequisite: Graduate standing

### **MIME 8230 CAD-SURFACE MODELING**

[3 hours] Theory and implementation of contemporary parametric sculptured surface modeling technology. Non-uniform rational B-spline [NURBS] curves and surfaces. Fundamental computational algorithms, construction techniques and advanced modeling topics. Prerequisite: Graduate standing and programming experience in Matlab or C.

### **MIME 8300 CONTINUUM MECHANICS**

[3 hours] A unified approach to the study of the mechanics of continuous media; analysis of tensors; kinematics of material media; analysis of deformation and stress; the mathematical statement of the laws of conservation of mass, momentum and energy; formulation of the mechanical constitutive equations for various classes of solids and fluids. Prerequisite: Graduate standing

### **MIME 8320 ADVANCED FINITE ELEMENT METHODS**

[3 hours] Formulation of isoperimetric elements, coordinate transformation, solids of revolution, bending of flat plates, general shell elements, dynamics, vibrations, and time dependent problems, geometric and material nonlinearity. Prerequisite: MIME 7280 or CIVE 8310

### **MIME 8350 ELASTICITY**

[3 hours] Review of tensor analysis, analysis of stress and strain, three dimensional equations of elasticity, plane problems in rectangular Cartesian and polar coordinates. Prerequisite: Graduate standing

### **MIME 8360 PLASTICITY**

[3 hours] Review of elastic stress-strain relations, analysis of strain rate and concept of stress rate, criteria of yielding and rules of plastic flow, elastoplastic bending and torsion, theory of slipline fields, mechanics of metal forming processes. Prerequisite: Graduate standing

### **MIME 8380 FRACTURE MECHANICS**

[3 hours] Principles of fracture mechanics and its applications to the prevention of fractures in components and structures, linear elastic and elastoplastic fracture mechanics, fracture mechanisms, fracture toughness, applications to fatigue crack propagation. Prerequisite: Graduate standing

### **MIME 8410 VISCOUS FLOW**

[3 hours] An advanced course in viscous fluid flow. Topics include relationships between boundary layer and viscous flow, laws of conservation of mass and momentum, exact solutions, similarity solutions, creeping flow, boundary layer concept, stability of laminar flows, small-disturbance stability, linearized stability of parallel flows and transition to turbulence. Prerequisite: Graduate standing

### **MIME 8420 CONDUCTION**

[3 hours] Theoretical analysis of problems in steady-state and transient heat conduction with constant and variable material properties, heat-source systems, Laplace transform techniques, numerical and computer solutions, analogies. Prerequisite: Graduate standing



**MIME 8440 COMPUTATIONAL FLUID DYNAMICS I**

[3 hours] Properties of various partial differential equations. Basics of finite difference methods. Governing equations of fluid mechanics and heat transfer. Numerical solution of inviscid flow equations. Methods for solving Euler equations. Treatment of shock waves. Applications to simple compressible flows. Numerical methods for boundary-layer type equations. Prerequisite: MIME 8170 or consent of instructor

**MIME 8450 EXPERIMENTAL FLUID MECHANICS**

[3 hours] Digital data acquisition and analysis; limitations and interpretation of physical measurements; sources of errors and difficulties in experimental technique; advanced experimental methods for static and dynamic measurements in thermal systems and fluid flow. Prerequisite: Graduate standing

**MIME 8510 BOUNDARY LAYER THEORY**

[3 hours] This course covers laminar and turbulent boundary layer theory. Topics include boundary layer equations, separation, similarity, 2-D and 3D, control, integral methods, turbulence, stability, transition, and heat transfer. Prerequisite: Graduate standing

**MIME 8520 CONVECTION**

[3 hours] Study of convection processes involving the transfer of heat, mass and momentum. Boundary layer theory. Analogy between heat and momentum transfer. Condensation and boiling, two-phase flow, diffusion, mass transfer between phases. Prerequisite: MIME 6000/8000

**MIME 8540 COMPUTATIONAL FLUID DYNAMICS II**

[3 hours] Finite difference procedures applied to the solution of reduced forms of the Navier-Stokes equations. Numerical solution of compressible and incompressible forms of the Navier-Stokes equations for laminar and turbulent flows. Fundamental turbulence models. Solution enhancement methods including multi-grid schemes and the use of preconditioning. Grid generation procedures using algebraic and differential equation methods. Structured versus unstructured grid methods. Grid adaptation procedures. Computer program applications. Prerequisite: MIME 8440

**MIME 8550 TURBULENT FLOW**

[3 hours] Study of the nature, origin and dynamics of turbulence. Governing equations of turbulent flows. Internal and external flows. Aspects of free shear flow, turbulent boundary layers and statistical descriptions are presented. Numerical and experimental methods applied to turbulent flow. Prerequisite: MIME 8150 or consent of instructor

**MIME 8560 COMBUSTION**

[3 hours] Physics and chemistry of combustion processes; chemical thermodynamics; chemical kinetics; heat and mass transfer in the combustion of gas, liquid and solid fuels; flame speed determination; applications to combustion efficiency, pollutant formation and combustor design. Prerequisite: Graduate standing

**MIME 8630 APPLIED STATISTICAL METHODS**

[3 hours] Techniques of statistical analysis which are applicable in a modern day manufacturing environment. Course is meant to provide the student having little or no background in the statistical areas with a sufficiently disciplined course to use statistical methods. Prerequisite: Graduate standing

**MIME 8640 INVENTORY THEORY**

[3 hours] Mathematical models of inventory and production systems. Consideration of static and dynamic problems under the influence of deterministic probabilistic demand. Demand forecasting using Box-Jenkins models of adaptive forecasting. Consideration of echelon inventory problems. Prerequisite: Graduate standing

**MIME 8670 QUEUING THEORY**

[3 hours] Single channel and multichannel queuing problems with Poisson arrivals and negative exponential service times. Single and multichannel systems with general service disciplines. Priority queues, busy period and waiting time distributions. Prerequisite: Graduate standing

**MIME 8720 DESIGN OF EXPERIMENTS**

[3 hours] Design and analysis of experiments including analysis of variance and regression analysis. Factorial, blocked and nested models are considered together with appropriate estimation and post ANOVA tests. Prerequisite: Graduate standing

**MIME 8740 OPTIMIZATION THEORY AND APPLICATIONS**

[3 hours] A consideration of general systems optimization techniques: classical calculus methods, Lagrange multipliers, linear and nonlinear programming, penalty functions, search methods and dynamic programming. Applications to design and manufacturing problems. Prerequisite: Graduate standing

**MIME 8780 ADVANCED ENGINEERING MANAGEMENT**

[3 hours] Classical analysis of the theories of organization and management applied to engineering and high technology management. Prerequisite: Graduate standing

**MIME 8800 ADVANCED MANUFACTURING SYSTEMS ENGINEERING**

[3 hours] Advanced studies of traditional manufacturing processes and advanced manufacturing systems with emphasis on manufacturing engineering processes and equipment, machine tools, process planning, design an operation of manufacturing systems. Prerequisite: Graduate standing

**MIME 8810 ASSEMBLY AND JOINING PROCESSES**

[3 hours] This course is comprised of two parts: joining processes and assembly systems. Commonly used joining methods, such as welding, mechanical fastening and adhesion are discussed. General principles of assembly are presented with extensive use of automobile assembly as an example. Prerequisite: Graduate standing

**MIME 8900 INDEPENDENT RESEARCH**

[1-16 hours] Research credit hours toward the doctoral degree for students in the mechanical, industrial and manufacturing engineering department. Students are to use the section number of their dissertation adviser. Prerequisite: Graduate standing

**MIME 8920 SPECIAL PROJECTS**

[1-6 hours] A special project by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students interested in mechanical, industrial or manufacturing engineering. Prerequisite: Consent of MIME faculty member

**MIME 8930 GRADUATE SEMINAR**

[1 hour] This is a seminar for graduate students in Mechanical, Industrial and Manufacturing Engineering. Topics include orientation to the graduate program and special topics by speakers from industry and other universities. Credit does not apply toward a graduate degree. Prerequisite: Graduate standing

**MIME 8960 DISSERTATION**

[1-16 hours] Doctoral dissertation research credit hours for students in the Mechanical, Industrial and Manufacturing Engineering Department. Students are to use the section number of their dissertation adviser. Prerequisite: Graduate standing.

**MIME 8980 SPECIAL TOPICS**

[1-6 hours] A special topic at the graduate level in Mechanical, Industrial or Manufacturing Engineering to be offered as a course during a term by a faculty member. Prerequisite: Consent of MIME faculty member

**MIME 8990 INDEPENDENT STUDY**

[1-6 hours] An independent study by the student to investigate or solve an acceptable problem in industrial or mechanical engineering. This course is primarily intended for graduate students in mechanical, industrial or manufacturing engineering. Prerequisite: Consent of MIME faculty member

## MKTG - Marketing

### Department of Marketing (BUS)

**MKTG 3130 SUPPLY CHAIN MANAGEMENT**

[3 hours] Examination of the role of logistics and supply chain management in creating value and as sources of competitive advantage. Analysis of transportation, warehousing, inventory management and materials management. Prerequisite: BUAD 2080

**MKTG 3140 INTERNATIONAL MARKETING**

[3 hours] Course focuses on developing an international marketing plan. Global market screening, selection and development of a plan of action are explored in hands-on learning experience. Prerequisite: BUAD 3010

**MKTG 3170 MARKETING FOR NON-PROFIT ORGANIZATIONS**

[3 hours] An introduction to marketing for non-business students. Focus is on planning and executing marketing programs in not-for-profit organizations. No credit for CBA students.

**MKTG 3200 MARKETING, ORGANIZATION, SOCIETY, AND ETHICS**

[3 hours] A macro approach to marketing utilizing readings and cases on topics related to the interface between managerial marketing and external socio-economic systems. Prerequisite: BUAD 3010

**MKTG 3260 GLOBAL FRAMEWORK FOR E-COMMERCE**

[3 hours] A study on how firms can capitalize on the Internet to conduct business internationally, assess e-commerce readiness in key regions, localize Web presence and contents and build business service infrastructures. Prerequisite: BUAD 2080, junior standing

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### **MKTG 3280 INTERNET MARKETING**

[3 hours] A study of Internet-based marketing management, including market opportunity and environmental assessment, Web presence and value propositions, and special issues concerning marketing mix design and implementation. Prerequisite: MKTG 3010

### **MKTG 3690 PRINCIPLES OF MARKETING COMMUNICATIONS**

[3 hours] Focuses on communication tools in marketing: advertising, sales promotion, specialty advertising, packaging, publicity, direct marketing and personal selling. Attention to managerial decision making, legal and ethical aspects of promotion. Prerequisite: BUAD 3010

### **MKTG 3850 BUYER BEHAVIOR AND RELATIONSHIP MARKETING**

[3 hours] Utilization of the behavioral sciences for the analysis of both consumer and business markets. Designing marketing programs to build strong seller-buyer relationships. Prerequisite: BUAD 3010

### **MKTG 3870 ADVERTISING STRATEGY**

[3 hours] Project-oriented course providing hands-on experience in advertising campaign design. Emphasis on strategy and application involved in advertising. Prerequisite: MKTG 3690

### **MKTG 3880 MARKETING RESEARCH AND DATA-BASED MANAGEMENT**

[3 hours] This course addresses the fundamentals of marketing information system, marketing research and data-based marketing. Emphasis is on searching, developing and providing customer information for marketing decision making. Prerequisite: BUAD 3010

### **MKTG 3910 DIRECT MARKETING**

[3 hours] Techniques used and problems encountered in direct marketing. Analysis of the various marketing strategies, with an emphasis on promotions and media employed. Analysis of the social issues of direct marketing is included. Prerequisite: BUAD 3010

### **MKTG 4120 MARKETING CHANNEL MANAGEMENT**

[3 hours] Channel structure and institutions, logistics, transportation, channel design, channel operations, behavioral dimensions such as leadership, conflict, cooperation and control. Prerequisite: BUAD 3010

### **MKTG 4130 MARKETING ANALYSIS AND DECISION MAKING**

[3 hours] This capstone course, which focuses on small and global firms, is designed to sharpen students' integrative decision-making abilities through case analysis and a simulation or project-based analysis experience. Prerequisite: MKTG 3880, 3850; 3 hours of MKTG elective

### **MKTG 4220 INTERNATIONAL SOURCING, LOGISTICS AND TRANSPORTATION**

[3 hours] Physical supply, logistics and transportation functions are discussed within the context of a global marketplace, global business operations and international trade. Prerequisite: BUAD 2080

### **MKTG 4520 ADVANCED MARKET ANALYSIS**

[3 hours] A course designed for students interested in market analysis and marketing research who wish further training in market analysis tools, research methodology, data analysis and analytical decision making models. Prerequisite: BUAD 3010

### **MKTG 4540 BUSINESS MARKETING**

[3 hours] Analysis of business markets and development of programs to market industrial business-to-business products/services. Prerequisite: BUAD 3010

### **MKTG 4570 PRODUCT AND PRICING MANAGEMENT**

[3 hours] Developing, analyzing, organizing, planning, implementing and controlling the organization's product and pricing policies. Both existing and new products will be considered. Prerequisite: BUAD 3010

### **MKTG 4940 MARKETING INTERNSHIP**

[1-3 hours] Receive practical business experience working in an organization. Prerequisite: Permission of adviser

### **MKTG 4980 SPECIAL TOPICS**

[3 hours] Analysis of current issues in Marketing, International Business, or Business Economics. Prerequisite: Permission of instructor

### **MKTG 4990 INDEPENDENT STUDY**

[1-3 hours] Independent study in marketing, international business, or business economics. Student must submit a proposal to be approved by a department faculty member prior to enrolling in the course. Prerequisite: Permission of instructor

### **MKTG 5170 MARKETING FOR NON-PROFIT ORGANIZATIONS**

[3 hours] An introduction to marketing for non-business students. Focus is on planning and executing marketing programs in not-for-profit organizations. No credit for CBA students.

### **MKTG 5410 MARKETING SYSTEMS**

[3 hours] Examines the areas of marketing management, marketing functions and institutions, and the role of marketing in the organization. The course explores the relationship between marketing and the environment. Prerequisite: Graduate standing

### **MKTG 6080 INTERNATIONAL SUPPLY MANAGEMENT**

[3 hours] Physical supply, logistics, transportation, sourcing and negotiating within a global context are evaluated. Impact of global business operations and world trade are discussed. Prerequisite: Graduate standing

### **MKTG 6120 MARKETING MANAGEMENT**

[3 hours] This course focuses on the application of marketing concepts and techniques to marketing problems. Emphasis is on decision-making using cases, simulation and computer analyses. Prerequisite: MKTG 5410

### **MKTG 6200 MARKET STRUCTURE**

[3 hours] Interdisciplinary (economics, psychology, geography, marketing, marketing channel) approach to analyzing and understanding markets (market structure). Product, pricing, promotion and channel management decisions taught as a function of market structure. Prerequisite: MKTG 5410

### **MKTG 6210 BUYER BEHAVIOR**

[3 hours] Explores behavioral dimensions of buyers focusing on psychological processes, individual differences, interpersonal influences, environmental influences, and incorporating these individual, group, and contextual influences into strategic marketing decisions. Prerequisite: MKTG 5410

### **MKTG 6230 MARKETING RESEARCH AND INFORMATION SYSTEMS**

[3 hours] Contemporary information sources for the development and implementation of marketing information system and decision support system, marketing research techniques, and their applications to marketing problems to assist marketing management. Prerequisite: MKTG 5410

### **MKTG 6290 BUSINESS MARKETING**

[3 hours] Nature, structure, and managerial problems and processes in the field of business-to-business marketing. Prerequisite: MKTG 5410/7410 or equivalent

### **MKTG 6400 INTERNATIONAL MARKETING**

[3 hours] This course focuses on identifying and servicing foreign market opportunities. Skills in research, strategic and tactical analysis, and adaptation are developed. Prerequisite: MKTG 6390

### **MKTG 6960 MBA THESIS**

[1-3 hours] Master's thesis. Requires student to submit for approval a written proposal. Faculty member must approve proposal and organize thesis committee to supervise project. Prerequisite: Faculty permission

### **MKTG 6980 SPECIAL TOPICS**

[3 hours] Current issues/developments in marketing, international business, or business economics are discussed. Prerequisite: Faculty permission

### **MKTG 6990 INDEPENDENT STUDY**

[1-3 hours] Independent study in marketing, international business, or business economics. A proposal for the independent study must be approved by faculty member and department chair. Prerequisite: Faculty permission

### **MKTG 7410 MARKETING SYSTEMS**

[3 hours] Examines the areas of marketing management, marketing functions and institutions, and the role of marketing in the organization. The course explores the relationship between marketing and the environment. Prerequisite: Graduate standing

### **MKTG 8290 BUSINESS MARKETING**

[3 hours] Nature, structure, and managerial problems and processes in the field of business-to-business marketing. Prerequisite: MKTG 5410/7410, Ph.D. status

## **MLS - Master of Liberal Studies**

### **Master of Liberal Studies Program (ARS)**

#### **MLS 6010 MLS SEMINAR IN HUMANITIES**

[3 hours] Introduction to the concerns and methods of graduate study in the Humanities. This course will demonstrate, through readings from different eras, the interrelated nature of literature, philosophy and history. Prerequisite: Graduate status

#### **MLS 6020 MLS SEMINAR IN SOCIAL SCIENCES**

[3 hours] Drawing from major principles and concepts in the social sciences, this course examines issues of the individual and society from a range of disciplinary approaches. Special topics vary. Prerequisite: Graduate status

**MLS 6030 MLS SEMINAR IN NATURAL SCIENCES**

[3 hours] This course discusses the major ideas of the natural sciences in terms of their impact upon the human species. Specific topics vary. Prerequisite: Graduate status

**MLS 6040 MLS SEMINAR IN THE VISUAL AND PERFORMING ARTS**

[3 hours] An examination of the concept of creativity in the fields of visual art, theater, dance and music. Topics covered vary with instructor. Prerequisite: Graduate status

**MLS 6400 STUDIES IN HUMANITIES**

[1-6 hours] Individually supervised study in the humanities. Permission of the director required. May be repeated for additional credit. Prerequisite: Admission to MLS Program; permission of the director

**MLS 6500 STUDIES IN SOCIAL SCIENCES**

[1-6 hours] Individually supervised study in the social sciences. Permission of the director required. May be repeated for additional credit. Prerequisite: Admission to MLS Program; permission of the director

**MLS 6600 STUDIES IN NATURAL SCIENCES**

[1-6 hours] Individually supervised study in the natural sciences. Permission of the director required. May be repeated for additional credit. Prerequisite: Admission to MLS Program; permission of the director

**MLS 6700 STUDIES IN THE VISUAL AND PERFORMING ARTS**

[1-6 hours] Individualized or small-group study in the visual and performing arts. Prerequisite: Permission of the director

**MLS 6990 MLS THESIS**

[1-6 hours] Permission of the Director required. May be repeated for additional credit. Prerequisite: Admission to MLS Program; permission of the director

## MSL - Military Science and Leadership

### Department of Military Science (HHS)

**MSL 1010 FOUNDATIONS OF OFFICERSHIP**

[2 hours] Introduces students to issues and competencies that are central to a commissioned officer's responsibilities. Establishes a framework for understanding leadership, officership, Army values, physical fitness and time management. Leadership Lab required.

**MSL 1020 BASIC LEADERSHIP**

[2 hours] Builds upon the basic leadership fundamentals introduced in MSL 1010 and includes lessons in goal setting, problem solving, critical thinking, values clarification, leadership and followership, and introduces techniques for improving listening and speaking skills. Leadership Lab required.

**MSL 1030 INTRODUCTION TO PHYSICAL FITNESS**

[1 hour] Students participate in the U.S. Army's physical fitness program three days each week. The sessions include running, strength exercises, agility exercises and organized sports.

**MSL 1040 PHYSICAL FITNESS**

[1 hour] Students participate in the U.S. Army's physical fitness program three days each week. The sessions build upon the fitness level previously achieved.

**MSL 2010 INDIVIDUAL LEADERSHIP STUDIES**

[3 hours] Identifies successful leadership characteristics through observation of others and self, using experiential learning exercises designed to teach students how to communicate, how to build teams and how to plan and organize effectively. Leadership Lab required.

**MSL 2020 LEADERSHIP AND TEAMWORK**

[3 hours] Students examine how to build successful teams, including methods for influencing action and achieving goals, effective communication techniques, values and ethics, problem solving and physical fitness. Leadership Lab required.

**MSL 2030 PHYSICAL TRAINING I**

[1 hour] Students participate in physical training three times each week. Students learn how to conduct and lead a military physical training session.

**MSL 2040 PHYSICAL TRAINING II**

[1 hour] Students participate in physical training three times each week. The sessions build upon the training level previously achieved.

**MSL 2200 LEADER'S TRAINING COURSE**

[3 hours] This training is a six week course in leadership management and interpersonal skills taught at Ft. Knox, Kentucky. The training compresses the Military Science 1000 and 2000-level courses. Camp graduates are eligible to enter the Army ROTC Advanced course. Prerequisite: Permission of department

**MSL 2990 INDEPENDENT STUDY IN MILITARY SCIENCE**

[1-3 hours] Students will study an appropriate subject mutually agreed upon between the student and instructor. Prerequisite: Permission of instructor

**MSL 3010 LEADERSHIP AND PROBLEM SOLVING**

[3 hours] Students assess leadership abilities, plan and conduct individual and small unit training, and apply basic tactical principles and reasoning skills. Leadership Lab required

**MSL 3020 LEADERSHIP AND ETHICS**

[3 hours] Examines the role that communications, values and ethics play in effective leadership. Topics include ethical decision making, consideration of others and Army Leadership Doctrine. Leadership Lab required.

**MSL 3030 PHYSICAL FITNESS PLANNING I**

[1 hour] Students design and implement weekly physical training sessions. In addition, they learn how to supervise a group training session. Corequisite: MSL 3010

**MSL 3040 PHYSICAL FITNESS PLANNING II**

[1 hour] Students design and implement weekly physical training sessions. The sessions build upon the skill level previously achieved. Corequisite: MSL 3020

**MSL 3600 AIRBORNE OPERATIONS**

[1 hour] Three weeks of intensive field training conducted at Ft. Benning, Georgia. Combines the study of military airborne operations, strenuous physical conditioning, military parachute techniques and culminates with five parachute jumps from military aircraft. Prerequisite: Permission of department

**MSL 3700 CADET TROOP LEADERSHIP TRAINING (CTLT)**

[2 hours] Three weeks of practical experience serving as a platoon leader with U.S. Army soldiers. This training puts the student in leadership situations and allows them to practice and hone their leadership skills in a real world environment. Prerequisite: Permission of department

**MSL 3800 AIR ASSAULT OPERATIONS**

[1 hour] Two weeks of intensive field training conducted at an Army installation. Combines the study of Military Heliborne Operations, strenuous physical conditioning and advanced rappelling. Culminates with 4 rappels from a military helicopter. Prerequisite: Permission of department

**MSL 3850 LEADERS DEVELOPMENT AND ASSESSMENT COURSE**

[3 hours] This is an intense five-week course conducted between the junior and senior year. This concentrated practical training provides an opportunity to evaluate the student's application of academic knowledge over a myriad of leadership situations and tasks. Prerequisite: Permission of department

**MSL 3990 INDEPENDENT STUDY IN MILITARY SCIENCE**

[1-3 hours] Students will study an appropriate subject mutually agreed upon between the student and instructor. Prerequisite: Permission of instructor

**MSL 4010 LEADERSHIP AND STAFF MANAGEMENT**

[3 hours] Develops student proficiency in planning and executing complex operations, functioning as a member of a staff and mentoring subordinates. Students explore the Army's training management system, methods of effective staff collaboration and developmental counseling techniques.

**MSL 4020 OFFICERSHIP**

[3 hours] Course includes a case study analysis of military law and practical exercises on establishing an ethical command climate. Students complete a semester-long Senior Leadership Project that requires them to plan, organize, analyze and demonstrate their leadership skills.

**MSL 4030 ADVANCED PT PLANNING I**

[1 hour] Students design and implement a physical training program for the entire semester. They supervise and critique implementation of the MS 3030 students' weekly training plans. Corequisite: MSL 4010

**MSL 4040 ADVANCED PT PLANNING II**

[1 hour] Students design and implement a physical training program for the entire semester. The sessions build upon the skill level previously achieved. Corequisite: MSL 4020

**MSL 4800 GETTYSBURG: A MILITARY HISTORY**

[3 hours] An in-depth study of the battle and its place in American history, examining combat leadership and the decision making process at both the operational and tactical level.

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### **MSL 4990 INDEPENDENT STUDY IN MILITARY SCIENCE**

[1-3 hours] Students will study an appropriate subject mutually agreed upon between the student and instructor. Prerequisite: Permission of instructor

## **MUS - Music**

### **Department of Music and Dance (ARS)**

#### **MUS 1000 RECITAL**

[0 hours] Required for music majors. Weekly student recitals. :01 Recital. :02 Recital Music Education Lab Ensemble. Students register to fulfill 5-semester requirement only when the lab is not included in a course taken during the semester. :03 recital. Required for music majors and minors until the department concert/recital attendance is completed. :04 Recital. FYI section for Music Education.

#### **MUS 1200 GROUP GUITAR FOR THE NON-MAJOR**

[3 hours] Basic guitar skills: note reading, chords, accompaniment, variety of musical styles. Includes rhythmic and aural training, theory and ensemble playing. Students must provide acoustic guitars. May be repeated for credit.

#### **MUS 1250 GROUP PIANO FOR THE NON-MAJOR I**

[2 hours] Classical and popular literature in a variety of styles and period will be explored. May be repeated for credit. Students may take P/NC.

#### **MUS 1260 GROUP PIANO FOR THE NON-MAJOR II**

[2 hours] Continuation of MUS 1250. Classical and popular literature in a variety of styles and period will be explored. May be repeated for credit. Students may take P/NC. Prerequisite: MUS 1250 or permission of instructor

#### **MUS 1280 GROUP VOICE FOR THE NON-MAJOR**

[3 hours] Develops basic vocal techniques with attention to the principles of voice production, vowel formation, breathing, articulation and flexibility. May be repeated for credit. Open to all students regardless of major. Students may take P/NC.

#### **MUS 1500 STRING CLASS**

[2 hours] Required in instrumental music education cluster and B.M. (strings). Principles, concepts, difficulties typical of stringed instruments and pedagogy addressed through performance. Includes lab ensemble and video recording technology. Includes MUS 1000:002.

#### **MUS 1530 BRASS CLASS**

[2 hours] Required in instrumental music education cluster and B.M. (brass). Principles, concepts, difficulties typical of brass instruments and pedagogy addressed through performance. Includes lab ensemble and video recording technology. Includes MUS 1000:002.

#### **MUS 1550 WOODWINDS CLASS**

[2 hours] Required in instrumental music education cluster and B.M. (woodwind). Principles, concepts, difficulties typical of woodwind instruments and pedagogy addressed through performance. Includes lab ensemble and video recording technology. Includes MUS 1000:002.

#### **MUS 1560 INSTRUMENTAL CLASS**

[3 hours] Required Fall Semester, sophomore year, in the Choral/General Music Education cluster. An overview of principles, concepts and difficulties typical of string, brass, woodwind and percussion instruments. Includes MUS 1000:002.

#### **MUS 1570 PIANO CLASS FOR MUSIC MAJORS I**

[1 hour] Provides instruction in keyboard skills required for the various degree programs. Progressive sequence of courses stressing technique, repertoire, sight reading, harmonization, improvisation and transposition. Includes keyboard technology. May only be taken P/NC.

#### **MUS 1580 PIANO CLASS FOR MUSIC MAJORS II**

[1 hour] Provides instruction in keyboard skills required for the various degree programs. Progressive sequence of courses stressing technique, repertoire, sight reading, harmonization, transposition. Includes keyboard technology. May only be taken as P/NC. Prerequisite: MUS 1570 or permission of instructor

#### **MUS 1590 JAZZ PIANO CLASS**

[1 hour] Provides instruction in jazz keyboard skills, including jazz techniques, voicings, repertoire, sight reading and harmonization. Prerequisite: MUS 1570 or equivalent proficiency exam or permission of instructor

#### **MUS 1610 MUSIC THEORY AND EAR TRAINING I**

[4 hours] Dictation, ear training and sight singing skills in rhythm, melody and harmony. Basic theoretical skills include key signatures, clefs, notation of scales, chords and rhythm patterns. Includes computer technology. Prerequisite: Music major or permission of instructor Corequisite: Minor or class piano instruction until the degree piano requirement is met.

#### **MUS 1620 MUSIC THEORY AND EAR TRAINING II**

[4 hours] Continuation of 1610. Emphasis on melody dictation and sight singing. Additional skill development in harmonizations, figured bass and study of basic forms. Includes computer technology. Prerequisite: MUS 1610 Corequisite: Minor or class piano instruction until the degree piano requirement is met

#### **MUS 1700 JAZZ FUNDAMENTALS**

[2 hours] Introduction to jazz performance practices, nomenclature, chord and music notation, analysis and improvisation. Prerequisite: MUS 1610

#### **MUS 2010 UNIVERSITY BAND**

[1-2 hours] Open to any qualified student. Sections :01 Rocket Marching Band, :02 Symphonic Band, :03 University Wind Ensemble, and :04 Varsity Band. Sections :01, :02, and :03 fulfill the large ensemble participation requirement. Prerequisite: Audition required for Section :03 University Wind Ensemble only

#### **MUS 2020 JAZZ BAND**

[1-2 hours] Open to any qualified student. Fulfills the large ensemble participation requirement for jazz majors only. Prerequisite: Audition

#### **MUS 2090 UNIVERSITY ORCHESTRA**

[1-2 hours] Open to any qualified student. Fulfills the large ensemble participation requirement for instrumentalists. Prerequisite: Audition

#### **MUS 2140 CONCERT CHORALE**

[1-2 hours] A select group of singers. Fulfills the large ensemble participation requirement for vocalists. Prerequisite: Audition

#### **MUS 2200 MUSIC THEORY FOR THE NON-MAJOR**

[3 hours] Introduction to the fundamentals of music, including notation, key and time signatures, scales, intervals, chords, melodic and formal analysis and elementary compositional procedures. Students may take P/NC. Not for major credit. Humanities core course

#### **MUS 2210 INTRODUCTION TO MUSIC**

[3 hours] The study of vocal and instrumental music from the standard repertoire primarily through listening. Previous music training is not required, but regular listening is part of the course. Not for major credit. Students may take P/NC. Humanities core course

#### **MUS 2220 HISTORY OF JAZZ**

[3 hours] A study of the development of jazz styles including listening skills and historical perspectives. Because the major innovations and stylistic interpretations of jazz are a result of African Americans, the course includes a study of how their culture influenced the development of jazz. Students may take P/NC. Humanities core course U.S. multicultural

#### **MUS 2230 THE INNER WORKINGS OF MUSIC**

[3 hours] Addresses relationships among music as an art form and its effects on the listener. Also examines the role music plays in our everyday lives. No previous music experience required. Not for major credit. Humanities core course

#### **MUS 2240 HISTORY OF ROCK AND ROLL**

[3 hours] A study of the styles, techniques and history of rock and roll. Students may take P/NC. Not for major credit. Humanities core course

#### **MUS 2250 MUSICAL DIVERSITY IN THE UNITED STATES**

[3 hours] The cultures of various ethnic groups (Native Americans, African-American, Mennonite, Moravian, Creole and others) are examined, especially as they relate to the development of folk, popular and art music styles in the United States. This course includes listening. Students may take P/NC. Not for major credit. Humanities core course U.S. multicultural course

#### **MUS 2260 ELECTRONIC MUSIC**

[2 hours] Introduction to electronic music for non-majors. Electronic music as a part of music history. Techniques, literature, scientific advances, instrumental development. Hands-on learning using studio instruments, composition and recording.

#### **MUS 2270 RECORDING TECHNIQUES**

[2 hours] Examination of contemporary recording technology for live recording and studio applications. Emphasis on microphone placement, signal processing devices and multitrack mixdown techniques.

#### **MUS 2410 MUSIC HISTORY AND LITERATURE I: WORLD MUSIC AND JAZZ**

[3 hours] A study of music from various world cultures and jazz. A special emphasis is placed on developing listening skills. Prerequisite: Music major or minor, or permission of instructor

**MUS 2420 CULTURES AND MUSIC OF NON-WESTERN STYLES**

[3 hours] This course examines the following world cultures and their music-Indonesian, Chinese, Middle eastern, North African, South African, West African and Balkan Countries. Student may take P/NC. Humanities core course Non-western multicultural course

**MUS 2500 PERCUSSION CLASS**

[2 hours] Required for instrumental music education cluster and percussion performance majors. Percussion instruction for the prospective school music teacher and percussion performance majors, stressing playing techniques, methods and materials. Includes MUS 1000:002 and video recording technology.

**MUS 2530 DICTION FOR SINGERS I**

[1 hour] International Phonetic Alphabet mastery; pronunciation of English, German, Latin, Italian and French in relation to art song and aria form, emphasis on the sound of the language. Meets two hours per week.

**MUS 2540 DICTION FOR SINGERS II**

[1 hour] Continuation of MUS 2530. IPA; pronunciation of German and English in relation to art song and aria form; emphasis on the sound of the language. Meets two hours per week.

**MUS 2550 VOICE CLASS FOR MUSIC MAJORS**

[1 hour] For instrumental and keyboard majors. Develops basic vocal techniques with attention to the principles of voice production, vowel formation, breathing, articulation and flexibility. May be repeated for credit. Prerequisite: MUS 1620

**MUS 2570 PIANO CLASS FOR MUSIC MAJORS III**

[1 hour] Provides instruction in keyboard skills required for the various degree programs. Progressive sequence of courses stressing technique, repertoire, sight reading, harmonization, improvisation and transposition. Includes keyboard technology. May only be taken as P/NC. Prerequisite: MUS 1580 or permission of instructor

**MUS 2580 PIANO CLASS FOR MUSIC MAJORS IV**

[1 hour] Provides instruction in keyboard skills required for the various degree programs. Progressive sequence stressing technique, repertoire, sight reading, harmonization, improvisation and transposition. Includes keyboard technology. May only be taken as P/NC. Prerequisite: MUS 2570 or permission of instructor

**MUS 2610 MUSIC THEORY AND EAR TRAINING III**

[4 hours] Continuation of 1620. Students develop proficiency in all musical elements through analytical, written and aural studies. Primary materials are the common practice period literature and small formal units. Includes computer technology. Prerequisite: MUS 1620 Corequisite: Minor or class piano instruction until the degree piano requirement is met.

**MUS 2620 MUSIC THEORY AND EAR TRAINING IV**

[4 hours] Continuation of 2610. Students are introduced to contemporary topics, styles and music through analysis and creative assignments. Dictation and sight-singing studies will also develop topics from MUS 2610. Includes computer technology. Prerequisite: MUS 2610

**MUS 2700 JAZZ IMPROVISATION I**

[2 hours] Practical application of beginning jazz improvisation techniques as applied to modal, blues, and the chord-scale relationships, ear training, and style analysis as applied to jazz. Prerequisite: MUS 1700

**MUS 2710 JAZZ IMPROVISATION II**

[2 hours] Practical application of intermediate jazz improvisation techniques as applied to jazz standards and bebop playing. Prerequisite: MUS 2700

**MUS 2800 APPLIED MUSIC**

[1-4 hours] 1, 2 or 4 hours. Applied music lessons for freshmen and sophomores. Music at grade III-IV. May be repeated for credit with permission of the instructor. Prerequisite: Permission of instructor Corequisite: Large ensemble

**MUS 2990 SPECIAL PROJECTS**

[1-3 hours] Designed to meet the needs of individual students who wish to pursue projects in the area of music. Prerequisite: Permission of instructor and department chair

**MUS 3010 UNIVERSITY BAND**

[1-2 hours] Open to any qualified student. :01 Rocket Marching Band :02 Symphonic Band :03 University Wind Ensemble :04 Varsity Band. Sections :01, :02, and :03 fulfill the large ensemble participation requirement. Prerequisite: Audition required for :03 only

**MUS 3020 JAZZ BAND**

[1-2 hours] Open to any qualified student. Fulfills the large ensemble participation requirement for jazz majors only. Prerequisite: Audition

**MUS 3030 BRASS CHOIR**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

**MUS 3040 UNIVERSITY WIND ENSEMBLE**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

**MUS 3050 CHAMBER MUSIC ENSEMBLES**

[1 hour] Open to a limited number of qualified students upon sufficient demand and with the permission of the instructor. The study and performance of chamber music literature. :12 Brass Quintet, :13 Small Brass Ensemble, :23 Clarinet Choir, :24 Woodwind Quintet, :26 Small Woodwind, :31 String Quintet, :32 Small String Ensembles, :36 Guitar Ensemble, :41 Chamber Music with Piano, 42 Chamber Music with Organ, :43 Piano Ensembles, :44 Accompanying, :71 Mixed Chamber Music Ensembles, :81 Percussion Ensemble, :91 Collegium Musicum, :136 Jazz Guitar Ensemble, :137 Jazz Combo, :181 Afro-Caribbean Ensemble Prerequisite: Permission of instructor

**MUS 3090 UNIVERSITY ORCHESTRA**

[1-2 hours] Open to any qualified student. Fulfills the large ensemble participation requirement for instrumentalists. Prerequisite: Audition

**MUS 3130 UNIVERSITY CHORUS**

[1 hour] Open to any qualified student. Prerequisite: No audition necessary

**MUS 3140 CONCERT CHORALE**

[1-2 hours] A select group of singers. Open only by audition. Prerequisite: Audition

**MUS 3150 JAZZ VOCALESE**

[1 hour] Open to qualified students upon sufficient demand with the permission of the instructor. Prerequisite: Audition

**MUS 3160 WOMEN'S CHORUS**

[1-2 hours] Open to any qualified student. Class meets 3 days per week. Prerequisite: No audition necessary

**MUS 3170 MADRIGAL SINGERS**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

**MUS 3180 MEN'S CHORUS**

[1-2 hours] Open to any qualified student. Class meets 3 days per week. Prerequisite: No audition necessary

**MUS 3190 OPERA WORKSHOP**

[1 hour] Prerequisite: Audition  
MUS 3260 ADVANCED ELECTRONIC MUSIC  
[3 hours] A continuation of the aesthetic and technical aspects of electronically or computer generated music and sound. Emphasis on individual lab work and project presentation. Prerequisite: MUS 2260

**MUS 3270 ADVANCED RECORDING TECHNIQUES**

[2 hours] This class examines state-of-the-art recording techniques with an emphasis on digital audio technology. Topics include principles of sound design and hard disk recording systems, with assigned production in the lab. Prerequisite: MUS 2270

**MUS 3410 MUSIC HISTORY AND LITERATURE II**

[3 hours] A study of the literature, composers, theorists, trends and musical style of Western Music from Plainchant through Early Classic.

**MUS 3420 MUSIC HISTORY AND LITERATURE III**

[3 hours] An intensive study of the music of the Late Classic period to the present day through the examination of major trends and styles.

**MUS 3450 JAZZ HISTORY AND LITERATURE**

[3 hours] An in-depth study of jazz styles, trends, performers and composers designed for music majors. Prerequisite: MUS 2220

**MUS 3470 THEATRE SOUND**

[3 hours] Students study the methods and techniques of sound production and design used in the theatre. Tools and techniques of audio production are used in laboratory recording and mixdown. (Alternate years.) Prerequisite: MUS 2270, THR 1040, COMM 2610

**MUS 3500 CONDUCTING**

[2 hours] Basic baton techniques and rehearsal routine applicable to both vocal and instrumental conducting. Preparation of scores and opportunity for conducting experience with student groups. Includes MUS 1000:002 and video recording technology. Prerequisite: MUS 1620

**MUS 3510 CHORAL CONDUCTING**

[2 hours] Conducting techniques and rehearsal routine especially concerned with choral groups. Opportunities to direct choral groups. Includes MUS 1000:002 and video recording technology. Prerequisite: MUS 3500

**MUS 3520 INSTRUMENTAL CONDUCTING**

[2 hours] Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups. Includes MUS 1000:002 and video recording technology. Prerequisite: MUS 3500

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### **MUS 3530 MARCHING BAND TECHNIQUES**

[1 hour] The organization and training of marching bands in secondary schools. Problems of planning and charting football shows for band of different sizes. Opportunity for practical laboratory experience. Includes computer technology and both music writing and marching band drill design software.

### **MUS 3540 JAZZ SYNTHESIS**

[1 hour] Instruction in the art of improvisation in the jazz style. A study of jazz harmony, melodic construction, keyboard voicings and practice materials. Lab instruction in combo performance techniques and repertoire. May be repeated for credit. Prerequisite: MUS 2620 or jazz performance experience

### **MUS 3550 TEACHING OF SINGING**

[2 hours] Intended for the potential teacher. A study of the techniques necessary to develop the singing voice and a study of materials available for class and private voice instruction. Prerequisite: MUS 2620 and vocal major or permission of instructor

### **MUS 3560 JAZZ PEDAGOGY AND CONDUCTING**

[2 hours] A study of teaching materials and conducting techniques of the jazz idiom. Prerequisite: MUS 2620

### **MUS 3570 GUITAR PEDAGOGY**

[3 hours] Comprehensive study of techniques and materials for private and group guitar instruction. Prerequisite: Permission of instructor

### **MUS 3580 FUNCTIONAL PIANO TECHNIQUES**

[2 hours] Designed for keyboard majors to develop functional skills in harmonization, improvisation, transposition, sight reading, score reading, etc. Successful completion of the course fulfills the piano requirement for student teaching and certification. Prerequisite: Junior standing in music or permission of instructor

### **MUS 3590 PIANO PEDAGOGY**

[2 hours] Exploration of techniques and materials for comprehensive, private and group instruction. Prerequisite: Permission of instructor

### **MUS 3610 FORM AND ANALYSIS**

[3 hours] The study of musical structures: the theme, the motive, the phrase and analysis of homophonic and polyphonic forms and procedures. Prerequisite: MUS 2620

### **MUS 3630 INSTRUMENTATION**

[3 hours] A study of wind, percussion and string instrumentation; scoring for small ensembles, band and orchestra. Opportunities for performances of student scores by university organizations. Includes computer technology. Prerequisite: MUS 2620

### **MUS 3650 JAZZ ARRANGING AND COMPOSITION I**

[3 hours] Scoring for contemporary jazz ensembles. A study of jazz notations, voicing, orchestration and composition for small jazz groups and the rhythm section. Prerequisite: MUS 2620 and jazz performance experience

### **MUS 3660 JAZZ ARRANGING AND COMPOSITION II**

[3 hours] Advanced scoring for contemporary jazz ensembles. A study of notations, voicing, orchestration and composition for large jazz groups. Prerequisite: MUS 3650 and jazz performance experience

### **MUS 3700 JAZZ IMPROVISATION III**

[2 hours] Practical application of advanced jazz improvisation techniques as applied to avant-garde, fusion and chromatic playing. Prerequisite: MUS 2710

### **MUS 3710 JAZZ IMPROVISATION IV**

[2 hours] Practical application of jazz improvisation techniques as applied to contemporary jazz composition and performance. Prerequisite: MUS 3700

### **MUS 4410 INSTRUMENTAL MUSIC LITERATURE**

[3 hours] Course will examine the development of the orchestral and chamber repertoire, from their origins to the present day. Prerequisite: MUS 2410, 2420, or permission of instructor

### **MUS 4420 VOCAL MUSIC LITERATURE**

[3 hours] A study of the vocal literature of western music, including art song, choral and operatic work. Prerequisite: MUS 2410, 2420

### **MUS 4450 KEYBOARD LITERATURE**

[3 hours] A survey of piano or organ/harpsichord literature from earliest publications to the present. Emphasis on a particular period or genre at the discretion of the instructor. Prerequisite: MUS 2410, 2420, 3420, or permission of instructor

### **MUS 4460 GUITAR HISTORY AND LITERATURE**

[3 hours] The history and literature of the guitar, including a study of the Renaissance and Baroque lute, vihuela and Baroque guitar, 19th and 20th century instruments. Prerequisite: Permission of instructor

### **MUS 4620 COUNTERPOINT: INTRODUCTION**

[3 hours] Study of counterpoint in all species, primarily in 18th century style. Development of motive with invertible counterpoint, canon, and analysis and composition of inventions and fugues. Prerequisite: MUS 2620

### **MUS 4640 COUNTERPOINT: 20TH CENTURY**

[3 hours] A study of contrapuntal techniques practiced in the 20th century through analysis and creative assignments. Prerequisite: MUS 4620

### **MUS 4690 SEMINAR IN MUSIC COMPOSITION**

[2 hours] May be repeated, but maximum accumulated credit is six hours toward graduation. Beginning composition including writing in the smaller musical forms. Opportunity for performance of original student compositions. Prerequisite: MUS 2620

### **MUS 4800 APPLIED MUSIC**

[1-4 hours] 1, 2 or 4 hours. Applied music lessons for juniors and seniors. May be repeated for credit with permission of the instructor. Prerequisite: Audition; permission of instructor. Corequisite: Large ensemble

### **MUS 4980 SEMINAR: SPECIAL TOPICS**

[1-3 hours] Critical inquiry into specific topics through lectures, class seminar reports and discussion. Seminar topics announced in semester schedule of classes. Prerequisite: Permission of instructor

### **MUS 4990 SPECIAL PROJECTS**

[1-3 hours] Designed to meet the needs of individual students who wish to pursue projects in the area of music. Prerequisite: Permission of instructor and department chair

### **MUS 5010 UNIVERSITY BAND**

[1-2 hours] Students will perform a wide variety of band literature. Sections :01 Rocket Marching Band, :02 Symphonic Band, :03 University Wind Ensemble, and :04 Varsity Band. Sections :01, :02, and :03 fulfill the large ensemble participation requirement. Prerequisite: Audition required for :03 only

### **MUS 5020 JAZZ BAND**

[1-2 hours] Open to any qualified student. Prerequisite: Audition

### **MUS 5030 BRASS CHOIR**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

### **MUS 5040 UNIVERSITY WIND ENSEMBLE**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

### **MUS 5050 CHAMBER MUSIC ENSEMBLES**

[1 hour] Open to a limited number of qualified students upon sufficient demand and with the permission of the instructor. The study and performance of chamber music literature. :12 Brass Quintet, :13 Small Brass Ensemble, :23 Clarinet Choir, :24 Woodwind Quintet, :26 Small Woodwind, :31 String Quintet, :32 Small String Ensembles, :36 Guitar Ensemble, :41 Chamber Music with Piano, :42 Chamber Music with Organ, :43 Piano Ensembles, :44 Accompanying, :71 Mixed Chamber Music Ensembles, :81 Percussion Ensemble, :91 Collegium Musicum, :136 Jazz Guitar Ensemble, :137 Jazz Combo, :181 Afro-Caribbean Ensemble Prerequisite: Permission of instructor

### **MUS 5090 UNIVERSITY ORCHESTRA**

[1-2 hours] Open to any qualified student. Prerequisite: Audition

### **MUS 5130 UNIVERSITY CHORUS**

[1 hour] Open to any qualified student. Prerequisite: No audition necessary.

### **MUS 5140 CONCERT CHORALE**

[1-2 hours] A select group of singers. Open only by audition. Prerequisite: Audition

### **MUS 5150 JAZZ VOCALESE**

[1 hour] Open to qualified students upon sufficient demand with the permission of the instructor. Prerequisite: Permission of instructor

### **MUS 5160 WOMEN'S CHORUS**

[1 hour] Open to any qualified student. Prerequisite: No audition necessary

### **MUS 5170 MADRIGAL SINGERS**

[1 hour] Open to a limited number of qualified students. Prerequisite: Audition

### **MUS 5180 MEN'S CHORUS**

[1 hour] Open to any qualified student. Prerequisite: No audition necessary

### **MUS 5190 OPERA WORKSHOP**

[1 hour] Open to any qualified student. Prerequisite: Audition

### **MUS 5410 MUSIC HISTORY AND LITERATURE: WORLD MUSIC**

[3 hours] Explores the function and styles of music in various cultures.

### **MUS 5440 MUSIC HISTORY AND LITERATURE: SPECIAL TOPICS**

[3 hours] The area of study will be announced at the time the course is offered.

**MUS 5490 MUSIC HISTORY AND LITERATURE: THE TWENTIETH CENTURY**  
[3 hours] An intensive study of the literature, composers, theorists, trends and musical styles during the 20th century. Prerequisite: Permission of instructor

**MUS 5510 CHORAL CONDUCTING**  
[2 hours] Conducting techniques and rehearsal routine, especially concerned with choral groups. Opportunities to direct student choral groups. Prerequisite: MUS 3500

**MUS 5520 INSTRUMENTAL CONDUCTING**  
[2 hours] Conducting techniques and rehearsal routine especially concerned with instrumental ensembles. Opportunities to direct student instrumental groups. Prerequisite: MUS 3500

**MUS 5590 PIANO PEDAGOGY**  
[3 hours] Exploration of techniques and materials for comprehensive, private and group instruction. Prerequisite: Permission of instructor

**MUS 5610 ANALYTICAL TECHNIQUES**  
[3 hours] Application of various analytical theories of music to selected works from different style periods to further the understanding of musical forms and works. Prerequisite: Graduate standing; MUS 2620

**MUS 5630 COUNTERPOINT: COMPARISON OF STYLES**  
[3 hours] A study of 16th, 18th and 20th century polyphony. Analysis of selected works and composition exercises will be the basis for comparing and contrasting these three styles. Prerequisite: MUS 4620

**MUS 5650 SEMINAR IN ADVANCED COUNTERPOINT**  
[3 hours] Detailed study of various contrapuntal procedures as employed from the Middle Ages through the present. Composers and their works are studied by analysis and original creative assignments. Prerequisite: MUS 5630

**MUS 5800 APPLIED MUSIC**  
[1-2 hours] 1, 2, or 4 hours. Methods and literature of the highest levels (6,7,8). Preparation for professional-level performance. May be repeated for credit with permission of the instructor. Intended for music education majors. Prerequisite: Audition at level, permission of instructor

**MUS 5900 GRADUATE STUDIES IN MUSIC**  
[3 hours] The study of sources and bibliographical materials in music. Prerequisite: Permission of instructor

**MUS 6000 MASTER'S RECITAL**  
[0 hours] Required for the Master of Music Performance degree. A passing grade documents successful completion of the recital requirement. Must be taken during the semester in which the recital is presented. Corequisite: MUS 6800

**MUS 6650 SEMINAR IN MUSIC ARRANGING**  
[3 hours] Examination and analysis of scores of varied composers and styles; creative assignments in orchestration exploring traditional and contemporary textures and timbres. Prerequisite: MUS 2620

**MUS 6690 SEMINAR IN MUSIC COMPOSITION**  
[2 hours] May be repeated, but maximum accumulated credit is six hours. Beginning composition, including writing in the smaller musical forms, to advanced compositions for large. Prerequisite: Graduate standing

**MUS 6800 APPLIED MUSIC**  
[2-5 hours] Study of methods and literature of the highest levels (7,8). Preparation for professional-level performance. May be repeated for credit with permission of the instructor. Prerequisite: Audition at level; permission of instructor

**MUS 6980 SEMINAR: SPECIAL TOPICS**  
[1-3 hours] Selected subjects in music in areas of special interest to the advanced master's degree student. The seminar topic will be announced in the semester schedule of classes. Prerequisite: Permission of instructor

**MUS 6990 INDEPENDENT STUDY**  
[1-3 hours] Designed to meet the needs of individual students who wish to pursue projects in the area of music. Prerequisite: Permission of the graduate committee of the department of music

## NASC - Natural Sciences

### Department of Physics and Astronomy (ARS)

**NASC 1100 OUR PHYSICAL WORLD**  
[3 hours] Elementary study of motion and gravity, thermodynamics, wave phenomena, light, electricity, magnetism, models of the atom, the solar system, stars and galaxies. Prerequisite: MATH 1180 or higher Natural Sciences core

**NASC 1110 PHYSICAL WORLD LABORATORY**  
[1 hour] Quantitative measurements and predictions concerning the physical universe in a laboratory environment. Motion, electric and magnetic fields, properties of matter, temperature and heat, radioactive decay. Two hours of laboratory per week. Corequisite: NASC 1100 Natural Sciences core course

## NURA - Nursing Technology

### Department of Health Professions (HHS)

**NURA 1160 FUNDAMENTALS OF COMMUNITY-BASED NURSING**  
[4 hours] Focuses on care of adult populations in community-based settings. Emphasis is placed on roles of community-based nurses, concepts of home health care and promotion of self-care agency. Prerequisite: Admission to associate's degree nursing program Corequisite: NURA 1170, KINE 2570 and HHS 2590

**NURA 1190 NURSING SYSTEMS FOR ADULTS I**  
[5 hours] Using Orem's theory and nursing process, this course introduces the student to basic concepts in nursing and foundational skills. Theory is reinforced by caring for individuals in acute-care settings. Prerequisite: Admission to associate's degree nursing program Corequisite: NURA 1160, KINE 2570 and HHS 2590

**NURA 1290 NURSING SYSTEMS FOR ADULTS II**  
[6 hours] Nursing management of adults with acute and chronic health deviations. Clinical experiences in acute and community settings under the guidance of faculty. Prerequisite: NURA 1160, 1190, KINE 2570 and HHS 2590 Corequisite: NURA 2110 and KINE 2580

**NURA 2110 NURSING SYSTEMS FOR MENTAL HEALTH**  
[4 hours] Focuses on nursing care of individuals across the life-span experiencing self-care deficits in mental health in acute/community settings. Clinical emphasis is on coping/adaptation and therapeutic communication. Prerequisite: NURA 1160, 1190, KINE 2570 and HHS 2590 Corequisite: NURA 1290 and KINE 2580

**NURA 2180 NURSING SYSTEMS FOR MATERNAL HEALTH**  
[4 hours] Focus is on health care needs of childbearing families, newborns and the gynecological care of women with self-care deficits. Clinical experiences are in ambulatory, acute care and community settings. Prerequisite: NURA 1290, 2110 and KINE 2580 Corequisite: NURA 2190

**NURA 2190 NURSING SYSTEMS FOR ADULTS III**  
[6 hours] Nursing management of adults with increasingly complex self-care deficits. Clinical experiences in acute and chronic care settings, under the guidance of faculty. Prerequisite: NURA 1290, 2110 and KINE 2580 Corequisite: NURA 2180

**NURA 2280 NURSING SYSTEMS FOR INFANTS AND CHILDREN**  
[4 hours] Focus is on health promotion/health deviations of infants and children in a family centered approach. Clinical will emphasize the elements present in theory in diverse locations with multiple patients. Prerequisite: NURA 2180 and 2190 Corequisite: NURA 2290 and 2300

**NURA 2290 NURSING SYSTEMS FOR ADULTS IV**  
[6 hours] Focuses on nursing management of adults with self-care deficits requiring critical, urgent, acute and rehabilitative care. Clinical experiences include leadership/management roles with guidance from faculty and preceptor. Prerequisite: NURA 2180 and 2190 Corequisite: NURA 2280 and 2300

**NURA 2300 NURSING SYSTEMS FOR SELF CARE**  
[2 hours] The course is designed to be the capstone experience to assist the senior nursing students as they prepare for their professional practice. Health promotion, maintenance and restoration are emphasized to promote self-care behaviors. Prerequisite: NURA 2180 and 2190 or permission of instructor

**NURA 2990 INDEPENDENT STUDY**  
[1-4 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

## NURS - Nursing

### Department of Health Professions (HHS)

#### NURS 3010 NURSING AGENCY I:

##### CONCEPTS

[3 hours] This course provides for acquisition of knowledge of basic nursing theory, concepts, therapeutic communication and selected skills. Students practice nursing interventions in a laboratory setting with simulated clients. Prerequisite: Admission to the nursing major

#### NURS 3060 HOLISTIC APPROACH TO NURSING INTERVENTIONS

[3 hours] Focuses on the holistic model integrating technology, scientific knowledge, and alternative/complementary clinical caring modalities into basic and advanced practices of nursing. Elective.

#### NURS 3070 NURSING CARE OF THE TERMINALLY ILL: ISSUES IN PALLIATIVE CARE

[2 hours] This theory course focuses on the concepts, knowledge, and skills necessary to provide holistic nursing care to individuals and their significant others who are affected by a terminal illness. Elective. Prerequisite: NURS 3120

#### NURS 3110 NURSING AGENCY II: ASSESSMENT

[3 hours] This course provides for acquisition of knowledge and development of skill in comprehensive nursing assessment. Prerequisite: Admission to major, NURS 3010 (prerequisite or corequisite)

#### NURS 3120 ADULT HEALTH NURSING I

[7 hours] Care of adults with common nursing problems using Orem's Self-Care Deficit Theory of Nursing. Prerequisite: NURS 3010 Corequisite: NURS 3140, 3110

#### NURS 3130 GERONTOLOGICAL NURSING

[3 hours] Focus on theories and concepts of aging and health, based on Universal Self-Care Requisites from Orem's Self-Care Deficit Theory of Nursing. Prerequisite: NURS 3120, 3170, 3180, 3210 Corequisite: NURS 3140, 3110 (prerequisite or corequisite)

#### NURS 3140 CONCEPTS OF PATHOPHYSIOLOGY AND PHARMACOLOGY

[4 hours] Basic concepts of pathophysiology and pharmacology. Critical thinking in application of concepts to nursing practice. Prerequisite: Admission to RN/BSN major

#### NURS 3170 CONCEPTS OF PATHOPHYSIOLOGY

[2 hours] Basic science of pathophysiology of disease across the life span. Prepares for critical thinking in application of concepts to nursing practice. Prerequisite: NURS 3010, 3110

#### NURS 3180 CONCEPTS OF NURSING PHARMACOLOGY

[2 hours] Fundamental pharmacologic principles of physiological response to drugs, therapeutic outcomes and potential drug interactions. Prepares for critical thinking in application of pharmacotherapy principles to nursing. Prerequisite: NURS 3010, 3110

#### NURS 3210 NURSING AGENCY III: INTERVENTIONS

[2 hours] Application of principles of nursing interventions in the learning lab on simulated clients. Prerequisite: NURS 3010, 3110

#### NURS 3620 WOMEN'S HEALTH NURSING

[5 hours] Focus on knowledge needed in nursing care of women within a self-care framework. Clinical experiences provide for holistic care across the life span with emphasis on childbearing. Prerequisite: NURS 3120, 3170, 3180, 3210 Corequisite: NURS 3210 (prerequisite or corequisite)

#### NURS 3630 MENTAL HEALTH NURSING

[5 hours] Psychosocial influences on self-care agency are presented within the context of culturally competent nursing care. These concepts are interpreted within self-care deficit theory and applied in clinical experiences. Prerequisite: NURS 3120, 3170, 3180, 3210 Corequisite: NURS 3210 (prerequisite or corequisite)

#### NURS 3640 PARENT-CHILD NURSING

[5 hours] The student has opportunities to gain experience in designing, implementing and evaluating nursing systems for infants, children, and adolescents within families and groups. Experiences are in class and clinical laboratories. Prerequisite: NURS 3120, 3170, 3180, 3210 Corequisite: NURS 3210 (prerequisite or corequisite)

#### NURS 3770 HEALTH ASSESSMENT

[3 hours] Focuses on the development of health history, physical and psychosocial assessment skills across the life span. Prerequisite: Admission to RN/BSN program

#### NURS 4010 COMMUNITY HEALTH NURSING

[5 hours] This course focuses on the design and implementation of nursing care for aggregates and communities. Individual and family care is provided within the context of population health. Prerequisite: NURS 3120, 3170, 3180, 3210 or NURS 3770, 4180, 4190 for RN

#### NURS 4020 LEADERSHIP AND MANAGEMENT IN NURSING

[3 hours] Focus on principles and theories of management/leadership as a basis for provision of nursing care. Prerequisite: NURS 3130, 3620, 3630, 3640, 4010, 4950 Corequisite: NURS 4030, 4250

#### NURS 4030 ADULT HEALTH NURSING II

[7 hours] Leadership/management principles are applied in design and implementation of nursing systems for individuals and families with complex problems. Prerequisite: NURS 3130, 3620, 3630, 3640, 4010, 4950 Corequisite: NURS 4020, 4250

#### NURS 4040 INTERDISCIPLINARY ETHICS

[1 hour] Interdisciplinary dialogue among health professionals. Explores potential conflicts among nurses, physicians and other health care providers. Includes conflict resolution, truth telling, withdrawing nutrition and hydration, whistle blowing and assisted suicide. Elective. Prerequisite: First semester nursing courses or RN

#### NURS 4050 ONCOLOGY NURSING

[3 hours] Focuses on concepts, knowledge and skills necessary to assist individuals who have cancer and their families. Emphasizes helping people to care for themselves throughout their illness. Elective. Prerequisite: First semester nursing courses or RN

#### NURS 4080 PERIOPERATIVE NURSING CARE

[3 hours] This course focuses on the practice of perioperative nursing. Application of Self-Care Deficit Theory of Nursing will be incorporated in class and clinical experiences. Prerequisite: NURS 3120, 3170, 3180, 3210

#### NURS 4120 NURSING LEADERSHIP AND MANAGEMENT

[5 hours] RN course focusing on the principles of management/leadership as a basis for provision of nursing care. Clinical application occurs in a variety of settings. Prerequisite: NURS 3770, 4180, 4190 for RN

#### NURS 4140 RESEARCH INQUIRY I AND II

[4 hours] Students will critically evaluate publishing research for clinical relevance, identify a research problem, select a conceptual framework, review selected literature, and prepare a quantitative or qualitative research proposal. Prerequisite: Admission to major for RN/MSN

#### NURS 4150 PATHOPHYSIOLOGY FOR ADVANCED PRACTICE NURSING

[3 hours] Overview of pathologic processes that influence the development of diseases in humans. Includes discussion of normal function and the impact of disease on health. Prerequisite: Admission to major for RN/MSN

#### NURS 4160 ADVANCED HEALTH ASSESSMENT

[3 hours] Focuses on specialty specific comprehensive and problem focused advanced patient assessment. Specialty laboratory practice and supervision are required. Prerequisite: Admission to major to RN/MSN

#### NURS 4170 HEALTH CARE ASPECTS OF HUMAN SEXUALITY

[3 hours] Examination of impact on health care of selected components of human sexuality. Aspects include sexual assessment, sexual changes during the life span and disturbances in sexuality due to health conditions. Elective. Prerequisite: First semester nursing courses or RN

#### NURS 4180 THEORETICAL AND PROFESSIONAL FOUNDATIONS IN NURSING

[4 hours] Focus on RN student's transition to professional higher education and theory-based practice. Current professional issues are explored. Political, socioeconomic, ethical and legal issues are critically examined and discussed.

#### NURS 4190 INTERPERSONAL STRATEGIES IN NURSING OF OLDER INDIVIDUALS

[6 hours] Focus on application of Self-Care Deficit Theory of Nursing and health maintenance for older individuals within the family and environment; emphasis on development of interpersonal skills for RNs. Prerequisite: NURS 3770, 4180 (prerequisite or corequisite)

#### NURS 4250 PROFESSIONAL NURSING COMPETENCY

[1 hour] This course provides an overview of NCLEX and practice in the application of knowledge required for the professional nursing examination. Prerequisite: NURS 4020, 4030



**NURS 4280 THEORIES OF ADDICTIVE BEHAVIORS**

[3 hours] Research and treatment related to addictive behaviors are critiqued. Nursing interventions specific for addicted persons are evaluated. Implications of legal/social/health policies on services for the population are explored. Elective.

**NURS 4600 CRITICAL CARE NURSING**

[3 hours] The student works with a preceptor in a critical care unit to design and implement nursing systems for clients with critical health states. Critical care content is presented in lecture. Elective. Prerequisite: NURS 3110, 3120, 3130, 3140, 3210 or RN

**NURS 4720 SPECIAL TOPICS IN WOMEN'S HEALTH**

[3 hours] This course examines specialized level women's and neonatal health care. Theory will include special topics and focus on nursing management of perinatal issues. Clinical experiences are individually arranged. Prerequisite: NURS 3620

**NURS 4950 NURSING RESEARCH**

[3 hours] Introduction to concepts, issues and processes in nursing research. Emphasis is on the research role, and critical analysis and evaluation of published research for use in nursing practice. Prerequisite: Statistics and NURS 3120, 3170, 3180, 3210 for basic students or admission to major for RN

**NURS 4960 PROFESSIONAL PERSPECTIVES**

[3 hours] Current professional issues facing nursing are explored. Political, socioeconomic, ethical, legal and professional perspectives are critically examined and discussed. Prerequisite: NURS 3210 or admission to major for RNs

**NURS 4990 INDEPENDENT STUDY**

[1-3 hours] Independent study in nursing.

## OPEP - Professional Experience Program

**OPEP 4940 OFFICE OF PROFESSIONAL EXPERIENCE PROGRAMS INTERNSHIP****/CO-OP**

[0 hours] Students receive intensive work experience related to their academic course work and career field. Prerequisite: At least a sophomore standing and a 2.5 GPA

## OPMT - Operations Management

### Department of Information Operations and Technology Management (BUS)

**OPMT 3310 COMPUTER AND MODEL BASED BUSINESS DECISION MAKING**

[3 hours] An introduction to quantitative methods of decision making including linear programming, transportation, simulation, waiting line analysis, advanced decision theory and Markov chains. Computer packages and creative thinking will be emphasized. Prerequisite: BUAD 2070

**OPMT 3340 QUALITY MANAGEMENT**

[3 hours] Covers major aspects of managing total quality functions in manufacturing/service operations. Includes: quality assurance, reliability, SPC, inspection/testing, acceptance sampling, product liability and organization of the quality function. Prerequisite: BUAD 3020

**OPMT 3600 FACILITY PLANNING**

[3 hours] The study of the design and planning of new facilities. Topics include product and process design, the application of CIM, FMS, capacity planning, facility location and layout, and job design. Prerequisite: BUAD 3020

**OPMT 3610 PRODUCTION PLANNING AND SCHEDULING**

[3 hours] Production planning, its relation to organizational/operational goals, MRP, MRP II, capacity management, JIT, scheduling of manufacturing/service systems and emerging/new concepts in the discipline will be discussed. Prerequisite: BUAD 3020

**OPMT 3660 MATERIALS MANAGEMENT AND PURCHASING**

[3 hours] Relationship between materials management and firm's strategic goals, forecasting, competing through materials management, inventory management of independent demand, aggregate inventory management, joint replenishing, purchasing, state-of-the-art supplier management, distribution and control. Prerequisite: BUAD 3020

**OPMT 3750 APPLIED REGRESSION ANALYSIS**

[3 hours] This course emphasizes model formulation, tests of goodness-of-fit and significance of parameters for the traditional linear regression model. Business applications/cases and computer packages will be emphasized. Prerequisite: BUAD 2070

**OPMT 3760 MANAGEMENT SCIENCE: CASES AND APPLICATIONS**

[3 hours] A study of business applications emphasizing model formulation, identification and validation. The course includes linear programming, critical path methods, queuing and various modeling techniques using computer packages. Prerequisite: OPMT 3310

**OPMT 4020 STATISTICS FOR ADMINISTRATIVE SERVICES**

[3 hours] An introduction to statistical methods, including measures of central tendency and dispersion, probability and probability distributions, sampling theory, decision theory, regression and correlation. Specifically designed for the Administrative Services program. Prerequisite: MATH 1270

**OPMT 4150 OPERATIONS MANAGEMENT CASES**

[3 hours] Course includes projects, presentations and case analysis using operation management models and computer software. Role of emerging topics (e.g. bench-marking, reengineering, systems/technology) in operations management will also be covered. Prerequisite: OPMT 3340, 3610, 3660

**OPMT 4210 PROJECT MANAGEMENT**

[3 hours] This course covers planning, organizing and controlling projects. Topics such as project selection, scheduling, budgeting, resource management, project control, time-based competition and concurrent engineering will be discussed. Prerequisite: BUAD 3020

**OPMT 4420 SERVICE OPERATIONS MANAGEMENT**

[3 hours] The service sector is the dominant sector of the economy. Students will study various aspects of Operations Management as applied to service industries. Services for manufacturing will be emphasized. Prerequisite: BUAD 3020

**OPMT 4450 FORECASTING**

[3 hours] A study of forecasting techniques including: time series analysis, moving average, exponential smoothing, auto-regressive models and Box-Jenkins. A statistical software package is used. Prerequisite: BUAD 2070

**OPMT 4750 ANALYSIS OF VARIANCE**

[3 hours] Analysis of variance and related topics such as factorial design and Latin squares. Experimental designs including repeated measures, factorial and nested designs. Prerequisite: BUAD 2070

**OPMT 4760 SIMULATION MODELING AND ANALYSIS OF MANUFACTURING/SERVICE SYSTEMS**

[3 hours] This course provides an introduction to modeling stochasticity in manufacturing/service systems using various techniques such as simulation, Queuing networks and other techniques using simulation software and business cases. Prerequisite: BUAD 3020

**OPMT 4980 CONTEMPORARY TOPICS IN OPERATIONS MANAGEMENT**

[3 hours] Selected current topics in Operations Management practice, trends and technology. Prerequisite: BUAD 3020

**OPMT 5510 BUSINESS STATISTICS WITH COMPUTER APPLICATIONS**

[3 hours] The application of statistics to business problem solving. Topics include descriptive statistics, probability theory, hypothesis testing, decision making, regression and correlation analysis, and time series analysis. Prerequisite: Graduate standing

**OPMT 5520 ANALYSIS OF MANUFACTURING & SERVICE SYSTEMS**

[3 hours] Concepts, methods and strategies for designing and managing manufacturing and service systems are discussed. Topics include creating flexible and efficient systems for producing services and goods, total quality management, time-based competition, global production and sourcing, information and computer systems applications. Prerequisite: OPMT 5510

**OPMT 5730 MODELING AND ANALYSIS FOR MANUFACTURING**

[3 hours] An introduction to model building and analysis with special reference to manufacturing and operations management issues. The students will be introduced to linear models, dynamic programming models and stochastic models. Prerequisite: OPMT 5510

**OPMT 6100 TIME SERIES ANALYSIS AND FORECASTING**

[3 hours] An introduction to time series analysis and forecasting. Moving average, exponential smoothing, trend projection with and without seasonality and regression-based techniques are covered. Statistical software packages are used. Prerequisite: OPMT 5510 or equivalent

## 462 Course Descriptions

### **OPMT 6180 REGRESSION ANALYSIS FOR BUSINESS**

[3 hours] Analysis of business data using simple and multiple regression. Model building, estimation and hypothesis testing in the context of regression, and stepwise regression are covered. Statistical software packages are used. Prerequisite: OPMT 5510

### **OPMT 6240 MANAGEMENT SCIENCE APPLICATIONS**

[3 hours] The definition of business problems and the formulation of appropriate models for their study. Cases and readings are discussed to illustrate the use of management science modeling techniques. Prerequisite: OPMT 5730

### **OPMT 6270 SIMULATION**

[3 hours] Simulation will be introduced through appropriate software (e.g. SIMAN, ARENA). Fitting distributions, validation, verification, confidence intervals, experimental design, comparison with analytic models will be the topics covered. Prerequisite: OPMT 5520 or equivalent

### **OPMT 6510 PROJECT MANAGEMENT**

[3 hours] This course deals with managing of projects in research and development, manufacturing, construction and service organizations. Students will discuss cases and use extensively a project management software. Prerequisite: OPMT 5520

### **OPMT 6680 TOTAL QUALITY MANAGEMENT AND SPC**

[3 hours] The course introduces students to the TQM philosophy, concepts and tools. Provides student with an overall approach for the design of a system to manage quality along the entire value adding chain. Prerequisite: OPMT 5520 or equivalent

### **OPMT 6690 MANUFACTURING RESOURCES MANAGEMENT**

[3 hours] Study methods such as MRP, JIT and bottleneck approaches used in managing manufacturing activities through business cases where appropriate. Tools such as scheduling, and inventory systems will be studied. Prerequisite: OPMT 5520 or equivalent

### **OPMT 6710 MANAGING OPERATIONS**

[3 hours] This course provides an integrative and interdisciplinary approach to managing operations. Strategic and tactical issues will be addressed primarily through business cases with focus on policy setting and problem solving. Prerequisite: OPMT 5520

### **OPMT 6720 MANUFACTURING SYSTEMS DESIGN**

[3 hours] Discusses the design and implementation of cellular and flexible manufacturing systems including the role of group technology. Describes the role of flexible manufacturing systems in the integrated and automated facility. Prerequisite: OPMT 5520

### **OPMT 6960 MASTER'S THESIS**

[1-6 hours] Master's thesis Prerequisite: Consent of adviser

### **OPMT 7520 ANALYSIS OF MANUFACTURING & SERVICE SYSTEMS**

[3 hours] Concepts, methods and strategies for designing and managing manufacturing and service systems are discussed. Topics include creating flexible and efficient systems for producing services and goods, total quality management, time-based competition, global production and sourcing, information and computer systems applications. Prerequisite: OPMT 5510

### **OPMT 8270 SIMULATION**

[3 hours] Simulation will be introduced through appropriate software (e.g. SIMAN, ARENA). Fitting distributions, validation, verification, confidence intervals, experimental design, comparison with analytic models will be the topics covered. Prerequisite: OPMT 7520

### **OPMT 8680 TOTAL QUALITY MANAGEMENT AND SPC**

[3 hours] The course introduces students to the TQM philosophy, concepts and tools. Provides student with an overall approach for the design of a system to manage quality along the entire value adding chain. Prerequisite: OPMT 7520

### **OPMT 8690 MANUFACTURING RESOURCES MANAGEMENT**

[3 hours] Study methods such as MRP, JIT and bottleneck approaches used in managing manufacturing activities through business cases where appropriate. Tools such as scheduling, and inventory systems will be studied. Prerequisite: OPMT 7520

### **OPMT 8720 MANUFACTURING SYSTEMS DESIGN**

[3 hours] Discusses the design and implementation of cellular and flexible manufacturing systems including the role of group technology. Describes the role of flexible manufacturing systems in the integrated and automated facility. Prerequisite: OPMT 7520

## **ORGD - Organizational Development**

### **Department of Management (BUS)**

#### **ORGD 4210 ORGANIZATIONAL DEVELOPMENT AND CHANGE**

[3 hours] Covers theory, practice and techniques in dealing with major organizational problems and issues, such as managing technology, productivity, decision making, leadership and organizational adaptation. Prerequisite: BUAD 3030

#### **ORGD 4240 COMMUNICATION STRATEGIES FOR LEADING CHANGE**

[3 hours] An applied course that focuses on development of communication competencies for people leading and facilitating change in organizations. Focuses on preparation for and delivery of intraorganizational and interorganizational communication programs. Prerequisite: BUAD 3030, COMM 3880

#### **ORGD 4330 ORGANIZATIONAL DIAGNOSIS AND INTERVENTION**

[3 hours] Advanced study of the methods and evaluation of planned change. Includes needs analysis, applied measurement and evaluation, and development of process consultation skills required in change. Prerequisite: ORGD 4210 and 4220

#### **ORGD 4780 LEADERSHIP & MANAGERIAL COMPETENCIES**

[3 hours] This course focuses on concepts and experiences for developing leadership skills that facilitate organizational development and change. Writing, cases, videos and exercises are used extensively. Prerequisite: BUAD 3030; senior standing

### **ORGD 6170 THE INDIVIDUAL AND THE ORGANIZATION**

[3 hours] Studies the behavior of individuals and small groups in organizations. Includes the behavioral science theories and research applicable to the work environment. Prerequisite: MGMT 5110

### **ORGD 6380 COMPARATIVE ORGANIZATION**

[3 hours] An analysis of the organizational design and administrative systems in different types of organizations such as business and other profit-making organization; non-profit organization - hospitals, unions, governmental and universities. Prerequisite: Graduate standing

### **ORGD 6590 ORGANIZATION THEORY AND DESIGN**

[3 hours] Course focuses on designing and managing innovative, continuously learning organizations in response to today's rapidly changing technological and market environment. The emphasis will be on top-down, macro perspective. Prerequisite: MGMT 5110

### **ORGD 7110 MANAGEMENT OF ORGANIZATIONAL BUSINESS**

[3 hours] Organizational behavior (individual and small group) and organizational theory (large group and total organization). Also included is a review of the key functions of management; (1) planning, (2) organizing, (3) directing and (4) controlling. Prerequisite: Ph.D. student status and graduate standing

## **PED - Physical Education**

### **Department of Early Childhood, Physical and Special Education (EDU)**

#### **PED 2000 COACHING OF PHYSICAL ACTIVITY**

[1 hour] Includes basic fundamentals, offensive and defensive team play, conditioning techniques, and scouting.

#### **PED 2100 SPORT SKILL AND STRATEGY I**

[3 hours] Sport skill and strategy development for students who are in the physical education major sequence. Must earn minimum grade of C to pass the course.

#### **PED 2200 SPORT SKILL AND STRATEGY II**

[3 hours] Sport skill and strategy development for students who are in the physical education major sequence. Stunts and tumbling, tennis, volleyball. Must earn minimum grade of C to pass the course.

#### **PED 2400 PHYSICAL EDUCATION IN THE ELEMENTARY SCHOOL**

[2 hours] Emphasis on perceptual-motor programs, motor performance, physical fitness, movement activities, testing and evaluation in the K-6 curriculum. Designed for elementary education majors.

#### **PED 2450 PHYSICAL EDUCATION FOR EARLY CHILDHOOD EDUCATION**

[2 hours] In this course, physical education major students will discuss the integration learned in physical education classes and teaching. Course may be repeated twice for a maximum total credit of 2 hours.

**PED 2800 SOPHOMORE FIELD EXPERIENCE**  
[2 hours] Physical education major students participate in early intensive field experience during sophomore year. Students are assigned to two experiences to come from elementary, middle school or high school physical education.

**PED 2900 PHYSICAL EDUCATION LINKING SEMINAR**

[1 hour] Developmentally appropriate activity for children in Pre-K-Grade 3. Includes fundamental motor skill development, assessment skills and evaluation techniques. Stress is on psychomotor, cognitive and affective development through movement. Corequisite: PED 3250 or 4540

**PED 2950 INTRODUCTION TO TEACHING IN PHYSICAL EDUCATION**

[3 hours] Designed to provide students with knowledge of effective instruction, skills in systematic data collection for teacher evaluation, task and skill analysis and instructional design. Field experience included. Prerequisite: KINE 1700 Corequisite: 3520 or 4540

**PED 3000 DEVELOPMENTALLY APPROPRIATE GAMES AND ACTIVITIES**

[3 hours] Content for elementary school physical education programs including physical fitness, fundamental motor skill, manipulative skills, games, sport-related skills, educational gymnastics, movement activities, etc. Prerequisite: KINE 1700, PED 2950; admission to professional education

**PED 3100 PHYSICAL EDUCATION METHODS PRE-K - 5**

[3 hours] Methods of teaching pre-K - 5 physical education. Students will combine readings, discussions and field experience to learn about different strategies for working in the physical activity environment at these levels. Prerequisite: PED 2950, 3120 Corequisite: PED 3000

**PED 3120 RHYTHMIC ACTIVITY AND DANCE**

[3 hours] Content for pre-school through high school education programs. Emphasis on fundamental motor skill, rhythmic activities, folk dance, square dance. Prerequisite: PED 1700, 2960; admission to professional education

**PED 3130 UNDERSTANDING GAMES: SPORT CONCEPTS**

[3 hours] Techniques and concepts of team and individual sport activities in the middle and secondary school. Course will focus on teaching for understanding, game tactics, progressions, technique analysis, appropriate practice and safety procedures. Prerequisite: KINE 1700, PED 1010, 2960; admission to professional education

**PED 3140 PHYSICAL EDUCATION METHODS FOR MIDDLE/ADOLESCENT LEVELS**

[3 hours] Methods of teaching grades 6 - 12 physical education. Students will combine readings, discussions and field experience to learn about different strategies for working in the physical activity environment at these levels. Prerequisite: PED 2950, 3120 Corequisite: PED 3130

**PED 3200 METHODS OF TEACHING IN THE MIDDLE AND SECONDARY SCHOOL AND PRACTICUM**

[3 hours] Methods of teaching physical education for children in grades 5-12. One class day lecture/discussion per week, 6 hours in the assigned field experience each week. Prerequisite: KINE 1700, PED 2950 Corequisite: PED 3130

**PED 3400 ADAPTED PHYSICAL EDUCATION**

[3 hours] Methods for teaching the atypical child. Evaluation and formulation of IEP. Exercise and activity prescription. Emphasis on disorders most prevalent within public school systems. Forty (40) hour field experience included. Prerequisite: KINE 1700, PED 2960; admission to professional education

**PED 3560 PHYSICAL EDUCATION/ RECREATION EDUCATION FOR ATYPICAL CHILD**

[2 hours] Physical activity and recreation program development in physically and mentally disabled children in educational and recreational environments. Practicum experience working with atypical children will be required.

**PED 3740 MEASUREMENT, ANALYSIS AND EVALUATION IN HUMAN PERFORMANCE**

[3 hours] Lecture and discussion on assessment in human performance, both authentic and traditional. Computer analysis procedures in descriptive and inferential statistics through ANOVA. Designated lab time for specialty areas. Prerequisite: KINE 1700

**PED 3950 SENIOR SEMINAR**

[1 hour] Readings and discussion centering on concepts learned in the professional content sequence and their applicability to teaching in the physical education setting. Prerequisite: KINE 2960, 3520, 4540

**PED 4100 DESIGN AND ADMINISTRATION OF PHYSICAL ACTIVITY PROGRAMS**

[3 hours] Procedures for development of curriculum and program design. Administrative issues, problems and concerns for organization and direction of facilities and equipment. Prerequisite: PED 3000, 3120, 3130; admission to professional education

**PED 4700 THE LAW AND SPORT**

[3 hours] The purpose of this course is to describe the requirements of the law and sports governing bodies, potential problems, possible courses of action and ways to work with legal counsel in the administration of sports activities. Prerequisite: Senior/junior standing

**PED 4920 STUDENT TEACHING SEMINAR: PHYSICAL EDUCATION**

[1 hour] This course will focus on reflection and feedback on student teaching, portfolio development, interviewing and resume writing. Prerequisite: Admission into professional education program Corequisite: PED 4930

**PED 4930 STUDENT TEACHING IN PHYSICAL EDUCATION**

[6-12 hours] Intensive field experience in school classrooms under the direction of university supervisors and master teachers. Observation of teaching of experienced teachers accompanied by full responsibility by student teacher. Student teachers will be expected to teach in two areas. Prerequisite: Completion of 90% of coursework; 2.5 overall GPA; 2.5 major GPA; 2.5 professional GPA

**PED 4950 WORKSHOP IN PHYSICAL EDUCATION**

[1-5 hours] Workshop developed around topics of interest and concern for preservice and inservice teachers and other professionals involved in health, wellness and physical activity. Prerequisite: Faculty members have the flexibility to design workshop courses and to designate the prerequisites at that time. Participants should be SR standing.

**PED 4990 INDEPENDENT STUDY IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-3 hours] Directed individual study. Specialty title and seminar sheet required. Prerequisite: Junior or senior standing; permission of instructor

**PED 5170 ADAPTED PHYSICAL EDUCATION**

[3 hours] Study of disabling conditions as related to physical education. Assessment and consequent development of IEP. Exercise prescription analysis and technique. Program implications for inclusion.

**PED 5250 CURRICULUM IN PHYSICAL EDUCATION**

[3 hours] Perspectives in curriculum theory and design for physical education. Procedures for development of curriculum K-12.

**PED 5610 TRENDS AND ISSUES IN PHYSICAL EDUCATION**

[3 hours] Analysis of contemporary trends and issues facing the physical educator. Content varies per semester: Children and Sport, Sport Sociology, Elementary/Secondary Teaching.

**PED 5620 EFFECTIVE SUPERVISION IN PHYSICAL EDUCATION**

[3 hours] Procedures and methods appropriate for supervision of student teachers or inservice teachers in the area of physical education. Computer analysis, observation techniques, conferencing skills and evaluation procedures are stressed.

**PED 5950 WORKSHOP IN EXERCISE SCIENCE AND PHYSICAL EDUCATION**

[1-4 hours] Topical workshops developed around areas of interest and concern to inservice teachers and/or exercise scientists. Credit cannot be applied towards a degree program without prior consent of adviser.

**PED 6920 MASTER'S PROJECT IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-4 hours] A research project is required for the M.Ed. program for the culminating experience.

**PED 6940 INTERNSHIP IN EXERCISE SCIENCE**

[1-12 hours] A field internship designed to supplement classroom experience by providing participation in the area of exercise science through participant-observer experience.

**PED 6960 MASTER'S THESIS IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-4 hours] Research thesis is required for M.S. and M.Ed. programs for the culminating experience.

**PED 6990 INDEPENDENT STUDY IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-4 hours] The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.

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### **PED 7170 ADAPTED PHYSICAL EDUCATION**

[3 hours] Study of disabling conditions as related to physical education. Assessment and consequent development of IEP. Exercise prescription analysis and technique. Program implications for inclusion.

### **PED 7250 CURRICULUM IN PHYSICAL EDUCATION**

[3 hours] Perspectives in curriculum theory and design for physical education. Procedures for development of curriculum K-12.

### **PED 7610 TRENDS AND ISSUES IN PHYSICAL EDUCATION**

[3 hours] Analysis of contemporary trends and issues facing the physical educator. Content varies per semester: Children and Sport, Sport Sociology, Elementary/Secondary Teaching.

### **PED 7620 EFFECTIVE SUPERVISION IN PHYSICAL EDUCATION**

[3 hours] Procedures and methods appropriate for supervision of student teachers or inservice teachers in the area of physical education. Computer analysis, observation techniques, conferencing skills and evaluation procedures are stressed.

### **PED 7950 WORKSHOP IN EXERCISE SCIENCE AND PHYSICAL EDUCATION**

[1-4 hours] Topical workshops developed around areas of interest and concern to inservice teachers and/or exercise scientists. Credit cannot be applied towards a degree program without prior consent of adviser.

### **PED 8940 INTERNSHIP IN EXERCISE SCIENCE**

[1-12 hours] A field internship designed to supplement classroom experience by providing participation in the area of exercise science through participant-observer experience.

### **PED 8990 INDEPENDENT STUDY IN EXERCISE SCIENCE/PHYSICAL EDUCATION**

[1-4 hours] The student will participate in independent readings, laboratory research, field experience and other activities not suited for class instruction. May be repeated for course credit.

## **PHCL - Pharmacology**

### **Department of Pharmacology (PHM)**

#### **PHCL 2220 DRUGS, MEDICINE AND SOCIETY**

[3 hours] The course conveys a general knowledge of drugs, including how and where drugs act and the general pharmacology of specific classes of drugs, e.g., central nervous system active agents, bronchodilators, etc.

#### **PHCL 2600 FUNCTIONAL ANATOMY AND PATHOPHYSIOLOGY I**

[4 hours] A study of functional anatomy, physiology and pathophysiology to serve as background for the understanding of the action of drugs. Prerequisite: CHEM 1230, 1240, 1280, 1290; BIOL 2150, 2160, 2170 and 2180 Corequisite: 2nd year standing

#### **PHCL 2620 FUNCTIONAL ANATOMY AND PATHOPHYSIOLOGY II**

[4 hours] A continuation of PHCL 2600. Prerequisite: PHCL 2600

#### **PHCL 3700 PHARMACOLOGY I: PRINCIPLES OF PHARMACOLOGY, AUTONOMIC PHARMACOLOGY AND NON-STEROIDAL ANTI-INFLAMMATORY AGENTS AND RELATED PHARMACOLOGY**

[3 hours] An introduction to the principles of pharmacology and the pharmacology of the autonomic nervous system. Non-steroidal anti-inflammatory agents are also discussed. Prerequisite: Admission to professional division Corequisite: MBC 3550, MBC 3310

#### **PHCL 3720 PHARMACOLOGY II: ENDOCRINE AND CNS PHARMACOLOGY**

[3 hours] The pharmacology of drugs acting upon the endocrine and reproductive systems will be discussed, followed by a treatment of drugs used in the management of sleep disorders, anxiety, affective illness, schizophrenia and seizure disorders. Prerequisite: PHCL 3700 Corequisite: MBC 3560

#### **PHCL 3810 PHARMACOLOGY AND TOXICOLOGY LABORATORY**

[1 hour] The course will teach undergraduate students current methods in pharmacology and toxicology with an emphasis on practical, hands-on experience. Students will learn a variety of techniques commonly used in the pharmaceutical and toxicology industries. Prerequisite: PHCL 3700

#### **PHCL 4140 INTERPRETATION OF PHARMACEUTICAL DATA**

[3 hours] A course designed to emphasize the interpretation of statistical data as it appears in pharmacy literature. The fundamental concepts of statistics will be discussed. Experimental design as well as appropriateness of analytical methodology and conclusions will be emphasized. Prerequisite: Admission to the professional division, or upper division, or permission of instructor

#### **PHCL 4150 BIOPHARMACEUTICS AND PHARMACOKINETICS**

[4 hours] Application of kinetic models to the processes of drug absorption, distribution, biotransformation and excretion. The influence of dosage form and physiology on these processes. Application of pharmacokinetic principles to clinical situations. Prerequisite: PPHR 3080, permission of instructor

#### **PHCL 4300 SELECTED TOPICS IN PHARMACOLOGY**

[2 hours] The pharmacology of selected classes of agents will be discussed. Discussions will include the pharmacology of: Drugs used to treat asthma, antihistamines, drugs used to treat migraine, drugs to manage movement disorders, local anesthetics and antineoplastic agents. Prerequisite: PHCL 4700

#### **PHCL 4600 EPIDEMIOLOGY**

[4 hours] This course is intended to provide fundamental concepts of epidemiology and its basic research methods. The course is designed as a prerequisite for pharmacoepidemiology. Prerequisite: 4th year standing or permission of instructor

#### **PHCL 4620 PHARMACOEPIDEMIOLOGY**

[4 hours] This course is intended to give an overview of and terminology commonly used in pharmacoepidemiology and to teach students how to review and comprehend pharmacoepidemiologic studies. Prerequisite: PHCL 4610 or permission of instructor. Corequisite: PHCL 5140

#### **PHCL 4700 PHARMACOLOGY III: CNS AND CARDIOVASCULAR PHARMACOLOGY**

[3 hours] The pharmacology of central nervous system active agents such as opioid analgesics and alcohol. Continues from PHCL 3720. Agents acting on the cardiovascular and renal systems are also discussed. Prerequisite: PHCL 3720

#### **PHCL 4720 PHARMACOLOGY IV: CHEMOTHERAPEUTIC AGENTS**

[3 hours] The pharmacology of anti-infective chemotherapeutic agents is presented. Issues such as the mechanism of antimicrobial action, disposition, resistance and problems attending the use of antimicrobial drugs will be discussed. Prerequisite: PHCL 4700, 4150, MBC 3600

#### **PHCL 4730 TOXICOLOGY I**

[3 hours] A synopsis of the basic elements of toxicology including dose-response, lethal dose-50, margin of safety, mechanisms of toxicity and nature of toxic injuries including mutagenesis and carcinogenesis. Treatments for poisonings will not be treated in detail (see PHCL 4740). Prerequisite: Permission of instructor for non-pharmacy majors Corequisite: PHCL 3700

#### **PHCL 4740 INTRODUCTION TO CLINICAL TOXICOLOGY**

[2 hours] An introduction to the diagnosis and treatment of human poisoning and risk assessment will be discussed utilizing the lecture and case presentation format. Prerequisite: 4th or 5th yr. standing in the college; PHCL 4700

#### **PHCL 4750 TOXICOLOGY II**

[3 hours] This course provides the students with an overview of environmental toxicology, which emphasizes both air and water pollution. It also reviews the applications of different areas of toxicology, such as food toxicology emphasizing the safety standards of food and methods of evaluation of food safety, analytic toxicology and its applications in forensic toxicology and occupational toxicology, emphasizing the health effects of industrial chemicals on workers and also the permissible levels of these chemicals in the work place. Prerequisite: PHCL 4730 or permission of instructor

#### **PHCL 4760 TOXICOKINETICS**

[3 hours] The theory and practice of using kinetic principles to model the time course of toxic chemicals in the body and in the environment. Relation of the chemical time course to negative outcomes and application to risk assessment. Hands-on practice with kinetic analysis methods and software. Prerequisite: 4th year standing; permission for non-pharmacy

#### **PHCL 4770 TOXICOLOGICAL RISK ASSESSMENT**

[3 hours] Study of human health risk assessment based on National Research Council paradigm. Topics (pharmacokinetic/dynamic modeling, etc.) are designed to provide the student with the tools necessary to conduct quantitative risk assessment. Prerequisite: PHCL 4760 or PHCL 4150 or permission of instructor

#### **PHCL 4780 PRACTICUM IN PHARMACOLOGY/TOXICOLOGY**

[6-12 hours] In this experiential course students will acquire practical knowledge and hands-on experience in the areas of pharmacology and/or toxicology by working at private or government laboratories. Prerequisite: PHCL 3720, 3810; MBC 3320, 3560

**PHCL 4800 HUMAN-XENOBIOTIC INTERACTIONS**

[3 hours] This course will summarize the ways in which xenobiotics affect the human condition both in the context of therapeutic benefit and also chemically-induced diseases. Existing strategies for developing xenobiotics to control disease and for managing xenobiotics in order to limit disease will be discussed. Prerequisite: PHCL 4140, 4700, 4730

**PHCL 4850 DRUG DISPOSITION**

[2 hours] The influence of host factors such as disease states, drug-drug interactions and environmental chemical exposure will be discussed within the framework of basic principles of drug absorption, distribution, metabolism and excretion. Prerequisite: PHCL 4150

**PHCL 4900 HONORS SEMINAR IN PHARMACOLOGY**

[1-3 hours] An examination of a specific question in the context of the primary literature in pharmacology and in the context of the student's own findings based on his/her thesis research. Prerequisite: 4th yr. standing; 3.3 overall GPA; 3.5 GPA in Pharmacology/ or instructor consent

**PHCL 4910 PROBLEMS IN PHARMACOLOGY**

[1-3 hours] An examination of a specific question in pharmacology which can be answered through application of experimental work. Prerequisite: Consent of instructor

**PHCL 4960 HONORS THESIS IN PHARMACOLOGY**

[2-5 hours] An examination of a specific question in pharmacology which can be answered through application of experimental work. Prerequisite: 4th. yr. standing; 3.3 GPA overall; 3.5 GPA in Pharmacology/or consent of instructor

**PHCL 5140 INTERPRETATION OF PHARMACEUTICAL DATA**

[2 hours] A course designed to emphasize the presentation, analysis and interpretation of data in the pharmaceutical sciences. The concepts of statistics will be discussed. Experimental design as well as appropriateness of analytical methodology and conclusions will be emphasized. Prerequisite: Admission to the graduate program or permission of

**PHCL 5300 SELECTED TOPICS IN PHARMACOLOGY**

[2 hours] This course discusses the pharmacodynamics and pharmacotherapeutics of selected classes of pharmacologic agents. The pathophysiology of the disease states for which these agents are commonly employed will be described. Prerequisite: PHCL 5700

**PHCL 5420 ADVANCED NEUROSCIENCE**

[2 hours] This course will explore in depth the anatomy, physiology and chemistry of neurological systems with emphasis on the role of the brain in behavior and the etiology of neurological disorders.

**PHCL 5600 RESEARCH METHODS IN EPIDEMIOLOGY**

[4 hours] This course is intended to provide fundamental concepts of epidemiology and its basic research methods. The course is designed as a prerequisite for pharmacoepidemiology. Prerequisite: 4th year standing or permission of instructor

**PHCL 5620 PHARMACOEPIDEMIOLOGY**

[4 hours] This course is intended to give an overview of and terminology commonly used in pharmacoepidemiology and to teach students how to review and comprehend pharmacoepidemiologic studies. Prerequisite: PHCL 4610, or permission of instructor. Corequisite: PHCL 5140

**PHCL 5700 PHARMACOLOGY I - PRINCIPLES OF PHARMACOLOGY, AUTONOMIC PHARMACOLOGY AND NON-STEROIDAL ANTI-INFLAMMATORY AGENTS AND RELATED PHARMACOLOGY**

[3 hours] An introduction to the principles of pharmacology and the pharmacology of the autonomic system. Non-steroidal anti inflammatory agents are also discussed. Prerequisite: Admission to the Graduate Program

**PHCL 5720 PHARMACOLOGY II: ENDOCRINE AND CNS PHARMACOLOGY**

[3 hours] The pharmacology of drugs acting upon the endocrine and reproductive systems will be discussed, followed by a treatment of drugs used in the management of sleep disorders, anxiety, affective illness, schizophrenia and seizure disorders. Prerequisite: PHCL 5700

**PHCL 5730 TOXICOLOGY I**

[3 hours] This course reviews the basic elements of toxicology. It includes those principles most frequently involved in a full understanding of toxicologic events, such as dose-response, lethal dose-50 (LD50) and margin of safety. It also identifies toxic chemicals and their systemic sites and mechanisms of action. Finally, this course provides information about the kinds of toxic injuries produced in specific organs or systems and the toxic agents that produce these effects. Information about the possible management of some cases of intoxication or poisonings by some agents will be briefly reviewed. Prerequisite: PHCL 5700

**PHCL 5750 TOXICOLOGY II**

[3 hours] This course provides the students with an overview of environmental toxicology, which emphasizes both air and water pollution. It also reviews the applications of different areas of toxicology, such as food toxicology emphasizing the safety standards of food and methods of evaluation of food safety, analytic toxicology and its applications in forensic toxicology, and occupational toxicology, emphasizing the health effects of industrial chemicals on workers and also the permissible levels of these chemicals in the work place. Prerequisite: Completion of PHCL 5730 or permission of instructor

**PHCL 5760 TOXICOKINETICS**

[3 hours] The theory and practice of using kinetic principles to model the time course of toxic chemicals in the body and in the environment. Relation of the chemical time course to negative outcomes and application to risk assessment. Hands-on practice with kinetic analysis methods and software. Prerequisite: Graduate status

**PHCL 5900 DRUG DISPOSITION**

[2 hours] The influence of host factors such as disease states, drug-drug interactions and environmental chemical exposure will be discussed within the framework of basic principles of drug absorption, distribution, metabolism and excretion. Prerequisite: Graduate status

**PHCL 5990 PROBLEMS IN PHARMACOLOGY**

[1-6 hours] Tutorial or directed individual research in pharmacology. Prerequisite: Graduate status

**PHCL 6150 ADVANCED PHARMACOKINETICS**

[2 hours] A study of the mathematical models describing the time course of drugs in the body and their application in the interpretation of in vivo data. Prerequisite: Admission to the graduate program; or consent of instructor

**PHCL 6600 SEMINAR IN PHARMACOLOGY**

[1 hour] Pharmacology students will attend seminar presentations offered through the seminar/colloquia programs in the departments of Biology and Chemistry and in the College of Pharmacy, and must present at least one seminar. Prerequisite: Graduate status

**PHCL 6700 PHARMACOLOGY III: CNS AND CARDIOVASCULAR/RENAL PHARMACOLOGY**

[3 hours] The pharmacology of central nervous system active agents such as the opioid analgesics and alcohol continues from PHCL 5720. Agents acting on the cardiovascular and renal systems are discussed. Prerequisite: PHCL 5720

**PHCL 6720 PHARMACOLOGY IV; CHEMOTHERAPEUTICS**

[3 hours] The pharmacology of anti-infective chemotherapeutic agents is presented. Issues such as the mechanism of antimicrobial action, disposition, resistance and problems attending the use of antimicrobial drugs will be discussed. Prerequisite: PHCL 6700

**PHCL 6770 TOXICOLOGICAL RISK ASSESSMENT**

[3 hours] Study of human health risk assessment on NRC paradigm of: hazard identification, effects characterization, exposure characterization and risk characterization. Topics to be covered (pharmacokinetic/pharmacodynamic modeling, etc.) are designed to provide the student with the tools necessary to conduct quantitative risk assessment. Prerequisite: PHCL 5760 or PHCL 6150

**PHCL 6900 M.S. THESIS RESEARCH IN PHARMACOLOGY**

[1-6 hours] M.S. thesis research in pharmacology. Prerequisite: Graduate status

**PHCL 6920 M.S. THESIS RESEARCH IN PHARMACOLOGY**

[1-6 hours] M.S. thesis research in pharmacology. Prerequisite: Graduate status

**PHCL 7420 ADVANCED NEUROSCIENCE**

[2 hours] This course will explore in depth the anatomy, physiology and chemistry of neurological systems with emphasis on the role of the brain in behavior and the etiology of neurological disorders.

## PHIL - Philosophy

### Department of Philosophy (ARS)

**PHIL 1010 INTRODUCTION TO LOGIC**

[3 hours] (not for major credit) An introduction to the symbolic analysis of argument components and structures. Topics include definition, syllogistic reasoning, semantics, sentential logic and probability. Humanities core course

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### **PHIL 1020 CRITICAL THINKING**

[3 hours] (not for major credit) A study of principles and patterns of good reasoning and writing, including the evaluation and construction of arguments and the identification and avoidance of fallacies. Humanities core course

### **PHIL 2200 INTRODUCTION TO PHILOSOPHY**

[3 hours] (not for major credit) An introduction to philosophical reflection on such issues as the existence of God, free will, knowledge and objectivity, social justice and moral responsibility. Humanities core course

### **PHIL 2400 CONTEMPORARY MORAL PROBLEMS**

[3 hours] A study of topics such as abortion, euthanasia, environmental responsibility, famine relief, affirmative action and sexuality. Attention is paid to moral argument and the bases of moral decisions. Humanities core course

### **PHIL 3000 SYMBOLIC LOGIC**

[3 hours] A study of propositional and predicate logic, techniques used to evaluate deductive arguments. Topics may include computability, set theory, Bayesianism and other formal systems with philosophical and mathematical relevance.

### **PHIL 3060 PHILOSOPHY OF LANGUAGE**

[3 hours] A historical and critical examination of topics in the philosophy of language such as truth, reference, representation, metaphor and interpretation.

### **PHIL 3120 BUSINESS ETHICS**

[3 hours] An examination of the ethical dimensions of the relationships between a business and employees, consumers, other businesses, society, government, the law and the environment.

### **PHIL 3140 COMPUTERS AND CULTURE**

[3 hours] A study of the philosophical issues computers raise which affect and reflect human values. Topics include censorship and privacy on the internet, virtual reality and the possibility of artificial intelligence.

### **PHIL 3180 ENVIRONMENTAL ETHICS**

[3 hours] An examination of our relation and responsibility to the natural environment. Topics include risk assessment, the value of non-human living things, resource use, economics, technology, environmental racism and ecology.

### **PHIL 3210 ANCIENT AND MEDIEVAL PHILOSOPHY**

[3 hours] A study of ancient and medieval philosophy from the pre-Socratics to Aquinas.

### **PHIL 3230 MODERN PHILOSOPHY**

[3 hours] A study of early modern philosophy from Descartes to Kant. Writing intensive course.

### **PHIL 3240 EXISTENTIALISM**

[3 hours] A study of existential philosophers, including Nietzsche, Kierkegaard, Sartre, Camus, Jaspers, Heidegger and others. Topics may include anxiety, meaning and meaninglessness, freedom, and human sociability. Prerequisite: One course in philosophy

### **PHIL 3250 CURRENT EUROPEAN PHILOSOPHY**

[3 hours] An examination of some of the most influential developments in European thought since 1960, such as structuralism, hermeneutics, deconstruction, feminism and post-modernism.

### **PHIL 3300 PHILOSOPHY OF BIOLOGY**

[3 hours] An examination of philosophical topics raised by evolutionary biology including the relation between theory and fact, the characterization of natural kinds, teleology, reductionism and the history of human morality.

### **PHIL 3310 SCIENCE AND SOCIETY**

[3 hours] A study of twentieth-century science and its relationships with government, industry, religion and medicine, including the emergence of Big Science and the future of science education and research.

### **PHIL 3320 PHILOSOPHY OF MATHEMATICS**

[3 hours] A study of philosophical writings, from Plato to the present, on the nature of mathematical objects, knowledge and progress. Topics may include form, number, proof, certainty, consistency, completeness and representation.

### **PHIL 3370 MEDICAL ETHICS**

[3 hours] The application of ethics to the practice of medical professionals. Topics include authority, paternalism, truth-telling, informed consent, health care reform, genetic manipulation, abortion, infanticide and euthanasia.

### **PHIL 3400 ETHICAL THEORY**

[3 hours] A study of the moral philosophies of Aristotle, Hume, Kant, Mill and their critics, focusing on knowledge and justification, virtue, justice, happiness, conflicts of obligation and ideals of community.

### **PHIL 3500 EASTERN THOUGHT**

[3 hours] An examination of major philosophies of Asia and the Far East, their specific concerns and their relevance to contemporary problems. Non-western multicultural course

### **PHIL 3510 ZEN PHILOSOPHY**

[3 hours] An intensive examination of the philosophical, literary and historical roots of Zen (Ch'an) teachings and meditative praxis as found in Madhyamika, Yogacara, Hua-yen and Taoism and an exploration of the ontological and phenomenological dimensions of Zen thought. Humanities core course Non-western multicultural course

### **PHIL 3540 FEMINISM AND PHILOSOPHY**

[3 hours] An examination of feminist perspectives in philosophy, exploring the relevance of gender to central questions in ethics, political theory and epistemology. U.S. multicultural course

### **PHIL 3550 PHILOSOPHY OF CULTURE**

[3 hours] Examines the relevance of cultural differences to values and modes of thought through case studies in non-Western culture. Topics may include cultural relativism and cultural imperialism. Non-western multicultural

### **PHIL 3560 AESTHETICS**

[3 hours] An analysis and evaluation of aesthetic topics such as the definition of art, truth in the arts, the role of representation, the nature of aesthetic value and the character of aesthetic experience.

### **PHIL 3570 PHILOSOPHY OF RELIGION**

[3 hours] A critical and philosophical analysis of topics in religion including the problem of evil, faith and reason, the existence of God and the nature of the religious experience.

### **PHIL 3600 THEORY OF KNOWLEDGE**

[3 hours] An historical and contemporary inquiry into the nature and limits of knowledge and justification. Topics include truth, skepticism, objectivity and relativism.

### **PHIL 3630 PHILOSOPHY OF PSYCHOLOGY**

[3 hours] A philosophical examination of problems concerning the nature of mind such as the relation between mind and body, self-knowledge, free will and personal identity.

### **PHIL 3710 PHILOSOPHY OF LAW**

[3 hours] A study of philosophical issues raised by law such as the relation of law to morality, obligation to obey the law, paternalism, censorship and free speech.

### **PHIL 3750 SOCIAL AND POLITICAL PHILOSOPHY**

[3 hours] A study of classic and contemporary treatments of justice, authority, the relations between individual and community, the meaning of freedom and equality, power and violence, and race and gender.

### **PHIL 3760 CRIME AND PUNISHMENT**

[3 hours] A philosophical study of topics such as crime, responsibility, justice and punishment. Special attention is paid to current practices in the criminal justice system.

### **PHIL 3900 SEMINAR**

[3 hours] Topics vary.

### **PHIL 4060 TOPICS IN THE PHILOSOPHY OF LANGUAGE**

[3 hours] Advanced study of issues in the philosophy of language such as: realism and anti-realism, holism and normativity, externalism and individualism, skepticism and rule following, pragmatics and implicature. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

### **PHIL 4210 ANCIENT PHILOSOPHY SEMINAR**

[3 hours] An intensive study of the texts and arguments of Presocratic philosophers, Plato, Aristotle, or Hellenistic philosophers. Course may be repeated as topics vary. Prerequisite Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

### **PHIL 4230 MODERN PHILOSOPHY SEMINAR**

[3 hours] An intensive study of one or more Continental or British philosophers from the sixteenth through eighteenth centuries. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

### **PHIL 4240 19TH C. EUROPEAN PHILOSOPHY**

[3 hours] An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4250 PHENOMENOLOGY**

[3 hours] An intensive study of major works from phenomenological philosophers, such as Husserl, Heidegger, Sartre, or Merleau-Ponty. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4260 RECENT EUROPEAN PHILOSOPHY**

[3 hours] An examination of texts and problems in the Frankfurt school, post-structuralism, deconstruction and post-modernism, or of such thinkers as Habermas, Foucault, Derrida and Lyotard. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4270 AMERICAN PHILOSOPHY**

[3 hours] A study of the development of American Philosophy, or one or more of Pierce, James, Dewey, or Mead. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4280 20TH C. ANALYTIC PHILOSOPHY**

[3 hours] Selected readings from Frege, Russell, Wittgenstein, the Vienna Circle, the Ordinary Language school, and American neo-pragmatists such as Quine, Rorty and Davidson. Course may be repeated as topics vary. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4300 PHILOSOPHY OF NATURAL SCIENCE**

[3 hours] A study of scientific inquiry including the structure of scientific explanations, relations of evidence and confirmation, the metaphysics of theoretical entities, and the nature of scientific change and progress. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4330 PHILOSOPHY OF SOCIAL SCIENCE**

[3 hours] A study of philosophical and logical problems encountered in the social sciences: statistical vs. causal explanation, operational definition, laws and hypotheses, inductive methods, the status of social facts. Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4400 ETHICS SEMINAR**

[3 hours] Selected topics or philosophers in ethical theory. Course may be repeated as topics vary Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4500 BUDDHIST PHILOSOPHY**

[3 hours] An examination of significant developments in Buddhist philosophical thought including that of Abhidharmika, Madhyamika, Yogacara, Hua-yen and Ch'an (Zen). Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor Non-western multicultural course

**PHIL 4600 EPISTEMOLOGY**

[3 hours] Advanced study of issues in the theory of knowledge such as: the nature and limits of knowledge, a priori and empirical knowledge, skepticism, empiricism and pragmatism. Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4610 CRITICAL THINKING AND EDUCATION**

[3 hours] A study of the principles and pitfalls of contextually good reasoning as relevant to the pre-school - 12 classroom. Topics include: elements of critical thinking, its assessment, transfer and development. Prerequisite: Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4650 PHILOSOPHY OF MIND**

[3 hours] Advanced study of issues in the philosophy of mind such as: intentionality and misrepresentation, rationality and interpretation, supervenience and reductionism, folk psychology and eliminative materialism. Course may be repeated as topics vary Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4750 POLITICAL PHILOSOPHY SEMINAR**

[3 hours] Selected topics or philosophers in political philosophy. Course may be repeated as topics vary. Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4900 ADVANCED SEMINAR**

[2-4 hours] Topics vary. Two 3000-level philosophy classes or one 3200-level philosophy class and junior standing or permission of instructor

**PHIL 4920 DIRECTED READINGS**

[1-4 hours] Prerequisite: Prior arrangement with instructor

**PHIL 4990 INDEPENDENT STUDY FOR HONORS**

[3 hours] Prerequisite: Junior standing and consent of department chair

**PHIL 5060 PHILOSOPHY OF LANGUAGE**

[3 hours] Advanced study of issues in the philosophy of language such as: realism and anti-realism, holism and normativity, externalism and individualism, skepticism and rule following, pragmatics and implicature. Course may be repeated as topics vary.

**PHIL 5210 ANCIENT PHILOSOPHY SEMINAR**

[3 hours] An intensive study of the texts and arguments of Presocratic philosophers, Plato, Aristotle, or Hellenistic philosophers. Course may be repeated as topics vary.

**PHIL 5230 MODERN PHILOSOPHY SEMINAR**

[3 hours] An intensive study of one or more Continental or British philosophers from the sixteenth through eighteenth centuries. Course may be repeated as topics vary.

**PHIL 5240 19TH CENTURY EUROPEAN PHILOSOPHY**

[3 hours] An intensive study of European philosophy after Kant, including Hegel, Marx, Kierkegaard and Nietzsche.

**PHIL 5250 PHENOMENOLOGY**

[3 hours] An intensive study of major works from phenomenological philosophers, such as Husserl, Heidegger, Sartre, or Merleau-Ponty. Course may be repeated as topics and texts vary.

**PHIL 5260 RECENT EUROPEAN PHILOSOPHY**

[3 hours] An examination of texts and problems in the Frankfurt School, post-structuralism, deconstruction, post-modernism, or of such thinkers as Habermas, Foucault, Derrida and Lyotard. Course may be repeated as topics vary.

**PHIL 5270 AMERICAN PHILOSOPHY**

[3 hours] A study of the development of American philosophy, or of one or more of Pierce, James, Dewey, or Mead. Course may be repeated as topics vary.

**PHIL 5280 20TH CENTURY ANALYTIC PHILOSOPHY**

[3 hours] Selected readings from Frege, the Russell, Wittgenstein, the Vienna Circle, the Ordinary Language school and American neopragmatists such as Quine, Rorty and Davidson. Course may be repeated as topics vary.

**PHIL 5300 PHILOSOPHY OF NATURAL SCIENCE**

[3 hours] A study of scientific inquiry including the structure of scientific explanations, relation of evidence and confirmation, the metaphysics of theoretical entities, and the nature of scientific change and progress.

**PHIL 5330 PHILOSOPHY OF SOCIAL SCIENCE**

[3 hours] A study of philosophical and logical problems encountered in the social sciences: statistical vs. causal explanation, operational definition, laws and hypotheses, inductive methods, the status of social facts.

**PHIL 5400 ETHICS SEMINAR**

[3 hours] Selected topics or philosophers in ethical theory. Course may be repeated as topics vary.

**PHIL 5500 BUDDHIST PHILOSOPHY**

[3 hours] An examination of significant developments in Buddhist philosophical thought including that of Abhidharmika, Madhyamika, Yogacara, Hua-yen and Ch'an (Zen). Prerequisite: Graduate standing

**PHIL 5600 EPISTEMOLOGY**

[3 hours] An advanced study of issues in the theory of knowledge, such as: the nature and limits of knowledge, a priori and empirical knowledge, skepticism, empiricism and pragmatism.

**PHIL 5610 CRITICAL THINKING AND EDUCATION**

[3 hours] A study of the principles and pitfalls of contextually good reasoning as relevant to pre-school - 12 classroom. Topics include: the elements of critical thinking, its assessment, transfer and development.

**PHIL 5650 PHILOSOPHY OF MIND**

[3 hours] Advanced study of issues in the philosophy of mind such as: intentionality and misrepresentation, rationality and interpretation, supervenience and reductionism, folk psychology and eliminative materialism. Course may be repeated as topics vary.

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### **PHIL 5750 POLITICAL PHILOSOPHY SEMINAR**

[3 hours] Selected topics or philosophers in political philosophy. Course may be repeated as topics vary.

### **PHIL 5920 READINGS IN PHILOSOPHY**

[3 hours] Critical inquiry into selected works of a particular philosopher or a specific philosophical problem. Prerequisite: Consent of instructor

### **PHIL 5990 INDEPENDENT STUDY**

[1-3 hours] Directed study in philosophy under supervision of a philosophy faculty member. Prerequisite: Consent of instructor

### **PHIL 6000 ADVANCED LOGIC**

[3 hours] A study of propositional and predicate logic, as well as examination of issues in the philosophy of logic.

### **PHIL 6370 ETHICS AND HEALTH CARE**

[3 hours] Advanced level course in ethics for health care related majors. An emphasis on ethical theory and its application to ethical problems in health care practices. Not open to philosophy majors.

### **PHIL 6800 PROSEMINAR**

[1-6 hours] Participation in departmental faculty-graduate student colloquia and mentoring program. Credit will carry the grade of S or U, and will not count toward credit hour requirements for the M.A. degree. Prerequisite: Permission of graduate adviser in philosophy

### **PHIL 6930 SEMINAR**

[3 hours] Advanced philosophy seminar open only to graduate students.

### **PHIL 6960 THESIS**

[1-16 hours]

## **PHPR - Pharmacy Practice**

### **Department of Pharmacy Practice (PHM)**

#### **PHPR 1000 ORIENTATION**

[1 hour] Lectures and small group discussions include University, Freshman Orientation, FYI subjects, plus introductory elements of Pharmacy professional culture. Prerequisite: Admission to College of Pharmacy

#### **PHPR 2010 INTRODUCTION TO PATIENT CARE**

[2 hours] Introduction to the primary dimensions of the profession of pharmacy with an emphasis on the pharmacist's responsibility to assure that drug therapy is used appropriately to improve patient outcomes.

#### **PHPR 3010 PHARMACEUTICAL CALCULATIONS**

[2 hours] This course is intended to present the principles involved in solving any mathematical problem which may be encountered in the practice of pharmacy-logical thought processes will be used. Prerequisite: Admission to professional division, permission of instructor

#### **PHPR 3070 PHARMACEUTICS AND PHARMACEUTICAL TECHNOLOGY I**

[4 hours] An introduction to the principles, theory and processes involved in the manufacture and extemporaneous compounding of the fundamental classes of dosage forms. Prerequisite: Third year professional division standing; permission of instructor Corequisite: PHPR 3010

#### **PHPR 3080 PHARMACEUTICS AND PHARMACEUTICAL TECHNOLOGY II**

[4 hours] Further exploration of the principles, theory and processes involved in the development and preparation of parenteral, ophthalmic and other non-oral drug delivery systems. Prerequisite: PHPR 3010, 3070; permission of instructor

#### **PHPR 3510 PHARMACEUTIC DIMENSIONS OF HEALTH CARE SYSTEM**

[3 hours] Description and analysis of the organization, financing and delivery of healthcare in the U.S. Development of communication skills for pharmacists to function optimally in the system is emphasized. Prerequisite: ECON 1200 or equivalent; permission of instructor

#### **PHPR 3940 EARLY PRACTICE DEVELOPMENT**

[1 hour] The purpose of this course is to increase students' awareness and involvement in areas related to the contemporary practice of pharmacy. Students will participate in projects that nurture their professional growth. Prerequisite: Admission to Pharm.D. track of B.S.P.S.

#### **PHPR 4250 STERILE PRODUCT TECHNOLOGY**

[2 hours] Study of the design, formulation, production, packaging and manipulation of parenteral products used as for therapeutic and nutritional purposes, including the use of blood and blood-related products. Prerequisite: PHPR 3010 Corequisite: PHPR 3080

#### **PHPR 4400 HUMAN INTERACTION IN HEALTHCARE**

[2 hours] An introduction to interpersonal communication with emphasis upon application of one-to-one communication in a variety of healthcare contexts, especially patient counseling. Prerequisite: PHPR 3510; fourth year student Corequisite: PHPR 4410

#### **PHPR 4410 PROFESSIONAL PRACTICE DEVELOPMENT I**

[3 hours] Instruction in the broad dimension of professional pharmacy practice and identification of the pharmacist's responsibility for providing pharmaceutical care, including medication distribution, patient education and use of drug information resources. Prerequisite: PHPR 3010, 3080, 3510; PHCL 3720

#### **PHPR 4420 PROFESSIONAL PRACTICE DEVELOPMENT II**

[3 hours] Building on competencies from PHPR 4400 and 4410, this course enhances professional development to meet specific patient and health care practitioner needs. Instruction includes effective literature analysis, presentation of care plans and pharmacy jurisprudence. Prerequisite: PHPR 3510, 4410 Corequisite: PHPR 4520

#### **PHPR 4430 PATHOPHYSIOLOGY AND PHARMACOTHERAPY (PPT): INTRODUCTION**

[1 hour] An introduction to clinical practice and concepts which will be utilized in the PPT course sequence. Corequisite: PHPR 3080

#### **PHPR 4440 PATHOPHYSIOLOGY AND PHARMACOTHERAPY (PPT): IMMUNOLOGY**

[2 hours] This course will consider current concepts and applications of immunological principles for disease prevention, for transplantation, and for treatment of cancer, autoimmune and infectious disease, using a seminar-discussion-student presentation format.

#### **PHPR 4450 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: RENAL**

[3 hours] Discussion of pathophysiology, clinical presentation, etiological causes, laboratory findings, diagnosis and therapy of renal disease states. Prerequisite: Admission into Pharm.D. track

#### **PHPR 4520 PHARMACEUTICAL MANAGEMENT AND MARKETING**

[3 hours] An introduction to the theoretical concepts and applied techniques for resource management and marketing issues that affect the delivery of pharmaceutical care. Prerequisite: PHPR 4510 Corequisite: PHPR 4420

#### **PHPR 4550 ANALYSIS OF THE PHARMACEUTICAL ENVIRONMENT**

[3 hours] A theoretical and practical examination of the pharmaceutical environment and drug distribution system using the science of marketing as a tool for analysis.

#### **PHPR 4680 PARENTERAL MANUFACTURING**

[2 hours] The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability. Prerequisite: PHPR 3010, 3070, 3080

#### **PHPR 4690 DOSAGE FORM DESIGN**

[3 hours] The utilization of pharmaceutical principles and practices for the design and manufacture of modern commercial dosage forms such as tablets, aerosols, emulsions, suspensions and solutions emphasizing biopharmaceutically efficacious products. Prerequisite: PHPR 3070, 3080, 3010

#### **PHPR 4700 EQUILIBRIUM PHENOMENA**

[2 hours] A theoretical and practical examination of the principles of chemical equilibrium and the techniques used in their calculation. Physical and chemical concepts focus on pharmaceutical systems as well as selected areas of chemistry. Prerequisite: PHPR 3010, 3070 Corequisite: PHPR 3080

#### **PHPR 4710 SELECTED TOPICS IN PHARMACEUTICAL TECHNOLOGY**

[3 hours] Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances. Prerequisite: PHPR 3010, 3070

#### **PHPR 4720 PHARMACEUTICAL RATE PROCESSES**

[3 hours] A theoretical and practical application of kinetic principles applied to pharmaceutical and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction



**PHPR 4780 PRACTICUM IN PHARMACY ADMINISTRATION**

[6 hours] Students will acquire practical knowledge and hands-on experience in the areas of pharmacy administration or industrial pharmacy/pharmaceutics by working in the pharmaceutical industry or with health care systems. Prerequisite: PHCL 3720; MBC 3320, 3560

**PHPR 4880 PRACTICUM IN PHARMACEUTICS**

[6-12 hours] Students will acquire practical knowledge and hands-on experience in the areas of pharmacy administration or industrial pharmacy/pharmaceutics by working in the pharmaceutical industry or with health care systems. Prerequisite: PHPR 3080; PHCL 3720; MBC 3320, 3560

**PHPR 4900 HONORS SEMINAR IN PHARMACY PRACTICE**

[3 hours] An examination of a specific question in the context of the primary literature in pharmacy practice for advanced students. Prerequisite: Fourth year standing

**PHPR 4910 PHARMACY PRACTICE PROBLEMS**

[1-5 hours] Selected undergraduate research projects in pharmacy practice. Prerequisite: Fourth year standing

**PHPR 4960 HONORS THESIS IN PHARMACY PRACTICE**

[5 hours] An examination of a specific research question in pharmacy practice which can be answered through application of experimental work. Prerequisite: Fourth year standing

**PHPR 5680 PARENTERAL MANUFACTURING**

[2 hours] The theory and technology of parenteral and ophthalmic formulation design, production, sterilization, packaging and stability. Prerequisite: PHPR 3010, 3070, 3090

**PHPR 5690 DOSAGE FORM DESIGN**

[3 hours] The utilization of pharmaceutical principles and practices for the design and manufacture of modern commercial dosage forms such as tablets, aerosols, emulsions, suspensions and solutions emphasizing biopharmaceutically efficacious products. Prerequisite: PHPR 3070, 3090, 3010

**PHPR 5700 EQUILIBRIUM PHENOMENON**

[2 hours] A theoretical and practical examination of the principles of chemical equilibrium and the techniques used in their calculation. Physical and chemical concepts focus on pharmaceutical systems as well as selected areas of chemistry.

**PHPR 5710 SELECTED TOPICS IN PHARMACEUTICAL TECHNOLOGY**

[2-3 hours] Discussion, evaluation, experimentation and production of selected dosage forms. A forum for the discussion of new dosage form technology and advances. Prerequisite: PHPR 3010, 3070

**PHPR 5720 PHARMACEUTICAL RATE PROCESSES**

[3 hours] A theoretical and practical application of kinetic principles applied to pharmaceutical and cosmetic systems in liquid and solid state. A mathematical treatment and development of the equations which support each reaction mechanism.

**PHPR 5990 PROBLEMS IN PHARMACY PRACTICE**

[1-6 hours] Tutorial or directed, individual research problems in administrative pharmacy, or other related fields. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

**PHPR 6160 ADVANCED APPLIED PHARMACOKINETIC**

[3 hours] Detailed discussion of pharmacokinetic characteristics of drugs which are commonly included in therapeutic drug monitoring including clinical application. Prerequisite: PHCL 6150

**PHPR 6210 INTRODUCTION TO RESEARCH METHODS**

[2 hours] General overview and introduction to research process as it pertains to clinical pharmacy practice. Special emphasis given to design issues, particularly those involving human subjects. Prerequisite: Admission into Pharm.D. program or permission of instructor

**PHPR 6230 PATIENT CARE ROUNDS I**

[3 hours] The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations. Prerequisite: Admission into Pharm.D. program

**PHPR 6240 PATIENT CARE ROUNDS II**

[3 hours] The course will provide students with advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to patient care. Students will present and discuss how they would identify, prevent and resolve the medication-related problems encountered by a diversity of patient populations. Prerequisite: PHPR 6230

**PHPR 6250 SELF-CARE**

[3 hours] The course will discuss issues surrounding the self-medication decision-making process. Special emphasis will be placed on how pharmacists should help patients safely and effectively treat common medical problems. The course will provide information about how pharmacists should educate and counsel patients about diagnostic tests that the public can purchase without a prescription. Prerequisite: PHPR 6230

**PHPR 6370 NUTRITION**

[1 hour] An overview of the fundamental principles of nutritional support and the pharmacist's role in providing nutritional support services. Prerequisite: Admission into Pharm.D. program

**PHPR 6380 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: ENDOCRINOLOGY**

[2 hours] Discussion of the pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of endocrine disorders. Prerequisite: Admission into Pharm.D. program or permission of instructor

**PHPR 6420 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: CARDIOLOGY**

[4 hours] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of cardiovascular disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor

**PHPR 6430 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: PULMONARY**

[3 hours] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of pulmonary disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor.

**PHPR 6440 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: INFECTIOUS DISEASE**

[4 hours] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of infectious disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor

**PHPR 6450 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: RENAL**

[3 hours] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of renal disease states. Prerequisite: Admission into Pharm.D. track or permission of instructor

**PHPR 6490 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: HEMATOLOGY AND ONCOLOGY**

[3 hours] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of hematologic and oncologic disease states. Prerequisite: Admission into Pharm. D. program or permission of instructor

**PHPR 6510 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: POISON MANAGEMENT**

[1 hour] Discussion of pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of poisoning and drug overdose management. Prerequisite: Admission into Pharm. D. program or permission of instructor

**PHPR 6520 ANALYSIS OF THE PHARMACEUTICAL ENVIRONMENT**

[3 hours] A theoretical and practical examination of the pharmaceutical environment and drug distribution system using administrative pharmacy sciences as a tool for analysis. Prerequisite: PHPR 4520; admission to graduate program in Pharmaceutical Sciences

**PHPR 6530 RESEARCH METHODS IN PHARMACY PRACTICE**

[3 hours] An introduction to research methods and principles used in designing, planning, implementing, analyzing and interpreting research projects in pharmacy practice. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

**PHPR 6550 MANAGEMENT TOPICS FOR CLINICAL PRACTICE**

[2 hours] Description of nature of management, basic management concepts and tools and environmental concerns pertinent to pharmacy practice in all of its practice settings. Prerequisite: Admission into Pharm.D. program or permission of instructor

**PHPR 6600 SEMINAR IN ADMINISTRATIVE PHARMACY**

[1 hour] A critical analysis of current problems in pharmacy practice with individual case presentations. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

## 470 Course Descriptions

### PHPR 6610 SEMINAR I

[1 hour] Instruction on preparation and presentation of clinical and/or scientific seminars. Prerequisite: Admission into a graduate program of pharmacy practice department or permission of instructor

### PHPR 6800 MONITORING THERAPY

[1 hour] An introduction to medical terminology and procedures with reference to physical exam, patient history, common diagnostic procedures and applications to drug and disease state monitoring. Prerequisite: Admission to Pharm.D. program or permission of instructor

### PHPR 6810 HOSPITAL PHARMACY ADMINISTRATION

[3 hours] An examination of the administrative and supervisory aspects of hospital pharmacy practice. Emphasis is placed on management techniques rather than functions performed. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6820 SELECTED TOPICS IN HOSPITAL PHARMACY

[3 hours] A treatment of contemporary trends which influence the practice of hospital pharmacy such as drug distribution systems. Emphasis is placed upon these concepts in light of the resources present. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6830 ADVANCED COMMUNITY PHARMACY ADMINISTRATION

[3 hours] An advanced analysis of concepts, practices and issues related to retail pharmacy management. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6840 SELECTED TOPICS IN COMMUNITY PHARMACY

[3 hours] Examination of contemporary trends influencing community pharmacy, such as home healthcare and prescription drug programs. Emphasis is placed on the impact of these trends on community pharmacy management. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6850 PRODUCT DEVELOPMENT

[3 hours] A study of various stages of development of pharmaceutical products. The student will develop formulations, using stability data and production technology for three products. Prerequisite: PHPR 5690

### PHPR 6890 M.S. PROJECT IN ADMINISTRATIVE PHARMACY

[1-4 hours] Development of a practical project in the pharmacy environment on a practicum basis. A written, bound report and oral presentation are required. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6940 EARLY PRACTICE EXPOSURE

[2 hours] Supervised instruction and participation in pharmacy practice at actual practice sites such as community, hospital, managed care, long-term care and nuclear pharmacies. Prerequisite: Admission into the Pharm.D. program

### PHPR 6950 SEMINAR IN INDUSTRIAL PHARMACY

[1 hour] A seminar course composed of graduate student presentations on their research and special topics as well as outside speakers from both the community and pharmaceutical industry. Prerequisite: Second year graduate student

### PHPR 6960 M.S. THESIS RESEARCH IN PHARMACY

[1-6 hours] Advanced and in-depth study of an issue pertinent to contemporary pharmacy practice. Part of degree requirement for M.S. in Pharmaceutical Sciences. Prerequisite: Admission to graduate program in Pharmaceutical Sciences

### PHPR 6980 SPECIAL TOPICS

[1-5 hours] Selected study of topics in Pharmacy Practice. New pharmacy and healthcare strategies are examined in detail.

### PHPR 8260 JURISPRUDENCE & ETHICS FOR PHARMACY

[1 hour] Discussion of federal, state and local laws affecting the profession and practice of pharmacy. Ethical principles involved in patient care will be reviewed and applied. Prerequisite: Admission into Pharm.D. program

### PHPR 8390 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: GASTROENTEROLOGY

[2 hours] Discussion of the pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of gastrointestinal disorders.

### PHPR 8470 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: RHEUMATOLOGY

[1 hour] Discussion of the pathophysiology, clinical presentation, etiologic causes, laboratory findings, diagnosis and therapy of rheumatologic disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor

### PHPR 8480 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: NEUROLOGY AND PSYCHIATRY

[3 hours] Discussion of pathophysiology, clinical presentation, etiological causes, laboratory findings, diagnosis and therapy of neurologic and psychiatric disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor

### PHPR 8500 PATHOPHYSIOLOGY AND PHARMACOTHERAPY: GERIATRICS AND PEDIATRICS

[2 hours] Discussion of pathophysiology, clinical presentation, etiological causes, laboratory findings, diagnosis and therapy of geriatric and pediatric disease states. Prerequisite: Admission into Pharm.D. program or permission of instructor

### PHPR 8540 GERIATRIC MONITORING PRINCIPLES

[3 hours] Application of didactic geriatric drug therapy principles in a geriatric patient care environment. Emphasis will be placed on geriatric drug monitoring skills. Corequisite: PHPR 8500

### PHPR 8620 SEMINAR II

[1 hour] Discussion of current topics relating to pharmacy practice. Prerequisite: Admission to graduate program in Pharmacy Practice or permission of instructor

### PHPR 8630 SEMINAR III

[2 hours] Presentation of clinical and/or scientific seminar and completion of in-depth pharmacy practice related paper. Prerequisite: Completion of all first year Pharm.D. courses and second year standing

### PHPR 8640 PPT: CAPSTONE

[2 hours] Advanced experiences in applying and integrating biomedical, psychosocial and pharmacoeconomic principles to drug literature evaluation and patient care. Prerequisite: PHPR 6240 Corequisite: PHPR 8500

### PHPR 8940 :002 CLINICAL CLERKSHIP II

[4 hours] Advanced clinical experience in various specialties of medicine and pharmacy. This course will consist of 340 practicum/internship hours for each section (2 months). Prerequisite: Completion of all required didactic coursework; second year standing

### PHPR 8980 SPECIAL TOPICS

[1-5 hours] Selected study of topics in Pharmacy Practice. New Pharmacy and healthcare strategies are examined in detail.

## PHYS - Physics

### Department of Physics and Astronomy (ARS)

#### PHYS 1050 THE WORLD OF ATOMS

[3 hours] The atomic structure of matter and the ideas of quantum physics. The sizes of objects from galaxies to nucleons. Molecules, solids, the wave nature of the electron, quarks and gluons. Natural Sciences core course

#### PHYS 1300 PHYSICS IN EVERYDAY LIFE

[3 hours] Not for major credit. Selected subjects of current interest, with their relation to the principles and concepts of physics. Content may vary from year to year. No special science or mathematics background needed. Natural Sciences core course

#### PHYS 1310 PHYSICS OF MUSIC AND SOUND

[3 hours] Not for major credit. Physics of waves and vibration. Human sound perception. Physics principles of wind, string and percussion instruments. Analog and digital reproduction of sound. Natural Sciences core course

#### PHYS 1320 JURASSIC PHYSICS

[3 hours] Not for major credit. Mechanics, energy, sound and thermodynamics of dinosaurs. The physics of vision and hearing. Fluids and flight. Radioactivity. Climate and the effects of an asteroid collision with the Earth. Natural Sciences core course

#### PHYS 1330 PHYSICS OF LIGHT AND COLOR

[3 hours] Not for major credit. Physics of light and human vision. Atmospheric phenomena, images, depth perception, color analysis, pigments and dyes, color perception, the physics of art, the reproduction of color, thin film interference and holography. Natural Sciences core course

#### PHYS 1340 THE NATURE OF SCIENCE

[3 hours] An interdisciplinary course that discusses major scientific discoveries, the role of hypothesis testing in science, the use of mathematics in science; data presentation; and moral and ethical issues that stem from science. Natural Sciences core course

**PHYS 1750 INTRODUCTION TO PHYSICS**

[4 hours] Not for major credit. High school mathematics including plane geometry, trigonometry and two years of algebra is strongly recommended. Fundamental laws of nature pertaining to mechanics, thermodynamics, waves, electricity, magnetism, optics, atoms and particles. Natural Sciences core course

**PHYS 1910 FRONTIERS OF PHYSICS AND ASTRONOMY**

[3 hours] An examination of our current understanding of the physical world at the conceptual level. Topics may include the ultimate structure of matter, quantum theory, relativity, astrophysics, cosmology and contemporary applications.

**PHYS 2010 TECHNICAL PHYSICS I**

[4 hours] Topics include measurement, statics, Newton's laws, friction, work, energy, power, impulse and momentum, and simple machines. Includes integrated laboratory. Prerequisite: MATH 1340 Natural Sciences core course

**PHYS 2020 TECHNICAL PHYSICS II**

[4 hours] Topics include thermodynamics, electricity, and magnetism, electromagnetic radiation, optics, atomic and nuclear physics. Includes integrated laboratory. Prerequisite: MATH 1340 Natural Sciences core course

**PHYS 2070 GENERAL PHYSICS I**

[5 hours] Calculus not required. Mechanics of energy and motion, gravitation, harmonic motion, fluids, heat, entropy and the laws of thermodynamics. Four hours lecture and discussion, two hours laboratory per week. Prerequisite: Minimum of three years high school mathematics including plane geometry, trigonometry and two years of algebra. Natural Sciences core course

**PHYS 2080 GENERAL PHYSICS II**

[5 hours] Calculus not required. Electricity and magnetism, capacitors and inductors, electromagnetic waves, optics, atomic physics, nuclear physics, and elementary particles. Four hours lecture and discussion, two hours laboratory per week. Prerequisite: PHYS 2070 Natural Sciences core course

**PHYS 2100 PHYSICS WITH CALCULUS**

[2 hours] A bridge course for students wishing to continue in physics after taking PHYS 2070-2080. The application of calculus and elementary differential equations in various physical contexts. No credit for students who take PHYS 2130-2140. Prerequisite: PHYS 2080, MATH 1860

**PHYS 2130 PHYSICS FOR SCIENCE AND ENGINEERING MAJORS I**

[5 hours] Calculus based general physics. Mechanics of motion and energy, rotation, gravitation, harmonic motion, waves, fluids and the laws of thermodynamics. Five hours lecture and discussion, two hours laboratory per week. Prerequisite: MATH 1850 (with C or better) Corequisite: MATH 1860 Natural Sciences core course

**PHYS 2140 PHYSICS FOR SCIENCE AND ENGINEERING MAJORS II**

[5 hours] Calculus based general physics. Electricity and magnetism, capacitors and inductors, electromagnetic oscillations, Maxwell's equations and electromagnetic radiation, optics, images, interference, and diffraction. Five hours lecture and discussion, two hours laboratory per week. Prerequisite: PHYS 2130 Natural Sciences core course

**PHYS 2330 BLACK HOLES, GENERAL RELATIVITY, AND THE BIG BANG THEORY**

[3 hours] Descriptive discussion of the theory of general relativity, the final states of stellar evolution, black holes, and history of the universe from the big bang through the formation of the solar system. May be offered as writing intensive. Prerequisite: ASTR 1010 or 2020

**PHYS 3070 QUANTUM PHYSICS FOR ENGINEERS**

[3 hours] The physics of electrons, photons, atoms and nuclei, with emphasis on topics of importance for engineering. Prerequisite: PHYS 2140

**PHYS 3180 INTERMEDIATE LABORATORY**

[3 hours] Physical measurements laboratory related to the development of modern physics, emphasizing techniques such as electronics, computer-aided experimental control and data acquisition, and data analysis. May be offered as writing intensive. Prerequisite: PHYS 2140 or 2100

**PHYS 3310 QUANTUM PHYSICS I**

[3 hours] Quantum mechanics: atomic and molecular structure and spectra. Prerequisite: PHYS 1910, 2140; MATH 1860

**PHYS 3320 QUANTUM PHYSICS II**

[3 hours] Quantum statistics, applications of quantum mechanics and quantum statistics in laser physics and solid state physics, nuclear physics. Prerequisite: PHYS 3310

**PHYS 3410 THERMAL PHYSICS**

[3 hours] Statistical mechanics, kinetic theory and thermodynamics from a unified microscopic point of view, with applications to a variety of topics from different areas of physics. Prerequisite: PHYS 3310

**PHYS 3610 OPTICS AND LASERS**

[3 hours] Electromagnetic theory, ray and wave optics including matrix methods, polarization, interference, diffraction, basic laser physics and survey of current laser systems. Prerequisite: PHYS 2140

**PHYS 4130 COMPUTATIONAL PHYSICS**

[3 hours] Working knowledge of computer operations and programming required. Numerical accuracy, advanced programming, graphics and spreadsheet packages, numerical techniques for differentiation, integration, matrices, solving differential equations and eigenvalue problems. Corequisite: PHYS 4210 or 4230

**PHYS 4210 THEORETICAL MECHANICS**

[3 hours] Statics and dynamics of particles, work, energy, Lagrange equations of motion, small oscillations, dynamics of rigid bodies. Prerequisite: PHYS 2140; MATH 1890, 3860

**PHYS 4230 ELECTRICITY AND MAGNETISM I**

[3 hours] Mathematical formulation of electrostatic and magnetostatic fields, potential theory solution of boundary value problems, method of images, dielectric and magnetic materials. Prerequisite: PHYS 2140; MATH 1890, 3860

**PHYS 4240 ELECTRICITY AND MAGNETISM II**

[3 hours] Maxwell's field equations, production and propagation of electromagnetic waves, solution of boundary value problems with application to the laws of optics and guided waves. Prerequisite: PHYS 4230

**PHYS 4310 QUANTUM MECHANICS**

[3 hours] Formalism and applications of quantum mechanics: Hilbert space, time-independent and time-dependent perturbation theories, atomic and molecular structure and spectra, and scattering theory. Prerequisite: PHYS 3320; MATH 1890 and 3860

**PHYS 4510 PHYSICS OF CONDENSED MATTER**

[3 hours] Crystal lattices and structures, reciprocal lattice and kinematical diffraction theory, binding in crystals, lattice dynamics and phonons, thermodynamic, electronic, and optical properties of insulators, semiconductors, metals and alloys. Prerequisite: PHYS 3320, 3410

**PHYS 4580 MOLECULAR AND CONDENSED MATTER LABORATORY**

[3 hours] Experiments in molecular and condensed matter physics such as Raman scattering and photoluminescence X-ray diffraction, Mossbauer effect, Hall effect, NMR and scanning tunneling microscopy. One 4 hour lab and 1 hour lecture per week. May be offered as writing intensive. Prerequisite: PHYS 3320

**PHYS 4620 THE PHYSICS OF LASERS**

[3 hours] Longitudinal and transverse coherence, stimulated emission, optical pumping, resonator structures, Q-switching, mode-locking and laser systems (gas, dye, diode, doped insulator and free electron lasers). Prerequisite: PHYS 3320

**PHYS 4780 ATOMIC AND NUCLEAR PHYSICS LABORATORY**

[3 hours] Detectors and electronics, beta, gamma, and X-ray spectroscopy, grating and interferometric spectroscopy, laser applications, solar spectroscopy. One 4 hour lab and 1 hour lecture per week. May be offered as writing intensive. Prerequisite: PHYS 3320

**PHYS 4910 RESEARCH PROBLEMS-PHYSICS AND ASTRONOMY**

[1-3 hours] Individual experimental or theoretical projects selected with the approval of the department. Prerequisite: Permission of department chair

**PHYS 4980 SPECIAL TOPICS IN PHYSICS**

[1-4 hours] Individual or small group study of selected topics not covered in regular undergraduate courses. Prerequisite: Permission of department

**PHYS 5130 COMPUTATIONAL PHYSICS**

[3 hours] Numerical accuracy, advanced programming, graphics and spreadsheet packages, numerical techniques for differentiation, integration, matrices, solving differential equations and eigenvalue problems. Prerequisite: Permission of department

**PHYS 5210 THEORETICAL MECHANICS**

[3 hours] Kinematics and dynamics of particles and rigid bodies. Lagrangian and Hamiltonian equations of motion. Prerequisite: Permission of department

**PHYS 5230 CLASSICAL ELECTRICITY AND MAGNETISM I**

[3 hours] Electrostatics: the equations of Laplace and Poisson-Maxwell's equations and their solutions. Prerequisite: Permission of department

**PHYS 5240 ELECTRICITY AND MAGNETISM II**

[3 hours] Maxwell's equations and their solutions; electromagnetic radiation. Prerequisite: PHYS 5230

## 472 Course Descriptions

### PHYS 5310 QUANTUM MECHANICS

[3 hours] Formalism and applications of quantum mechanics: Hilbert space, time independent and time-dependent perturbation theories, atomic and molecular structure and spectra, and scattering theory. Prerequisite: Permission of department

### PHYS 5510 CONDENSED MATTER PHYSICS

[3 hours] Crystal lattices and structures, reciprocal lattice and kinematical diffraction theory. Survey of binding in crystals. Lattice dynamics and phonons. Thermodynamic, electronic, and optical properties of insulators, semiconductors, metals and alloys. Prerequisite: Permission of department

### PHYS 5620 THE PHYSICS OF LASERS

[3 hours] Longitudinal and transverse coherence, stimulated emission, optical pumping, resonator structures, Q-switching, mode-locking and laser systems (gas, dye, diode, doped insulator and free electron lasers). Prerequisite: Permission of department

### PHYS 5800 ASTRONOMY IN THE PLANETARIUM

[3 hours] Theory and practice of astronomical outreach programming. Sky and calendar, mythology, constellations, physical physics, buying and using small telescopes, operating and maintaining planetarium projectors, sky simulation software, projects and program production. Prerequisite: Permission of department

### PHYS 5810 ASTROPHYSICS I

[3 hours] Spherical coordinate systems, astronomical time, celestial mechanics, the solar system and planetary physics, photometry, radiative transfer, stellar spectra and classification, binary stars and stellar masses. Prerequisite: Permission of department

### PHYS 5820 ASTROPHYSICS II

[3 hours] Stellar structure and evolution, close binaries, origin of the elements, the sun, variable stars, star clusters, the interstellar medium, the Milky Way Galaxy, stellar statistics, galaxy structure and evolution, cosmology. Prerequisite: PHYS 5810

### PHYS 5880 ASTROPHYSICS LABORATORY

[3 hours] Astronomical, optical and electronic principles of operation of a modern astronomical observatory. Observing with the 1-meter telescope of Ritter Observatory, reduction, analysis and interpretation of astronomical spectra. Six hours laboratory per week. Corequisite: PHYS 5810

### PHYS 5900 RESEARCH TECHNIQUES IN PHYSICS AND ASTRONOMY

[1-6 hours] Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the M.S. degree. Prerequisite: Permission of department

### PHYS 5950 EDUCATION WORKSHOP IN THE PHYSICAL SCIENCES

[1-4 hours] For teachers in grades K-12. Introduction to modern physical science concepts suitable for classroom use; lecture and laboratory. Not acceptable for physics degree program.

### PHYS 6010 PHYSICS AND ASTRONOMY COLLOQUIUM

[2 hours] Topical lectures by visiting and local professionals. Prerequisite: Permission of department

### PHYS 6020 PHYSICS AND ASTRONOMY JOURNAL SEMINAR

[1 hour] Literature review seminar. Prerequisite: Permission of department

### PHYS 6030 TEACHING THE BASIC CONCEPTS OF PHYSICS

[3 hours] Review of key concepts of physics and teaching strategies useful in introductory courses and laboratories. Prerequisite: Permission of department

### PHYS 6130 COMPUTATIONAL PHYSICS FOR RESEARCH

[3 hours] Software packages for display and analytic manipulation, numerical methods for linear and nonlinear systems of differential equations, matrix algebra, and the Schrodinger equation. Vector and parallel processing. Prerequisite: Permission of instructor

### PHYS 6140 FUNDAMENTALS OF MODERN PHYSICS

[3 hours] An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy. Prerequisite: Permission of department

### PHYS 6180 MODERN PHYSICS LABORATORY

[2-3 hours] Experiments in atomic, condensed matter and nuclear physics, such as Zeeman, Raman, Mossbauer and Hall Effects, Doppler shifts, X-ray diffraction, NMR, STM, and alpha, beta and gamma ray spectroscopies. Prerequisite: PHYS 6140/7140

### PHYS 6220 CLASSICAL MECHANICS

[3 hours] Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems. Prerequisite: Permission of instructor.

### PHYS 6250 CLASSICAL ELECTRODYNAMICS I

[3 hours] Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials. Prerequisite: Permission of instructor

### PHYS 6260 CLASSICAL ELECTRODYNAMICS II

[3 hours] Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities. Prerequisite: PHYS 6250 or 7250

### PHYS 6290 CURRENT ISSUES IN PLASMA PHYSICS

[3 hours] Content may vary, covering topics such as fusion, plasmas in astrophysics, microdischarges, plasma display devices. Prerequisite: Permission of instructor

### PHYS 6320 QUANTUM MECHANICS I

[3 hours] Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method. Prerequisite: Permission of department

### PHYS 6330 QUANTUM MECHANICS II

[3 hours] The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation. Prerequisite: Permission of department

### PHYS 6390 CURRENT ISSUES IN BIOLOGICAL AND MEDICAL PHYSICS

[3 hours] Physical principles of living processes, structural and dynamical properties of nucleic acids, proteins, polysaccharides, and lipids, intermolecular interactions of biomolecules, statistical mechanics of macromolecules, interactions of ionizing radiation with tissue. Prerequisite: Permission of instructor

### PHYS 6450 STATISTICAL MECHANICS

[3 hours] A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics. Prerequisite: PHYS 5310 or equivalent

### PHYS 6490 CURRENT ISSUES IN THEORETICAL PHYSICS

[3 hours] Problems in theory relative to the research programs pursued at the University.

### PHYS 6520 CONDENSED MATTER PHYSICS I

[3 hours] A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations. Prerequisite: PHYS 6330 or permission of instructor

### PHYS 6530 CONDENSED MATTER PHYSICS II

[3 hours] A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory. Prerequisite: PHYS 6330 or permission of instructor

### PHYS 6540 STRUCTURE, DEFECTS AND DIFFUSION

[4 hours] A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state. Prerequisite: Permission of instructor

### PHYS 6550 THERMODYNAMICS AND PHASE TRANSFORMATIONS IN CONDENSED SYSTEMS

[4 hours] A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics. Prerequisite: PHYS 6540/8540 or permission of instructor

### PHYS 6590 CURRENT ISSUES IN CONDENSED MATTER AND MATERIAL SCIENCE

[3 hours] A survey of various areas in the physics of condensed matter and materials. Content will vary with instructor and from year to year. Prerequisite: Permission of instructor

### PHYS 6690 CURRENT ISSUES IN OPTICS

[3 hours] Current research in optics and the optical excitation of material modes. Prerequisite: Permission of instructor

**PHYS 6710 ATOMIC PHYSICS**

[3 hours] A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions. Prerequisite: PHYS 5310 or equivalent

**PHYS 6720 ATOMIC & MOLECULAR SPECTROSCOPY**

[3 hours] Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra. Prerequisite: PHYS 6710

**PHYS 6730 PARTICLE PHYSICS**

[3 hours] The study of particles and their interactions: conserved quantum numbers, symmetries and invariance principles, the standard model and beyond, accelerator/non-accelerator experiments, detectors and particle astrophysics. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 6740 NUCLEAR PHYSICS**

[3 hours] Properties of the atomic nucleus and the nucleon-nucleon interaction, models for the structure of the nucleus, analysis of nuclear decay and nuclear reactions with applications to interdisciplinary areas. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 6770 ACCELERATOR PHYSICS**

[3 hours] Basic electrodynamic functioning of charged-particle accelerators, particle dynamics of non-relativistic and relativistic accelerators, accelerator applications, static field and dynamic field accelerator designs. Prerequisite: Permission of department

**PHYS 6790 CURRENT ISSUES IN ATOMIC, MOLECULAR AND PARTICLE PHYSICS**

[3 hours] Current research in atomic and molecular physics theory and experiment. Prerequisite: Permission of instructor

**PHYS 6810 STELLAR ASTROPHYSICS I**

[3 hours] Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation and spectral signatures of atmospheric physics. Prerequisite: PHYS 5820 or equivalent

**PHYS 6820 STELLAR ASTROPHYSICS II**

[3 hours] Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology. Prerequisite: PHYS 5820 or equivalent

**PHYS 6830 GALACTIC ASTRONOMY I**

[3 hours] Stellar spectra, colors, compositions and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium. Prerequisite: PHYS 5820 or equivalent

**PHYS 6840 GALACTIC ASTRONOMY II**

[3 hours] Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution. Prerequisite: PHYS 5820 or equivalent

**PHYS 6890 CURRENT ISSUES IN ASTROPHYSICS**

[3 hours] Current research in solar, solar system, stellar, interstellar matter, galactic and/or cosmological physics. Prerequisite: Permission of instructor

**PHYS 6960 M.S. THESIS RESEARCH**

[1-15 hours] Thesis research required for the M.S. degree. Prerequisite: Permission of department

**PHYS 6980 SPECIAL TOPICS**

[1-4 hours] Course reserved for visiting lecturers and topics not covered otherwise. Prerequisite: Permission of department

**PHYS 6990 INDEPENDENT STUDY**

[1-4 hours] Prerequisite: Permission of department

**PHYS 7030 TEACHING THE BASIC CONCEPTS OF PHYSICS**

[3 hours] Review of key concepts of physics and teaching strategies useful in introductory courses and laboratories. Prerequisite: Permission of department

**PHYS 7130 COMPUTATIONAL PHYSICS FOR RESEARCH**

[3 hours] Software packages for display and analytic manipulation, numerical methods for linear and non-linear systems of differential equations, matrix algebra, and the Schrodinger equation. Vector and parallel processing. Prerequisite: Permission of instructor

**PHYS 7140 FUNDAMENTALS OF MODERN PHYSICS**

[3 hours] An intensive course which reviews the fundamentals of atomic, statistical and condensed matter physics. Provides a common foundation for entering graduate students for succeeding courses in physics and astronomy. Prerequisite: Permission of department

**PHYS 7180 MODERN PHYSICS LABORATORY**

[2-3 hours] Experiments in atomic, condensed matter and nuclear physics, such as Zeeman, Raman, Mossbauer, and Hall Effects, Doppler shifts, X-ray diffraction, NMR, STM, and alpha, beta and gamma ray spectroscopies. Prerequisite: PHYS 6140/7140

**PHYS 7220 CLASSICAL MECHANICS**

[3 hours] Advanced classical mechanics, including the variational principles, Lagrange and Hamilton mechanics, and linear and nonlinear systems. Prerequisite: Permission of instructor.

**PHYS 7250 CLASSICAL ELECTRODYNAMICS I**

[3 hours] Solutions to Poisson's equation in Cartesian, spherical and cylindrical coordinates with Dirichlet, Neuman and mixed boundary conditions. Maxwell's equations and their solutions applied to waveguides and nonlinear materials. Prerequisite: Permission of instructor

**PHYS 7260 CLASSICAL ELECTRODYNAMICS II**

[3 hours] Solutions to the wave equation with time dependent source terms, energy loss from high energy charged particles in dense materials, special relativity, classical field theory, invariant Lagrangians and conserved quantities. Prerequisite: PHYS 6250 or 7250

**PHYS 7320 QUANTUM MECHANICS I**

[3 hours] Quantum theory and its application to physical problems. Topics include dynamics in the Schrodinger and Heisenberg pictures, invariance principles and angular momentum theory, perturbation theory, the variational method. Prerequisite: Permission of department

**PHYS 7330 QUANTUM MECHANICS II**

[3 hours] The quantum theory of scattering, electromagnetic interactions, quantization of the electromagnetic field and introduction to the Dirac equation. Prerequisite: Permission of department

**PHYS 7450 STATISTICAL MECHANICS**

[3 hours] A fundamental quantum-mechanical development of statistical thermodynamics. Non-interacting and weakly interacting many-particle systems in the classical and quantum regimes, with applications to various fields of physics. Prerequisite: PHYS 5310 or equivalent

**PHYS 7520 CONDENSED MATTER PHYSICS I**

[3 hours] A study of the electromagnetic, thermal and elastic properties of condensed matter through the quantum-mechanical treatment of the electrons and elementary excitations. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 7530 CONDENSED MATTER PHYSICS II**

[3 hours] A survey of condensed matter phenomena of interest to experimentalists, as elucidated by theory. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 7710 ATOMIC PHYSICS**

[3 hours] A study of the fundamental properties of atoms, their theoretical description and experimental measurement. Topics include atomic structure, radiative transitions, external field interactions and atomic collisions. Prerequisite: PHYS 5310 or equivalent

**PHYS 7720 ATOMIC & MOLECULAR SPECTROSCOPY**

[3 hours] Theory and experimental methods of atomic and molecular spectroscopy. Topics include the theory of interpretation of atomic and molecular spectra and the experimental means to measure the spectra. Prerequisite: PHYS 6710

**PHYS 7730 PARTICLE PHYSICS**

[3 hours] The study of particles and their interactions: conserved quantum numbers, symmetries and invariance principles, the standard model and beyond, accelerator/non-accelerator experiments, detectors, and particle astrophysics. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 7740 NUCLEAR PHYSICS**

[3 hours] Properties of the atomic nucleus and the nucleon-nucleon interaction, models for the structure of the nucleus, analysis of nuclear decay and nuclear reactions with applications to interdisciplinary areas. Prerequisite: PHYS 6330 or permission of instructor

**PHYS 7770 ACCELERATOR PHYSICS**

[3 hours] Basic electrodynamic functioning of charged-particle accelerators, particle dynamics of non-relativistic and relativistic accelerators, accelerator applications, static field and dynamic field accelerator designs. Prerequisite: Permission of department

## 474 Course Descriptions

### PHYS 7810 STELLAR ASTROPHYSICS I

[3 hours] Stellar atmospheres and their emergent spectra. Physics of radiation, matter and their interaction. Radiative transfer, hydrostatic and radiative equilibrium, convection, line formation, and spectral signatures of atmospheric physics. Prerequisite: PHYS 5820 or equivalent

### PHYS 7820 STELLAR ASTROPHYSICS II

[3 hours] Stellar structure and evolution. Equation of state, nuclear reactions and nucleosynthesis, stellar formation, evolution and death, enrichment of the interstellar medium, formation of planetary systems, solar physics and helioseismology. Prerequisite: PHYS 5820 or equivalent

### PHYS 7830 GALACTIC ASTRONOMY I

[3 hours] Stellar spectra, colors, compositions, and ages; star clusters; pulsating stars; calibration of distance indicators. Interstellar dust, interstellar extinction, interstellar gas, nebulae; structure of the interstellar medium. Prerequisite: PHYS 5820 or equivalent

### PHYS 7840 GALACTIC ASTRONOMY II

[3 hours] Structure and dynamics of the Galaxy, shocks and explosions, stellar kinematics, galactic rotation, and dynamical and chemical evolution. Prerequisite: PHYS 5820 or equivalent

### PHYS 7910 ADVANCED RESEARCH IN PHYSICS AND ASTRONOMY

[1-15 hours] Research work under the guidance of a member of the graduate faculty. Designed to prepare the student to propose and carry out the thesis research required for the Ph.D. degree. Prerequisite: Permission of department

### PHYS 7950 EDUCATION WORKSHOP IN THE PHYSICAL SCIENCES

[1-4 hours] For teachers in grades K-12. Introduction to modern physical science concepts suitable for classroom use; lecture and laboratory. Not acceptable for physics degree program.

### PHYS 8010 PHYSICS AND ASTRONOMY COLLOQUIUM

[2 hours] Topical lectures by visiting and local professionals. Prerequisite: Permission of department

### PHYS 8020 PHYSICS AND ASTRONOMY JOURNAL SEMINAR

[1 hour] Literature review seminar. Prerequisite: Permission of department

### PHYS 8290 CURRENT ISSUES IN PLASMA PHYSICS

[3 hours] Content may vary, covering topics such as fusion, plasmas in astrophysics, microdischarges, plasma display devices. Prerequisite: Permission of instructor

### PHYS 8340 RELATIVISTIC QUANTUM MECHANICS

[3 hours] A general approach to relativistic quantum mechanics. Detailed study of Klein-Gordon and Dirac equations. Bilinear covariants and trace theorems. Prerequisite: PHYS 7330

### PHYS 8350 QUANTUM FIELD THEORY

[3 hours] Quantum mechanics of multiparticle systems. Essentials of quantum field theory and quantum scattering theory. Interactions, scattering matrix and Feynman approach to perturbation theory. Prerequisite: PHYS 8340

### PHYS 8390 CURRENT ISSUES IN BIOLOGICAL AND MEDICAL PHYSICS

[3 hours] Physical principles of living processes, structural and dynamical properties of nucleic acids, proteins, polysaccharides and lipids, intermolecular interactions of biomolecules, statistical mechanics of macromolecules, interactions of ionizing radiation with tissue. Prerequisite: Permission of instructor

### PHYS 8490 CURRENT ISSUES IN THEORETICAL PHYSICS

[3 hours] Problems in theory relative to the research programs pursued at the University. Prerequisite: Permission of instructor

### PHYS 8540 STRUCTURE, DEFECTS AND DIFFUSION

[4 hours] A generic materials science approach to the study of crystalline structure, defects (point, line and planar) in crystalline materials, and the mechanisms and kinetics of diffusion in the condensed state. Prerequisite: Permission of instructor

### PHYS 8550 THERMODYNAMICS AND PHASE TRANSFORMATIONS IN CONDENSED SYSTEMS

[4 hours] A materials science approach to the thermodynamics of condensed state equilibria and phase transformation kinetics. Prerequisite: PHYS 6540/8540 or permission of instructor

### PHYS 8590 CURRENT ISSUES IN CONDENSED MATTER AND MATERIAL SCIENCE

[3 hours] A survey of various areas in the physics of condensed matter and materials. Content will vary with instructor and from year to year. Prerequisite: Permission of instructor

### PHYS 8690 CURRENT ISSUES IN OPTICS

[3 hours] Current research in optics and the optical excitation of material modes. Prerequisite: Permission of instructor

### PHYS 8790 CURRENT ISSUES IN ATOMIC, MOLECULAR AND PARTICLE PHYSICS

[3 hours] Current research in atomic and molecular physics theory and experiment. Prerequisite: Permission of instructor

### PHYS 8860 GENERAL RELATIVITY

[3 hours] Differential geometry, exterior calculus of tensors, the stress-energy tensor and Einstein field equation, stellar evolution and black holes, gravitational lensing, tests of the theory, and gravitational wave detection. Prerequisite: PHYS 7260 or permission of instructor

### PHYS 8870 COSMOLOGY

[3 hours] Cosmological solutions for Einstein's field equation, the standard cosmological model, particle physics, nucleosynthesis and the cosmic background radiation. Inflation, dark matter and mass distribution, gravitational evolution, and formation of galaxies. Prerequisite: PHYS 8860 or permission of instructor

### PHYS 8890 CURRENT ISSUES IN ASTROPHYSICS

[3 hours] Current research in solar, solar system, stellar, interstellar matter, galactic and/or cosmological physics. Prerequisite: Permission of instructor

### PHYS 8960 PH. D. THESIS RESEARCH

[1-15 hours] Thesis research required for the Ph.D. degree. Prerequisite: Permission of department

### PHYS 8980 SPECIAL TOPICS

[1-4 hours] Course reserved for visiting lecturers and topics not covered otherwise. Prerequisite: Permission of department

### PHYS 8990 INDEPENDENT STUDY

[1-4 hours] Prerequisite: Permission of department

## PMED - Pre-Med

### Pre-Med Program (ARS)

### PMED 1000 HOSPITAL FIELD EXPERIENCE

[1-3 hours] Supervised independent study designed to provide pre-medical students with volunteer experiences in a health care institution. To receive 1 hr credit, students must complete 4 hrs of volunteer work per week. May be taken only as PS/NC.

## PSC - Political Science

### Department of Political Science and Public Administration (ARS)

### PSC 1200 AMERICAN NATIONAL GOVERNMENT

[3 hours] An introductory survey of the institutions, processes and politics of the government of the United States and its relationship to state governments. (not for major credit) Social Sciences core course

### PSC 1400 CURRENT ISSUES IN U.S. PUBLIC POLICY

[3 hours] A course designed to introduce the student to the policy process in the United States through an examination of current social, social, economic and political issues facing local, state and national governments. Social Sciences core course

### PSC 1710 CURRENT INTERNATIONAL PROBLEMS

[3 hours] A course designed to give the student a perspective on world affairs through an examination of some contemporary international problems. Non-western multicultural course

### PSC 2210 WOMEN IN AMERICAN POLITICS

[3 hours] An examination of the role of women in the American political system with special attention to their socializing experiences, political power bases and legal status. Prerequisite: PSC 1200 or 1400 U.S. multicultural course

### PSC 2300 PRINCIPLES OF STATE AND LOCAL GOVERNMENT

[3 hours] A study of the political processes and institutions of American state and local governments, with attention given to selected areas of public policy and intergovernmental relations. Prerequisite: PSC 1200 or 1400

### PSC 2610 GOVERNMENT OF GREAT BRITAIN

[3 hours] An analysis of British parliamentary democracy and an examination of modern British politics. Recommended: PSC 1200 or 1400.

**PSC 2620 COMPARATIVE POLITICS: CONTINENTAL EUROPE**

[3 hours] A comparative analysis of the politics of continental Europe focusing on the French and German political systems. Recommended: PSC 1200 or 1400

**PSC 2660 POLITICS IN AFRICA**

[3 hours] The character and development of African political institutions and processes with a special emphasis on patterns in the post-independence period and prospects for the future. Non-western multicultural course

**PSC 2680 GOVERNMENTS OF ASIA**

[3 hours] An examination of culture, political institutions, and political processes and problems of development of selected Asian countries. Non-western multicultural course

**PSC 2700 PRINCIPLES OF INTERNATIONAL RELATIONS**

[3 hours] An examination of such basic forces as nationalism, ideology and power that promote conflict and cooperation among states in the international community.

**PSC 2790 POLITICAL SCIENCE STUDY ABROAD**

[1-3 hours] An examination of topics in political science or public administration requiring study and travel in other countries. Topics vary.

**PSC 2800 PRINCIPLES OF POLITICAL THEORY**

[3 hours] An investigation of important themes in classical and contemporary political theory, including: justice, liberty and democracy. These issues are approached through discussion of a number of original works by political theorists.

**PSC 3110 SOCIAL SCIENCE STATISTICS**

[3 hours] Descriptive statistics, introduction to inferential statistics, data processing and computer applications in the social sciences.

**PSC 3210 POLITICAL PARTIES**

[3 hours] An analysis of the theory, organization, techniques and dynamics of the American party system. Prerequisite: PSC 1200 or 1400

**PSC 3240 AFRICAN-AMERICAN POLITICS**

[3 hours] A study of the many ways blacks have involved themselves in American politics; examines African-American participation in the political and governmental process. Prerequisite: PSC 1200 or 1400

**PSC 3250 PUBLIC OPINION**

[3 hours] A study of American public opinion with attention to polling and voting data and analysis. Prerequisite: PSC 1200 or 1400

**PSC 3260 GOVERNMENT AND THE ECONOMY**

[3 hours] An examination of the politics of the American economic system including the role of government in both the public and private sectors of the economy. Prerequisite: PSC 1200 or 1400

**PSC 3310 MUNICIPAL GOVERNMENT**

[3 hours] A survey of urban government and politics, including the philosophy of local government, urban political processes, structural problems and relations with other units of government. Prerequisite: PSC 2300 and junior standing or permission of instructor

**PSC 3420 PRINCIPLES OF PUBLIC ADMINISTRATION**

[3 hours] An overview of public administration including organization theory, decision making, budgeting, public policy and the changing role of public institutions. Prerequisite: PSC 1200 or 1400 or equivalent

**PSC 3500 PRINCIPLES OF LAW**

[3 hours] An overview of law, legal procedures and the legal professions. Prerequisite: PSC 1200 or 1400

**PSC 3510 CONSTITUTIONAL LAW I**

[3 hours] The development of the American legal system and the implications of judicial decisions affecting the institutions and powers of government, the federal system and the relationship of the individual to government. Prerequisite: PSC 1200 or 1400

**PSC 3520 CONSTITUTIONAL LAW II**

[3 hours] The development of the American legal system and the implications of judicial decisions affecting the institutions and powers of government, the federal system and the relationship of the individual to government. Prerequisite: PSC 1200 or 1400, and PSC 3510

**PSC 3730 AMERICAN FOREIGN POLICY**

[3 hours] An examination of the American foreign policy-making process as well as an analysis of the major problems facing the United States in its interaction with the international environment. Prerequisite: PSC 1200 or 1400, and PSC 2700

**PSC 3800 SEXUAL POLITICS**

[3 hours] This course examines sexual politics through studying canonical literature of Western political theory, feminism and postmodern theory.

**PSC 3820 CONTEMPORARY POLITICAL IDEAS**

[3 hours] Surveys trends in 20th century political and social thought, including critical theory, post-structuralist theory, feminism and anti-racist politics. Particular issues addressed include bureaucracy, mass society, state and civil violence, and identity politics. Prerequisite: Recommended: PSC 2800

**PSC 3900 HONORS SEMINAR**

[3 hours] Seminar focused on timely topics in political science chosen by rotating faculty in the department. Prerequisite: Invitation or permission of instructor.

**PSC 3990 INDEPENDENT STUDY FOR HONORS STUDENTS**

[3 hours] Individual reading and research in selected topics for honors students. Prerequisite: Admission to Honors Program or permission of department chair

**PSC 4180 COMPUTER APPLICATIONS IN PUBLIC ADMINISTRATION**

[3 hours] Applications of spreadsheet, database and statistical software to policy and administrative problems in the public sector. Prerequisite: PSC 3110 and 3420

**PSC 4210 POLITICAL BEHAVIOR AND VOTING**

[3 hours] A study of the political ideas and the psychological and sociological motivations underlying voting and other types of political behavior in the United States. Prerequisite: PSC 1200 or 1400

**PSC 4230 PRESIDENCY**

[3 hours] The nomination, election, responsibilities and performance of the American president. The course includes decision making, policy making, personality, and relations with Congress, the courts, news media and interest groups. Prerequisite: PSC 1200 or 1400

**PSC 4250 INTERGOVERNMENTAL RELATIONS**

[3 hours] A study of the relationships among the various types and levels of government in the United States with an examination of the fields in which the major governmental contacts occur. Prerequisite: PSC 1200 or 1400, and PSC 1300

**PSC 4280 U.S. CONGRESS**

[3 hours] An intensive study of the development, functions, committees, party and factional organizations of the U.S. Congress and state legislatures. Prerequisite: PSC 1200 or 1400

**PSC 4320 URBAN POLICY AND ADMINISTRATION**

[3 hours] An examination of the policy process in modern cities, focusing on the interactions between the principal political and administrative organizations in formulating and implementing policy. Prerequisite: PSC 3310 and 3420

**PSC 4330 HEALTH CARE POLICY**

[3 hours] An examination of United States health care policy and its progression to the current era of cost controls. In addition, the principal actors and theories influencing health care policy are analyzed. Prerequisite: PSC 3420

**PSC 4340 ENVIRONMENTAL POLICY AND ADMINISTRATION**

[3 hours] Policy for air and water pollution control, hazardous wastes, nuclear wastes. Examination of EPA, Congressional committees, state and city agencies. Some international issues. Prerequisite: PSC 3420 or permission of instructor, or major in either environmental sciences or environmental studies

**PSC 4350 HEALTH CARE DELIVERY SYSTEMS**

[3 hours] An overview of the United States health care delivery system. The roles, responsibilities and relationships of various components are discussed and analyzed, with emphasis on interrelationships between government, providers and institutions. Prerequisite: PSC 1200 or 1400, and PSC 3420

**PSC 4360 ETHICS IN PUBLIC POLICY AND ADMINISTRATION**

[3 hours] Examination of values and principles which influence public policy and public administration. Applications to policy problems and responsibilities of public administrators will be emphasized. Prerequisite: PSC 3420

**PSC 4370 ADMINISTRATIVE BEHAVIOR**

[3 hours] Individual and group behavior in public organizations from the perspective of alternative management strategies. Occasionally offered as a writing intensive course. Prerequisite: PSC 3420

**PSC 4410 MANAGEMENT OF NONPROFIT ORGANIZATIONS**

[3 hours] Examination of forces that influence management of nonprofit organizations in the United States, and their roles and responsibilities. Consideration of organizational structures, leadership, fiscal administration, and relations with citizens and other organizations. Prerequisite: PSC 3420

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### **PSC 4430 PUBLIC PERSONNEL ADMINISTRATION**

[3 hours] The organization, operation and problems of public personnel systems in the functions of selection, training, classification and employee relations. Prerequisite: PSC 3420

### **PSC 4440 BUDGETING AND FINANCIAL ADMINISTRATION**

[3 hours] An examination of the institutions and techniques of financial administration, including government accounting, budgeting, financial management and governmental choice. Prerequisite: PSC 3420 and knowledge of a computer spreadsheet

### **PSC 4460 POLICY AND ADMINISTRATION**

[3 hours] The relationship of national administration to the formulation of policy by the Executive Branch and Congress and the exercise of controls over the bureaucracy by the Executive Branch, Congress and the Judiciary. Prerequisite: PSC 3420

### **PSC 4470 PUBLIC ORGANIZATION THEORY**

[3 hours] A systematic consideration of theories of political organization and administration, including institutional, behavioral, sociological, psychological and political theories, with emphasis on decision-making in governmental organizations. Prerequisite: PSC 3420

### **PSC 4490 CURRENT TOPICS IN PUBLIC ADMINISTRATION**

[3 hours] Examination of selected current problems in public policy and administration. Topics vary and are listed in each term's schedule of classes. Prerequisite: PSC 3420 or permission of adviser

### **PSC 4530 CIVIL RIGHTS**

[3 hours] A study of judicial policy-making and administrative implementation of decisions affecting racial issues, freedom of expression, national security and criminal procedures. Prerequisite: PSC 1200 or 1400

### **PSC 4540 RACE AND PUBLIC POLICY**

[3 hours] This course examines theories of race relations and applies these theories to select public policy issues, such as affirmative action, welfare, criminal justice and others. U.S. multicultural course

### **PSC 4550 ISSUES IN CONTEMPORARY LAW**

[3 hours] Examination of contemporary approaches to the analyses of law and the judicial system with special focus on current issues facing the courts. Prerequisite: PSC 3510 or 3520

### **PSC 4560 LAW AND PUBLIC ADMINISTRATION**

[3 hours] The impact of law on public administration with emphasis on judicial review, agency rule making and procedures. Prerequisite: PSC 3420

### **PSC 4570 JUDICIAL PROCESS AND JURISPRUDENCE**

[3 hours] A study of the politics and practices of judges and courts, including judicial reasoning. Prerequisite: PSC 1200 or 1400

### **PSC 4580 INTERNATIONAL LAW**

[3 hours] An examination of the legal status of nation states and dependencies and of the rules concerning international diplomacy, treatment of persons and peaceful settlement of disputes. Recommended: PSC 1710 or PSC 2700

### **PSC 4610 COMPARATIVE GOVERNMENT**

[3 hours] A study of political functions such as elections, political parties, interest groups, executive-legislative relations and centralization of powers in various nations. Recommended: PSC 2610 or PSC 2620

### **PSC 4620 POLITICS OF RUSSIA AND FORMER SOVIET REPUBLICS**

[3 hours] Politics and government of Russia, especially since 1989. Discussion of other former Soviet republics will also be included.

### **PSC 4630 GOVERNMENT OF CANADA**

[3 hours] The government and politics of Canada with particular emphasis on federalism and the operation of parliamentary government in a changing party system. Recommended: PSC 1200 or 1400.

### **PSC 4650 INTERNATIONAL POLITICAL ECONOMY**

[3 hours] An examination of the relationship between political and economic structures, organizations and events, including such issues as the politics of trade, foreign aid and economic development. Prerequisite: PSC 2700 or permission of instructor

### **PSC 4660 GOVERNMENTAL & POLITICAL INSTITUTIONS OF AFRICA**

[3 hours] An examination of political behavior in selected African states using a case method to examine alternative courses of action available to decision makers. Prerequisite: Prior social science or history course on Africa Non-western multicultural course

### **PSC 4670 GOVERNMENTS OF THE MIDDLE EAST**

[3 hours] A survey of the institutions of government, political processes, parties and interest groups and problems of development in the Middle East. Recommended: PSC 1710 or PSC 2610 or PSC 2620.

### **PSC 4690 GOVERNMENT OF CHINA**

[3 hours] A study of the development of Chinese governmental institutions and political process, interest groups, political culture, political participation, economic development, national defense and foreign relations. Prerequisite: Two courses in political science Non-western multicultural course

### **PSC 4700 INTERNATIONAL RELATIONS - AFRICA**

[3 hours] An examination of factors affecting foreign policy processes in Africa, emphasizing the relations between Africa, the Big Powers and the United Nations. Prerequisite: two courses in political science

### **PSC 4710 THEORIES OF INTERNATIONAL POLITICS**

[3 hours] An analysis of the major concepts of international politics that attempt to construct a general theory of behavior in world affairs. Recommended PSC 2800. Prerequisite: PSC 2700

### **PSC 4720 INTERNATIONAL ORGANIZATION**

[3 hours] A study of the background, general concepts and problems of international organizations including the United Nations, historical models, regional organizations and non-governmental organizations. Recommended: PSC 2700

### **PSC 4730 THE UNITED NATIONS**

[3 hours] An investigation of the origins, organization, political practices, administrative activities and problems of the United Nations and its related agencies. Recommended: PSC 1710 or PSC 2700

### **PSC 4740 INTERNATIONAL RELATIONSMIDDLE EAST**

[3 hours] An examination of political, economic and geographic actors affecting international relations of the Middle East, including the role of the major world and regional powers. Recommended: PSC 1710 or PSC 2700

### **PSC 4800 COMPARATIVE FOREIGN POLICY**

[3 hours] A theoretical and comparative study of the patterns of foreign policy. It emphasizes the evaluation of analytical models and conceptual frameworks, and the examination of the foreign policy of key states as case material. Prerequisite: two courses in political science

### **PSC 4860 FEMINIST POLITICAL THEORY**

[3 hours] An analysis and discussion of contemporary feminist political theory. Prerequisite: PSC 2800

### **PSC 4880 ISSUES IN POLITICAL THEORY**

[3 hours] The course will focus on close readings of influential critical theories about particular issues relevant to contemporary political life. The themes of the course will vary and may include questions of liberalism and power, the politics of violence, identity and difference, or post-structuralism. Prerequisite: PSC 2800

### **PSC 4900 SEMINAR IN ASIAN AFFAIRS**

[3 hours] An interdisciplinary and comparative study of the major issues in Asia with special emphasis on political and economic development and international relations in Asia. Prerequisite: two courses in political science

### **PSC 4940 APPLIED POLITICS INTERNSHIP**

[3 hours] A study of electoral politics, public decision-making or policy implementation through internships with candidates, political parties, public officials or governmental or nonprofit agencies. Prerequisite: PSC 2300 and permission of instructor

### **PSC 4960 SENIOR HONORS THESIS**

[3 hours] Supervised research and writing for honors students only. Prerequisite: permission of departmental honors director; permission of instructor

### **PSC 4980 CURRENT TOPICS IN POLITICAL SCIENCE**

[3 hours] Timely examination of emerging issues within the various segments of the discipline of political science. Prerequisite: a prior course in the topic subfield

### **PSC 4990 INDEPENDENT STUDY IN POLITICAL SCIENCE**

[1-3 hours] Individual study in selected topic. Prerequisite: three courses at the 4000 level; permission of instructor

### **PSC 5110 SOCIAL SCIENCE STATISTICS**

[3 hours] A course covering descriptive statistics and providing an introduction to inferential statistics, data processing and computer applications specifically tailored for the needs of the social sciences.



**PSC 5140 INTERMEDIATE SOCIAL SCIENCE STATISTICS**

[3 hours] An approach to regression analysis designed for social scientists. Development of a common conceptual basis for correlation and regression analysis and analyses of variance and covariance. Prerequisite: PSC 3110 or equivalent

**PSC 5180 COMPUTER APPLICATIONS IN PUBLIC ADMINISTRATION**

[3 hours] Use of software with an emphasis on database, spreadsheet, statistical and desktop publishing programs for microcomputers. Application to analysis of administrative and policy problems in the public sector. Prerequisite: PSC 5110, PSC 3420 or equivalent

**PSC 5210 POLITICAL BEHAVIOR AND ELECTIONS**

[3 hours] A study of American voting and political behavior. Emphasis is placed on the ideological, psychological and sociological parameters which affect the political behavior and voting of Americans. Prerequisite: Two courses in political science

**PSC 5230 PRESIDENCY**

[3 hours] The nomination, election, responsibilities and performance of the American president. The course includes decision making, policy making, personality, and relations with Congress, the Courts, news media and interest groups. Prerequisite: Two courses in political science

**PSC 5250 INTERGOVERNMENTAL RELATIONS**

[3 hours] National, state and local governmental relationships are examined with emphasis on grant-in-aid, formal and informal cooperative devices, and current problems of the federal system in the United States. Prerequisite: Two courses in political science

**PSC 5280 LEGISLATIVE PROCESS**

[3 hours] An intensive study of the development, functions, committees, party and factional organizations of the U.S. Congress, state legislatures and non-American legislative bodies.

**PSC 5320 URBAN POLICY & ADMINISTRATION**

[3 hours] An examination of the policy process in modern cities, focusing on the interactions between the principal political and administrative organizations in formulating and implementing policy. Prerequisite: Graduate standing (PSC 3310 and 3420 or 6410 recommended)

**PSC 5330 HEALTH CARE POLICY**

[3 hours] An examination of United States health care policy and its progression to the current era of cost controls. In addition, the principal actors and theories influencing health care policy are analyzed. Prerequisite: PSC 3420 or permission of instructor

**PSC 5340 ENVIRONMENTAL POLICY AND ADMINISTRATION**

[3 hours] Policy for air and water pollution control, hazardous wastes, nuclear wastes. Examination of EPA, Congressional committees, state and city agencies as well as some international issues. Prerequisite: Graduate standing

**PSC 5350 HEALTH CARE DELIVERY SYSTEMS**

[3 hours] An overview of the United States health care delivery system. The roles, responsibilities and relationships of various components are discussed and analyzed with emphasis on interrelationships between government, providers and institutions. Prerequisite: PSC 3420 or permission of instructor

**PSC 5360 ETHICS IN PUBLIC POLICY AND ADMINISTRATION**

[3 hours] Examination of values and principles which guide public policy formation and public administration. Applications of philosophical concepts to policy problems and the responsibilities of public administrators will be emphasized. Prerequisite: PSC 3420 or equivalent

**PSC 5370 ADMINISTRATIVE BEHAVIOR**

[3 hours] Individual and group behavior in public organizations from the perspective of alternative management strategies. Prerequisite: Admission to MPA program or permission of instructor

**PSC 5390 APPLIED POLITICS INTERNSHIP**

[3 hours] A study of electoral politics, public decision-making or policy implementation through internships with candidates, political parties, public officials or governmental or nonprofit agencies. Prerequisite: two courses in political science; permission of instructor

**PSC 5410 MANAGEMENT OF NONPROFIT ORGANIZATIONS**

[3 hours] Examination of social, cultural, organizational, economic and political forces that influence management of nonprofit organizations in the United States. Historical and theoretical origins of their roles and responsibilities.

**PSC 5430 PUBLIC PERSONNEL ADMINISTRATION**

[3 hours] A study of developments and problems in the recruitment and management of public employees. Prerequisite: Admission to MPA program or permission of instructor

**PSC 5440 BUDGETING AND FINANCIAL ADMINISTRATION**

[3 hours] An examination of the institutions and techniques of financial administration, including government accounting, budgeting, financial management and governmental choice. Prerequisite: PSC 3420; knowledge of a computer spreadsheet

**PSC 5470 PUBLIC ORGANIZATION THEORY**

[3 hours] Relates a diverse body of literature known as "organization theory" to the behavior of public organizations in their political setting. Prerequisite: PSC 3420

**PSC 5490 CURRENT TOPICS IN PUBLIC ADMINISTRATION**

[3 hours] Examination and analysis of a current policy or administrative issue. Topics vary and are listed in each term's schedule of courses. Prerequisite: permission of MPA adviser

**PSC 5530 CIVIL RIGHTS**

[3 hours] Development of analytical methods and research into the judicial and administrative decisions with regard to political dissent and criminal administration. Prerequisite: two courses in political science

**PSC 5540 RACE AND PUBLIC POLICY**

[3 hours] This course examines theories of race relations and applies these theories to select public policy issues, such as affirmative action, welfare, criminal justice and others.

**PSC 5550 CONTEMPORARY ISSUES IN LAW**

[3 hours] Development of research techniques into the structure of contemporary problems facing the courts, with emphasis on integrating such issues into existing theory.

**PSC 5560 LAW AND PUBLIC ADMINISTRATION**

[3 hours] Reading, research and discourse on the impact of law on public administration, including judicial review. Prerequisite: PSC 3420 or equivalent

**PSC 5570 JUDICIAL PROCESS AND JURISPRUDENCE**

[3 hours] A research-oriented course providing a broad theoretical context for the study of decision making, reasoning and politics in the process of court adjudication. Prerequisite: two courses in political science

**PSC 5580 INTERNATIONAL LAW**

[3 hours] A study of the legal system governing interstate relations. Cases will be reviewed. State jurisdiction and responsibilities will be examined, emphasizing the rules of war. Prerequisite: two courses in political science

**PSC 5610 COMPARATIVE GOVERNMENT**

[3 hours] An examination of selected topics in comparative politics, with special emphasis on the problems of advanced industrial democracies. Prerequisite: open to graduate students in political science

**PSC 5620 POLITICS OF RUSSIA AND FORMER SOVIET REPUBLIC**

[3 hours] An examination of government and politics in Russia and the former Soviet Republics. Prerequisite: Two courses in political science

**PSC 5630 GOVERNMENT OF CANADA**

[3 hours] An examination of the political institutions and parties of Canada with special attention to the effect of federalism on a parliamentary system of government.

**PSC 5650 INTERNATIONAL POLITICAL ECONOMY**

[3 hours] An analysis of the interaction of the international political and economic systems with focus on the political aspects of the international economy. Topics include economic development, interdependence, trade and multilateral institutions.

**PSC 5660 GOVERNMENT AND POLITICAL INSTITUTIONS OF AFRICA**

[3 hours] A study of political decision making in selected African states using a case method to examine alternative types of political behavior and their practical consequences. Prerequisite: Prior social science or history course on Africa

**PSC 5670 GOVERNMENTS OF THE MIDDLE EAST**

[3 hours] A survey within a historical context of the states in the Middle East. Study of political processes and structures. Conferences with the instructor and a paper are required. Prerequisite: Two courses in political science

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### **PSC 5690 GOVERNMENT OF CHINA**

[3 hours] A study of the development of Chinese governmental institutions and political process, interest groups, political culture, political participation, economic development, national defense and foreign relations. Prerequisite: two courses in political science

### **PSC 5700 INTERNATIONAL RELATIONS - AFRICA**

[3 hours] An examination of factors affecting foreign policy processes in Africa, emphasizing the relations between Africa, the Big Powers and the United Nations. Prerequisite: Two courses in political science

### **PSC 5710 THEORIES OF INTERNATIONAL POLITICS**

[3 hours] An analysis of the leading approaches to the study of international politics that contribute to the construction of a general theory. Prerequisite: Two courses in political science

### **PSC 5720 INTERNATIONAL ORGANIZATIONS**

[3 hours] A study of the background, aims, purposes and problems of international organizations. An examination of the functions of the specialized agencies and other organizations of the United Nations system. Prerequisite: Two courses in political science

### **PSC 5730 THE UNITED NATIONS**

[3 hours] An investigation of the origins of the United Nations. Study of the relevant articles of the charter of the United Nations, emphasizing problems of the United Nations through case study. Prerequisite: Two courses in political science

### **PSC 5740 INTERNATIONAL RELATIONS - MIDDLE EAST**

[3 hours] A survey of geopolitical, economic and sociocultural factors affecting foreign policy processes; an examination of the role of the Big Powers and the United Nations. Conferences with the instructor are required. Prerequisite: Two courses in political science

### **PSC 5750 GENOCIDE AND CRIMES AGAINST HUMANITY IN INTERNATIONAL JUSTICE**

[3 hours] This course traces the genesis and evolution of genocide and crimes against humanity as distinct categories of international criminality. Prerequisite: Graduate standing

### **PSC 5800 COMPARATIVE FOREIGN POLICY**

[3 hours] A theoretical and comparative study of the patterns of foreign policy. It emphasizes the evaluation of analytical models and conceptual frameworks, and the examination of the foreign policy of key states as case material. Prerequisite: two courses in political science

### **PSC 5860 FEMINIST POLITICAL THEORY**

[3 hours] An analysis and discussion of contemporary feminist political theory. Prerequisite: PSC 2800 or equivalent

### **PSC 5880 ISSUES IN POLITICAL THEORY**

[3 hours] This course will focus on close readings of influential critical theories about particular issues relevant to contemporary political life. The themes of the course will vary and may include questions of liberalism and power, the politics of violence, identity and difference, or post-structuralism.

### **PSC 5920 SEMINAR IN ASIAN AFFAIRS**

[3 hours] An interdisciplinary and comparative study of the major issues in Asia with special emphasis on political and economic development and international relations in Asia. Prerequisite: Two courses in political science

### **PSC 5950 MPA RESEARCH REPORT**

[2 hours] Independent research, under the direction of a faculty adviser, analyzing experience as a public official. Prerequisite: Permission of MPA adviser

### **PSC 5980 CURRENT TOPICS IN POLITICAL SCIENCE**

[3 hours] Examination of emerging issues within the various segments and subfields of the discipline of political science. Prerequisite: A prior course in the topic subfield

### **PSC 5990 INDEPENDENT STUDY IN POLITICAL SCIENCE**

[1-3 hours] Individual study in selected topic. Prerequisite: Three courses at the 4000 or 5000 level; permission of graduate adviser and instructor

### **PSC 6100 SEMINAR IN METHODOLOGY**

[3 hours] A seminar in selected topics of methodology. Prerequisite: PSC 5110 or equivalent; one other course in Political Science and permission of instructor

### **PSC 6110 SCOPE AND METHODS OF POLITICAL SCIENCE**

[3 hours] An examination of the development, fields of study and methodological approaches of political science and of research techniques and the process of thesis writing. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6200 SEMINAR IN AMERICAN POLITICS**

[3 hours] A seminar in selected topics of American political behavior. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6300 SEMINAR IN STATE AND LOCAL GOVERNMENT**

[3 hours] A seminar in selected problems of state and local political issues. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6400 SEMINAR IN PUBLIC ADMINISTRATION**

[3 hours] A seminar in selected problems and issues of public administration. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6410 PROSEMINAR IN PUBLIC ADMINISTRATION**

[3 hours] An extensive examination of the field of public administration designed to acquaint advanced students with the major academic literature of the major subfields. Prerequisite: PSC 3420 and admission into MPA program or permission of instructor

### **PSC 6420 QUANTITATIVE METHODS IN DECISION MAKING**

[3 hours] Examination of analytical techniques appropriate for public sector decision making and applications to specific problems. Decision analysis, cost benefit analysis and tools for evaluating public policies will be considered. Prerequisite: PSC 3420, PSC 5140, PSC 6430; permission of graduate adviser

### **PSC 6430 SEMINAR IN PUBLIC POLICY THEORY AND ANALYSIS**

[3 hours] Models, theories, approaches and techniques used to analyze public policy with application to policy areas such as discrimination, welfare, mental health or the environment. Prerequisite: Admission into MPA program or permission of instructor

### **PSC 6440 HEALTH SYSTEMS MANAGEMENT**

[3 hours] An overview of the management process and the opportunity to develop skills to apply the process of health-related settings. Emphasis is placed on the premise that an effective manager must be a leader. Prerequisite: PSC 3420

### **PSC 6460 PROBLEMS IN POLICY AND ADMINISTRATION**

[3 hours] An in-depth examination of major problems in the administration of public policies. Topics will vary from year to year. Prerequisite: PSC 6410

### **PSC 6470 SEMINAR IN INTERNATIONAL ADMINISTRATION**

[3 hours] The course will acquaint students with the structure of international organizations, personnel policies and problems, and budgeting. Emphasis is placed on the concept of international civil service, management and programming. Prerequisite: Two courses in political science or permission of graduate adviser or instructor

### **PSC 6500 SEMINAR IN PUBLIC LAW**

[3 hours] A seminar in selected topics of constitutional administrative or international law. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6600 SEMINAR IN COMPARATIVE POLITICS**

[3 hours] A seminar in selected topics of comparative political processes or area of studies. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6700 SEMINAR IN INTERNATIONAL POLITICS**

[3 hours] A seminar in selected topics of international politics or national foreign policies. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6710 SEMINAR ON THE UNITED NATIONS**

[3 hours] A seminar on selected topics of the United Nations and other international organizations within the United Nations system. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6800 SEMINAR IN POLITICAL THEORY**

[3 hours] A seminar in selected political theorists or political ideas. Prerequisite: Two courses in political science; permission of graduate adviser

### **PSC 6940 PUBLIC SERVICE INTERNSHIP**

[1-6 hours] Internship in public or nonprofit agency and preparation of an internship paper analyzing the internship experience. Prerequisite: Permission of MPA adviser

### **PSC 6960 THESIS SEMINAR**

[1-6 hours] Supervision of master's thesis writing. Prerequisite: Permission of graduate adviser

## PSLS - Professional Sales

### Department of Marketing (BUS)

#### PSLS 3000 SALES CAREER ORIENTATION AND MANAGEMENT

[1 hour] This course is designed to provide an overview of careers in professional selling. This course will also deal with resume writing, interviewing, business etiquette and dressing for success. Prerequisite: Admitted to upper division

#### PSLS 3080 PURCHASING AND BUSINESS RELATIONSHIP MANAGEMENT

[3 hours] This course looks at the purchasing function from a strategic and behavioral perspective, using role plays, simulations, exercises and cases to investigate issues relating to negotiation, relationship management and other strategic purchasing issues. Prerequisite: BUAD 3010

#### PSLS 3440 SALES

[3 hours] Techniques for prospecting and qualifying potential customers and making presentations and demonstrations are considered, as well as personal management of the selling function. Analyzes the role of selling in Marketing. Prerequisite: BUAD 3010

#### PSLS 3450 ACCOUNT AND TERRITORY MANAGEMENT

[3 hours] Introduction to activities involved in supporting buyer-seller interactions. Exposes students to software and analysis skills needed for prospecting, sales paperwork, technology, time and territory management, and customer follow-up. Prerequisite: BUAD 3010

#### PSLS 4710 SALESFORCE LEADERSHIP

[3 hours] The role and functions of the first line sales manager will be examined, including sales force size and organization, and management of the sales force. Issues related to hiring, training, supervising, compensating and evaluating salespersons are also emphasized. Prerequisite: PSLs 3440

#### PSLS 4740 ADVANCED SALES

[3 hours] The course provides in-depth study of advanced sales concepts including relationship management, negotiation, proposal writing and account management. Course involves presentations by business, field work, video-taped role-playing. Prerequisite: PSLs 3440

#### PSLS 4940 INTEGRATIVE CAPSTONE: SALES INTERNSHIP

[3 hours] Receive practical business experience working in an organization. Prerequisite: Senior standing.

## PSY - Psychology

### Department of Psychology (ARS)

#### PSY 1010 PRINCIPLES OF PSYCHOLOGY

[3 hours] A survey of the branches of psychology and the scientific approach to the study of behavior. Social Sciences core course

#### PSY 2100 STATISTICAL METHODS

[3 hours] Descriptive and inferential statistics as applied to research in basic behavioral science and to clinical application. Prerequisite: MATH 1320 or higher

#### PSY 2200 ABNORMAL PSYCHOLOGY

[3 hours] Disordered human behavior; its etiology, classification and treatment. Consideration of different theories. Prerequisite: PSY 1010

#### PSY 2400 COGNITIVE PSYCHOLOGY

[3 hours] Theoretical and empirical approaches to the role of pattern recognition, attention, memory, language, problem solving and decision making in human thinking. Prerequisite: PSY 1010

#### PSY 2500 DEVELOPMENTAL PSYCHOLOGY

[3 hours] Emphasizes change and continuity in development, with a focus on research and theory during infancy, childhood and adolescence. Prerequisite: PSY 1010

#### PSY 2510 LIFESPAN DEVELOPMENTAL PSYCHOLOGY

[3 hours] Emphasizes research and theory from conception through old age, and integrates important developmental issues within a lifespan approach. Prerequisite: PSY 1010

#### PSY 2600 PSYCHOBIOLOGY

[3 hours] The neural bases of behavior; topics include organization of the nervous system, perception and movement, learning and memory, emotion and motivation, drugs, language, and mental disorders. Prerequisite: Recommend PSY 1010

#### PSY 2610 LEARNING AND MOTIVATION

[3 hours] Extended treatment of learning, conditioning and motivation including operant learning, reinforcement schedules, symbolic reward, generalization and related theoretical developments. Prerequisite: PSY 1010

#### PSY 2700 SOCIAL PSYCHOLOGY

[3 hours] Theoretical and empirical treatment of socially-based perception and cognition, interpersonal influence, small group processes and interpersonal relations. Prerequisite: PSY 1010

#### PSY 3000 HISTORY OF PSYCHOLOGY

[3 hours] An historical treatment of the development of modern psychology, starting in the mid 19th century, with some consideration of earlier approaches. Theoretical developments are emphasized. Prerequisite: PSY 1010

#### PSY 3010 CULTURE AND PSYCHOLOGY

[3 hours] Theoretical and empirical examination of the generality of psychological concepts across cultural and ethnic groups. A cultural analysis of key topics in clinical, cognitive, developmental and social psychology. Prerequisite: Any two 2000-level psychology courses

#### PSY 3020 PSYCHOLOGY OF WOMEN

[3 hours] Explore and critique theories and research related to the psychology of women. Life span development in women, the validity of the study of gender differences and selected topics relevant to women's mental health will be addressed. Prerequisite: PSY 1010

#### PSY 3110 RESEARCH METHODS IN PSYCHOLOGY

[4 hours] Design, execution, analysis and reporting of research in psychology. Lecture and laboratory. Prerequisite: PSY 2100

#### PSY 3120 UNDERSTANDING PSYCHOLOGICAL RESEARCH

[4 hours] Emphasis on the interpretation (as opposed to execution) of psychological research. Features overview of statistical methods and experimental design principles. Required for Psychology majors on liberal Arts track. Prerequisite: PSY 1010

#### PSY 3200 PERSONALITY AND INDIVIDUAL DIFFERENCES

[3 hours] Overview of major theoretical ideas and empirical research in personality and individual differences.

#### PSY 3210 CLINICAL PSYCHOLOGY

[3 hours] An overview of the field of Clinical Psychology including clinical assessment, psychotherapy, community intervention methods and professional/ethical issues. Prerequisite: PSY 2200

#### PSY 3220 PSYCHOPATHOLOGY OF CHILDHOOD

[3 hours] Clinical and experimental perspectives on behavioral, developmental and emotional disturbances in childhood. Prerequisite: PSY 2500 or 2510; 2200

#### PSY 3400 COGNITIVE NEUROPSYCHOLOGY

[3 hours] Analysis of the neural basis of higher level mental functions (e.g., perception, language, emotion), with an emphasis on anatomic and functional differences between the left and right cerebral hemispheres. Prerequisite: PSY 2400

#### PSY 3410 PSYCHOLOGY OF LANGUAGE

[3 hours] Examination of the cognitive processes involved in language. Topics include neural bases of language, speech production and perception, syntax, semantics, language acquisition and comprehension. Prerequisite: PSY 2400 or permission of instructor

#### PSY 3500 ADOLESCENCE

[3 hours] Views the biological and psychosocial changes during adolescence from a systems perspective. Emphasizes issues of identity and cognitive growth. Prerequisite: PSY 2500 or 2510

#### PSY 3510 THE ADULT YEARS

[3 hours] Emphasizes growth and change throughout adulthood. Issues of personality and cognitive change are investigated, and theory and research are highlighted. Prerequisite: PSY 2500 or 2510

#### PSY 3520 PERCEPTUAL AND COGNITIVE DEVELOPMENT

[3 hours] Emphasizes both theory and research in perceptual and cognitive development, with a focus on infants, children and adolescents. Prerequisite: PSY 2500 or 2510

#### PSY 3610 BEHAVIORAL NEUROSCIENCE

[3 hours] In-depth treatment of the structure and function of neurons and their mediation of behavior, both normal and abnormal: circadian rhythms, eating, emotions, sexual behavior, memory, language and mental disorders. The scientific study of the brain and methods of neuroscience are emphasized. Prerequisite: PSY 2600 or permission of instructor

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### **PSY 3620 SENSORY PROCESSES**

[3 hours] In-depth treatment of the neural organization of the sensory and motor systems. A comparative and evolutionary approach to the study of perception is emphasized. Prerequisite: PSY 2600 or PSY 3610 or permission of instructor.

### **PSY 3630 EVERYDAY BEHAVIOR ANALYSIS**

[3 hours] Application of learning and motivation in the home, classroom and workplace. Covers how to define and measure behavior principles of positive and negative reinforcement, and the effects of aversive control.

### **PSY 3700 SMALL GROUP BEHAVIOR**

[3 hours] An examination of the psychological processes within small groups.

### **PSY 3710 PSYCHOLOGY AND THE LAW**

[3 hours] Emphasizes the utilization of theoretical and empirical notions of psychological science as they apply to both civil and criminal law. Prerequisite: PSY 2700

### **PSY 3800 HONORS PROPOSAL**

[1-3 hours] Literature review and design of an experiment that will form the basis for an Honors Thesis; a formal written proposal will be prepared in conjunction with, and approved by, the thesis adviser and must be submitted to the departmental honors advisor. Prerequisite: PYS 2100; admission to Psychology Honors and permission of instructor

### **PSY 3820 HONORS MEETING FOR JUNIORS**

[1 hour] Topics include advanced research tools, research design, practical approach to experiments, ethics in research and career planning. Admission to Psychology Honors and permission of instructor. Prerequisite: Permission of instructor

### **PSY 3910 HONORS RESEARCH**

[1-3 hours] Data collection for research that will form the basis for the Honors Thesis. Admission to Psychology Honors and permission of instructor. Prerequisite: Permission of instructor

### **PSY 3940 EXTERNSHIP IN PSYCHOLOGY**

[1-4 hours] Supervised work experience in Psychology-related employment settings. Prerequisite: Permission of instructor

### **PSY 4100 RESEARCH PRACTICUM**

[1-4 hours] Directed by experience in empirical psychological research by students participating in faculty laboratories. Section number denotes field of research. :030-Developmental psychology :040-Social psychology :060-Cognitive and biological psychology :070-Clinical psychology Prerequisite: 2000 level course in content area of the practicum and permission of instructor

### **PSY 4110 QUALITATIVE RESEARCH METHODS**

[4 hours] Study and training in systematic, open-ended, nonquantitative methods for studying human beings, with an emphasis on grounded theory and phenomenological research methods. Prerequisite: PSY 3110 or 3210

### **PSY 4200 RESEARCH IN CLINICAL PSYCHOLOGY**

[4 hours] Experience in designing and analyzing research in clinical psychology. Prerequisite: PSY 3110 or 3210

### **PSY 4400 RESEARCH IN COGNITIVE PSYCHOLOGY**

[4 hours] Experience in designing, conducting and interpreting research on cognitive processes. Prerequisite: PSY 2400, PSY 3110

### **PSY 4500 RESEARCH IN DEVELOPMENTAL PSYCHOLOGY**

[4 hours] Study and analysis of research methods, as applied to the development of perception, learning, socialization, cognition and language. Experience in designing and carrying out research in some of these areas. Prerequisite: PSY 2500 or 2510, PSY 3110

### **PSY 4600 RESEARCH IN PSYCHOBIOLOGY AND LEARNING**

[4 hours] Experience in designing and carrying out research in learning and motivation with animals. Prerequisite: PSY 3110

### **PSY 4700 RESEARCH IN SOCIAL PSYCHOLOGY**

[4 hours] Experience in designing research in social psychology, including a research project. Prerequisite: PSY 3110, PSY 2700 or equivalent

### **PSY 4800 PSYCHOLOGY HONORS CONFERENCE**

[4 hours] Intensive reading and discussion of some aspect of psychology. Content varies. Prerequisite: Permission of instructor.

### **PSY 4820 HONORS MEETING FOR SENIORS**

[1 hour] Topics include scientific graphics and visualizing data, professional publishing, scientific oral and poster presentations. Prerequisite: Permission of instructor

### **PSY 4910 INDEPENDENT RESEARCH**

[1-4 hours] This course will be offered every semester and will fill the requirement for an advanced research course. A student will carry out an empirical research project of his or her own design under the guidance of a member of the faculty. Prerequisite: PSY 3110 and permission of instructor

### **PSY 4950 SENIOR THESIS**

[4 hours] In-depth reading and evaluation of a topic in psychology by a student near the end of the undergraduate career, under the guidance of an individual faculty member. Topic must be approved in advance. Prerequisite: Senior standing and permission of instructor

### **PSY 4960 HONORS THESIS**

[2-3 hours] Analysis, interpretation and reporting of research aimed at understanding some aspect of behavior or its underlying mechanisms. The reports include a formal written thesis, a scientific poster and an oral presentation. Prerequisite: PSY 3110, PSY 3800, PSY 3820; and permission of instructor

### **PSY 4980 SPECIAL TOPICS IN PSYCHOLOGY**

[3 hours] Seminar discussion of selected topics in psychology to allow for a more comprehensive treatment than possible in other available courses; or technical laboratory course in neuroanatomical techniques. Topics will vary depending on student demand and availability of instructors.

### **PSY 4990 INDEPENDENT STUDY**

[1-4 hours] This course is a tutorial consisting of directed independent reading, conferences with the instructor to discuss the readings and assess the student's understanding of their significance, and a paper in which the student summarizes the read material, integrates the material and discusses its significance for understanding some aspect of behavior. Prerequisite: Permission of instructor

### **PSY 6000 HISTORY OF PSYCHOLOGY**

[3 hours] Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

### **PSY 6010 PSYCHOLOGICAL APPARATUS**

[3 hours] Section 001 Practical electronics and programming with logic modules. Section 002 - Computer programming.

### **PSY 6020 PSYCHOLOGY OF WOMEN**

[3 hours] All aspects of the psychology of women will be addressed in this seminar. In particular a lifespan approach will be taken to an exploration of how social context (violence, economic conditions, etc.) impacts women's psychological growth.

### **PSY 6030 RESEARCH PRACTICUM**

[1-3 hours] Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated. Prerequisite: Permission of instructor

### **PSY 6040 TEACHING PRACTICUM**

[3 hours] Supervised experience in the teaching of psychology. May be repeated for credit. Prerequisite: Permission of instructor

### **PSY 6050 CULTURE AND PSYCHOLOGY**

[3 hours] A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology. Prerequisite: Permission of instructor

### **PSY 6060 ETHICAL ISSUES IN SCIENTIFIC RESEARCH**

[3 hours] Seminar examining the responsibilities of scientists including: protecting human and animal subjects, data collection and publication, authorship, reviewing, conflict of interest, mentoring, and misconduct.

### **PSY 6100 QUANTITATIVE METHODS IN PSYCHOLOGY I**

[3 hours] Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.

### **PSY 6110 QUANTITATIVE METHODS IN PSYCHOLOGY II**

[3 hours] Analysis of variance, regression analyses, non-parametric analyses. Prerequisite: PSY 6100/7100 or equivalent

### **PSY 6130 DESIGN AND EVALUATION OF PSYCHOLOGICAL RESEARCH**

[3 hours] Readings and discussion of problems of research design and analysis. Prerequisite: PSY 6110 or equivalent

**PSY 6140 ADVANCED RESEARCH METHODS**

[3 hours] Overview of inquiry methods for applied research, including relevant philosophy of science; qualitative and quantitative data collection and analysis; common research designs; and specialized analysis methods (e.g., meta-analysis). Prerequisite: PSY 6110 or equivalent

**PSY 6200 SYSTEMS OF PERSONALITY**

[3 hours] Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.

**PSY 6210 PSYCHOPATHOLOGY**

[3 hours] Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions for mental disorders.

**PSY 6220 COGNITIVE ASSESSMENT**

[3 hours] Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.

**PSY 6230 PERSONALITY ASSESSMENT**

[3 hours] Assessment of personality functioning utilizing objective tests. Prerequisite: PSY 6220/7220

**PSY 6250 SEMINAR IN CLINICAL PSYCHOLOGY**

[3 hours] Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation. Prerequisite: Permission of instructor

**PSY 6260 PROFESSIONAL AND ETHICAL ISSUES**

[3 hours] Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Prerequisite: Graduate standing in the department of psychology

**PSY 6270 CHILD CLINICAL PSYCHOLOGY**

[3 hours] Advanced study of the psychopathology and treatment of behavioral, developmental and emotional disturbances in childhood. Prerequisite: Permission of instructor

**PSY 6310 PSYCHOTHERAPY WITH CHILDREN AND ADOLESCENTS**

[3-4 hours] Presentation and exploration of techniques of psychotherapy with children and adolescents. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 6390

**PSY 6320 EXPERIENTIAL PSYCHOTHERAPY**

[3-4 hours] Presentation and exploration of techniques of experiential psychotherapy. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 6390

**PSY 6330 PSYCHODYNAMIC PSYCHOTHERAPY**

[3-4 hours] Presentation and exploration of techniques of psychodynamic psychotherapy. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 6390

**PSY 6340 COGNITIVE-BEHAVIORAL PSYCHOTHERAPY**

[3-4 hours] Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings. Prerequisite: Permission of instructor

**PSY 6390 CLINICAL LABORATORY**

[4 hours] Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.

**PSY 6400 COGNITIVE PSYCHOLOGY**

[3 hours] An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.

**PSY 6410 SEMINAR IN COGNITIVE PSYCHOLOGY**

[3 hours] An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.

**PSY 6420 SEMINAR ON THE PSYCHOLOGY OF LANGUAGE**

[3 hours] An advanced seminar focusing on selected topics concerned with the psychology of language. Prerequisite: Permission of instructor

**PSY 6500 DEVELOPMENTAL PSYCHOLOGY**

[3 hours] Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.

**PSY 6510 SEMINAR IN DEVELOPMENTAL PSYCHOLOGY**

[3 hours] Readings and evaluative discussions of the primary research literature in developmental psychology. Prerequisite: PSY 6500

**PSY 6600 BEHAVIORAL NEUROSCIENCE**

[3 hours] Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.

**PSY 6610 SEMINAR IN PSYCHOBIOLOGY AND LEARNING**

[3 hours] Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception. Prerequisite: Permission of instructor

**PSY 6620 COMPARATIVE NEUROANATOMY**

[3 hours] -001 Laboratory; identification of structures in all of the major functional systems in histological brain sections of at least three different species. -002 Laboratory; neurohistological techniques including sectioning and staining. Prerequisite: PSY 6600 or equivalent

**PSY 6630 SENSORY PROCESSES**

[3 hours] In-depth treatment of the neural organization of the sensory and motor systems. A comparative and evolutionary approach to the study of perception is emphasized. Prerequisite: PSY 6600 or equivalent

**PSY 6700 SOCIAL PSYCHOLOGY**

[3 hours] Social cognition and behavior, interpersonal influence and social relations will be addressed.

**PSY 6710 SEMINAR IN SOCIAL PSYCHOLOGY**

[3 hours] In-depth treatment of selected topics in Social Psychology.

**PSY 6930 SEMINAR IN PSYCHOLOGY**

[3 hours] Readings and evaluative discussions of the primary research literature in psychology.

**PSY 6940 COMMUNITY EXTERNSHIP**

[4 hours] Supervised applied assessment, therapeutic and consultative experience in community settings. Prerequisite: Permission of instructor

**PSY 6960 M.A. THESIS**

[1-6 hours] Developing, conducting and analyzing the thesis research project, writing the thesis.

**PSY 6980 SPECIAL TOPICS**

[1-3 hours] Professional issues in academic and scientific psychology.

**PSY 6990 INDEPENDENT STUDY**

[1-15 hours] Directed reading and/or experimentation on a topic selected by the student in conjunction with a faculty mentor.

**PSY 7000 HISTORY OF PSYCHOLOGY**

[3 hours] Intensive historical treatment of the development of modern psychology from the 19th century. Theoretical psychological and related philosophical positions are emphasized.

**PSY 7010 PSYCHOLOGICAL APPARATUS**

[3 hours] Section 001 Practical electronics and programming with logic modules. Section 002 - Computer programming.

**PSY 7020 PSYCHOLOGY OF WOMEN**

[3 hours] All aspects of the psychology of women will be addressed in this seminar. In particular a lifespan approach will be taken to an exploration of how social context (violence, economic conditions, etc.) impacts women's psychological growth.

**PSY 7030 RESEARCH PRACTICUM**

[1-3 hours] Developing, conducting, analyzing and preparing reports of research projects under faculty supervision. May be repeated. Prerequisite: Permission of instructor

**PSY 7040 TEACHING PRACTICUM**

[3 hours] Supervised experience in the teaching of psychology. May be repeated for credit. Prerequisite: Permission of instructor

**PSY 7050 CULTURE AND PSYCHOLOGY**

[3 hours] A theoretical and empirical analysis of the systematic functioning of culture in psychological phenomena, with a focus on key concepts in clinical, cognitive, developmental and social psychology. Prerequisite: Permission of instructor

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[3 hours] Probability theory, descriptive and inferential statistics, hypothesis testing, correlation.

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[3 hours] Analysis of variance, regression analyses, non-parametric analyses. Prerequisite: PSY 6100/7100 or equivalent

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[3 hours] Readings and discussion of problems of research design and analysis. Prerequisite: PSY 6110 or equivalent

### **PSY 7140 ADVANCED RESEARCH METHODS**

[3 hours] Overview of inquiry methods for applied research, including relevant philosophy of science; qualitative and quantitative data collection and analysis; common research designs; and specialized analysis methods (e.g., meta-analysis). Prerequisite: PSY 6110 or equivalent

### **PSY 7200 SYSTEMS OF PERSONALITY**

[3 hours] Advanced historical overview of the main systems for understanding human beings: sources of motivation, coping, dysfunction, strengths/virtues. Emphasizes philosophical understandings of personality systems, analysis of major contributions and multi-perspective critiques.

### **PSY 7210 PSYCHOPATHOLOGY**

[3 hours] Critical analysis of diagnostic classification models, etiological conceptualizations and therapeutic interventions form mental disorders.

### **PSY 7220 COGNITIVE ASSESSMENT**

[3 hours] Assessment of cognitive functioning, utilizing tests of cognitive abilities and achievement.

### **PSY 7230 PERSONALITY ASSESSMENT**

[3 hours] Assessment of personality functioning utilizing objective tests. Prerequisite: PSY 6220/7220

### **PSY 7250 SEMINAR IN CLINICAL PSYCHOLOGY**

[3 hours] Advanced seminar focusing on selected topics from the general area of clinical psychology. -001 Clinical neuropsychology -002 Child psychopathology -003 Child Clinical Intervention -004 Marital & Family Therapy -005 Psychotherapy research & program evaluation. Prerequisite: Permission of instructor

### **PSY 7260 PROFESSIONAL AND ETHICAL ISSUES**

[3 hours] Exploration of ethical and professional issues faced by clinical psychologists. Detailed analysis of the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Prerequisite: Graduate standing in the department of psychology

### **PSY 7270 CHILD CLINICAL PSYCHOLOGY**

[3 hours] Advanced study of the psychopathology and treatment of behavioral, developmental and emotional disturbances in childhood. Prerequisite: Permission of instructor

### **PSY 7310 PSYCHOTHERAPY WITH CHILDREN AND ADOLESCENTS**

[3-4 hours] Presentation and exploration of techniques of psychotherapy with children and adolescents. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 7390

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[3-4 hours] Presentation and exploration of techniques of experiential psychotherapy. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 7390

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[3-4 hours] Presentation and exploration of techniques of psychodynamic psychotherapy. Practicum work with clients through the Psychology Clinic and Training Center. Prerequisite: PSY 7390

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[3-4 hours] Presentation and exploration of the theory and techniques of cognitive-behavioral assessment and therapy. Emphasis on understanding the theoretical and empirical base for cognitive-behavioral interventions and implications for application in clinical and clinical-research settings. Prerequisite: Permission of instructor

### **PSY 7390 CLINICAL LABORATORY**

[4 hours] Clinical interviewing, diagnostic assessment, case conceptualization and oral presentation of clinical cases. Diagnostic, therapeutic and professional issues are addressed via didactic coursework and practicum work with clients in the Psychology Clinic.

### **PSY 7400 COGNITIVE PSYCHOLOGY**

[3 hours] An intensive examination of human information processing. Topics include neural bases of cognition, perceptual and attentional processing, mental imagery, memory, problem solving and reasoning.

### **PSY 7410 SEMINAR IN COGNITIVE PSYCHOLOGY**

[3 hours] An advanced seminar focusing on selected topics from the general area of Cognitive Psychology.

### **PSY 7420 SEMINAR ON THE PSYCHOLOGY OF LANGUAGE**

[3 hours] An advanced seminar focusing on selected topics concerned with the psychology of language. Prerequisite: Permission of instructor

### **PSY 7500 DEVELOPMENTAL PSYCHOLOGY**

[3 hours] Advanced treatment of the theoretical and empirical literature in developmental psychology, and of the major issues of the field.

### **PSY 7510 SEMINAR IN DEVELOPMENTAL PSYCHOLOGY**

[3 hours] Readings and evaluative discussions of the primary research literature in developmental psychology. Prerequisite: PSY 6500

### **PSY 7600 BEHAVIORAL NEUROSCIENCE**

[3 hours] Structure and function of neurons and the neural mediation of behavior, both normal and abnormal.

### **PSY 7610 SEMINAR IN PSYCHOBIOLOGY AND LEARNING**

[3 hours] Readings and evaluative discussions of the primary research literature in psychobiology, behavioral neuroscience, neuroanatomy, learning, motivation and perception. Prerequisite: Permission of instructor

### **PSY 7620 COMPARATIVE NEUROANATOMY**

[3 hours] -001 Laboratory; identification of structures in all of the major functional systems in histological brain sections of at least three different species. -002 Laboratory; neurohistological techniques including sectioning and staining. Prerequisite: PSY 6600 or equivalent

### **PSY 7630 SENSORY PROCESSES**

[3 hours] In-depth treatment of the neural organization of the sensory and motor systems. A comparative and evolutionary approach to the study of perception is emphasized. Prerequisite: PSY 6600 or equivalent

### **PSY 7700 SOCIAL PSYCHOLOGY**

[3 hours] Social cognition and behavior, interpersonal influence and social relations will be addressed.

### **PSY 7710 SEMINAR IN SOCIAL PSYCHOLOGY**

[3 hours] In depth treatment of selected topics in Social Psychology.

### **PSY 7930 SEMINAR IN PSYCHOLOGY**

[3 hours] Readings and evaluative discussions of the primary research literature in psychology.

### **PSY 7940 COMMUNITY EXTERNSHIP**

[4 hours] Supervised applied assessment, therapeutic and consultative experience in community settings. Prerequisite: Permission of instructor

### **PSY 7960 M.A. THESIS**

[1-6 hours] Developing, conducting and analyzing the thesis research project, writing the thesis.

### **PSY 7980 SPECIAL TOPICS**

[1-3 hours] Professional issues in academic and scientific psychology.

### **PSY 7990 INDEPENDENT STUDY**

[1-15 hours] Directed reading and/or experimentation on a topic selected by the study in conjunction with a faculty mentor.

### **PSY 8060 ETHICAL ISSUES IN SCIENTIFIC RESEARCH**

[3 hours] Seminar examining the responsibilities of scientists including: protecting human and animal subjects, data collection and publication, authorship, reviewing, conflict of interest, mentoring, and misconduct.

### **PSY 8960 PHD DISSERTATION**

[1-15 hours] Developing, conducting and analyzing the dissertation research project; writing the dissertation.

## **RCA - Recreation Activity**

### **Department of Public Health and Rehabilitative Services (HHS)**

### **RCA 1010 SPORTS AND PHYSICAL ACTIVITY**

[1 hour] Basic instruction in rules, knowledge and skill development and strategy in designated sport or activity. Physical Education majors must take six different classes.

**RCA 1020 AQUATIC ACTIVITY**

[2 hours] Different sections of the course will offer a variety of aquatic activities: beginning-intermediate-advanced swimming techniques, emergency water safety, lifeguard training and water safety instructor.

**RCA 1030 POPULAR OUTDOOR PURSUITS**

[1 hour] Study of and participation in the skills and knowledge of various outdoor recreational activities in natural settings. Two weekend trips usually required. Courses are graded P/NC. Lab fee may be required.

## RCBS - Respiratory Care

### Department of Health Professions (HHS)

**RCBS 1050 PHYSICS FOR RESPIRATORY CARE PRACTITIONERS**

[3 hours] A course which studies at a basic level the fundamental principles of physics which apply to the practice of respiratory care. Prerequisite: MATH 0980

**RCBS 1150 FUNDAMENTALS OF PATIENT ASSESSMENT**

[3 hours] An introductory experience in respiratory care, including the skills necessary for basic assessment and treatment of the pulmonary patient with oxygen. Medical ethics and interpersonal communications skills along with protection of the patient and staff from infection will also be covered. Corequisite: RCBS 1160

**RCBS 1160 RESPIRATORY PHYSIOLOGY**

[3 hours] A study of respiratory physiology, including gas laws, gas transport and the mechanics of ventilation. Corequisite: RCBS 1150

**RCBS 1250 AIRWAY CARE AND MAINTENANCE**

[3 hours] Discussion and practice of procedures used to establish and maintain a patent airway. Artificial airways, aerosol therapy, Intermittent Positive Pressure Breathing and bronchopulmonary drainage are included in this course. Prerequisite: RCBS 1150, 1160; CPR certification Corequisite: RCBS 1260

**RCBS 1260 CARDIOPULMONARY THERAPEUTICS**

[3 hours] Discussion of the principles and agents used in the pharmacologic treatment of cardiopulmonary diseases. Prerequisite: RCBS 1150, 1160 Corequisite: RCBS 1250

**RCBS 1350 PATIENT MONITORING**

[3 hours] Laboratory and clinical experiences are provided in invasive and non invasive procedures used to monitor patient status, including blood gas analysis, pulse oximetry and capnography. Prerequisite: RCBS 1250, 1260 Corequisite: RCBS 1360

**RCBS 1360 ACID BASE BALANCE**

[3 hours] This course includes a discussion of acid base and electrolyte balance, and interpretation of laboratory values. Prerequisite: RCBS 1250, 1260 Corequisite: RCBS 1350

**RCBS 2450 ADVANCED THERAPEUTICS**

[4 hours] Theoretical principles involved in the initiation, maintenance and discontinuance of mechanical ventilation. Laboratory experiments on a variety of adult mechanical ventilators. Clinical experiences that encompass the total care of the critically ill patient. Prerequisite: RCBS 1350, 1360 Corequisite: RCBS 2460

**RCBS 2460 CARDIOPULMONARY PATHOPHYSIOLOGY**

[3 hours] Discussion of the etiology, pathophysiology, clinical manifestations and treatment of diseases affecting the cardiopulmonary systems is presented. Case studies involving various disease states will also be reviewed. Prerequisite: RCBS 1350, 1360 Corequisite: RCBS 2450

**RCBS 2550 MECHANICAL VENTILATION OF THE ADULT**

[3 hours] Theoretical principles involved in the initiation, maintenance and discontinuance of mechanical ventilation on the adult patient. Special emphasis on the monitoring of hemodynamic values in critically ill patients. Prerequisite: RCBS 2450, 2460 Corequisite: RCBS 2560

**RCBS 2560 CARDIOPULMONARY DIAGNOSTICS**

[3 hours] Discussion of the theory of cardiopulmonary diagnostics to include cardiac rhythm analysis, hemodynamic monitoring, spirometry and x-ray interpretation. Prerequisite: RCBS 2450, 2460 Corequisite: RCBS 2550

**RCBS 2990 INDEPENDENT STUDY**

[1-4 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

**RCBS 3100 CLINICAL ASSESSMENT**

[3 hours] This course will aid the student in the design, development and implementation of patient respiratory care plans. The students' critical thinking skills are enhanced through the use of case studies and clinical simulations that are combined with assessment techniques to evaluate the care and the steps necessary to modify care. Prerequisite: RCBS 2550, 2560 or permission of instructor

**RCBS 3200 NEONATAL/PEDIATRIC RESPIRATORY CARE**

[4 hours] A discussion of the etiology, pathophysiology and treatment of neonatal and pediatric disorders. Laboratory exercises designed to familiarize student with neonatal and pediatric resuscitation and ventilation. Prerequisite: RCBS 2450 or permission of instructor

**RCBS 3300 ADVANCED CARDIAC LIFE SUPPORT**

[2 hours] American Heart Association Advanced Cardiac Life Support course designed to aid in the management of rdiopulmonary emergencies. Students must have previous knowledge of cardiac pharmacology and rhythms, and current CPR certification. Prerequisite: Permission of instructor; CPR

**RCBS 3400 ADVANCED CARDIOPULMONARY THERAPEUTICS FOR THE RCP**

[3 hours] Course will provide students with knowledge and skills outlined by Ohio Respiratory Care licensure law for administration of medications in the diagnosis and treatment of cardiopulmonary ailments. Prerequisite: Permission of instructor

**RCBS 4100 NEONATAL/PEDIATRIC CLINICAL**

[2 hours] Applied neonatal and pediatric care including mechanical ventilation and invasive and non-invasive monitoring. Prerequisite: RCBS 3200

**RCBS 4300 ADVANCED PULMONARY DIAGNOSTICS AND PROCEDURES**

[4 hours] Advanced studies in the theory and practice of pulmonary monitoring including calculation and interpretation of hemodynamic values, indirect calorimetry, indirect spirometry, exercise testing, impedance pneumography and apnea monitoring. Prerequisite: RCBS 3100, 3200

**RCBS 4500 DELIVERY OF CARE AT ALTERNATIVE SITES**

[4 hours] The delivery of care to cardiopulmonary patients outside of the acute care facility will be discussed. Standards of care in addition to the funding of this care will be investigated. Special procedures in respiratory care will be presented. Prerequisite: Permission of instructor

**RCBS 4600 ADVANCED CRITICAL CARE**

[3 hours] Discussion of current ventilatory support techniques and specialized procedures used in the monitoring and management of critically ill patients. Clinical experiences concentrate on advanced skills in the acute care setting. Prerequisite: Permission of instructor

**RCBS 4700 RESEARCH ANALYSIS IN RESPIRATORY CARE**

[3 hours] Review of appropriate statistical knowledge required to analyze applied/clinical and basic published research. Includes a review of the elements of basic research design, reliability and validity, and critical review of cardiopulmonary research literature. Prerequisite: HEAL 4800

**RCBS 4740 POLYSOMNOGRAPHY I**

[3 hours] Examination of the physical and physiologic/neuromuscular basis for sleep disorders, including sleep apnea syndrome and obstructive sleep apnea syndrome. Practical application of overnight diagnostic screening, emergency procedures, patient safety, equipment setup, calibration and safety. Prerequisite: Permission of instructor

**RCBS 4760 POLYSOMNOGRAPHY II**

[3 hours] Examination of the pathology and morbidity associated with sleep dysfunction and sleep disorders. Continued practical application of overnight testing procedures and specialized treatment procedures, i.e., continuous positive airway pressure, supplemental oxygen administration, multiple sleep latency testing, nocturnal penile tumescence, infant/pediatric studies. Prerequisite: RCBS 4740

**RCBS 4990 INDEPENDENT STUDY**

[1-4 hours] Independent study of specific topics and issues under the supervision of a faculty member of the department of health promotion and human performance. The student will participate in independent reading, clinical/laboratory research, field experience and other similar activities. Independent study course must have a specialty; seminar sheet

## RCRT - Recreation & Recreational Therapy

### Department of Public Health and Rehabilitative Services (HHS)

#### RCRT 1300 INTRODUCTION TO RECREATION AND LEISURE STUDIES

[3 hours] A general introductory course which gives an overview of recreation and leisure in educational, governmental, institutional and professional settings. Explores historical, social and economic implications from personal and professional perspectives.

#### RCRT 1310 RECREATION PROGRAMMING

[3 hours] Theories and principles of programming, preparation of materials and resources, and practical experiences in organization and development of exemplary programs and scheduling. Prerequisite: RCRT 1300

#### RCRT 1400 CAMPING AND OUTDOOR RECREATION

[3 hours] Major areas covered include: equipment, nutrition, first aid, planning, ethics and conservation. Overnight trip and lab fee required. Includes discussions on economics, land planning, understanding conservation problems, trends and projections.

#### RCRT 2300 RECREATION LEADERSHIP AND GROUP DYNAMICS

[3 hours] The concepts of recreation leadership will be introduced. These concepts will emphasize group dynamics, group behavior and development creativity in recreational leadership, and problem solving as related to recreation.

#### RCRT 3310 RECREATION AND ADAPTATION FOR SPECIAL POPULATIONS

[3 hours] An introductory course into mainstreaming as applied to the delivery of recreation services to individuals with disabilities. Thirty hour volunteer component required.

#### RCRT 3710 ADVENTURE PROGRAMMING IN RECREATION AND RECREATIONAL THERAPY

[3 hours] An introduction to theory and techniques of adventure programming as a treatment protocol and/or leisure education tool. Prerequisite: RCRT 1310, 2300

#### RCRT 3940 RECREATION APPLICATION EXPERIENCE

[3 hours] The student will gain personal experience in the field of parks and recreation at an appropriate agency. The student will participate in a wide range of agency activities. Prerequisite: RCRT 1300, 1310, 2300, 3310, 3710

#### RCRT 4330 ADMINISTRATION IN RECREATION AND RECREATIONAL THERAPY

[3 hours] The political and economic policy and decision making in recreation and recreational therapy are investigated. Content includes the investigation of financial resources, management and marketing of recreation and recreational therapy from an administrative perspective. Prerequisite: RECT/RLS acceptance or junior standing

#### RCRT 4340 LEISURE RECREATION AND AGING

[3 hours] This course provides a study of leisure and recreation activities for the older adult by investigating the aging process and the impact of leisure and recreation programming in the process. Prerequisite: RECT/RLS acceptance, or junior standing and RCRT 1310, 2300

#### RCRT 4430 INTERPRETIVE SERVICES

[3 hours] Lectures and laboratory exercises to analyze the role and the skills of the park naturalist, including outdoor education techniques. In addition, students will identify appropriate means of interpreting park features and facilities to the public. Prerequisite: RLS acceptance or junior standing

#### RCRT 4440 PARK AND RECREATION PLANNING

[3 hours] An integration of landscape architecture, facility design and location, as well as the functional aesthetic considerations of park and recreational facility planning. Emphasis will be on plan-formulation procedures. Prerequisite: RLS acceptance or junior standing

#### RCRT 4450 RESEARCH APPLICATIONS IN RECREATION AND RECREATIONAL THERAPY

[3 hours] A critical study of the problems relating to the evaluation of park and recreation programs. Students will conduct assigned field studies to become familiar with current recreation program research practices. Prerequisite: RLS acceptance or junior standing

#### RCRT 4520 URBAN PARK AND OPEN SPACE ADMINISTRATION

[3 hours] Social inquiry of United States wildlife, their habitat and implications for management on the federal, state and local level, including urban parks set aside as natural preserves. Prerequisite: RLS acceptance or junior standing

#### RCRT 4530 RECREATION POLICY AND LEADERSHIP

[3 hours] An extended field trip to major wilderness areas and national parks and forests of the United States and Canada. Includes a comprehensive analysis of major resource areas and small group dynamics, as well as practical exercises in survival, rescue techniques and orienteering. Lab fee is required. Prerequisite: RLS acceptance or junior standing

#### RCRT 4600 RT INTERVENTION: CRAFT THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using crafts. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4610 RT INTERVENTION: HORTICULTURE THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using plants. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4620 RT INTERVENTION: PET ASSISTED THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using animals. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4630 RT INTERVENTION: PLAY AND HUMOR THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using games, humor and play activities. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4640 RT INTERVENTION: THERAPEUTIC GROUPS

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using groups. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4650 RT INTERVENTION: THERAPEUTIC RIDING

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using horseback riding. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4660 RT INTERVENTION: FITNESS & RELAXATION THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using weight lifting, exercise and relaxation techniques. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4670 RT INTERVENTION: LEISURE EDUCATION

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using leisure education activities, including social skills, values clarification and leisure: awareness, resources and knowledge. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4680 RT INTERVENTION: ASSISTIVE TECHNOLOGY AND TECHNIQUES

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using assistive technology and techniques. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4690 RT INTERVENTION: AQUATIC THERAPY

[1 hour] Provides the student with fundamental skills needed to implement therapeutic outcomes using swimming and aquatic programming. Prerequisite: RLS or RCRT major and junior standing

#### RCRT 4700 CREATIVE ART THERAPIES

[3 hours] An introduction to theory and techniques of music, dance, drama, poetry and horticulture in recreational therapy as they relate to entry-level practice.

#### RCRT 4720 INTRODUCTION TO THERAPEUTIC RECREATION

[3 hours] Theories principles and history of therapeutic recreation will be discussed. Lectures, discussions, self-directed learning activities, will examine the structure and function of therapeutic recreation for individuals with limitations.

#### RCRT 4730 MEDICAL AND CLINICAL ASPECTS OF THERAPEUTIC RECREATION

[3 hours] This course was designed to give students an in-depth knowledge of the medical aspects relating to impairments and their implications for therapeutic recreation practice. Prerequisite: Admission into the professional sequence in therapeutic recreation



**RCRT 4740 ASSESSMENT AND DOCUMENTATION IN THERAPEUTIC RECREATION**

[3 hours] This course was designed to introduce the student to documentation and assessment skills needed for therapeutic recreation practice including: initial evaluation, treatment plan, progress note and discharge summary. Prerequisite: Admission into the professional sequence in therapeutic recreation

**RCRT 4750 GROUP DYNAMICS IN RECREATIONAL THERAPY**

[3 hours] The concepts and theories of therapeutic group process applied to Recreational Therapy group dynamics. These concepts will emphasize group goals, communications, decision making and leadership. Prerequisite: RCRT 1310; admission into the professional sequence in therapeutic recreation

**RCRT 4760 RESEARCH ADMINISTRATIVE PROGRAMMING IN THERAPEUTIC RECREATION**

[3 hours] Course will focus on current issues and techniques relating to comprehensive research program design, implementation and evaluation relating to the practice of therapeutic recreation. Prerequisite: RCRT 4720, 4730, 4740; admission into the professional sequence in therapeutic recreation

**RCRT 4770 PROJECT DESIGN**

[1-3 hours] This course is designed to give the student an opportunity to design a research project in affiliation with his/her full-time internship in recreation or recreational therapy. Prerequisite: RLS or RCRT major and senior standing Corequisite: RCRT 4930 or 4940

**RCRT 4780 PROJECT EVALUATION**

[1-3 hours] This course is designed to give the student an opportunity to implement and evaluate a research project in affiliation with his/her full-time internship in recreation or recreational therapy. Prerequisite: RLS or RCRT major and senior standing Corequisite: RCRT 4930 or 4940

**RCRT 4790 MEDICAL & CLINICAL ASPECTS IN THERAPEUTIC RECREATION II**

[3 hours] This course is designed to introduce students to those conditions or disabilities that would typically be related to mental retardation/developmental disability, pediatrics and psychiatry. Students will gain an in-depth knowledge of the medical aspects relating to impairments and their implications for therapeutic recreation. Prerequisite: RCRT 4730; acceptance into the professional sequence in Recreational courses

**RCRT 4800 CLINICAL: PHYSICAL REHABILITATION**

[1 hour] Provides the students with a structured environment to practice assessment, documentation and treatment interventions in a physical rehabilitation or subacute rehabilitation facility. Prerequisite: RCRT 4720, 4730, 4740

**RCRT 4810 CLINICAL: PSYCHIATRIC REHABILITATION**

[1 hour] Provides the student with a structured environment to practice assessment, documentation and treatment interventions in a psychiatric rehabilitation facility. Prerequisite: RCRT 4720, 4730, 4740

**RCRT 4820 CLINICAL: MENTAL RETARDATION/DEVELOPMENTAL DISABILITY**

[1 hour] Provides the student with a structured environment to practice assessment, documentation and habilitation interventions in a mental retardation/developmental disability facility. Prerequisite: RCRT 4720, 4730, 4740

**RCRT 4830 CLINICAL: GERIATRIC**

[1 hour] Provides the student with a structured environment to practice assessment, documentation, and habilitation and maintenance interventions in a geriatric facility. Prerequisite: RCRT 4720, 4730, 4740

**RCRT 4840 CLINICAL: PEDIATRIC**

[1 hour] Provides the student with a structured environment to practice assessment, documentation, and treatment and education interventions in a pediatric facility. Prerequisite: RCRT 4720, 4730, 4740

**RCRT 4850 INTERNSHIP PREPARATION**

[1 hour] This course is designed to introduce and explain the project design, project evaluation, internship requirements and the National Council on Therapeutic Recreation certification and/or Certified Park and Recreation Professional requirements. Prerequisite: Acceptance into the professional sequence in Recreation or Recreational Therapy

**RCRT 4900 SEMINAR IN RECREATION AND LEISURE**

[1-3 hours] This course was designed to provide a consideration of problems and provide advanced study in recreation and leisure education not offered as part of the current curriculum.

**RCRT 4930 SENIOR INTERNSHIP**

[4 hours] An opportunity for the student to become totally involved as an intern in functionally related tasks which will help prepare for an appropriate role as a professional in the field. Not available for therapeutic recreation students. This course may be taken twice in the same semester. Prerequisite: RLS or RCRT major and senior standing

**RCRT 4940 INTERNSHIP IN RECREATIONAL THERAPY**

[4 hours] This course is designed to give the student a comprehensive full-time experience in recreational therapy. The student will complete 40 hours per week per credit hour. This course may be taken twice in the same semester. 010: Recreational Therapy Internship: Physical Rehabilitation; 011: Recreational Therapy Internship: Psychiatric Rehabilitation; 012: Recreational Therapy Internship: MR/DD; 013: Recreational Therapy Internship: Geriatric; 014: Recreational Therapy Internship: Pediatric; 080: Recreational Therapy Internship: Physical Rehabilitation; 081: Recreational Therapy Internship: Psychiatric Rehabilitation; 082: Recreational Therapy Internship: MR/DD; Prerequisite: RLS or RCRT major and senior standing

**RCRT 4990 INDEPENDENT STUDY IN RECREATION AND LEISURE STUDIES**

[1-3 hours] Designed to provide students with the opportunity to work individually on professional problems under the direction of faculty of the department of health promotion and human performance. All individual studies must have a specialty title. Seminar sheet required.

**RCRT 5300 RECREATION AND ADAPTATION FOR SPECIAL EDUCATION**

[3 hours] An introductory course into mainstreaming as applied to the delivery of recreation services to individuals with disabilities. Thirty hour volunteer component required.

**RCRT 5310 LEISURE AND POPULAR CULTURE**

[3 hours] This course provides a comprehensive study of leisure and culture. The course consists of three areas: history of leisure, leisure and its association with culture, and leisure philosophy.

**RCRT 5320 ADMINISTRATION IN RECREATION AND RECREATIONAL THERAPY**

[3 hours] The political and economic policy and decision making in recreation and recreational therapy are investigated. Content includes the investigation of financial resources, management and marketing of recreation and recreational therapy from an administration prospective.

**RCRT 5400 NATURALIST AND INTERPRETIVE SERVICES**

[3 hours] Lectures and laboratory exercises to analyze the role and the skills of the park naturalist including outdoor education techniques. Additionally, students will identify appropriate means of interpreting park features and facilities to the public.

**RCRT 5410 PARK AND RECREATION PLANNING**

[3 hours] An integration of landscape architecture, facility design and location, as well as the functional aesthetic consideration of park and recreational facility planning. Emphasis will be on plan-formulation procedures.

**RCRT 5420 LEISURE PROGRAM RESEARCH TECHNIQUES**

[3 hours] A critical study of the research problems relating to the evaluation of park and recreation programs. Students will conduct assigned field studies to become familiar with current recreation program research practices.

**RCRT 5500 WILDLIFE MANAGEMENT**

[3 hours] Social inquiry of United States wildlife, their habitat and implications for management. State and national wildlife areas, endangered species, recreational safari areas and the behavior aspects of the hunter, fisherman and naturalist will be investigated.

**RCRT 5510 WILDERNESS POLICY AND MANAGEMENT**

[3 hours] An extended field trip to major wilderness areas and national parks and forests of the United States and Canada. Includes a comprehensive analysis of major resource areas and small group dynamics, as well as practical exercises in survival, rescue techniques and orienteering.

**RCRT 5600 FOUNDATION OF CREATIVE ARTS THERAPY**

[3 hours] An introduction to the philosophy, theory and practice of music, dance, drama, poetry, horticulture and play as expressive techniques in recreational therapy. Prerequisite: Admission into the Professional Sequence in Therapeutic Recreation; RCRT 4940

**RCRT 5610 ADVENTURE THERAPY PROGRAMMING**

[3 hours] An introduction to the philosophy, theory and historical foundations of adventure therapy as a treatment protocol. Therapeutic uses of outdoor/challenge activities for various special population groups will be explored. Prerequisite: Admission into the Professional Sequence in Therapeutic Recreation; RCRT 4940

**RCRT 5940 INTERNSHIP IN RECREATION AND LEISURE**

[1-6 hours] An opportunity for the student specializing in Outdoor Recreation, National Parks and Community Recreation Programs to work in an internship experience under the supervision of a recreation specialist.

**RCRT 6000 ISSUES AND TRENDS IN RECREATION/RECREATIONAL THERAPY**

[3 hours] Provides the advanced student with an in-depth analysis of the trends and issues related to the practice of recreation and recreational therapy.

**RCRT 6020 FINANCIAL RESOURCES OF RECREATION AND RECREATIONAL THERAPY**

[3 hours] Provides the advanced student with an in-depth analysis of the financial management concepts related to the practice of recreation and recreational therapy.

**RCRT 6920 MASTER'S PROJECT IN RECREATION AND LEISURE**

[1-4 hours] Master's Research Project in Recreation. Open to graduate students who elect the completion of a research project to fulfill the research requirements of the master's degree program.

**RCRT 6930 SEMINAR IN RECREATION AND LEISURE**

[1-3 hours] This course is designed to provide a consideration of problems and provide advanced study in recreation and leisure education not offered as part of the current curriculum.

**RCRT 6940 INTERNSHIP**

[1-4 hours] Course will incorporate advanced recreational therapy programming skills within an internship environment using expressive techniques.  
01: Creative Arts Therapy Physical Rehabilitation  
02: Creative Arts Therapy Psychiatric Rehabilitation  
03: Creative Arts Therapy MR/DD  
04: Creative Arts Therapy Geriatric  
05: Creative Arts Therapy Pediatric  
06: Supervision Physical Rehabilitation  
07: Supervision Psychiatric Rehabilitation  
08: Supervision MR/DD  
09: Supervision Geriatric  
10: Supervision Pediatric Prerequisite: Admission into the Professional Sequence in Therapeutic Recreation; RCRT 4940

**RCRT 6960 MASTER'S THESIS IN RECREATION AND LEISURE**

[1-4 hours] Master's Research Thesis in Recreation. Open to graduate students who elect the completion of a master's thesis to fulfill the research requirements of the master's degree program.

**RCRT 6990 INDEPENDENT STUDY IN RECREATION AND LEISURE**

[1-3 hours] Independent study of specific problems under the supervision of a Recreation and Leisure Studies faculty member. The student should obtain the permission of the faculty member who will supervise the study.

**REL - Religion**

**Department of Philosophy (ARS)**

**REL 1220 WORLD RELIGIONS**

[3 hours] A study of the major religions of the world, with an emphasis on non-Western religions. Humanities core course Non-western multicultural course

**REL 2000 INTRODUCTION TO RELIGION**

[3 hours] Critical and thematic study of the concepts, values, practices and world-views intrinsic to the religious life. Humanities core course

**REL 2070 ANCIENT JEWISH HISTORY**

[3 hours] Institutions, culture and religion from the earliest times through the Biblical period to the Medieval period.

**REL 2090 MODERN JEWISH HISTORY**

[3 hours] Institutions, culture and religion from the Medieval period to the present, including ghetto, emancipation, Zionism, Holocaust and third Jewish commonwealth Israel.

**REL 2300 UNDERSTANDING THE MONOTHEISTIC RELIGIONS**

[3 hours] A study of the similarities as well as the differences between Judaism, Christianity and Islam. Humanities core course Non-western multicultural course

**REL 2310 ANCIENT SCRIPTURES OF PALESTINE**

[3 hours] An examination of the history and ideas of Jewish scriptures of pre-Common Era Palestine, with some emphasis on the Jewish interpretations and Christian appropriations of those scriptures. Humanities core course

**REL 2330 NEW TESTAMENT HISTORY AND IDEAS**

[3 hours] Examination of the history and ideas of the New Testament. Humanities core course

**REL 2380 TOPICS IN CATHOLIC THOUGHT**

[3 hours] Critical examination of selected topics in contemporary Catholic thought and life, offered by the visiting professor of Catholic thought.

**REL 2410 INTRODUCTION TO CHRISTIAN THOUGHT**

[3 hours] This course will introduce students to the fundamental creedal commitments of Christianity, with an extended consideration given to a particular Christian tradition determined by the instructor.

**REL 2600 RELIGIOUS STUDIES TOPICS IN THE ARTS**

[3 hours] Cross listings with 2000-level courses offered in the visual and performing arts departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 2610 RELIGIOUS STUDIES TOPICS IN THE HUMANITIES**

[3 hours] Cross-listings with 2000-level courses offered in the humanities departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 2620 RELIGIOUS STUDIES TOPICS IN THE SOCIAL SCIENCES**

[3 hours] Cross listings with 2000-level courses offered in the social sciences departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 2670 RITUAL, SYMBOL, SACRAMENT**

[3 hours] This course will explore the history of both Christian ritual practice and the diverse theological understandings of that practice, with a focus on a particular Christian tradition determined by the instructor.

**REL 2980 SPECIAL TOPICS IN RELIGIOUS STUDIES**

[3 hours] Special topics courses. Course may be repeated for credit as topics vary.

**REL 3080 JEWISH BIBLICAL STUDIES**

[3 hours] An examination of the texts and methods of historical and contemporary Jewish scriptural studies.

**REL 3090 SCRIPTURE, TRADITION, AUTHORITY**

[3 hours] This course will explore issues related to the sources and exercise of religious authority within Christianity, with an extended consideration given to a particular Christian tradition determined by the instructor.

**REL 3100 ISLAM**

[3 hours] A study of religion of Islam, its historical development, contemporary forms and current issues. Non-western multicultural course

**REL 3110 CLASSICAL MYTHOLOGY**

[3 hours] A survey of Greek and Roman mythology in classical literature, sculpture and art.

**REL 3130 EUROPEAN MIDDLE AGES I**

[3 hours] The history of Western Europe from its beginnings to the eve of the First Crusade.

**REL 3140 EUROPEAN MIDDLE AGES II**

[3 hours] Europe from the First Crusade to the late 13th century.

**REL 3210 ANCIENT AND MEDIEVAL PHILOSOPHY**

[3 hours] A study of ancient and medieval philosophy from the pre-Socratics to Aquinas.

**REL 3420 CHRISTIAN ETHICAL PERSPECTIVES**

[3 hours] This course will study fundamental ethical concerns in Christian thought, with an extended consideration given to a particular Christian tradition determined by the instructor.

**REL 3500 EASTERN THOUGHT**

[3 hours] An examination of major philosophies of Asia and the Far East, their specific concerns and their relevance to contemporary problems.

**REL 3510 COMPARATIVE RELIGION: LIVING NON-WESTERN RELIGIONS**

[3 hours] Study of the major attitudes toward life, human existence and the world embodied in such major religions of the world as Buddhism, Confucianism, Hinduism, Islam and Taoism. Non-western multicultural course

**REL 3520 ZEN PHILOSOPHY**

[3 hours] A study of the thought and practice of historical and contemporary Zen philosophy.

**REL 3570 PHILOSOPHY OF RELIGION**

[3 hours] A critical and philosophical analysis of topics in religion including the problem of evil, faith and reason the existence of God and the nature of religious experience.

**REL 3600 RELIGIOUS STUDIES TOPICS IN THE ARTS**

[3 hours] Cross listings with 3000-level courses offered in the visual and performing arts departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 3610 RELIGIOUS STUDIES TOPICS IN THE HUMANITIES**

[3 hours] Cross listings with 3000-level courses offered in the humanities departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 3620 RELIGIOUS STUDIES TOPICS IN THE SOCIAL SCIENCES**

[3 hours] Cross listings with 3000-level courses offered in the social sciences departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 3710 LITERATURE OF THE OLD TESTAMENT**

[3 hours] A study of the Old Testament from the literary point of view, including ancient poetry, history, romance, short story, hymn, prophecy and wisdom writing. Recommended: ENGL 2700 or 2800.

**REL 3720 LITERATURE AND MYTHOLOGY**

[3 hours] Study of classical and biblical mythologies in modern Western literature, private mythologies and literary adaptations of patterns from legend and folklore. Recommended: ENGL 2700 or 2800.

**REL 3760 EUROPEAN LITERATURE TO THE RENAISSANCE**

[3 hours] The literary European heritage from its biblical and classical origins to the 16th century. Includes (in English translation) such writers as Homer, Virgil and Dante. Recommended: ENGL 2700, 2800 or 3790.

**REL 3900 SEMINAR-CONTEMPORARY RELIGIOUS THOUGHT**

[3 hours] A critical examination of selected topics in the area of religion.

**REL 3980 SPECIAL TOPICS IN RELIGIOUS STUDIES**

[3 hours] Special topics courses. Course may be repeated for credit as topics vary.

**REL 4030 EUROPE IN THE 14TH - 15TH CENTURIES**

[3 hours] The waning of the Middle Ages and the development of the Renaissance in Western Europe with emphasis on Italy.

**REL 4040 EUROPE IN THE 16TH - 17TH CENTURIES**

[3 hours] Society, culture and politics in early modern Europe with emphasis on culture north of the Alps, the Reformation and the nation-state.

**REL 4310 HISTORY OF NATIVE AMERICAN RELIGIOUS MOVEMENTS**

[3 hours] History of Native American religious movements as a response to European colonization and Indian dispossession.

**REL 4490 WITCHCRAFT AND MAGIC IN MEDIEVAL AND EARLY MODERN EUROPE**

[3 hours] Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolic magic, the witchcraze and its decline.

**REL 4500 BUDDHIST PHILOSOPHY**

[3 hours] An examination of significant developments of Buddhist philosophical thought, including that of Abhidharmika, Madhyamika, Yogacara, Hua-Yen and Ch'an (Zen). Prerequisite: Two 3000-level philosophy classes, or one 3200-level philosophy class and junior standing, or permission of instructor

**REL 4520 HISTORY OF THE MIDDLE EAST FROM 600 - 1500**

[3 hours] A survey of Middle East history from the emergence of Islam and the formation of Islamic states until the establishment of the Ottoman and Persian empires in the 15th-16th centuries.

**REL 4600 RELIGIOUS STUDIES TOPICS IN THE ARTS**

[3 hours] Cross listings with 4000-level courses offered in the visual and performing arts departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 4610 RELIGIOUS STUDIES TOPICS IN THE HUMANITIES**

[3 hours] Cross listings with 4000-level courses offered in the humanities departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 4620 RELIGIOUS STUDIES TOPICS IN THE SOCIAL SCIENCES**

[3 hours] Cross listings with 4000-level courses offered in the social sciences departments. Specific topics vary, and course may be repeated for credit as topics vary. Check course schedules for specific subject and prerequisites.

**REL 4820 ANTHROPOLOGY OF RELIGION**

[3 hours] A cross-cultural approach to the description and analyses of magical and religious beliefs and practices in Asia, Africa, Latin America and Indigenous North America. Prerequisite: ANTH 2800

**REL 4900 SEMINAR IN RELIGIOUS STUDIES**

[3 hours] Topics vary. Course may be repeated for credit as topics vary. See adviser for Seminar Request Form.

**REL 4920 DIRECTED READINGS IN RELIGIOUS STUDIES**

[1-4 hours] Critical inquiry of selected works under the guidance of an instructor on a topic not offered as a regular course. Prerequisite: Prior arrangement with instructor

**REL 4930 FIELDWORK IN RELIGIOUS STUDIES**

[1-6 hours] Fieldwork involving the student in meaningful research under the direction of an instructor. The student is introduced to methods and problems related to fieldwork in religious studies. Prerequisite: Prior arrangement with instructor

**REL 4940 INTERNSHIP IN RELIGIOUS STUDIES**

[1-4 hours] A professional experience in a related organization, during which the student integrates classroom learning with the professional experience. Prerequisite: Prior arrangement with instructor

**REL 4960 SENIOR THESIS FOR HONORS**

[3 hours] Prerequisite: Junior standing and permission of program director

**REL 4980 SPECIAL TOPICS IN RELIGIOUS STUDIES**

[3 hours] Topics vary. Course may be repeated for credit as topics vary.

**REL 4990 INDEPENDENT STUDY IN RELIGIOUS STUDIES**

[1-4 hours] Directed study in religious studies under the supervision of a religious studies instructor. Prerequisite: Prior arrangement with instructor

**REL 5930 SEMINAR IN RELIGION**

[3 hours] Advanced academic study of a thinker or topic in religion.

## RESM - Research and Measurement

### Department of Foundations of Education (EDU)

**RESM 4100 EDUCATIONAL STATISTICS**

[3 hours] Introduction to major concepts of statistical description; central tendency, dispersion, and relative position and relationship. Inferential methods such as t-tests, one-way analysis of variance and multiple comparisons are also presented.

**RESM 4200 CLASSROOM ASSESSMENT**

[3 hours] Familiarizes preservice teachers with concepts and principles of classroom assessment. Examines formal and informal strategies for assessing student achievement and explores conceptual and practical issues in assessment and grading. Prerequisite: Admission to professional education or approval of instructor

**RESM 4990 INDEPENDENT STUDY IN EDUCATIONAL RESEARCH**

[1-4 hours] The study of a current topic in educational research, measurement, statistics, or program evaluation. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Instructor consent

**RESM 5110 QUANTITATIVE METHODS I**

[3 hours] Introduction to major concepts of statistical description; central tendency, dispersion, and relative position and relationship. Inferential methods such as t-tests, one-way analysis of variance, and multiple comparisons are also presented.

## 488 Course Descriptions

### **RESM 5210 EDUCATIONAL TESTING AND GRADING**

[3 hours] Development, administration and interpretation of teacher-made tests and other pupil assessments; basic principles underlying norm- and criterion-referenced tests; problems and issues in grading systems and assigning grades.

### **RESM 5310 EDUCATIONAL RESEARCH**

[3 hours] This course offers an introduction to the history and foundations of research processes. It incorporates the purposes and strengths of both qualitative and quantitative approaches for understanding research problems.

### **RESM 5330 QUALITATIVE RESEARCH I: INTRODUCTION AND BASIC METHODS**

[3 hours] Introduction to history and theoretical underpinnings of qualitative research. Students then learn and practice fundamental methods of participant-observation, fieldnotes, interviewing, and transcription, and explore common models of qualitative research.

### **RESM 5950 WORKSHOP IN RESEARCH AND MEASUREMENT**

[3 hours] Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.

### **RESM 6120 QUANTITATIVE METHODS II**

[3 hours] Course covers the major inferential statistical techniques common to the behavioral sciences. Correlation, analysis of variance, linear regression and analysis of covariance are major topics. Computer applications are included. Prerequisite: RESM 5110 or 5970

### **RESM 6130 MULTIVARIATE STATISTICS**

[3 hours] Study of multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included. Prerequisite: RESM 6120/8120

### **RESM 6140 ADVANCED QUANTITATIVE METHODS**

[3 hours] The study of various experimental designs such as complete and fractional factorial designs, repeated measures designs, and nested designs. Both the conceptual rationale and the computational procedures are covered. Prerequisite: RESM 6120/8120

### **RESM 6150 STRUCTURAL EQUATION MODELING**

[3 hours] Structural equation modeling serves as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with LISREL. Prerequisite: RESM 6120/8120

### **RESM 6160 NONPARAMETRIC STATISTICS**

[3 hours] Study of classical nonparametric statistical techniques and recent developments in this field. Coverage includes contingency tables, binomial distribution tests, several rank tests and other distribution-free statistics. Prerequisite: RESM 5110/7110

### **RESM 6220 MEASUREMENT I**

[3 hours] Introduction to psychometric theories, with emphasis on classical test theory; reliability theory, including generalizability theory; approaches to validation; practical applications such as standard setting. Prerequisite: RESM 5110/7110 or 5210/7210 or approval of instructor

### **RESM 6230 MEASUREMENT II**

[3 hours] Primary focus on Item Response Theory, with emphasis on 1- 2- and 3-parameter logistic models. Also covers applied issues such as test equating, scaling, item/test bias detection methods and current issues. Prerequisite: RESM 6220/8220 or approval of instructor

### **RESM 6320 RESEARCH DESIGN**

[3 hours] The study of research approaches that are used in theses and dissertations. Competing designs for addressing research questions are compared. The purpose is to prepare students for their dissertation experience. Prerequisite: RESM 5110/7110 or consent of instructor

### **RESM 6340 QUALITATIVE RESEARCH II: DESIGN AND ANALYSIS**

[3 hours] Students design, conduct and write up a qualitative study. Topics include theoretical frameworks and research design; managing, analyzing and interpreting data; collaboration between researcher and researched; using computers in analysis. Prerequisite: RESM 5330/7330

### **RESM 6350 METHODS OF SURVEY RESEARCH**

[3 hours] The design of large scale surveys with emphasis on sampling. Methods for telephone surveys, face-to-face interviews and mail surveys are included. Prerequisite: RESM 6320/8320

### **RESM 6360 PROGRAM EVALUATION**

[3 hours] An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are considered. Prerequisite: RESM 5110

### **RESM 6370 FUNDAMENTALS OF GRANT WRITING**

[3 hours] This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.

### **RESM 6940 INTERNSHIPS IN MEASUREMENT, EVALUATION, RESEARCH & STATISTICS**

[3 hours] Supervised field experiences in measurement, evaluation, research design, or statistics in a variety of settings. Prerequisite: Permission of instructor

### **RESM 6960 MASTER'S THESIS IN EDUCATIONAL RESEARCH**

[1-3 hours] Open to a graduate student who elects the completion of a research thesis in fulfilling the research requirement of the master's degree. Prerequisite: Permission of instructor

### **RESM 6980 MASTER'S PROJECT IN EDUCATIONAL RESEARCH**

[1-3 hours] A formal independent project applying principles of research and/or measurement to solve a particular problem and culminating in a written discourse. Prerequisite: Permission of instructor

### **RESM 6990 MASTER'S INDEPENDENT STUDY IN EDUCATIONAL RESEARCH**

[1-3 hours] The study of a current topic in educational research, measurement, statistics, or program evaluation. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

### **RESM 7110 QUANTITATIVE METHODS I**

[3 hours] Introduction to major concepts of statistical description; central tendency, dispersion, and relative position and relationship. Inferential methods such as t-tests, one-way analysis of variance, and multiple comparisons are also presented.

### **RESM 7210 EDUCATIONAL TESTING AND GRADING**

[3 hours] Development, administration and interpretation of teacher-made tests and other pupil assessments; basic principles underlying norm- and criterion-referenced tests; problems and issues in grading systems and assigning grades.

### **RESM 7310 EDUCATIONAL RESEARCH**

[3 hours] This course offers an introduction to the history and foundations of research processes. It incorporates the purposes and strengths of both qualitative and quantitative approaches for understanding research problems.

### **RESM 7330 QUALITATIVE RESEARCH I: INTRODUCTION AND BASIC METHODS**

[3 hours] Introduction to history and theoretical underpinnings of qualitative research. Students then learn and practice fundamental methods of participant-observation, fieldnotes, interviewing, and transcription, and explore common models of qualitative research.

### **RESM 7950 WORKSHOP IN RESEARCH AND MEASUREMENT**

[3 hours] Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.

### **RESM 7980 SPECIAL TOPICS IN RESEARCH, MEASUREMENT, STATISTICS AND EVALUATION**

[3 hours] The study of a current topic or set of related topics in educational research, measurement, statistics, or program evaluation. The course is typically taught as a seminar. Prerequisite: RESM 7110, permission of instructor

### **RESM 8120 QUANTITATIVE METHODS II**

[3 hours] Course covers the major inferential statistical techniques common to the behavioral sciences. Correlation, analysis of variance, linear regression and analysis of covariance are major topics. Computer applications are included. Prerequisite: RESM 5110 or 5970

### **RESM 8130 MULTIVARIATE STATISTICS**

[3 hours] Study of multivariate analysis of variance, canonical correlation, discriminant analysis, repeated measures and factor analysis. Computer applications are included. Prerequisite: RESM 6120/8120

### **RESM 8140 ADVANCED QUANTITATIVE METHODS**

[3 hours] The study of various experimental designs such as complete and fractional factorial designs, repeated measures designs and nested designs. Both the conceptual rationale and the computational procedures are covered. Prerequisite: RESM 6120/8120

### **RESM 8150 STRUCTURAL EQUATION MODELING**

[3 hours] Structural equation modeling serves as a statistical method to assess the strengths of a priori relations among variables. Topics include path analysis and confirmatory factor analysis. Computer applications with LISREL. Prerequisite: RESM 6120/8120

**RESM 8160 NONPARAMETRIC STATISTICS**  
[3 hours] Study of classical nonparametric statistical techniques and recent developments in this field. Coverage includes contingency tables, binomial distribution tests, several rank tests and other distribution-free statistics. Prerequisite: RESM 5110/7110

**RESM 8180 INTERDISCIPLINARY SEMINAR IN EDUCATIONAL PSYCHOLOGY, RESEARCH, AND SOCIAL FOUNDATIONS**  
[1 hour] The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions. Prerequisite: Permission of instructor

**RESM 8220 MEASUREMENT I**  
[3 hours] Introduction to psychometric theories, with emphasis on classical test theory; reliability theory, including generalizability theory; approaches to validation; practical applications such as standard setting. Prerequisite: RESM 5110/7110 or 5210/7210 or permission of instructor

**RESM 8230 MEASUREMENT II**  
[3 hours] Primary focus on Item Response Theory, with emphasis on 1- 2- and 3-parameter logistic models. Also covers applied issues such as test equating, scaling, item/test bias detection methods and current issues. Prerequisite: RESM 6220/8220 or permission of instructor

**RESM 8320 RESEARCH DESIGN**  
[3 hours] The study of research approaches that are used in theses and dissertations. Competing designs for addressing research questions are compared. The purpose is to prepare students for their dissertation experience. Prerequisite: RESM 5110/7110 or permission of instructor

**RESM 8340 QUALITATIVE RESEARCH II: DESIGN AND ANALYSIS**  
[3 hours] Students design, conduct and write up a qualitative study. Topics include theoretical frameworks and research design; managing, analyzing and interpreting data; collaboration between researcher and researched; using computers in analysis. Prerequisite: RESM 5330/7330

**RESM 8350 METHODS OF SURVEY RESEARCH**  
[3 hours] The design of large scale surveys with emphasis on sampling. Methods for telephone surveys, face-to-face interviews and mail surveys are included. Prerequisite: RESM 6320/8320

**RESM 8360 PROGRAM EVALUATION**  
[3 hours] An overview of prominent human services program evaluation methods including objectives-based, experimental, statistical and economic approaches. Evaluation criteria, issues, ethics and politics are included. Prerequisite: RESM 7110

**RESM 8370 FUNDAMENTALS OF GRANT WRITING**  
[3 hours] This seminar will teach participants about fundamentals of grant writing. Topics covered will include: locating sources of funding, writing grants, designing evaluation instruments and administering grants.

**RESM 8940 INTERNSHIPS IN MEASUREMENT, EVALUATION, RESEARCH & STATISTICS**  
[3 hours] Supervised field experiences in measurement, evaluation, research design, or statistics in a variety of settings. Prerequisite: Permission of instructor

**RESM 8960 DISSERTATION RESEARCH IN FOUNDATIONS OF EDUCATION**  
[1-12 hours] A formal independent study culminating in a written discourse central to the advancement of knowledge in educational research design, statistics, measurement, or evaluation. Prerequisite: Permission of instructor

**RESM 8990 DOCTORAL-INDEPENDENT STUDY**  
[1-6 hours] The study of a current topic in educational research, measurement, statistics, or program evaluation. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

## RUS - Russian

### Department of Foreign Languages and Literature (ARS)

**RUS 1080 RUSSIAN CULTURE AND COMMERCE**  
[3 hours] Study of Russian culture and society with emphasis on business and economics. Taught in English. Humanities core course Non-western multicultural course

**RUS 1090 INTRODUCTION TO RUSSIAN CULTURE**  
[3 hours] An introduction to principal social, artistic and literary aspects of Russian culture. Taught in English. (Not for major credit) Humanities core course Non-western multicultural course

**RUS 1110 ELEMENTARY RUSSIAN I**  
[4 hours] An introduction to Russian language and culture through aural comprehension, speaking, reading and writing. Laboratory practice required. (Not for major credit)

**RUS 1120 ELEMENTARY RUSSIAN II**  
[4 hours] An introduction to Russian language and culture through aural comprehension, speaking, reading and writing. Laboratory practice required. (Not for major credit) Prerequisite: RUS 1110 or satisfactory score on placement test. Humanities core course

**RUS 2140 INTERMEDIATE RUSSIAN I**  
[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (Not for major credit) Prerequisite: RUS 1120 or satisfactory score on placement test. Humanities core course

**RUS 2150 INTERMEDIATE RUSSIAN II**  
[3 hours] Further practice of the four language skills with grammar review and readings of a literary-cultural nature. Laboratory practice required. (Not for major credit) Prerequisite: RUS 2140 or satisfactory score on placement test. Humanities core course

**RUS 2190 STUDY ABROAD**  
[1-3 hours] The course permits the student to spend time in a country where Russian is spoken. Credit will be awarded in accordance with established departmental procedures. Prerequisite: RUS 2150 and consent of instructor

**RUS 3010 CONVERSATION AND COMPOSITION I**  
[3 hours] Work on advanced aural comprehension, speaking, reading and writing skills through intensive work with authentic texts dealing with contemporary issues relating to the Russian-speaking world. Prerequisite: RUS 2150 or satisfactory score on placement test

**RUS 3020 CONVERSATION AND COMPOSITION II**  
[3 hours] Further work on advanced aural comprehension, speaking, reading and writing skills through intensive work with authentic texts dealing with contemporary issues relating to the Russian-speaking world. A writing-intensive course. Prerequisite: RUS 3010 or consent of instructor

**RUS 3170 BUSINESS RUSSIAN**  
[3 hours] An introduction to the language and practices of Russian business and commerce. Prerequisite: RUS 2150 or consent of instructor

**RUS 3210 SURVEY OF RUSSIAN LITERATURE I**  
[3 hours] A survey of Russian literature from its origins to the present. Prerequisite: RUS 2150 or consent of instructor

**RUS 3220 SURVEY OF RUSSIAN LITERATURE II**  
[3 hours] A survey of Russian literature from its origins to the present. Prerequisite: RUS 2150 or consent of instructor

**RUS 4070 HISTORY OF THE RUSSIAN LANGUAGE**  
[3 hours] Russian phonology, morphology and syntax from Common Slavic to the present period. Prerequisite: Two 3000-level courses

**RUS 4110 STRUCTURE OF MODERN RUSSIAN**  
[3 hours] Linguistic description of the entire structure of contemporary Russian: phonology, morphology and syntax. Prerequisite: Two 3000-level courses

**RUS 4950 STUDIES IN THE WORKS OF AN AUTHOR OR AUTHORS**  
[1-3 hours] Readings of the works of a major author or authors of Russian literature.

**RUS 4980 SPECIAL TOPICS IN RUSSIAN STUDIES**  
[1-3 hours] Study of a selected topic in Russian language, literature, or culture. May be repeated for credit when topic varies. Prerequisite: Two 3000-level courses

**RUS 4990 INDEPENDENT STUDY IN RUSSIAN**  
[1-3 hours] Independent research in special topics. May be repeated once for additional credit. Prerequisite: Consent of instructor

## SBS - Severe Behavioral Spectrum

### Department of Criminal Justice (HHS)

#### SBS 6410 THEORY AND RESEARCH: EMOTIONAL BEHAVIORAL DISORDERS

[3 hours] This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings. Prerequisite: Permission of instructor Corequisite: SBS 6420, 6430

#### SBS 6420 PUBLIC SCHOOL EMOTIONAL BEHAVIOR DISORDERS

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public school settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles. Prerequisite: Permission of instructor Corequisite: SBS 6410, 6430

#### SBS 6430 ALTERNATIVE SCHOOL SETTING: EBD

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. The alternative school setting includes: self-contained, transition-mainstreamed and consultative-collaborative teaching roles. Corequisite: SBS 6410, 6420

#### SBS 6440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: SPED 6410 or permission of instructor Corequisite: SBS 6450, 6460

#### SBS 6450 ADJUDICATED-LOCKED SETTING: EBD

[1 hour] This course provides supervised practice in classroom with children and youth identified as Emotionally Behaviorally Disturbed/Disordered. The adjudicated-locked setting includes: self-contained, remedial plus consultative-collaborative teaching roles. Prerequisite: SBS 6420, 6430 Corequisite: SBS 6440, 6460

#### SBS 6460 HOSPITAL SETTING: EBD

[1 hour] This course provides supervised practice teaching children and youth identified as Emotionally Behaviorally Disturbed/Disordered. Hospital setting include: self-contained, individualized and group tutoring, and consultative-collaborative teaching roles. Prerequisite: SBS 6420, 6430 Corequisite: SBS 6440, 6450

#### SBS 6470 THEORY AND RESEARCH: AUTISM

[3 hours] This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism. Prerequisite: SBS 6460 or permission of instructor

#### SBS 6480 TEACHING CHILDREN AND YOUTH WITH AUTISM

[3 hours] This course provides research based methodologies for understanding and teaching children and youth with autism. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: SBS 6470 or permission of instructor

#### SBS 6510 MANAGEMENT OF SEVERE BEHAVIORS OF INCARCERATED CHILDREN AND YOUTH

[3 hours] Managing severe behaviors of incarcerated children and youth, including learning knowledge, skills and a solid dispositional commitment to empower cognitive-behavioral change through emotional, neurological, biophysical, sociological and cultural barriers. Prerequisite: Admission to the Criminal Justice graduate program or permission of

#### SBS 6520 PRACTICUM: CHILD STUDY INSTITUTE

[1 hour] The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

#### SBS 6990 INDEPENDENT STUDY: SEVERE BEHAVIOR

[1-5 hours] Provides advanced graduate students with opportunities to study severe behavior related issues. Individual meetings with sponsoring faculty are scheduled. Prerequisite: Admission to graduate degree program

#### SBS 8410 THEORY AND RESEARCH: EMOTIONAL BEHAVIORAL DISORDERS

[3 hours] This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings. Prerequisite: Permission of instructor Corequisite: SBS 8420, 8430

#### SBS 8420 PUBLIC SCHOOL: EMOTIONAL BEHAVIOR DISORDERS

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public school settings include: self-contained, resource, transition, transition, mainstreamed and consultative-collaborative teaching roles. Prerequisite: Permission of instructor Corequisite: SBS 6410, 6430

#### SBS 8430 ALTERNATIVE SCHOOL SETTING: EBD

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. The alternative school setting includes: self-contained, transition-mainstreamed and consultative-collaborative teaching roles. Corequisite: SBS 8410, 8420

#### SBS 8440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral disorders/disturbances. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: SBS 6410 or permission of instructor Corequisite: SBS 6450, 6460

#### SBS 8450 ADJUDICATED-LOCKED SETTING: EBD

[1 hour] This course provides supervised practice in classroom with children and youth identified as Emotionally Behaviorally Disturbed/Disordered. The adjudicated-locked setting includes: self-contained, remedial plus consultative-collaborative teaching roles. Prerequisite: SBS 8420, 8430 Corequisite: SBS 8440, 8460

#### SBS 8460 HOSPITAL SETTING: EBD

[1 hour] This course provides supervised practice teaching children and youth identified as Emotionally Behaviorally Disturbed/Disordered. Hospital setting include: self-contained, individualized and group tutoring, and consultative-collaborative teaching roles. Prerequisite: SBS 8420, 8430 Corequisite: SBS 8440, 8450

#### SBS 8470 THEORY AND RESEARCH: AUTISM

[3 hours] This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism. Prerequisite: SBS 8460 or permission of instructor

#### SBS 8480 TEACHING CHILDREN AND YOUTH WITH AUTISM

[3 hours] This course provides research based methodologies for understanding and teaching children and youth with autism. Psychosocial educational best practices within the least restrictive environment are presented. Prerequisite: SBS 8470 or permission of instructor

#### SBS 8510 MANAGEMENT OF SEVERE BEHAVIORS OF INCARCERATED CHILDREN AND YOUTH

[3 hours] Managing severe behaviors of incarcerated children and youth, including learning knowledge, skills and a solid dispositional commitment to empower cognitive-behavioral change through emotional, neurological, biophysical, sociological and cultural barriers. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

#### SBS 8520 PRACTICUM: CHILD STUDY INSTITUTE

[1 hour] The Child Study Institute, Lucas County Juvenile Detention Center, offers frontline knowledge-to-skill practicing in the management of incarcerated children and youth with severe, chronic and potentially violent behaviors. Prerequisite: Admission to the Criminal Justice graduate program or permission of instructor

#### SBS 8990 INDEPENDENT STUDY: SEVERE BEHAVIOR

[1-5 hours] Provides advanced graduate students with opportunities to study severe behavior related issues. Individual meetings with sponsoring faculty are scheduled. Prerequisite: Admission to graduate degree program

## SKLS - Skills

### University College (UNV)

#### SKLS 0970 EFFECTIVE READING

[3 hours] A transitional course emphasizing college reading strategies as applied to a content course; must be taken with SOC 1010. Course is graded on a PS/NC basis. Prerequisite: SKLS 0610 Corequisite: SOC 1010

#### SKLS 0980 COLLEGE READING

[3 hours] Prepares students for success in academic course of study by upgrading textbook comprehension strategies, developing critical reading strategies and expanding academic reading vocabulary through the textbook and other academic reading materials. Grades do not apply to the student's GPA. Prerequisite: SKLS 0610 or proficiency exam

#### SKLS 0990 ACADEMIC WRITING

[4 hours] Coursework introduces students to college-level writing strategies, as well as self-evaluative assessment tools essential for introductory intellectual work. Students who pass SKLS 0990 progress to ENGL 1100 (or ENGL 1100 as determined by placement). Grades do not apply to the student's GPA. Prerequisite: Placement exam or permission of instructor

#### SKLS 1000 GENERAL EDUCATION/ COLLEGE ORIENTATION

[1 hour] Acquaints the new student with the services, policies, procedures and layout of the University, college and department. Establishes relationships among new students, full-time professors and peer mentors during this time of adjustment. Corequisite: Must be taken during first semester of enrollment

#### SKLS 1110 CREATIVE PROBLEM SOLVING

[2 hours] This course aids students in developing problem-solving techniques through simulated situations and other activities.

#### SKLS 1120 CAREER AND SELF-EVALUATION

[2 hours] This course offers an opportunity to explore two important considerations in choosing a career: (1) career opportunities and requirements, (2) individual interests, abilities, skills, needs, values and goals.

#### SKLS 1140 TECHNICAL ORAL PRESENTATIONS

[1 hour] Essentials of delivering oral technical presentations. Awareness of audience, purpose and presentation techniques are emphasized through required weekly presentations.

#### SKLS 1150 COLLEGE STUDY STRATEGIES AND ORIENTATION

[3 hours] Acquaints students with the services, policies, procedures and layout of the University, along with relevant study skills and student learning services available campus-wide. Required of all pre-major students; optional for others.

#### SKLS 1160 WRITING IN THE SOCIAL SCIENCES AND HUMANITIES

[1 hour] This course will assist students in planning, organizing, researching and revising papers assigned in social science and humanities courses. Students may work on papers assigned for a class in which they are currently enrolled. Course is offered as a 7-1/2 week module.

#### SKLS 1940 LEARNING THROUGH SERVICE

[2 hours] Students will be involved four hours a week in various community service projects and analyze and reflect on their experiences through journals, discussion and a final paper in a weekly seminar.

## SLP - Speech Language Pathology

### Department of Public Health and Rehabilitative Services (HHS)

#### SLP 2400 COMMUNICATION DISORDERS

[3 hours] A study of causative factors and characteristics of communicative disorders in comparison to normal speech/language/hearing processes.

#### SLP 3010 CLINICAL PHONETICS

[3 hours] Understanding of articulatory and acoustic phonetics with emphasis on the development of transcription skills using the International Phonetic Alphabet in recording normal and disordered speech production.

#### SLP 3020 ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING MECHANISM

[3 hours] The study of the anatomy and physiology of the speech and hearing mechanism with relation to functioning for speech production and auditory perception.

#### SLP 3030 NORMAL LANGUAGE ACQUISITION

[3 hours] This course will include procedures to describe language and the developmental sequence in which it is acquired by children. Basic theories of language acquisition will be discussed.

#### SLP 3140 ANALYZING LANGUAGE

[3 hours] Identification of linguistic structures in standard English. Course focuses on analysis of semantic and syntactic components of language with pragmatic analysis included.

#### SLP 3150 SPEECH SCIENCE

[3 hours] Detailed exploration of the functions of the speech and language production system including neurological components. Aerodynamic and acoustical functions are explored through the phonatory, respiratory and articulatory parameters of speech. Prerequisite: SLP 3010, 3020

#### SLP 3200 ARTICULATION/PHONOLOGICAL DISORDERS

[3 hours] Assessment techniques and intervention strategies for persons with disorders of the sound system of the language. Theories of phonological acquisition and etiological factors will be discussed during this course.

#### SLP 3300 COMMUNICATIVE DISORDERS: LANGUAGE

[3 hours] Course includes the identification of etiologic bases and characteristics of language disorders. Assessment strategies leading to choice of intervention techniques will be discussed. Prerequisite: SLP 3030

#### SLP 3400 CLINICAL AUDIOLOGY

[3 hours] The student learns to administer and interpret the comprehensive auditory battery consisting of pure-tone air conduction and bone conduction thresholds, speech reception thresholds, speech discrimination tests and acoustic emittance test battery. Prerequisite: SLP 2400, 3020, 3150

#### SLP 3500 AURAL REHABILITATION AND SPEECH READING

[3 hours] Emphasis on aural rehabilitation with focus in use and care of individual learning aids, auditory trainers and assistive listening devices. Teaching speech reading to hearing impaired children and adults using residual hearing, contextual cues and visual augmentation. Prerequisite: SLP 3400

#### SLP 3800 METHODS FOR CLINICAL INTERVENTION

[3 hours] Teaches methods of intervention of speech, language and hearing services in various settings. Emphasis on developing skills in observation, report writing, and structuring intervention services and their implementation. Requires 25 hours of observation. Mandatory clinic meeting, and one hour lab duty. Prerequisite: Permission of clinic director; SLP 3200, 3300; major GPA of 2.75; and documentation of completion of 2-step Mantoux TB test and initiation of the Hepatitis B series.

#### SLP 4000 BEGINNING CLINICAL PRACTICUM

[2 hours] Supervised participation in structured individual or group intervention leading to the accumulation of 25 clinical hours of practicum. Prerequisite: SLP 3800 and major GPA of 2.67

#### SLP 4300 ADVANCED CLINICAL PRACTICUM I

[2 hours] Students are assigned individual clients for whom they will plan an intervention program, implement the program and evaluate the results of the intervention under faculty supervision. Mandatory clinic meeting and 1 hour lab duty. Prerequisite: Permission of clinic director; SLP 4000 and major GPA of 2.75

#### SLP 4440 AUGMENTATIVE COMMUNICATION SYSTEMS

[3 hours] Technological systems available for persons with the absence of functional speech will be described. Etiological factors, assessment and intervention procedures and hands-on experience with devices will be provided.

#### SLP 4500 ORGANIC DISORDERS OF SPEECH AND LANGUAGE

[3 hours] Course provides basic information on the nature of communication disorders resulting from organic etiologies, with particular emphasis on aphasia, motor speech disorders and cleft lip palate. Prerequisite: SLP 3200, 3300

#### SLP 4600 VOICE AND FLUENCY DISORDERS

[3 hours] This course will present quantitative and qualitative descriptions and etiological factors related to voice and fluency disorders. Assessment and intervention strategies will be discussed. Prerequisite: SLP 3020; 3150 recommended

## 492 Course Descriptions

### **SLP 4700 DIAGNOSTIC PROCEDURES IN COMMUNICATION DISORDERS**

[3 hours] Assessment techniques to diagnose and describe communication disorders will be presented. Included will be interview strategies, case history information and determination of intervention techniques based upon assessment results. Prerequisite: SLP 3200, 3300

### **SLP 4800 ADVANCED CLINICAL PRACTICUM II**

[2 hours] Senior level practicum includes supervised clinical experience via off-campus placements (optional) in schools, hospitals, or nursing/rehabilitation facility or in the on-campus Speech-Language and Learning Clinic. Mandatory clinic meeting and 1 hour lab duty. Prerequisite: Permission of clinic director; SLP 4300 and major GPA of 2.75

### **SLP 4900 SEMINAR IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Seminar provides students with the opportunity to explore, as a group, specific topics with a faculty member. Current issues in the area of speech-language pathology will be the focus. Prerequisite: Permission of instructor

### **SLP 4910 DIRECTED RESEARCH IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Directed research provides students the opportunity to explore specific topics and develop individual research with a faculty member. Current questions in the area of speech-language pathology will be the focus. Prerequisite: Permission of instructor

### **SLP 4920 READINGS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Individual Readings is designed to provide students with opportunities to examine literature related to specific issues. The student works under the direction of faculty in the speech-language pathology program. Prerequisite: Permission of instructor

### **SLP 4980 SPECIAL TOPICS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] An advanced course for undergraduate majors in speech-language pathology or majors in related fields covering an important area of communication disorders. Student may repeat this course under different section numbers. Prerequisite: Permission of instructor

### **SLP 4990 INDEPENDENT STUDY SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Independent study provides students with opportunities to work individually on issues under the direction of the speech-language pathology program faculty. The student meets with instructor without formal classes. Prerequisite: Permission of instructor

### **SLP 6000 ADVANCED PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. Prerequisite: Approval of instructor

### **SLP 6010 DIAGNOSTIC PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases. Corequisite: SLP 6100/8100

### **SLP 6020 AUDIOLOGICAL PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis. Prerequisite: Permission of instructor

### **SLP 6100 DIAGNOSIS OF SPEECH AND LANGUAGE DISORDERS**

[3 hours] Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders. Prerequisite: Undergraduate degree in speech-language pathology; permission of instructor

### **SLP 6210 PRESCHOOL LANGUAGE DISORDERS**

[3 hours] The conceptual framework for understanding language disorders in young children. Application and theory of assessment and intervention strategies will be described and discussed.

### **SLP 6220 LANGUAGE DISORDERS IN SCHOOL-AGE CHILDREN**

[2 hours] The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.

### **SLP 6300 PHONOLOGICAL AND ARTICULATORY DISORDERS**

[3 hours] Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multi-cultural society with emphasis on assessment of disorders and current advances in remediation.

### **SLP 6400 NEUROLOGICAL DISORDERS: APHASIA**

[3 hours] Advanced course in deficits due to neurological alterations resulting in aphasia. Formal and informal assessment procedures for the diagnosis of aphasia as well as techniques and functional strategies for communicative compensation provide the focus of the course.

### **SLP 6450 NEUROLOGICAL DISORDERS: BRAIN INJURY AND DEMENTIA**

[2 hours] Course in cognitive and linguistics deficits due to trauma and disease to central nervous system. Course focuses on identification and intervention in communication disorders as the result of acquired brain injury/disease. Traumatic brain injury, right hemisphere damage and dementia are addressed.

### **SLP 6500 MOTOR SPEECH DISORDERS**

[3 hours] Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.

### **SLP 6550 AUGMENTATIVE AND ALTERNATIVE COMMUNICATION**

[2 hours] The study and application of assistive communication technology for persons who are nonspeaking. The course includes characteristics of ACC consumers, design features of augmentative communication devices, assessment strategies to choose a system and intervention strategies to facilitate use of the ACC system.

### **SLP 6600 VOICE DISORDERS: DIAGNOSIS AND TREATMENT**

[3 hours] Advanced course in the evaluation and treatment of voice disorders. Major voice disorders in children and adults are emphasized. Prerequisite: SLP 3150, 4500 or equivalent

### **SLP 6650 DYSPHAGIA AND OROPHARYNGEAL DISORDERS**

[2 hours] Evaluation and intervention procedures for individuals with communication problems related to structural impairments of the oral cavity and pharynx.

### **SLP 6700 ASSESSMENT AND REMEDIATION OF FLUENCY DISORDERS**

[3 hours] An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy. Prerequisite: 45 hours in speech-language pathology; permission of instructor

### **SLP 6800 AURAL REHABILITATION**

[3 hours] Advanced care and training in the use of individual and group assistive listening devices, auditory trainers and other aids to augment hearing. Methods for using residual hearing and contextual factors to augment technology are addressed. Prerequisite: SLP 3400

### **SLP 6900 INDEPENDENT RESEARCH IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Independent research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting. Prerequisite: Admission to the Graduate School

### **SLP 6920 MASTER'S RESEARCH PROJECT IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] The Master's project is an individually designed product. Prerequisite: Admission to master's program; SLP 6930

### **SLP 6930 SEMINARS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program. Prerequisite: Admission to degree program

### **SLP 6940 INTERNSHIP IN SPEECH-LANGUAGE PATHOLOGY**

[1-8 hours] Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served. Prerequisite: Completion of all course work; permission of instructor

### **SLP 6960 MASTER RESEARCH THESIS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] The master's thesis is an individually designed investigation approved by the thesis committee and designed to contribute to the knowledge base of the speech-language pathology. Meets the final activity requirement for completion of the master's degree. Prerequisite: Admission to master's program; SLP 6930



**SLP 6990 INDEPENDENT STUDY IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held. Prerequisite: Admission to graduate degree program

**SLP 8000 ADVANCED PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides students with supervised therapeutic experiences with specific speech and language disorders. Students should have completed or be currently enrolled in graduate level communication disorders course addressing the specific practicum disorder selected. Prerequisite: Permission of instructor

**SLP 8010 DIAGNOSTIC PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides a minimum of 30 hours supervised diagnostic practicum with a variety of communicatively disordered cases. Corequisite: SLP 6100/8100

**SLP 8020 AUDIOLOGICAL PRACTICUM IN COMMUNICATION DISORDERS**

[2 hours] Provides the advanced student with supervised practicum hours in the screening, impedance and pure tone threshold testing for audiological diagnosis. Prerequisite: Permission of instructor

**SLP 8100 DIAGNOSIS OF SPEECH AND LANGUAGE DISORDERS**

[3 hours] Detailed analysis of formal and informal instruments and procedures designed to evaluate speech and language disorders. Prerequisite: Undergraduate degree in speech-language pathology; permission of instructor

**SLP 8210 PRESCHOOL LANGUAGE DISORDERS**

[3 hours] The conceptual framework for understanding language disorders in young children. Application and theory of assessment and intervention strategies will be described and discussed.

**SLP 8220 LANGUAGE DISORDERS IN SCHOOL-AGE CHILDREN**

[2 hours] The conceptual framework for understanding language disorders in school-age children with special emphasis on language assessment and language interventions in school settings.

**SLP 8300 PHONOLOGICAL AND ARTICULATORY DISORDERS**

[3 hours] Advanced study of phonological and articulatory disorders including developmental apraxia. Focus on phonological differences in multi-cultural society with emphasis on assessment of disorders and current advances in remediation.

**SLP 8400 NEUROLOGICAL DISORDERS: APHASIA**

[3 hours] Advanced course in deficits due to neurological alterations resulting in aphasia. Formal and informal assessment procedures for the diagnosis of aphasia as well as techniques and functional strategies for communicative compensation provide the focus of the course.

**SLP 8450 NEUROLOGICAL DISORDERS: BRAIN INJURY AND DEMENTIA**

[2 hours] Course in cognitive and linguistics deficits due to trauma and disease to central nervous system. Course focuses on identification and intervention in communication disorders as the result of acquired brain injury/disease. Traumatic brain injury, right hemisphere damage and dementia are addressed.

**SLP 8500 MOTOR SPEECH DISORDERS**

[3 hours] Adult apraxia and dysarthrias are discussed in relation to neurological organization, disorders and speech characteristics.

**SLP 8550 AUGMENTATIVE AND ALTERNATIVE COMMUNICATION**

[2 hours] The study and application of assistive communication technology for persons who are nonspeaking. The course includes characteristics of ACC consumers, design features of augmentative communication devices, assessment strategies to choose a system and intervention strategies to facilitate use of the ACC system.

**SLP 8600 VOICE DISORDERS: DIAGNOSIS AND TREATMENT**

[3 hours] Advanced course in the evaluation and treatment of voice disorders. Major voice disorders in children and adults are emphasized. Prerequisite: SLP 3150, 4500 or equivalent.

**SLP 8650 DYSPHAGIA AND ORPHARYNGEAL DISORDERS**

[2 hours] Evaluation and intervention procedures for individuals with communication problems related to structural impairments of the oral cavity and pharynx.

**SLP 8700 ASSESSMENT AND REMEDIATION OF FLUENCY DISORDERS**

[3 hours] An advanced course to develop skills in the assessment and remediation of fluency disorders with special emphasis on current trends in stuttering therapy. Prerequisite: 45 hours in speech-language pathology; permission of instructor

**SLP 8800 AURAL REHABILITATION**

[3 hours] Advanced care and training in the use of individual and group assistive listening devices, auditory trainers and other aids to augment hearing. Methods for using residual hearing and contextual factors to augment technology is addressed. Prerequisite: SLP 3400.

**SLP 8900 INDEPENDENT RESEARCH IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting. Prerequisite: Admission to the graduate school.

**SLP 8930 SEMINARS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Seminars will consider problems and provide advanced study in the field of Speech-Language Pathology. A student may register for more than one seminar during a graduate program. Prerequisite: Admission to degree program

**SLP 8940 INTERNSHIP IN SPEECH-LANGUAGE PATHOLOGY**

[1-8 hours] Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served. Prerequisite: Speech and Language; completion of all course work; permission of instructor.

**SLP 8960 MASTER RESEARCH THESIS IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] The master's thesis is an individually designed investigation approved by the thesis committee and designed to contribute to the knowledge base of the speech-language pathology. Prerequisite: Admission to Master's Program; SLP 6930.

**SLP 8990 INDEPENDENT STUDY IN SPEECH-LANGUAGE PATHOLOGY**

[1-5 hours] Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Speech-Language Pathology program. Individual meetings with sponsoring faculty are held. Prerequisite: Admission to graduate degree program.

## SOC - Sociology

### Department of Sociology and Anthropology (ARS)

**SOC 1010 INTRODUCTION TO SOCIOLOGY**

[3 hours] (not for major credit) Freshman and sophomores only. Sociological topics regarding social behavior, institutional dynamics and social change are examined, and the principles and basic concepts used by sociologists are taught. Social Sciences core course

**SOC 1750 SOCIAL PROBLEMS**

[3 hours] (not for major credit) Introduces students to the sociological perspective through the analysis of various social problems including inequality, population, environment, workplace and deviant behavior. Social Sciences core course

**SOC 2010 SOCIOLOGY OF THE INTERNET**

[3 hours] This course focuses on the rapidly expanding use of the Internet and its impact on society. The course will also be experiential, with Internet based interaction (through on-line, e-mail, list-servs, etc.) an essential component of the course.

**SOC 2100 AMERICAN SOCIETY**

[3 hours] Examination of American society. Emphasis upon the interplay between cultural ideas and actual behavior as these relate to change in American institutions. Social Sciences core course

**SOC 2150 THE CHANGING FAMILY**

[3 hours] Examines changes in the family through history, focusing especially on current changes in the nature of the family and on theoretical explanations for why these changes are occurring and what they may mean for family members. Prerequisite: SOC 1010 or equivalent

## 494 Course Descriptions

### **SOC 2200 THE SOCIOLOGY OF THE LIFE COURSE**

[3 hours] Examines social significance of various stages of the life cycle. Problems and issues for individuals and society as people progress through the life cycle. Prerequisite: SOC 1010 or equivalent

### **SOC 2410 COMMUNITIES**

[3 hours] This course will focus on the problem of defining community and will explore various forms of community. Social Sciences core course

### **SOC 2500 WOMEN'S ROLES: A GLOBAL PERSPECTIVE**

[3 hours] The course focuses on the current and evolving social, economic and political status of women in the United States and selected non-Western societies. For both men and women students. Social Sciences core course  
Non-western multicultural course

### **SOC 2600 SOCIAL ORGANIZATION**

[3 hours] This course will review and analyze the major ways society organizes itself, including families, communities, formal organizations and informal organizations, education, economic, political, and religious institutions. Prerequisite: SOC 1010 or equivalent

### **SOC 2640 RACE, CLASS, AND GENDER**

[3 hours] Introduction to the study of race, class and gender as factors in American stratification. Social Sciences core course U.S. multicultural course

### **SOC 2900 AFRICAN AMERICAN CULTURE**

[3 hours] A survey of the sociohistorical and cultural factors related to the African American experience in the United States. Social Sciences core course U.S. multicultural course

### **SOC 2980 SPECIAL TOPICS**

[3 hours] Examination of a special topical area in sociology. May be repeated on different topics. Prerequisite: SOC 1010 or equivalent

### **SOC 3240 FAMILY PLANNING AND POPULATION POLICY**

[3 hours] Examination of family planning and population policies in Western and non-Western societies. Historical background and current issues will be investigated and specific programs will be evaluated.

### **SOC 3270 SOCIAL RESEARCH METHODS**

[3 hours] Introduction to procedures used in the various phases of sociological research. Prerequisite: 3 hours of sociology

### **SOC 3290 SOCIAL STATISTICS**

[3 hours] Study of major statistical procedures and techniques in sociology. Prerequisite: 3 hours of sociology, MATH 1180 or higher

### **SOC 3340 THE CHANGING AMERICAN POPULATION**

[3 hours] The course will outline the historical development of population trends in the U. S. and consider current dynamics, trends and tendencies.

### **SOC 3600 WORK IN MODERN SOCIETY**

[3 hours] An overview of the sociology of work, examining how different types of occupations affect the people who perform them, and current social forces that are changing the nature of work organizations.

### **SOC 3640 SOCIAL INEQUALITY**

[3 hours] This course examines the bases, varieties and consequences of systems of stratification, including the development of and changes in stratification patterns in the US and other societies.

### **SOC 3800 SOCIAL PSYCHOLOGY**

[3 hours] An introduction to theory and research concerning social influences on the experience and behavior of individuals. Includes interaction patterns, interpersonal and intergroup relations.

### **SOC 4040 CLASSICAL THEORY**

[3 hours] 19th century theory in sociology with emphasis on A. Comte, K. Marx, E. Durkheim, T. Veblen, M. Weber and H. Spencer. Prerequisite: 6 hrs. in sociology; or 9 hrs. in social science

### **SOC 4050 CONTEMPORARY SOCIOLOGICAL THEORY**

[3 hours] Theoretical developments in sociology today. Prerequisite: 6 hours in sociology or 9 hours in social science

### **SOC 4100 COMMUNITY ORGANIZING AND DEVELOPMENT**

[3 hours] This course focuses on attempt of communities to regain power and wealth lost through urban disinvestment occurring since World War II. The course will involve numerous practical workshops to learn how to do community organizing and community development and will include information on Toledo case studies. Prerequisite: 6 hrs. of sociology or 9 hrs. of social science

### **SOC 4110 POLITICAL SOCIOLOGY**

[3 hours] Examination of political institutions, organizations and behavior with special attention to participation, power, ideology, decision making and conflict. Prerequisite: 6 hrs. of sociology or; 9 hrs. of social science

### **SOC 4160 HEALTH AND GENDER**

[3 hours] An examination of gender as a predisposing factor of health status, health behavior, health care delivery, and the structure and posture of health care professionals. Prerequisite: 6 hrs. of sociology or; 9 hrs. of social science

### **SOC 4170 LAW AND SOCIETY**

[3 hours] Dynamics of law and legal institutions; the relationship of sociocultural changes in substantive and procedural aspects of law to the concept of justice, and to the social control of deviance. Prerequisite: 6 hrs. of sociology or 9 hrs. of social science

### **SOC 4180 MEDICAL SOCIOLOGY**

[3 hours] An analysis of the sociocultural factors in health and illness, and in medical and paramedical services, and in the field of health practice as a social institution. Prerequisite: 6 hrs. of sociology or; 9 hrs. of social science

### **SOC 4190 SOCIAL GERONTOLOGY**

[3 hours] A study of the changing proportions of older people in the population, their changing roles and statuses, and the problems and processes of adjustment. Prerequisite: 6 hrs. of sociology or ; 9 hrs. of social science

### **SOC 4210 COMMUNITY INFORMATICS**

[3 hours] The study of how information and communication technologies interact with spatial and non-spatial communities, including a focus on the use of technology as a community development strategy. Prerequisite: SOC 2010

### **SOC 4220 THEORIES OF THE INFORMATION SOCIETY**

[3 hours] The study and application of sociological theory to understand the role of information and communication technologies in shaping social structure and social processes, with special focus on social policy issues. Prerequisite: SOC 2010

### **SOC 4340 POPULATION AND SOCIETY**

[3 hours] Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization. Prerequisite: 6 hrs of sociology or; 9 hrs. of social science

### **SOC 4440 METHODS OF POPULATION ANALYSIS**

[3 hours] Methods of population analysis, including examination and evaluation of data sources. Prerequisite: 6 hrs of sociology or; 9 hrs. of social science

### **SOC 4450 SOCIOLOGY OF CITIES**

[3 hours] This course provides a systematic overview of the economic, political, racial/ethnic and sex/gender dynamics of cities. It analyzes changes in cities since World War II, using numerous North American case studies, including Toledo. Prerequisite: 6 hrs of sociology or; 9 hrs of social science

### **SOC 4580 SCIENCE, TECHNOLOGY, AND SOCIAL CHANGE**

[3 hours] The impact of rapidly changing science and technology on North American society: social change in a technological age; the emergence of post industrial society. Prerequisite: 6 hrs. of sociology or; 9 hrs of social science

### **SOC 4600 CORPORATION AND SOCIETY**

[3 hours] Analysis of the social networks affecting institutionalized economic life, and the impact of corporate power on society. Prerequisite: 6 hrs. of sociology; or 9 hrs. of social science

### **SOC 4610 SOCIOLOGY OF ORGANIZATIONS**

[3 hours] Study of the structure and processes of organizations; includes theory of bureaucratic and non-bureaucratic organizations, as well as structure and function of organizations. Prerequisite: 6 hrs of sociology; 9 hrs of social science

### **SOC 4620 GENDER AND WORK**

[3 hours] Analysis of the contemporary position in the U.S. work force focusing on the expansion of the number of women joining the labor force in recent decades, and the persistence of relatively low pay, status and authority in female-dominated occupations. Prerequisite: 6 hrs of sociology or 9 hrs of social science

### **SOC 4660 RACIAL AND ETHNIC MINORITIES IN THE US**

[3 hours] Basic principles of majority/minority relations including the minority groups nature and consequences of prejudice, discrimination, segregation, entitlement and differing cultural practices between such groups. Prerequisite: 6 hrs of sociology, 9 hrs of social science U.S. multicultural course

**SOC 4670 AFRICAN AMERICANS IN THE UNITED STATES**

[3 hours] Sociological study of African Americans in the United States, focusing on issues of ethnic identity, educational and economic achievement, continuing sources of discrimination, and current movements for change. Prerequisite: 6 hrs of sociology or 9 hrs of social science U.S. multicultural course

**SOC 4710 CRIMINOLOGY**

[3 hours] Crime and criminal behavior: nature, types and extent of crime, societal reactions; problems in research and theory, prevention, control and treatment. Prerequisite: 6 hrs sociology or 9 hrs social science

**SOC 4720 DEVIANT BEHAVIOR**

[3 hours] Study and analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction. Prerequisite: 6 hrs of sociology, 9 hrs. of social science

**SOC 4730 SOCIAL PSYCHIATRY**

[3 hours] Etiological theories of mental illness; community role in etiology; community processes in relation to prognosis and rehabilitation; treatment modalities including clinic, mental hospital and therapeutic community. Prerequisite: 6 hrs of sociology or 9 hrs of social science

**SOC 4740 ISSUES IN CRIME**

[3 hours] Topics may include legalizing drugs, police violence, plea bargaining, death sentence and mandatory sentencing. Emphasizes liberal/conservative ideology. Prerequisite: 6 hrs of sociology or 9 hrs of social science

**SOC 4750 LEGAL ISSUES**

[3 hours] Topics may include abortion, three strike sentencing, homosexual rights, hate speech and decriminalizing narcotics. Emphasizes liberal/conservative ideology. Prerequisite: 6 hrs of sociology or 9 hrs of social science

**SOC 4760 JUVENILE DELINQUENCY**

[3 hours] Delinquency and delinquent behavior, including definitions, extent, process, types and causes; methods of prevention, protective control and treatment; institutional and non-institutional facilities and services. Prerequisite: 6 hrs of sociology or 9 hrs of social science

**SOC 4770 CRIMINAL CORRECTIONS: THEORIES AND PRACTICES**

[3 hours] Historical and theoretical analysis of ideas concerning punishment. Treatment of offenders as reflected in the type of administration of correctional programs, including probation and parole. Prerequisite: 6 hrs of sociology or 9 hrs of social science

**SOC 4800 DEVELOPMENT IN THIRD WORLD NATIONS**

[3 hours] The new emerging ideological, political, social and economic patterns which repeat themselves in and determine the Third World transition from a traditional to a new society. Prerequisite: 6 hrs of sociology or 9 hrs of social science Non-western multicultural course

**SOC 4810 GENDER IN CROSS-CULTURAL PERSPECTIVE**

[3 hours] Analysis of gender stratification and its impact on culture in various nations and across ethnic groups in the United States. Prerequisite: 6 hrs. of sociology or 9 hrs. of social science Non-western multicultural course

**SOC 4820 GENDER ROLES**

[3 hours] Sociocultural factors in development of gender identity and behavioral differences between men and women. Sex differentials in participation, power and reward in family, education, work, politics and community. Prerequisite: 6 hrs of sociology or 9 hours of social science. U.S. multicultural course

**SOC 4830 SOCIAL MOVEMENTS**

[3 hours] This course analyzes how and why social protest movements form, and how and why they succeed or fail. Attention will be given to post-World War II social movements, including current examples. Prerequisite: 6 hours of sociology or 9 hours of social science

**SOC 4900 SENIOR SEMINAR**

[3 hours] Discussion of substantive problems in sociology, in terms of significant theoretical and methodological debates in the discipline. Prerequisite: 21 hours of sociology or SOC 3270; SOC 4040; advanced junior standing or advanced senior standing or permission of adviser or instructor.

**SOC 4910 DIRECTED RESEARCH IN SOCIOLOGY**

[1-3 hours] Student-selected research topic under the supervision of a sociology faculty member. Permission to enroll is contingent on the instructor's acceptance of the student's research proposal. Prerequisite: SOC 3270; consent of instructor.

**SOC 4920 DIRECTED READINGS IN SOCIOLOGY**

[1-3 hours] Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas. Prerequisite: 12 hours of sociology and consent of instructor

**SOC 4940 INTERNSHIP IN SOCIOLOGY**

[3 hours]

**SOC 4960 HONORS THESIS**

[3-6 hours] Prerequisite: Senior standing; approval of the department adviser

**SOC 4980 SPECIAL TOPICS IN SOCIOLOGY**

[3 hours] Sociological examination of a developing and/or important social issue or sociological topic. May be repeated for different specialized topics. Prerequisite: 6 hours of sociology or 9 hours of social science

**SOC 4990 INDEPENDENT STUDY**

[1-3 hours]

**SOC 5040 CLASSICAL THEORY**

[3 hours] 19th Century theory in sociology with emphasis on A. Comte, K. Marx, E. Durkheim, T. Veblen, M. Weber and H. Spencer.

**SOC 5050 CONTEMPORARY SOCIOLOGICAL THEORY**

[3 hours] Theoretical developments in sociology today.

**SOC 5100 COMMUNITY ORGANIZING AND DEVELOPMENT**

[3 hours] This course will review the major forms of community and organizing since World War II. Practical issues and theoretical issues will be stressed. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on the various topics.

**SOC 5110 POLITICAL SOCIOLOGY**

[3 hours] Examination of political institutions, organizations and behavior with special attention to participation, power, ideology, decision making and conflict.

**SOC 5160 HEALTH AND GENDER**

[3 hours] An examination of gender as a predisposing factor of health status, health behavior, health care delivery, and the structure and posture of health care professionals.

**SOC 5170 LAW AND SOCIETY**

[3 hours] Dynamics of law and legal institutions; the relationship of sociocultural changes in substantive and procedural aspects of law to the concept of justice, and to the social control of deviance.

**SOC 5180 MEDICAL SOCIOLOGY**

[3 hours] An analysis of the sociocultural factors in health and illness, and in medical and paramedical services, and in the field of health practice as a social institution.

**SOC 5190 SOCIAL GERONTOLOGY**

[3 hours] A study of the changing proportions of older people in the population, their changing roles and statuses, and the problems and processes of adjustment.

**SOC 5210 COMMUNITY INFORMATICS**

[3 hours] The study of how information and communication technologies interact with spatial and non-spatial communities, including a focus on the use of technology as a community development strategy. Prerequisite: SOC 2010 or 6 hours of Social Science or permission of instructor

**SOC 5220 THEORIES OF THE INFORMATION SOCIETY**

[3 hours] The study and application of sociological theory to understand the role of information and communication technologies in shaping social structure and social processes, with special focus on social policy issues. Prerequisite: SOC 2010 or 6 hours of social science or permission of instructor

**SOC 5270 SOCIAL RESEARCH METHODS**

[3 hours] Introduction to procedures used in the various phases of sociological research.

**SOC 5290 SOCIAL RESEARCH STATISTICS**

[3 hours] Study of major statistical procedures and techniques in sociology.

**SOC 5340 POPULATION AND SOCIETY**

[3 hours] Examination of the interaction among variables of population (fertility, mortality and migration) and other aspects of societal organization.

**SOC 5440 METHODS OF POPULATION ANALYSIS**

[3 hours] Methods of population analysis, including examination and evaluation of data sources.

**SOC 5450 SOCIOLOGY OF CITIES**

[3 hours] This course will review the current literature on how cities are organized, with special attention to economic, political, racial/ethnic and sex/gender dynamics. Understanding the historically changing positions and character of cities will be emphasized. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on the various topics.

## 496 Course Descriptions

### **SOC 5580 SCIENCE, TECHNOLOGY, AND SOCIAL CHANGE**

[3 hours] The impact of rapidly changing science and technology on North American society: social change in a technological age; the emergence of post industrial society.

### **SOC 5600 CORPORATION AND SOCIETY**

[3 hours] Analysis of the social networks affecting institutionalized economic life, and the impact of corporate power on society.

### **SOC 5610 SOCIOLOGY OF ORGANIZATIONS**

[3 hours] Study of the structure and processes of organizations; includes theory of bureaucratic and non-bureaucratic organizations, as well as structure and function of organizations.

### **SOC 5620 GENDER AND WORK**

[3 hours] Analysis of the contemporary position in the U.S. work force focusing on the expansion of the number of women joining the labor force in recent decades, and the persistence of relatively low pay, status and authority in female-dominated occupations.

### **SOC 5660 RACIAL AND ETHNIC MINORITIES IN THE US**

[3 hours] Review of current theoretical and empirical work in American sociology on racism, discrimination and other dimensions of racial inequality.

### **SOC 5670 AFRICAN AMERICANS IN THE UNITED STATES**

[3 hours] Sociological study of African Americans in the United States, focusing on issues of ethnic identity, educational and economic achievement, continuing sources of discrimination, and current movements for change.

### **SOC 5710 CRIMINOLOGY**

[3 hours] Crime and criminal behavior: nature, types and extent of crime, societal reactions; problems in research and theory, prevention, control and treatment.

### **SOC 5720 DEVIANT BEHAVIOR**

[3 hours] Study of the analysis of the nature, meaning and process of deviant behavior in terms of social norms, control and societal reaction.

### **SOC 5730 SOCIAL PSYCHIATRY**

[3 hours] Etiological theories of mental illness; community role in etiology; community processes in relation to prognosis and rehabilitation; treatment modalities including clinic, mental hospital and therapeutic community.

### **SOC 5740 ISSUES IN CRIME**

[3 hours] Topics may include legalizing drugs, police violence, plea bargaining, death sentence and mandatory sentencing. Emphasizes liberal/conservative ideology.

### **SOC 5750 LEGAL ISSUES**

[3 hours] Topics may include abortion, three strike sentencing, homosexual rights, hate speech and decriminalizing narcotics. Emphasizes liberal/conservative ideology.

### **SOC 5760 JUVENILE DELINQUENCY**

[3 hours] Delinquency and delinquent behavior, including definitions, extent, process, types and causes; methods of prevention, protective control and treatment; institutional and non-institutional facilities and services.

### **SOC 5770 CRIMINAL CORRECTIONS: THEORY AND PRACTICES**

[3 hours] Historical and theoretical analysis of ideas concerning punishment. Treatment of offenders as reflected in the type of administration of correctional programs, including probation and parole.

### **SOC 5800 DEVELOPMENT OF SUBORDINATE NATIONS**

[3 hours] The new emerging ideological, political, social and economic patterns which repeat themselves in and determine the Third World transition from a traditional to a new society.

### **SOC 5810 GENDER IN CROSS-CULTURAL PERSPECTIVE**

[3 hours] Analysis of gender stratification and its impact on culture in various nations and across ethnic groups in the United States.

### **SOC 5820 GENDER ROLES**

[3 hours] Social context in which gender role ideologies have developed, their influence on social change, and reflections of change in public policy and the social sciences.

### **SOC 5830 SOCIAL MOVEMENTS**

[3 hours] This course will focus on social movements and their political context to understand the causes of social movement success and failure. Special attention will be given to the 1960s wave of protest, as well as to contemporary movement forms. Students will engage in intensive case study research applying the course concepts in addition to reading and writing on relevant topics.

### **SOC 5980 SPECIAL TOPICS IN SOCIOLOGY**

[3 hours] Sociological examination of a developing social issue. May be repeated in different specialized topics.

### **SOC 5990 DIRECTED READINGS IN SOCIOLOGY**

[1-3 hours] Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.

### **SOC 6000 INTRODUCTION TO GRADUATE STUDIES IN SOCIOLOGY**

[1 hour] Graduate students are exposed to and get acquainted with the academic and professional nature of the field of sociology from the experience of several faculty members. Some of the topics that will be covered include writing theses, doing internships and seeking graduate work and careers.

### **SOC 6040 ADVANCED SOCIOLOGICAL THEORY**

[3 hours] Building on classical traditions, the course includes readings and lectures on functionalist, neo-Marxist, symbolic interactionist and other significant twentieth century sociological theories. Prerequisite: SOC 4040 or 5040

### **SOC 6050 ADVANCED SOCIAL THEORY AND POLITICAL ECONOMY**

[3 hours] This course will analyze and evaluate major social theories drawn from various 19th and 20th century intellectual and ideological traditions. The common subject focus of course readings is state, power and class relations. Prerequisite: SOC 4040 or 5040

### **SOC 6140 SEMINAR IN THE FAMILY**

[3 hours] Building on previous theoretical and empirical research, this course examines contemporary perspectives of family dynamics. Socio-demographic changes of the family in the US with cross-ethnic and cross-cultural comparisons will also be examined.

### **SOC 6270 ADVANCED SOCIAL RESEARCH METHODS**

[3 hours] Examination of advanced methods of data collection in sociological research. Prerequisite: SOC 5270

### **SOC 6290 ADVANCED SOCIAL RESEARCH STATISTICS**

[3 hours] Examination of advanced methods of data analysis in sociological research. Prerequisite: SOC 5290

### **SOC 6340 SEMINAR IN POPULATION AND HUMAN ECOLOGY**

[3 hours] Examination of the development of contemporary theoretical and empirical research of selected topics in population and human ecology. Students should be familiar with some population and human ecology studies.

### **SOC 6440 SEMINAR IN URBANIZATION**

[3 hours] This course will explore current topics in urbanization, with significant student input into design of topics. Students must have previous experience in urban studies.

### **SOC 6560 SEMINAR IN SOCIOLOGY AND SOCIAL POLICY**

[3 hours] Examination of 20th Century social policy from various ideological perspectives. The course will include social policy efforts promoted by governments, foundations, trade associations, trade unions, social movements and other selected institutions.

### **SOC 6610 SEMINAR IN SOCIAL MOVEMENTS**

[3 hours] This course will explore current topics in social movements and protest, with significant student input into design of topics. Students must have previous experience in social movement studies.

### **SOC 6620 SEMINAR IN WORK AND OCCUPATION**

[3 hours] A social scientific analysis of work, including differences between occupations and workplace issues.

### **SOC 6640 SEMINAR IN STRATIFICATION**

[3 hours] After examination of the historical development of stratification (social classes), the course will examine contemporary theoretical and empirical research of social stratification in social inequality.

### **SOC 6660 SEMINAR IN RACE AND ETHNIC RELATIONS**

[3 hours] Sociological explanations of racial and ethnic inequality are explored. Major figures in the sociological study of race and ethnicity are examined.

### **SOC 6710 SEMINAR IN RESEARCH IN CRIME**

[3 hours] The course will examine recent development in the research of crime with critical analysis of the paradigms that this research tries to build upon. Measurement, trends and patterns are also examined.

**SOC 6800 SEMINAR IN THEORIES IN SOCIAL PSYCHOLOGY**

[3 hours] Intensive sociological study of theory building in social psychology including, among others, paradigms of social cognition and belief, social influence, and social relations.

**SOC 6810 SEMINAR IN MEDICAL SOCIOLOGY**

[3 hours] Intensive sociological study of selected topics from among those including the illness experience, patient-health provider relations, the organization of medicine and problems inherent in the delivery of health care services.

**SOC 6850 SEMINAR IN SMALL GROUPS RESEARCH**

[3 hours] Sociological study of one or more selected topics in small group research including structural properties of groups, power and influence, group membership, and emergence of leadership in small groups.

**SOC 6860 SEMINAR IN RESEARCH IN SOCIAL PSYCHOLOGY**

[3 hours] Supervised research in selected topics in social psychology with special focus on measurement issues.

**SOC 6900 INDEPENDENT RESEARCH IN SOCIOLOGY**

[1-3 hours] Student-selected research topic under the supervision of a sociology faculty member. Permission to enroll is contingent on the instructor's acceptance of the student's research proposal.

**SOC 6930 SEMINARS IN SOCIOLOGY**

[3 hours] Seminar on selected topics in the field of Sociology.

**SOC 6940 GRADUATE INTERNSHIP**

[3 hours] In applied setting in areas of student interest: community organizing - health-probation - gerontology. Prerequisite: SOC 6000, 6040, 6270, 6290

**SOC 6960 THESIS**

[1-6 hours] Topic (proposal) is selected by the student and approved by a thesis committee. Prerequisite: SOC 6270, 6290, 6040, 6000

**SOC 6990 INDEPENDENT STUDY IN SOCIOLOGY**

[1-3 hours] Written proposal required. May be repeated for additional credit. For majors wishing to continue course work in greater depth or seeking contact with unlisted subject areas.

## SOCW - Social Work

### Department of Social Work (HHS)

**SOCW 1030 INTRODUCTION TO SOCIAL WELFARE**

[3 hours] An introduction to the social welfare institution, its history, relation to social values, major social laws and programs, and the systems characteristic of service delivery. (not for major credit) Social Sciences core course U.S. multicultural course

**SOCW 2010 SURVEY OF THE SOCIAL WORK PROFESSION**

[3 hours] A beginning study of the profession of social work, values and ethics, and diversity. The generalist framework, strengths perspective and systems theory are introduced. Prerequisite: SOCW 1030 (may be taken concurrently)

**SOCW 2210 FIELD EXPERIENCE AND LAB I**

[3 hours] Supervised field experience. Ninety hours evenly distributed with weekly directed classroom discussion of reflecting the relationship of field experience to social work practice. This course meets the WAC requirements, and journaling and written classroom exercises will be required. Prerequisite: SOCW 2010

**SOCW 3020 SOCIAL WORK ISSUES IN SOCIAL & ECONOMIC JUSTICE**

[3 hours] Provides an in depth study of the concepts of social and economic justice relative to the practice of social work including power and economic distribution, oppression, discrimination and confronting injustice. Prerequisite: SOCW 2210 or permission of instructor

**SOCW 3030 SURVEY OF SOCIAL WORK ASSESSMENT TOOLS**

[3 hours] Provides an overview of various tools used by social workers in practice including use of DSM IV, individual, family, group, organization and community assessments. Prerequisite: SOCW 2210 or permission of instructor

**SOCW 3040 SOCIAL WORK WITH OLDER ADULTS**

[3 hours] History and development of practice with older adults. Trends in aging, services for older adults, health care, social security, retirement, elder abuse, substitute care decision, hospice, loss, death and dying. Prerequisite: SOCW 2210 or permission of instructor

**SOCW 3050 CRISIS INTERVENTION**

[3 hours] Provides an examination of crisis intervention theories and strategies to deal with stress. Emphasis is on observing, formulating, defining and measuring the threats, tasks and opportunities associated with crisis behavior. Prerequisite: SOCW 2010 or permission of instructor

**SOCW 3060 SOCIAL WORK ETHICS**

[3 hours] Examination of social work values and their professional implications. Provision of working knowledge of Social Work Code of Ethics and licensing and subsequent professional responsibilities. Integration of theoretical models with practice situations. Prerequisite: SOCW 2210

**SOCW 3070 CHILD WELFARE I**

[3 hours] Child welfare history. Knowledge, concepts and skill development concerning child maltreatment and protection, risk assessment and family-centered services. Prerequisite: SOCW 2010

**SOCW 3080 WOMEN IN POVERTY**

[3 hours] Provides an understanding of women's poverty and its perpetuation through marriage and divorce, women's work and wages, welfare, children, child support and the economics of the unpaid women's labor. Prerequisite: SOCW 2210

**SOCW 3090 SOCIAL WORK PERSPECTIVES ON CULTURE AND OPPRESSION**

[3 hours] Focus is on racial/ethnic groups who are among social welfare consumers. Cultural characteristics and group strengths, needs, priorities and experiences within the context of social work are also explored. Prerequisite: SOCW 2110

**SOCW 3110 SOCIAL WORK PRACTICE I**

[3 hours] An overview of generalist social work practice with various system sizes. Emphasizes strengths, empowerment, social and economic justice, ethical practice and examination of self in relation to professional social work. Prerequisite: SOCW 2210, Social Work major or permission of instructor

**SOCW 3120 SOCIAL WORK INTERVIEWING AND RECORDING**

[4 hours] Develops skills needed for the generalist social work interview and appropriate recording techniques. Integrates computer simulation, role-play and video recording for a participatory learning experience. Prerequisite: SOCW 3110

**SOCW 3170 CHILD WELFARE II**

[3 hours] Addresses the developmental and permanence needs of children, effects of maltreatment on children, placement issues, separation, reunification and adoption. Includes child welfare services for children with developmental disabilities. Prerequisite: SOCW 2010, 3070

**SOCW 3210 HUMAN BEHAVIOR IN THE SOC ENVIRONMENT I**

[3 hours] Human development from birth through early adolescence. Developmental theories of individuals and families will be integrated into a systems perspective. These developmental frameworks will be explored with attention to individual psychosocial functioning with specific attention to the acquisition of social roles and gender and cultural identity. Prerequisite: BIO 1120, ANTH 2100 or 2800, Social Work major or permission of instructor

**SOCW 3220 HUMAN BEHAVIOR IN SOCIAL ENVIRONMENT II**

[3 hours] Human development from adolescence through old age. Developmental theories of individuals and families will be integrated into a systems perspective. These developmental frameworks will be explored with attention to individual psychosocial functioning and specific attention to the acquisition of social roles and gender and cultural identity. Prerequisite: SOCW 3210

**SOCW 3230 HUMAN BEHAVIOR IN THE SOCIAL ENVIRONMENT III**

[3 hours] Provides a view of the behavior of larger systems including groups, organizations and communities through a strengths perspective, focusing on social and economic justice and the values of the profession. Prerequisite: Must be social work major.

**SOCW 3300 SOCIAL POLICY AND LEGISLATION**

[3 hours] An examination of current social welfare issues and theories and the significance to the social, economic and political factors which influence policymaking and implementation. Prerequisite: PSC 1200, Social Work major or permission of instructor

## 498 Course Descriptions

### **SOCW 4010 SOCIAL WORK RESEARCH METHODS**

[3 hours] Presentation of basic concepts used in social work research. Practice based methods are emphasized. Course content will focus on scientific methods of building knowledge within the social sciences. Prerequisite: SOC 3290 or PSC 3110 or PSY 2100 or RESM 4100, Social Work major or permission of instructor

### **SOCW 4120 SOCIAL WORK PRACTICE II**

[3 hours] Provides advanced theory and skill development as a generalist social worker with individuals, families and groups. Emphasis is on a strengths and empowerment perspective focused on social and economic justice. Prerequisite: SOCW 3120 Corequisite: SOCW 4220, 4200

### **SOCW 4130 SOCIAL WORK PRACTICE III**

[3 hours] Provides advanced theory and skill development as a generalist social worker with organizations and communities. Emphasis is on a strengths and empowerment perspective focused on social and economic justice. Prerequisite: SOCW 4120 Corequisite: SOCW 4230, 4210

### **SOCW 4200 FIELD LABORATORY II**

[1 hour] Integration of field experience and proactive principles. Prerequisite: Permission of instructor Corequisite: SOCW 4120, 4220

### **SOCW 4210 FIELD LABORATORY III**

[1 hour] Integration of field experience and proactive principles. Prerequisite: Permission of instructor Corequisite: SOCW 4130, 4230

### **SOCW 4220 SOCIAL WORK FIELD EXPERIENCE II**

[5 hours] A professional experience in generalist social work practice with an integration of classroom learning with practice in a social agency. Must be taken in successive semesters during a single academic year. Application for entry to field placement must be submitted to social work office during spring semester prior to fall placement. Prerequisite: Permission of instructor Corequisite: SOCW 4120, 4200

### **SOCW 4230 FIELD EXPERIENCE III**

[5 hours] A professional experience in generalist social work practice with an integration of classroom learning with practice in a social agency. Must be taken in successive semesters during a single academic year. Application for entry to field placement must be submitted to social work office during spring semester prior to fall placement. Prerequisite: Permission of instructor, SOCW 4220 Corequisite: SOCW 4130, 4210

### **SOCW 4500 APPRECIATING DIVERSITY IN SOCIAL WORK PRACTICE**

[3 hours] This course focuses upon the cultural group strengths, needs, priorities and experiences of ethnic/racial groups in the U.S. through a social welfare perspective. Individual and institutional racism are examined. Prerequisite: SOCW 2210 or permission of instructor

### **SOCW 4960 HONORS THESIS**

[1-6 hours] Senior standing and approval of the department honor adviser.

### **SOCW 4980 SPECIAL ISSUES IN SOCIAL WORK**

[1-3 hours] Courses on various social work specialties. May be repeated in different topics.

### **SOCW 4990 INDEPENDENT STUDY IN SOCIAL WORK**

[1-3 hours] Designed for advanced students in social work to pursue supervised independent study in unlisted subject areas or to continue course work in greater depth. Written proposal required.

## **SOST - Social Service Technology**

### **Department of Social Work (HHS)**

### **SOST 1010 INTRODUCTION TO SOCIAL SERVICES**

[3 hours] The historical development of social services as it relates to the present system of delivery of services. Significant writing involved.

### **SOST 1020 HELPING SKILLS IN SOCIAL SERVICE**

[3 hours] All social services agencies use a modified form of the Scientific Method. This course will assist the student in executing gathering data, defining problems, generating solutions, implementing solutions and follow-up. Significant writing involved. Corequisite: SOST 1500 for Social Services and Gerontology majors

### **SOST 1040 INTRODUCTION TO GERONTOLOGY**

[3 hours] This course gives an overview of the role of the older adult in contemporary society, including the demography of aging, physical and social environments, specialized services available and stereotypical myths related to the aged. Significant writing involved.

### **SOST 1070 TECHNIQUES OF INTERVIEWING**

[3 hours] The knowledge and practice of effective approaches to interviewing. Significant writing involved.

### **SOST 1080 TEAM APPROACH IN SOCIAL SERVICES**

[3 hours] Experiential exploration of the variety of professional teams, the division of responsibility within the professional team and the differences in function of its members. Significant writing involved.

### **SOST 1130 COMMUNITY RESOURCES**

[3 hours] An explanation of community resources (human services agencies) with focus on their effective use for connecting clientele to services. Significant writing involved.

### **SOST 1150 APPLIED CREATIVE EXPRESSIONS**

[3 hours] Exploration of materials and applications of techniques covering a variety of two and three dimensional arts and crafts projects as applied to various age groups.

### **SOST 1500 SELF-MANAGEMENT AND INTERPERSONAL RELATIONSHIPS**

[3 hours] A course designed to assist the student in learning about human behavior in relation to awareness of oneself and relationships to others. Significant writing involved. Corequisite: SOST 1020 for Social Services and Gerontology majors

### **SOST 2020 METHODS IN SOCIAL SERVICES**

[3 hours] Experientially learning the processes involved in the various methods of giving service casework, (one-to-one approach), group work and community organization. Significant writing involved. Prerequisite: SOST 2100 Corequisite: SOST 2350

### **SOST 2030 FINANCING HEALTH AND SOCIAL SERVICES**

[3 hours] An in-depth examination of current funding systems in human services, with particular emphasis on Medicare, Medicaid, social security benefits and private health care coverage. Significant writing involved.

### **SOST 2100 RECORD KEEPING**

[3 hours] Assists the student in acquiring recording skills for use in providing service with emphasis on relationship between practice and record keeping. Significant writing involved. Prerequisite: SOST 1010 or 1040; 1070; ENGL 1100, or 1110; SOST 1020, 1130, 1080

### **SOST 2110 ETHNIC STUDIES IN SOCIAL SERVICES**

[3 hours] This course explores the effects of living in a multi-cultural society, examines stereotyping, discrimination and racism. Significant writing involved.

### **SOST 2160 DEALING WITH DEATH AND DYING**

[3 hours] This course explores the meaning of death, as well as adjustment to the deaths of others and the social-emotional consequences. Dealing with those who are terminally ill and who must deal with dying is of concern in this course. Significant writing involved.

### **SOST 2210 ADULT-CHILD RELATIONSHIPS**

[3 hours] Understanding the child as an interacting member of family and community. Management techniques and methods to promote mental and emotional health will be studied. Significant writing involved.

### **SOST 2220 DEVELOPMENTAL PATTERNS OF CHILDREN**

[3 hours] A study of normal patterns of development from conception through middle childhood. Recognition of abnormal patterns which indicate special physical, mental or emotional problems or needs. Significant writing involved.

### **SOST 2230 ADOLESCENT PSYCHOLOGY**

[3 hours] Investigates the changes and stress in adolescence and the special dynamics of parent-adolescent interaction through use of journal research and class discussions. Significant writing involved.

### **SOST 2350 SOCIAL SERVICES INTERNSHIP**

[4 hours] Supervised practice obtained in the equivalent of up to 18 hours a week at an agency. Significant writing involved. Prerequisite: SOST 2100, permission of instructor Corequisite: SOST 2020

### **SOST 2990 INDEPENDENT STUDY**

[1-4 hours] A course designed to provide educational opportunities in a specialized academic area under the direct supervision of a faculty member.

## SPAN - Spanish

### Department of Foreign Languages (ARS)

#### SPAN 1080 CULTURE & COMMERCE IN THE SPANISH-SPEAKING WORLD

[3 hours] A study of the Hispanic world with emphasis on the relationship between its culture and business and economic institutions and practices. Taught in English. (Not for major credit) Humanities core course

#### SPAN 1090 CULTURE OF LATIN AMERICA

[3 hours] A study of selected artistic, literary, philosophical, political and social aspects of present day Latin American culture. Taught in English. (Not for major credit) Humanities core course Non-western multicultural course

#### SPAN 1100 CULTURE OF SPAIN

[3 hours] A study of the events, people and movements that have formed Spain. Taught in English. (Not for major credit) Humanities core course

#### SPAN 1110 ELEMENTARY SPANISH I

[4 hours] Practice in using and understanding Spanish to develop listening, speaking, reading and writing skills. Pronunciation, grammar, vocabulary and cultural topics. Lab practice required. (Not for major credit)

#### SPAN 1120 ELEMENTARY SPANISH II

[4 hours] A comprehensive introductory course in Spanish language and culture through the four basic skills: aural comprehension, reading, speaking and writing. Laboratory practice required. (Not for major credit) Prerequisite: SPAN 1110 or satisfactory score on placement test. Humanities core course

#### SPAN 1500 REVIEW OF ELEMENTARY SPANISH

[4 hours] Review of first-year college Spanish for students who studied the language in high school and who need to strengthen communication skills, vocabulary, grammar and pronunciation before study at the 2000 level. (Not for major credit) Prerequisite: High school Spanish; placement test Humanities core course

#### SPAN 2140 INTERMEDIATE SPANISH I

[3 hours] Intermediate-level review and development of aural comprehension, speaking, reading and writing skills. Topics in the cultures of the Spanish-speaking world. Lab practice required. (Not for major credit) Prerequisite: SPAN 1120, 1500 or satisfactory score on placement test. Humanities core course

#### SPAN 2150 INTERMEDIATE SPANISH II

[3 hours] Further review and development of aural comprehension, speaking, reading and writing skills. Topics in the cultures of the Spanish-speaking world. Lab practice required. (Not for major credit) Prerequisite: SPAN 2140 or satisfactory score on placement test. Humanities core course

#### SPAN 2190 STUDY ABROAD

[1-3 hours] Designed to permit and encourage non-majors to spend time in a country where Spanish is spoken. Credit will be given in accordance with established departmental procedures. (Not for major credit.)

#### SPAN 3000 SPANISH GRAMMAR

[3 hours] A study of all Spanish grammatical aspects with special emphasis on those which present greater difficulty for the English speaker. Prerequisite: SPAN 2150 or satisfactory score on placement test.

#### SPAN 3010 CONVERSATION AND COMPOSITION I

[3 hours] Practice in speaking, listening, reading and writing. Vocabulary and fluency building in Spanish with special emphasis on oral practice. Prerequisite: SPAN 2150 or satisfactory score on placement test

#### SPAN 3020 CONVERSATION AND COMPOSITION II

[3 hours] Practice in speaking, listening, reading and writing. Vocabulary and fluency building in Spanish with special emphasis on writing practice. A writing-intensive course. Prerequisite: SPAN 2150 or satisfactory score on placement test

#### SPAN 3170 BUSINESS SPANISH

[3 hours] An introduction to the language of the Hispanic world peculiar to the areas of business and commerce. Prerequisite: SPAN 2150 or consent of instructor

#### SPAN 3210 SURVEY OF SPANISH LITERATURE I

[3 hours] A survey of Spanish literature from its origins through the seventeenth century. Prerequisite: SPAN 2150 or consent of instructor

#### SPAN 3220 SURVEY OF SPANISH LITERATURE II

[3 hours] A survey of Spanish literature from the eighteenth century to the present. Prerequisite: SPAN 2150

#### SPAN 3270 SURVEY OF LATIN AMERICAN LITERATURE I

[3 hours] The literature of Latin America from the Colonial period to the end of the nineteenth century. Prerequisite: SPAN 2150 or consent of instructor

#### SPAN 3280 SURVEY OF LATIN AMERICAN LITERATURE II

[3 hours] The literature of Latin America from the beginning of the twentieth century to the present. Prerequisite: SPAN 2150

#### SPAN 3410 SPANISH CULTURE AND CIVILIZATION

[3 hours] A study of the events, people and movements that have formed Spain. Attention is also given to the nation's contemporary life-style and culture. Prerequisite: SPAN 2150 or consent of instructor

#### SPAN 3420 LATIN AMERICAN CIVILIZATION

[3 hours] A study of Latin America's contributions to world culture in such fields as architecture, painting, sculpture, music, literature, folklore, sciences, philosophy and education. Prerequisite: SPAN 2150 or consent of instructor

#### SPAN 4000 ADVANCED SPANISH GRAMMAR

[3 hours] An advanced study of Spanish grammar in preparation for higher levels of study in the language and for its use in professional pursuits. Prerequisite: two 3000 level courses

#### SPAN 4010 SYNTAX AND STYLISTICS

[4 hours] A thorough study of the grammatical structure of Spanish with special attention to stylistic problems. Prerequisite: SPAN 3000, 3010, 3020

#### SPAN 4060 TRANSLATION & INTERPRETATION IN SPANISH

[3 hours] A study of the techniques of translation and interpretation as they relate to English and Spanish based on a contrastive analysis of the two languages, both in theory and practice. Prerequisite: SPAN 4010

#### SPAN 4070 HISTORY OF THE SPANISH LANGUAGE

[3 hours] A study of the development of the Spanish language from Vulgar Latin to the present, illustrated with selected texts. Prerequisite: two 3000 level courses

#### SPAN 4110 INTRODUCTION TO SPANISH LINGUISTICS

[4 hours] Basic concepts of linguistics as applied to the study of the Spanish language and its dialectal systems. Emphasis on phonetics, phonology, morphology, syntax and semantics. Prerequisite: two 3000 level courses

#### SPAN 4120 TEACHING COLLOQUIUM

[3 hours] A course in the theory and practice of teaching Spanish and of second language acquisition in general. Prerequisite: Two 3000 level courses

#### SPAN 4150 RESEARCH METHODS & LITERARY THEORY

[3 hours] An analysis of critical theory and methodology as it applies to Spanish-language literature. Special emphasis on the most recent trends. Highly recommended for students planning graduate studies. Prerequisite: Two 3000 level courses

#### SPAN 4160 LATIN AMERICAN NOVEL I

[3 hours] A study of the Latin American novel from the nineteenth century to the authors of the literary Boom of 1963. Prerequisite: SPAN 3020

#### SPAN 4170 LATIN AMERICAN NOVEL II

[3 hours] A study of the major developments in Latin American novel from the Boom to the present. Prerequisite: SPAN 3020

#### SPAN 4190 STUDY ABROAD

[1-12 hours] The course permits the Spanish major or minor to spend time in a country where Spanish is spoken. Credit awarded in accordance with established departmental procedures. Prerequisite: SPAN 3020 and consent of instructor

#### SPAN 4240 LATIN AMERICAN ESSAY

[3 hours] A study of the social, philosophical, political and economic ideas expressed in the Latin American essay from the Colonial period to the present. Prerequisite: SPAN 3020

#### SPAN 4250 LATIN AMERICAN SHORT STORY

[3 hours] Development of the Latin American short story from its origins with special emphasis on the contemporary authors such as Allende, Borges, Cortazar, Garcia Marquez and Rulfo among others. Prerequisite: SPAN 3020

## 500 Course Descriptions

### SPAN 4260 LATIN AMERICAN POETRY I

[3 hours] The poetry of Latin America from Sor Juana Ines de la Cruz to Ruben Dario. Prerequisite: SPAN 3020

### SPAN 4270 LATIN AMERICAN POETRY II

[3 hours] Latin American poetry from Surrealism to the present, with emphasis on authors such as Borges, Huidobro, Neruda, Paz and Vallejo. Prerequisite: SPAN 3020

### SPAN 4310 MEDIEVAL & RENAISSANCE SPANISH LITERATURE

[3 hours] Study of major works from the Poema de Mio Cid to the early writers of the Siglo de Oro. Prerequisite: Two 3000-level courses

### SPAN 4370 ADVANCED BUSINESS SPANISH

[3 hours] Advanced study of the business language, cultural attitudes and current business climate of the societies that comprise the Spanish-speaking world. Prerequisite: SPAN 3170 or consent of instructor.

### SPAN 4410 GOLDEN AGE LITERATURE

[3 hours] Readings in the literature of the fifteenth and sixteenth centuries. Among the authors covered are Lope de Vega, Calderon de la Barca, Gongora and Quevedo. Prerequisite: Two 3000-level courses

### SPAN 4430 CERVANTES

[3 hours] Reading and discussion of Don Quijote de la Mancha. Prerequisite: Two 3000-level classes

### SPAN 4710 19TH CENTURY SPANISH NOVEL

[3 hours] Critical readings of works by such realist and naturalist masters as Galdos, Pardo Bazan and Blasco Ibanez. Prerequisite: Two classes at 3000-level

### SPAN 4720 20TH CENTURY SPANISH NOVEL

[3 hours] Critical readings of Spanish novels from the Generation of 1898 to the most recent trends. Prerequisite: Two 3000 level courses

### SPAN 4810 MODERN SPANISH POETRY

[3 hours] Critical readings of Spanish poetry from Romanticism to the present. Prerequisite: two 3000-level courses

### SPAN 4820 MODERN SPANISH DRAMA

[3 hours] Critical readings of Spanish drama from Romanticism to the latest contemporary trends. Prerequisite: Two courses at 3000 level

### SPAN 4830 HISPANIC CINEMA

[3 hours] Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism. Prerequisite: Two 3000 courses

### SPAN 4910 HONORS RESEARCH IN SPANISH

[3 hours] Independent research in special topics. May be repeated once for credit. Prerequisite: Permission of instructor and honors status

### SPAN 4980 SPECIAL TOPICS

[3 hours] Study and research in specific areas or authors with considerable reading of Spanish texts plus written reports in Spanish. Prerequisite: Two 3000 level courses or consent of instructor

### SPAN 5000 ADVANCED SPANISH GRAMMAR

[3 hours] An advanced study of Spanish grammar in preparation for higher levels of study in the language and for its use in professional pursuits.

### SPAN 5010 SYNTAX AND STYLISTICS

[4 hours] A thorough study of the grammatical structure of Spanish with special attention to stylistic problems.

### SPAN 5060 TRANSLATION & INTERPRETATION IN SPANISH

[3 hours] A study of the techniques of translation and interpretation as they relate to English and Spanish based on a contrastive analysis of two languages, both in theory and practice.

### SPAN 5070 HISTORY OF THE SPANISH LANGUAGE

[3 hours] A study of the development of the Spanish language from Vulgar Latin to the present, illustrated with selected texts.

### SPAN 5110 INTRODUCTION TO SPANISH LINGUISTICS

[4 hours] Basic concepts of linguistics as applied to the study of the Spanish language and its dialectal systems. Emphasis is on phonetics, phonology, morphology, syntax and semantics.

### SPAN 5120 TEACHING COLLOQUIA

[3 hours] A practical course in the theories, methods and specific techniques of teaching Spanish.

### SPAN 5140 ROMANCE LINGUISTICS

[3 hours] A comparative study of the emergence of Romance vernaculars against the historical perspective of Classical and Vulgar Latin, with special attention to the problems of interest to the hispanist. Prerequisite: SPAN 5110

### SPAN 5150 RESEARCH METHODS & LITERARY THEORY

[3 hours] An analysis of critical theory and methodology as it applies to Spanish-language literature. Special emphasis on the most recent trends. Extensive analysis of selected works of criticism.

### SPAN 5160 LATIN AMERICAN NOVEL I

[3 hours] A study of the Latin American novel from the nineteenth century to the authors of the literary Boom of 1963.

### SPAN 5170 LATIN AMERICAN NOVEL II

[3 hours] A study of the major developments in Latin American novel from the Boom to the present.

### SPAN 5190 STUDY ABROAD

[1-12 hours] Study Abroad in Latin America or Spain is designed to permit and encourage the language major to gain personal contact with the language and culture under study. Prerequisite: Consent of instructor

### SPAN 5210 SPANISH FOR READING KNOWLEDGE I

[3 hours] Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)

### SPAN 5220 SPANISH FOR READING KNOWLEDGE II

[3 hours] Study of those elements of structure and vocabulary most appropriate for preparing graduate students to read effectively in Spanish. (Not for majors)

### SPAN 5240 LATIN AMERICAN ESSAY

[3 hours] A study of the social, philosophical, political and economic ideas expressed in the Latin American essay from the Colonial period to the present.

### SPAN 5250 LATIN AMERICAN SHORT STORY

[3 hours] Development of the Latin American short story from its origins with special emphasis on the contemporary authors such as Allende, Borges, Cortazar, Garcia Marquez and Rulfo among others.

### SPAN 5260 LATIN AMERICAN POETRY I

[3 hours] The poetry of Latin America from Sor Juana Ines de la Cruz to Ruben Dario.

### SPAN 5270 LATIN AMERICAN POETRY II

[3 hours] Latin American poetry from Surrealism to the present, with emphasis on authors such as Borges, Huidobro, Neruda, Paz and Vallejo.

### SPAN 5310 MEDIEVAL & RENAISSANCE SPANISH LITERATURE

[3 hours] Study of major works from the Poema de Mio Cid to the early writers of the Siglo de Oro.

### SPAN 5370 ADVANCED BUSINESS SPANISH

[3 hours] Advanced study of the language of business, cultural attitudes and current business climate of the societies that comprise the Spanish-speaking world.

### SPAN 5410 GOLDEN AGE LITERATURE

[3 hours] Readings in the literature of the fifteenth and sixteenth centuries. Among the authors covered are Lope de Vega, Calderon de la Barca, Gongora and Quevedo.

### SPAN 5430 CERVANTES

[3 hours] Reading and discussion of Don Quijote de la Mancha.

### SPAN 5710 19TH CENTURY SPANISH NOVEL

[3 hours] Critical readings of works by such realist and naturalist masters as Galdos, Pardo Bazan and Blasco Ibanez.

### SPAN 5720 20TH CENTURY SPANISH NOVEL

[3 hours] Critical readings of Spanish novels from the Generation of 1898 to the most recent trends.

### SPAN 5810 MODERN SPANISH POETRY

[3 hours] Critical readings of Spanish poetry from Romanticism to the present.

### SPAN 5820 MODERN SPANISH DRAMA

[3 hours] Critical readings of Spanish drama from Romanticism to the latest contemporary trends.

### SPAN 5830 HISPANIC CINEMA

[3 hours] Critical viewings of Spanish-language films from Spain and the Americas. Emphasis on cultural criticism.

### SPAN 5980 SPECIAL TOPICS

[3 hours] Study and research in specific areas or authors with considerable reading of Spanish texts plus written reports in Spanish. Prerequisite: Consent of instructor

### SPAN 6900 RESEARCH IN SPANISH

[1-3 hours] May be repeated for additional credit when topic varies. Prerequisite: Consent of instructor

### SPAN 6930 SEMINAR: SELECTED TOPICS

[1-3 hours] Selected topics from Spanish culture, linguistics, or literature.



## SPED - Special Education

### Department of Early Childhood, Physical and Special Education (EDU)

#### SPED 2010 PRACTICUM IN SPECIAL EDUCATION

[3 hours] Lecture and fieldwork, consisting of a minimum of 15 clock hours as assistant in each of two placements for persons with disabilities (total of 30 hours)

#### SPED 2040 PERSPECTIVES IN THE FIELD OF SPECIAL EDUCATION

[3 hours] Synthesis of the cross-categorical components required of special education. Issues addressed: causes and characteristics for disabling conditions and issues related to persons with disabilities, i.e., legal aspects, educational settings. Role of professionals in the field of special education.

#### SPED 2900 EARLY SEMINAR SPECIAL EDUCATION

[1-5 hours] Seminar provides students with the opportunity to explore, as a group, specific topics with a faculty member. Current issues in the area of Special Education will be the focus.

#### SPED 2910 CULTURAL DIVERSITY AND DISABILITIES

[1 hour] This is a linking seminar with the urban studies or public administration dual majors. The purpose is to integrate the two majors. Students will learn the relation of cultural diversity and special education. Theoretical as well as pragmatic positions will be discussed.

#### SPED 2990 INDEPENDENT STUDY IN SPECIAL EDUCATION

[1-5 hours] Designed to provide the student with the opportunity to explore special interests through individual study.

#### SPED 3130 LINGUISTIC ANALYSIS

[3 hours] Identification and evaluation of language usage. Course focuses upon development of competence for the analysis of semantic and syntactic components of language. Some pragmatic analysis is included. Lab required.

#### SPED 3220 ATYPICAL DEVELOPMENT IN EARLY CHILDHOOD

[1 hour] Causes, diagnosis and implications of prenatal, perinatal and postnatal conditions on development in early childhood will be examined. The effects of developmental disabilities on language, cognition, social, motor, self-help and play skills will be explored.

#### SPED 3670 AMERICAN SIGN LANGUAGE I

[3 hours] Principles of manual communication. Course builds an expressive and receptive vocabulary of at least 1,000 signs in American Sign Language (ASL) and Pidgin Signed English. Ten hours of lab required.

#### SPED 3680 AMERICAN SIGN LANGUAGE II AND BASICS OF INTERPRETING

[3 hours] Emphasis on fluency development in manual communication. Study of various models of interpreting and transliterating processes. Prerequisite: SPED 3670

#### SPED 3690 AMERICAN SIGN LANGUAGE III

[4 hours] American Sign Language III is designed to continue the development of proficiency in using the language and understanding the culture of the Deaf. Student will gain knowledge and skill in applying approximately 900 additional vocabulary words. Students will advance in the complexity of sentence structure and grammatical structures including classifiers, specifier, verb modulations and aspects, special referencing, pluralizations and the importance of facial expressions. Prerequisite: SPED 3680

#### SPED 3700 AMERICAN SIGN LANGUAGE IV

[4 hours] American Sign Language IV is designed to continue the development of proficiency in using the language and understanding the culture of the Deaf. Student will gain knowledge and skill in applying approximately 900 additional vocabulary words. Prerequisite: SPED 3670, 3680 and 3690, all with grade of C or better, or permission of instructor

#### SPED 3850 BRAILLE I

[3 hours] Basic course in both reading and writing Grade 2 Literary Braille; practical application of this medium to teaching. Prerequisite: SPED 2040; permission of instructor

#### SPED 3860 BRAILLE II AND OTHER MEDIA FOR THE BLIND AND VISUALLY IMPAIRED

[3 hours] Covered in this course will be Advanced literary Braille, Nemeth code and textbook codes, using the Perkins brailler and other equipment. Prerequisite: SPED 2040; SPED 3850 and admission into Professional Education; or permission of instructor

#### SPED 4020 EDUCATING STUDENTS WITH DISABILITIES WITHIN THE REGULAR EDUCATION ENVIRONMENT

[2 hours] Focus on the classroom teacher's role in the development and modification of environment, curriculum and instruction to enable students with disabilities to be educated within the typical educational environment. Prerequisite: Professional Education Status

#### SPED 4030 EDUCATING STUDENTS WITH DISABILITIES IN THE MIDDLE GRADES

[3 hours] Focus on the teacher's role in middle age grade classrooms in the development and modification of environment curriculum and instruction to enable students with disabilities to be educated within an inclusive educational environment. Course must be taken concurrently with CI 4200. Prerequisite: admission to professional education Corequisite: CI 4010, CMHS 4580, CI 4000, CI 4400, CI 4200

#### SPED 4060 SPECIALIZED INTERVENTION IN INFANCY AND EARLY CHILDHOOD

[4 hours] Atypical infant, toddler and early childhood development examined. Intervention strategies in home, school and specialized environments, which are family-centered and developmentally appropriate, will be addressed. Forty (40) clock hour practicum required. Prerequisite: SPED 2040; Admission to professional education

#### SPED 4070 SPECIALIZED INTERVENTION IN INFANCY AND EARLY CHILDHOOD

[3 hours] Atypical infant, toddler and early childhood development examined. Intervention strategies in home, school and specialized environments, which are family-centered and developmentally appropriate, will be addressed. 20 clock hour practicum required. Note: This course is for students who enroll at The University of Toledo prior to Fall 1998. Prerequisite: SPED 3040; Professional Education Status

#### SPED 4080 CURRICULUM ADAPTATIONS & STRATEGIES IN EARLY CHILDHOOD EDUCATION

[4 hours] Curriculum models and intervention strategies which facilitate the cognitive, academic, social, language, self-help and lay skills of children with disabilities in preschool and primary grades will be examined. Prerequisite: Admission to professional education, CIEC/SPED 3350, CIEC/SPED 3380, CIEC/SPED 3390, TSOC 3000; Corequisite: CIEC 4070, CIEC/SPED 4480, CIEC/SPED 4490

#### SPED 4100 FIELD PRACTICUM WITH STUDENTS WITH MILD/MODERATE EDUCATIONAL NEEDS

[4 hours] This course must be taken with SPED 4110 or SPED 4370. The purpose is to implement strategies and techniques for teaching students with mild and moderate educational needs. Students will have the opportunity to work in educational settings with experienced teachers. One hundred sixty hours of required field. Prerequisite: SPED 2040 Corequisite: SPED 4110 or SPED 4370

#### SPED 4110 CURRICULUM AND METHODOLOGY FOR STUDENTS WITH MODERATE EDUCATIONAL NEEDS

[3 hours] This course focuses on community-referenced functional curricula approaches to teaching students with moderate educational needs. Topics include inclusionary activities, community-based instruction, social skills.

#### SPED 4120 CURRICULUM AND METHODOLOGY FOR STUDENTS WITH INTENSIVE EDUCATIONAL NEEDS

[3 hours] Examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with intensive education needs. A transdisciplinary team approach is explored. Must be taken concurrently with SPED 4130. Prerequisite: SPED 2040, Instructor's permission Corequisite: SPED 4130

#### SPED 4130 FIELD PRACTICUM WITH STUDENTS WITH MODERATE/INTENSIVE EDUCATIONAL NEEDS

[4 hours] This course must be taken concurrently with SPED 4110 and 4120 to implement strategies and techniques in applied settings for teaching students with moderate to intensive educational needs. Through this course students gain experience working with persons with moderate to intensive needs. One hundred sixty hours of required field. Prerequisite: SPED 2040 Corequisite: SPED 4110, 4120

#### SPED 4150 PRACTICUM FOR TEACHING STUDENTS WHO ARE MODERATELY TO SEVERELY DEVELOPMENTALLY DELAYED

[1 hour] This course must be taken with SPED 4160 to implement strategies and techniques for teaching students with moderate to severe developmental delays the applied settings. Forty hours of required field. Note: This course is for students who enroll at The University of Toledo prior to Fall 1998. Prerequisite: SPED 3040, 4220; Professional Education Status Corequisite: SPED 4160

#### SPED 4170 WORKING WITH ADULTS WITH DISABILITIES IN COMMUNITY SETTING

[3 hours] Study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required. Prerequisite: SPED 3040; Professional Educational Status Corequisite: SPED 4160

## 502 Course Descriptions

### **SPED 4220 DIAGNOSTIC AND PRESCRIPTIVE TEACHING STUDENTS WITH DISABILITIES**

[4 hours] Exploration of the development of visual, auditory and tactile-kinesthetic learning modalities and implications for social and academic learning with curricular consideration for math and language arts. Field experience required. Note: This course is for students who enroll at The University of Toledo prior to Fall 1998. Prerequisite: SPED 2010, 3040; admission to professional education Corequisite: SPED 4230

### **SPED 4230 FIELD PRACTICUM FOR DIAGNOSTIC AND PRESCRIPTIVE TEACHING**

[2 hours] Provides opportunities for field experience to use and refine the teaching of basic skills presented in SPED 4220. Eighty hours of field required. Must be taken concurrently with SPED 4220. Note: This course is for students who enroll at The University of Toledo prior to Fall 1998. Prerequisite: SPED 3040 Corequisite: SPED 4220

### **SPED 4240 TEACHING PHONICS, CONTEXTUAL READING AND WRITING TO LEARNERS WITH SPECIAL NEEDS**

[3 hours] Methods for teaching reading and writing to diverse learners. Emphasis on individualized and small-group approach using structured, explicit phonics in a balanced literacy program. Twenty-four hours of field required. Prerequisite: SPED 2040, 2910 and 3130 or coregistration in SPED 2910 and/or 3130 Corequisite: Admission to professional education

### **SPED 4250 TEACHING CAREER AND VOCATIONAL SKILLS TO YOUTHS WITH DISABILITIES**

[3 hours] This course covers career and vocational education activities for youths with disabilities. Special emphasis is placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers. Prerequisite: SPED 2040 and Professional Educational Status

### **SPED 4260 FAMILY AND PROFESSIONAL PARTNERSHIP IN SPECIAL EDUCATION**

[3 hours] Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed. Prerequisite: SPED 2040 and Professional Educational Status

### **SPED 4310 LEARNING AND BEHAVIOR PROBLEMS OF CHILDREN**

[4 hours] The purpose of this course is to present causes and characteristics of learning and behavioral problems. Emphasis of course: (a)theoretical models and considerations, (b)techniques of instruction and (3) the IEP. Prerequisite: SPED 3040 or 4220 (or permission of instructor)

### **SPED 4320 FIELD PRACTICUM FOR LEARNING AND BEHAVIOR PROBLEMS**

[1 hour] Provides opportunities to use, refine and implement strategies for working with persons with specific learning disabilities presented in SPED 4310. Forty hours of field required. Taken concurrently with SPED 4310. Prerequisite: SPED 4220, 4230 Corequisite: SPED 4310

### **SPED 4330 CHILD STUDY INSTITUTE: EBD**

[1 hour] Provides educational settings for preservice teachers to practice effective behavioral/academic managing of children and youth experiencing emotional stress/trauma. Thirty hours of field required. Prerequisite: SPED 4220 or consent of instructor Corequisite: SPED 4340 Note: This course is for students who enroll at The University of Toledo prior to Fall 1998.

### **SPED 4340 EFFECTIVE MANAGEMENT OF STUDENTS WITH SPECIAL NEEDS IN EDUCATIONAL SETTINGS**

[3 hours] Techniques for managing student behavior. Topics include analyzing environments and problems, implementing and evaluating interventions, data collection and analysis, and handling aggression and noncompliance. Case-backed approach. Integrated field component required. Prerequisite: Admission to Professional Education

### **SPED 4350 ADVANCED METHODS IN LEARNING DISABILITIES**

[3 hours] An in-depth study of instructional methods and strategies for persons with learning disabilities. The focus will be on organization, study skills and self-advocacy strategies. Prerequisite: SPED 4310

### **SPED 4360 CLINICAL PRACTICE IN SPECIFIC LEARNING DISABILITIES**

[1 hour] Provides students with supervised practice in developing and implementing learning strategies and study skills for persons with learning problems. Required 15 hours instructional practice with weekly meetings with supervisors/instructors. Prerequisite: SPED 4350 (can be concurrent) Corequisite: SPED 4350

### **SPED 4370 CURRICULUM AND METHODS FOR STUDENTS WITH MILD EDUCATIONAL NEEDS**

[3 hours] Study of causes and characteristics of mild disorders. Discussion will be on theoretical considerations as well as intervention approaches pertinent to the school and clinic setting. Taken concurrently with SPED 4100 and SPED 4110. Prerequisite: SPED 2040, SPED 4240 Corequisite: SPED 4100, SPED 4110

### **SPED 4510 INSTRUCTION OF STUDENTS WITH PHYSICAL AND OTHER HEALTH IMPAIRMENTS**

[3 hours] Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternative response modes will be discussed. Prerequisite: SPED 3040; computer literacy

### **SPED 4600 PROFESSIONAL REFLECTIVE SEMINAR**

[1 hour] This seminar is taken concurrently with student teaching/internship. Students will evaluate their behavior in relation to the classroom environment. The students will develop alternative strategies in the educational setting. Corequisite: SPED 4930

### **SPED 4620 LINGUISTIC DIVERSITY ISSUES IN SPEECH-LANGUAGE PATHOLOGY**

[1 hour] Explores the relationship of disorders of communication with the concept of community language as it impacts language development in children. Prerequisite: COMM 2410 Corequisite: COMM 2440

### **SPED 4630 COLLABORATION FOR THE SPEECH-LANGUAGE PATHOLOGIST**

[1 hour] Develops an understanding of the roles and expertise of the professionals; enhances skills which benefit the communicatively disordered client by contributing to diagnostic and intervention terms. Corequisite: COMM 4370

### **SPED 4800 VISION IMPAIRMENT**

[3 hours] This course covers the anatomy and physiology of the eye, visual impairments and their implication for learning, working and independent living. Prerequisite: Admission to Professional Level; SPED 3040

### **SPED 4810 IMPLICATIONS OF LOW VISION**

[3 hours] This course covers low vision conditions as well as the instruction of persons with low vision. Advantages and disadvantages of specialized equipment are discussed. Strategies for instruction will be explored. Rehearsal with the equipment is required. Prerequisite: Admission to Professional Education Level; SPED 3040

### **SPED 4870 EDUCATION OF THE BLIND AND VISUALLY IMPAIRED**

[3 hours] The course focuses on methods of instructions, in various settings, of persons who are visually impaired. Various types of assessments, methodologies and curricula are addressed. Prerequisite: Permission of instructor

### **SPED 4880 TECHNOLOGY AND INDEPENDENT SKILLS FOR PERSONS WITH VISUAL IMPAIRMENT**

[3 hours] This course focuses on the general independent living of the blind and visually impaired. Covered are current technology equipment as well as daily living skills for the blind and visual impaired. Prerequisite: Admission to Professional Status; SPED 3040

### **SPED 4900 SEMINAR IN SPECIAL EDUCATION**

[1-5 hours] Seminar provides students with the opportunity to explore, as a group, specific topics with a faculty member. Current issues in the area of Special Education will be the focus. Prerequisite: Admission to professional education

### **SPED 4910 DIRECTED RESEARCH IN SPECIAL EDUCATION**

[1-5 hours] Directed research provides students the opportunity to explore specific topics and develop individual research with a faculty member. Current questions in the area of Special Education will be the focus. Prerequisite: Admission to professional education

### **SPED 4920 READINGS IN SPECIAL EDUCATION**

[1-5 hours] Individual Readings is designed to provide students with opportunities to examine literature related to specific issues. The student works under the direction of staff in the Department of Special Education Services. Prerequisite: Admission to professional education

### **SPED 4930 STUDENT TEACHING IN SPECIAL EDUCATION**

[4-12 hours] Planned field experience in public school classrooms under the direction of University supervisors. Full responsibility for the classroom is expected by the end of the student teaching experience. Prerequisite: Approval of Student Services office; completion of requirements for the respective specialty areas

**SPED 4940 INTERNSHIP/EXTERNSHIP IN SPECIAL EDUCATION**

[4-12 hours] Provides advanced undergraduate students with supervised practicum experiences at off-campus site, including schools, hospitals, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served. Prerequisite: Admission to Professional Education.

**SPED 4980 SPECIAL TOPICS IN SPECIAL EDUCATION**

[1-5 hours] An advanced course for undergraduate majors in special education or majors in related fields covering an important area of special education. Student may repeat this course under different section numbers. Prerequisite: Permission of instructor

**SPED 4990 INDEPENDENT STUDY - SPECIAL EDUCATION**

[1-5 hours] Individual study provides students with opportunities to work individually on issues under the direction of department of Special Education Services faculty. The student meets with instructor without formal classes. Prerequisite: Admission to Professional Education

**SPED 5000 ISSUES IN SPECIAL EDUCATION**

[3 hours] Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.

**SPED 5120 STUDENTS WITH SPECIAL NEEDS: DEVELOPMENTAL AND EDUCATIONAL IMPLICATION**

[3 hours] In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

**SPED 5150 ADVANCED PRACTICUM FOR TEACHING STUDENTS WITH MODERATE EDUCATIONAL NEEDS**

[1 hour] This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field. Prerequisite: SPED 5000 Corequisite: SPED 5160

**SPED 5160 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH MODERATE EDUCATIONAL NEEDS**

[3 hours] This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills. Prerequisite: SPED 5000 Corequisite: SPED 5150

**SPED 5170 SUPPORTING YOUTHS AND ADULTS WITH DISABILITIES LIVING AND WORKING IN THE COMMUNITY**

[3 hours] In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required. Prerequisite: SPED 5120; SPED 5160

**SPED 5180 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH INTENSIVE EDUCATIONAL NEEDS**

[3 hours] An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored. Prerequisite: SPED 5000 Corequisite: SPED 5190

**SPED 5190 ADVANCED PRACTICUM FOR STUDENTS WITH INTENSIVE NEEDS**

[1 hour] This course is taken with SPED 5180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required. Prerequisite: SPED 5000 Corequisite: SPED 5180

**SPED 5220 RESEARCH AND PRACTICE IN TEACHING PHONICS, READING AND WRITING TO STUDENTS WITH SPECIAL NEEDS**

[3 hours] Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required. Prerequisite: SPED 5000

**SPED 5230 ADVANCED FIELD PRACTICUM IN DIAGNOSTIC AND PRESCRIPTIVE TEACHING**

[1 hour] Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 5220. Prerequisite: SPED 5120 Corequisite: SPED 5220

**SPED 5250 CAREER AND VOCATIONAL EDUCATION FOR STUDENTS WITH DISABILITIES**

[3 hours] This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers. Prerequisite: SPED 5120

**SPED 5260 FAMILY AND PROFESSIONAL RELATIONS IN SPECIAL EDUCATION**

[3 hours] Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed. Prerequisite: SPED 5120

**SPED 5270 TEAM MODELS AND COMMUNITY NETWORKING IN EARLY INTERVENTION**

[3 hours] Theoretical and conceptual bases of instruction for students with mild disabilities. Analysis of a range of intervention models. Prerequisite: SPED 5000

**SPED 5300 TEACHING LITERACY SKILLS TO ADOLESCENTS WITH DISABILITIES**

[3 hours] This course will review existing theories and research regarding teaching literacy to students with disabilities in 4th through 12th grades (those who did not learn to read by 3rd grade).

**SPED 5310 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH MILD EDUCATIONAL NEEDS**

[3 hours] A study of the research on theoretical models and considerations about the causes and characteristics of learning and behavioral problems. Emphasis of course: (1) techniques of instruction and (2) the IEP process. Prerequisite: SPED 5220 Corequisite: SPED 5320

**SPED 5320 ADVANCED FIELD PRACTICUM FOR STUDENTS WITH MILD EDUCATIONAL NEEDS**

[1 hour] Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 5310. Forty hours of field required. Prerequisite: SPED 5000 Corequisite: SPED 5310

**SPED 5330 ADVANCED CHILD STUDY INSTITUTE: EBD**

[1 hour] Provides quality educational settings to inservice teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma. Prerequisite: SPED 5310 or consent of instructor

**SPED 5340 ADVANCED BEHAVIOR MANAGEMENT**

[3 hours] This course provides training inservice teachers to become managers of intra-communication and interpersonal relationships in diverse special education settings. Nonviolent Crisis Prevention/Intervention (CPI) training required. Prerequisite: SPED 5220; permission of instructor Corequisite: SPED 5330

**SPED 5510 CURRICULUM AND TEACHING STRATEGIES: PHYSICAL AND OTHER HEALTH IMPAIRMENTS**

[3 hours] Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed. Prerequisite: SPED 5120/7120; Computer literacy

**SPED 5800 PRACTICAL AND THEORETICAL IMPLICATION OF VISION IMPAIRMENT**

[3 hours] A study of the research on the anatomy and physiology of the eye, visual impairments and the practical implication for learning, working and independent living. Prerequisite: SPED 5120

**SPED 5810 LOW VISION: THEORY & RESEARCH**

[3 hours] An in-depth study of the field of low vision. Conditions, equipment and instruction will be reviewed and analyzed for their implication to the field of vision. Prerequisite: SPED 5120

**SPED 5870 EDUCATIONAL AND CURRICULUM ISSUES OF PERSONS WITH VISUAL IMPAIRMENT**

[3 hours] This course focuses on the practical and philosophical pedagogy of teaching persons who are blind or visually impaired. Research on spectrum of learning environments is explored. Prerequisite: Permission of instructor

## 504 Course Descriptions

### **SPED 5880 ADVANCED STUDY OF TECHNOLOGY AND INDEPENDENT DAILY LIVING FOR THE PERSONS WITH VISUAL IMPAIRMENT**

[3 hours] This course includes the research regarding technology, strategies and an analytical evaluation of the independent living of the blind and visually impaired. Prerequisite: Permission of instructor

### **SPED 5950 WORKSHOP IN SPECIAL EDUCATION**

[1-5 hours] A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized. Prerequisite: Varies per course requirements

### **SPED 5980 SPECIAL TOPICS IN SPECIAL EDUCATION**

[1-5 hours] An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers. Prerequisite: Permission of instructor

### **SPED 5990 INDEPENDENT STUDY IN SPECIAL EDUCATION**

[1-5 hours] Individual study provides graduate students with opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held.

### **SPED 6070 CURRICULUM MODELS AND INTERVENTION STRATEGIES IN EARLY CHILDHOOD SPECIAL EDUCATION**

[3 hours] Atypical infant, toddler and early childhood development will be examined. Specialized intervention techniques, their research and practice base and appropriate curriculum models will be explored. 20 clock hour practicum required. Prerequisite: SPED 5000, 5120

### **SPED 6080 CLINICAL AND EDUCATIONAL EVALUATION OF STUDENTS WITH DISABILITIES**

[3 hours] An in-depth study of instruments used by school psychologists and classroom teachers to access and evaluate students. The diagnostic uses and the understanding of the results will be the focus. Prerequisite: SPED 5000; permission of instructor

### **SPED 6220 COLLABORATION FOR INCLUSIVE SCHOOLS**

[3 hours] Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

### **SPED 6250 ISSUES AND RESEARCH IN TRANSITION AND POST-SECONDARY OUTCOMES FOR STUDENT WITH DISABILITIES**

[3 hours] In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation. Prerequisite: SPED 5250

### **SPED 6350 EDUCATIONAL AND INSTRUCTIONAL IMPLICATIONS IN SPECIFIC LEARNING DISABILITIES**

[3 hours] Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

### **SPED 6360 CLINICAL PRACTICUM: LEARNING STRATEGIES FOR STUDENTS WITH SPECIFIC LEARNING DISABILITIES**

[1 hour] Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors. Prerequisite: SPED 6350 Corequisite: SPED 6350

### **SPED 6410 THEORY AND RESEARCH: EMOTIONAL BEHAVIORAL DISORDERS**

[3 hours] This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings. Prerequisite: Permission of instructor Corequisite: SPED 6420, 6430

### **SPED 6420 PUBLIC SCHOOL EMOTIONAL BEHAVIOR DISORDERS**

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles. Prerequisite: Permission of instructor Corequisite: SPED 6410, 6430

### **SPED 6440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS**

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented. Prerequisite: SPED 6410 or Permission of instructor Corequisite: SPED 6450, 6460

### **SPED 6470 THEORY AND RESEARCH: AUTISM**

[3 hours] This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism. Prerequisite: SPED 6460 or permission of instructor

### **SPED 6480 TEACH YOUTH/CHILD WITH AUTISM**

[3 hours] This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented. Prerequisite: SPED 6470 or permission of instructor

### **SPED 6720 ADVANCED LANGUAGE AND SPEECH FOR PERSONS WITH HEARING IMPAIRMENTS**

[3 hours] Clinical evaluation model in descriptive linguistics and interaction in the use of a process approach to developing language with children with hearing impairments. Includes relation of hearing impairment to language development. Prerequisite: Competence in ASL

### **SPED 6730 SYNTHESIS OF PRINCIPLES OF EDUCATING CHILDREN WITH HEARING IMPAIRMENTS**

[3 hours] Historical, Philosophical, psychological and social aspects of educating the hearing impaired. Factors affecting successful public school instruction are covered. Prerequisite: SPED 6720

### **SPED 6740 CURRICULUM AND ASSESSMENT ISSUES OF THE EDUCATION OF PERSONS WITH HEARING IMPAIRMENTS**

[3 hours] Principles of educational assessment and curriculum development for students with hearing impairment. Assessment and curriculum issues will be discussed as they relate to current research trends in hearing impairment. Prerequisite: SPED 6730

### **SPED 6900 INDEPENDENT RESEARCH IN SPECIAL EDUCATION**

[1-5 hours] Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting. Prerequisite: Admission to graduate school

### **SPED 6920 MASTER'S RESEARCH PROJECT IN SPECIAL EDUCATION**

[1-5 hours] The master's project is an individually designed product which meets the final activity requirement for completion of the masters degree. Prerequisite: Admission to Master's Program; SPED 6930

### **SPED 6930 SEMINARS IN SPECIAL EDUCATION**

[1-5 hours] Seminars will consider problems and provide advanced study in the field of Special Education. A student may register for more than one seminar during a graduate program. Prerequisite: Admission to degree program

### **SPED 6940 INTERNSHIP/EXTERNSHIP IN SPECIAL EDUCATION**

[1-8 hours] Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served. Prerequisite: Speech and Language: Completion of all course work; Special Education: Permission of instructor

### **SPED 6960 MASTER RESEARCH THESIS IN SPECIAL EDUCATION**

[1-5 hours] The master's thesis is an individually designed research study which meets the final activity requirement for completion of the master's degree. Prerequisite: Admission to Master's Program; SPED 6930

**SPED 6990 INDEPENDENT STUDY IN SPECIAL EDUCATION**

[1-5 hours] Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held. Prerequisite: Admission to graduate degree program

**SPED 7000 ISSUES IN SPECIAL EDUCATION**

[3 hours] Examination of causes and characteristics, identification procedures, and potential of learners who significantly deviate from the norm mentally, physically and behaviorally. Issues related to services for persons with disabilities will be studied.

**SPED 7120 STUDENTS WITH SPECIAL NEEDS: DEVELOPMENTAL AND EDUCATIONAL IMPLICATION**

[3 hours] In-depth study of personality, psychological and physical development, and educational needs of atypical children: including current research issues in areas of social, legal and environmental aspects of exceptional populations.

**SPED 7150 ADVANCED PRACTICUM FOR TEACHING STUDENTS WITH MODERATE EDUCATIONAL NEEDS**

[1 hour] This course is taken with SPED 5160 to apply strategies and techniques for teaching students with moderate educational needs. Forty hours of required field. Prerequisite: SPED 7000 Corequisite: SPED 7160

**SPED 7160 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH MODERATE EDUCATIONAL NEEDS**

[3 hours] This course focuses on a community-referenced functional curricula approach to teaching children and youths with moderate to severe delays. An in-depth study of inclusionary activities, community-based instruction, social skills. Prerequisite: SPED 7000 Corequisite: SPED 7150

**SPED 7170 SUPPORTING YOUTHS AND ADULTS WITH DISABILITIES LIVING AND WORKING IN THE COMMUNITY**

[3 hours] In-depth study of issues faced by adults with severe and multiple disabilities and their families. Emphasis on supported employment, residential options, self-determination, recreation and quality of life issues. Field experience required. Prerequisite: SPED 5120; SPED 5160

**SPED 7180 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH INTENSIVE EDUCATIONAL NEEDS**

[3 hours] An in-depth examination of appropriate curriculum models, instructional strategies and adaptations, and related behavior problems for students with severe and multiple disabilities. A transdisciplinary team approach is explored. Prerequisite: SPED 7000 Corequisite: SPED 7190

**SPED 7190 ADVANCED PRACTICUM FOR STUDENTS WITH INTENSIVE NEEDS**

[1 hour] This course is taken with SPED 7180 to apply strategies and techniques for teaching students with intensive needs. Forty field hours are required. Prerequisite: SPED 5000 Corequisite: SPED 7180

**SPED 7220 RESEARCH AND PRACTICE IN TEACHING PHONICS, READING AND WRITING TO STUDENTS WITH SPECIAL NEEDS**

[3 hours] Current trends and issues in teaching reading and writing to students with disabilities. Examination of research supporting various methods. Application of research-based methods into practical strategies for classroom implementation. Twenty-four hours of field required. Prerequisite: SPED 7000

**SPED 7230 ADVANCED FIELD PRACTICUM IN DIAGNOSTIC AND PRESCRIPTIVE TEACHING**

[1 hour] Provides the laboratory to rehearse and refine the teaching skills presented in SPED 5/7220. Required of persons seeking initial special education certification. Forty field hours required. Taken concurrently with SPED 7220. Prerequisite: SPED 7120 Corequisite: SPED 7220

**SPED 7250 CAREER AND VOCATIONAL EDUCATION FOR STUDENTS WITH DISABILITIES**

[3 hours] This course covers career and vocational education activities for youths with disabilities. Special emphasis placed on developing and implementing an Individual Transition Plan (ITP) and coordination with adult service providers. Prerequisite: SPED 5120

**SPED 7260 FAMILY AND PROFESSIONAL RELATIONS IN SPECIAL EDUCATION**

[3 hours] Effective parent and professional partnerships will be explored. Interpersonal communication skills, legal issues, effective models for home-school communication, and differences in culture, values and family expectations will be discussed. Prerequisite: SPED 7120

**SPED 7270 TEAM MODELS AND COMMUNITY NETWORKING IN EARLY INTERVENTION**

[3 hours] Focus of course is on effective service coordination strategies in early intervention and early childhood special education. Issues related to peer coaching and collaborative consultation also will be examined. Prerequisite: SPED 4260

**SPED 7310 ADVANCED INSTRUCTIONAL METHODS FOR TEACHING STUDENTS WITH MILD EDUCATIONAL NEEDS**

[4 hours] Theoretical and conceptual bases of instruction for students with mild disabilities. Analysis of a range of intervention models. Prerequisite: SPED 7000

**SPED 7320 ADVANCED FIELD PRACTICUM FOR STUDENTS WITH MILD EDUCATIONAL NEEDS**

[1 hour] Provides opportunities for field experience to use and refine the strategies for persons with mild disabilities presented in SPED 7310. Forty hours of field required. Prerequisite: SPED 7000 Corequisite: SPED 7310

**SPED 7330 ADVANCED CHILD STUDY INSTITUTE: EBD**

[1 hour] Provides quality educational settings to inservice teachers to practice effective behavioral and academic managing of children and youth experiencing continuous emotional stress and trauma. Prerequisite: SPED 7310 or consent of instructor

**SPED 7340 ADVANCED BEHAVIOR MANAGEMENT**

[3 hours] This course provides training inservice teachers to become managers of intra-communication and interpersonal relationships in diverse special education settings. Nonviolent Crisis Prevention/Intervention (CPI) training required. Prerequisite: SPED 7220; permission of instructor Corequisite: SPED 7330

**SPED 7510 CURRICULUM AND TEACHING STRATEGIES: PHYSICAL AND OTHER HEALTH IMPAIRMENTS**

[3 hours] Appropriate curriculum models, learning objectives and teaching strategies for students with physical or health impairing conditions are examined. Modification of materials, assessment options and alternatives response modes will be discussed. Prerequisite: SPED 7120; computer literacy

**SPED 7800 PRACTICAL AND THEORETICAL IMPLICATION OF VISION IMPAIRMENT**

[3 hours] A study of the research on the anatomy and physiology of the eye, visual impairments and the practical implication for learning, working and independent living. Prerequisite: SPED 5120

**SPED 7810 LOW VISION: THEORY & RESEARCH**

[3 hours] An in-depth study of the field of low vision. Conditions, equipment and instruction will be reviewed and analyzed for their implication to the field of vision. Prerequisite: SPED 5120

**SPED 7880 ADVANCED STUDY OF TECHNOLOGY AND INDEPENDENT DAILY LIVING FOR THE PERSONS WITH VISUAL IMPAIRMENT**

[3 hours] This course includes the research regarding technology, strategies and an analytical evaluation of the independent living of the blind and visually impaired. Prerequisite: Permission of instructor

**SPED 7950 WORKSHOP IN SPECIAL EDUCATION**

[1-5 hours] A workshop developed around topics of interest and concern for in-service teachers and other education personnel. Practical application of workshop topics will be emphasized. Prerequisite: Varies per course requirements

**SPED 7980 SPECIAL TOPICS IN SPECIAL EDUCATION**

[1-5 hours] An advanced course for graduate students in special education or related fields. Topics are selected based on needs of the population. Student may repeat this course under different section numbers. Prerequisite: Permission of instructor

**SPED 7990 INDEPENDENT STUDY IN SPECIAL EDUCATION**

[1-5 hours] Individual study provides graduate students with opportunities to work individually on professional problems with special education faculty. Individual meetings with sponsoring faculty are held.

**SPED 8070 CURRICULUM MODELS AND INTERVENTION STRATEGIES IN EARLY CHILDHOOD SPECIAL EDUCATION**

[3 hours] Atypical infant, toddler and early childhood development will be examined. Specialized intervention techniques, their research and practice base, and appropriate curriculum models will be explored. 20 clock hour practicum required. Prerequisite: SPED 5120/7120; SPED 5000/7000

## 506 Course Descriptions

### **SPED 8080 CLINICAL AND EDUCATIONAL EVALUATION OF STUDENTS WITH DISABILITIES**

[3 hours] An in-depth study of instruments used by school psychologists and classroom teachers to access and evaluate students. The diagnostic uses and the understanding of the results will be the focus. Prerequisite: SPED 7000; permission of instructor

### **SPED 8220 COLLABORATION FOR INCLUSIVE SCHOOLS**

[3 hours] Provides information and competencies to develop, implement and evaluate collaborative programs. Educators will enhance their ability to collaborate so that they can better meet the needs of their students.

### **SPED 8250 ISSUES AND RESEARCH IN TRANSITIN AND POST-SECONDARY OUTCOMES FOR STUDENT WITH DISABILITIES**

[3 hours] In-depth study of transition issues and outcomes focusing on: a) best practices, b) the roles and responsibilities of a transition specialist, c) inter-agency collaboration, d) team building, and e) program development, implementation and evaluation. Prerequisite: SPED 7250

### **SPED 8350 EDUCATIONAL AND INSTRUCTIONAL IMPLICATIONS IN SPECIFIC LEARNING DISABILITIES**

[3 hours] Students will examine current trends in research and program development in Specific Learning Disabilities. The focus will be on learning and study skills: their implication in the development of learning.

### **SPED 8360 CLINICAL PRACTICUM: LEARNING STRATEGIES FOR STUDENTS WITH SPECIFIC LEARNING DISABILITIES**

[1 hour] Provides advanced graduate student with supervised practice in developing and implementing strategies and study skills for persons with learning problems. Required 15 hours instructional practice and weekly meetings with supervisors. Prerequisite: SPED 8350 Corequisite: SPED 8350

### **SPED 8410 THEORY AND RESEARCH: EMOTIONAL BEHAVIORAL DISORDERS**

[3 hours] This course provides in-depth readings on problems of emotionally and behaviorally disturbed/disordered children and youth. Intense study on two levels: (1) theoretical considerations and (2) treatments pertinent to diverse educational settings. Prerequisite: Permission of instructor Corequisite: SPED 8420, 8430

### **SPED 8420 PUBLIC SCHOOL EMOTIONAL BEHAVIOR DISORDERS**

[1 hour] This course provides supervised practice in classroom participation with students identified as Emotionally Behaviorally Disturbed/Disordered. Public School settings include: self-contained, resource, transition, mainstreamed and consultative-collaborative teaching roles. Prerequisite: Permission of instructor Corequisite: SPED 6410, 6430

### **SPED 8440 TEACHING CHILDREN AND YOUTH WITH EMOTIONAL BEHAVIOR DISORDERS**

[3 hours] This course provides evaluation and application techniques of research based methodologies for teaching students with emotional behavioral Disorders/disturbances. Psycho-social educational best practices within the least restrictive environment are presented. Prerequisite: SPED 6410 or Permission of instructor Corequisite: SPED 6450, 6460

### **SPED 8470 THEORY AND RESEARCH: AUTISM**

[3 hours] This course provides in-depth readings in the field of autism. The course includes intense study on two levels: (1) theoretical considerations and (2) treatment approaches pertinent to populations with autism. Prerequisite: SPED 8460 or permission of instructor

### **SPED 8480 TEACH YOUTH/CHILD WITH AUTISM**

[3 hours] This course provides research based methodologies for understanding and teaching children and youth with autism. Psycho-Social Educational best practices within the least restrictive environment are presented. Prerequisite: SPED 8470 or permission of instructor

### **SPED 8720 ADVANCED LANGUAGE AND SPEECH FOR PERSONS WITH HEARING IMPAIRMENTS**

[3 hours] Clinical evaluation model in descriptive linguistics and interaction in the use of a process approach to developing language with children with hearing impairments. Includes relation of hearing impairment to language development. Prerequisite: Competence in ASL

### **SPED 8730 SYNTHESIS OF PRINCIPLES OF EDUCATING CHILDREN WITH HEARING IMPAIRMENTS**

[3 hours] Historical, Philosophical, psychological and social aspects of educating the hearing impaired. Factors affecting successful public school instruction is covered. Prerequisite: SPED 6720/8720

### **SPED 8740 CURRICULUM AND ASSESSMENT ISSUES OF THE EDUCATION OF PERSONS WITH HEARING IMPAIRMENTS**

[3 hours] Principles of educational assessment and curriculum development for students with hearing impairment. Assessment and curriculum issues will be discussed as they relate to current research trends in hearing impairment. Prerequisite: SPED 6730/8730

### **SPED 8900 INDEPENDENT RESEARCH IN SPECIAL EDUCATION**

[1-5 hours] Independent Research provides opportunities to work on individual research under the direction of faculty. The student meets with the instructor at intervals and conducts research without formal class meeting. Prerequisite: Admission to graduate school

### **SPED 8930 SEMINARS IN SPECIAL EDUCATION**

[1-5 hours] Seminars will consider problems and provide advanced study in the field of Special Education. A student may register for more than one seminar during a graduate program. Prerequisite: Admission to degree program

### **SPED 8940 INTERNSHIP/EXTERNSHIP IN SPECIAL EDUCATION**

[1-8 hours] Provides the advanced graduate student with supervised practicum experiences at an off-campus site; including schools, hospitals, agencies, rehabilitation clinics, work training sites and other community sites where persons with disabilities are served. Prerequisite: Speech and Language: Completion of all course work; Special Education: Permission of instructor

### **SPED 8960 DOCTORAL DISSERTATION IN CURRICULUM & INSTRUCTION**

[1-12 hours] The doctoral dissertation is an original scholarly product required of all students completing the doctoral degree in Special Education Services. Prerequisite: Completion of Doctoral Program requirements

### **SPED 8990 INDEPENDENT STUDY IN SPECIAL EDUCATION**

[1-5 hours] Individual study provides advanced graduate students opportunities to work individually on professional problems with faculty of the Department of Special Education Services. Individual meetings with sponsoring faculty are held. Prerequisite: Admission to graduate degree program

## **THR - Theatre and Film**

### **Department of Theatre and Film (ARS)**

#### **THR 1010 CREATIVE PROCESS**

[3 hours] Using theatre games and theatrical techniques, students explore the nature of creativity and its relationship to their own processes of creative expression.

#### **THR 1030 STAGECRAFT**

[3 hours] Introduction to scenic design and construction using the tools and techniques of theatre including properties and scene painting. Lectures, readings and projects with practical laboratory experience.

#### **THR 1040 STAGE LIGHTING AND SOUND**

[3 hours] Introduction to theory and practice in stage lighting and sound. Students will use lighting and sound tools and equipment in production crews on department productions.

#### **THR 1050 COSTUMING**

[3 hours] Introduction to the theory and practice of stage costuming. Lectures, readings and projects offer practical laboratory experiences. Students will use tools and equipment of the costume shop on production crews.

#### **THR 1100 INTRODUCTION TO THEATRE**

[3 hours] Introductory survey of the development of theatre and drama from the ancient world to the present day; discussion of representative plays; slides and films complement lectures. (Not recommended or required for majors.) Humanities core course

#### **THR 2000 THEATRE PRACTICUM**

[1 hour] Students will be assigned a crew position for one of the department productions.

**THR 2200 PERSPECTIVES ON THEATRE**

[3 hours] A study of contemporary theatrical organization and styles; theatre compared with film and television; Broadway, regional and experimental theatre; research skills development; exploration of career opportunities in theatre and related fields.

**THR 2420 MAKEUP FOR THE ACTOR**

[2 hours] Principles and techniques of makeup for stage. Practical execution of stage makeup problems. Students are required to purchase supplies.

**THR 2610 ACTING I**

[3 hours] An introduction to the art and craft of acting. Through scene work and improvisation, students learn to use acting terminology, identify dramatic beats, develop character objectives and play actions. Prerequisite: Major status or THR 1010

**THR 2620 ACTING II**

[3 hours] Students are exposed to a range of techniques explicated by primary acting theorists/practitioners, including diagnosis of individual skills, work in voice, movement, textual analysis and scene preparation. Prerequisite: THR 2610

**THR 2640 VOICE AND MOVEMENT**

[2 hours] Theory and practice of vocal and physical techniques for the actor. Repeatable for up to 8 hours of credit. (BFA Performance majors should enroll in the course every semester up to the maximum credit.)

**THR 2990 SPECIAL PROJECTS**

[1-3 hours] Individual study provides a student an opportunity to work independently on a problem of special interest in theatre, film or dance under the direction of the faculty. For Freshman and Sophomore Students. Prerequisite: Prior approval of a prospectus by the faculty. (Seminar forms may be picked up at the department office.)

**THR 3110 WORLD THEATRE I**

[3 hours] Developments and trends in theatre and drama from the ancient world through the Renaissance, including traditional forms of theatre in India, China and Japan.

**THR 3120 WORLD THEATRE II**

[3 hours] Developments and trends in theatre and drama from the late 17th Century to the present day, including developments in Latin America and Africa.

**THR 3210 PLAYWRITING**

[3 hours] Creative writing for the theatre analyzing traditional and contemporary structure and style. Prerequisite: ENGL 2720 or THR 2200

**THR 3410 STAGE LIGHTING DESIGN**

[3 hours] Principles and theories of lighting design for theatrical productions are explored. Develop skills of script analysis, light study, light plot and related graphics for conceptualization and communication of design ideas. Prerequisite: THR 1040 or permission of instructor

**THR 3440 STAGE DESIGN**

[3 hours] Theory and principles of scenic design for stage are the focus. Conceptualization and communication of design ideas are explored through renderings, models, ground plans and elevations. Students are required to purchase supplies. Prerequisite: THR 1030 or permission of instructor

**THR 3470 THEATRE SOUND**

[3 hours] Students study the methods and techniques of sound production and design used in the theatre. Tools and techniques of audio production are used in laboratory recording and mixdown. Prerequisite: THR 1040 or MUS 2270 or COMM 2610

**THR 3480 COSTUME DESIGN**

[3 hours] Principles and theories of costume design for theatrical productions are explored. Develop skills of script analysis, sketching, fabric study and rendering for conceptualization and communication of design ideas. Students are required to purchase supplies. Prerequisite: THR 1050 or permission of instructor

**THR 3610 ACTING FOR THE CAMERA**

[3 hours] Performing dramatic material for camera with an emphasis on the differences between stage and screen performing. Prerequisite: THR 2620 or permission of instructor

**THR 3620 ACTING: CONTEMPORARY STYLES**

[3 hours] Contemporary, nonrealistic theatre requires adjustments for actors trained in the Stanislavski tradition. This course examines the theory and praxis of artists such as Brecht, Artaud, Grotowski, Boal and others. Prerequisite: THR 2620 or permission of instructor

**THR 3640 VOICE AND DICTION**

[2 hours] Theories and practice of vocal techniques for the actor. Diagnosis of individual skills continues work begun in voice and movement. Prerequisite: THR 2640 or permission of instructor

**THR 3650 STAGE MOVEMENT**

[2 hours] Theories and practice of physical techniques for the actor. Diagnosis of individual skills continues the work begun in voice and movement. Prerequisite: THR 2610, 2640 or permission of the instructor

**THR 3710 DIRECTING I**

[3 hours] The director's approach to analyzing a script, formulating a production concept and realizing that concept on stage. Discussions and exercises progress to directing scenes or short plays in class. Prerequisite: THR 2610, 2640 and one of the following: THR 3110, 3120 or 4110, or permission of instructor

**THR 3800 PRODUCTION ACTING**

[1-3 hours] Through study and practice the student contributes significantly in areas of acting and performance on department productions. Students should audition for roles in department productions. Prerequisite: At least one other Theatre or Film course.

**THR 3810 PRODUCTION MANAGEMENT**

[1-3 hours] Through study and practice the student contributes significantly as a stage manager, assistant stage manager or assistant to the director on department productions. Students should apply for management positions the semester preceding. Prerequisite: At least one other Theatre or Film course.

**THR 3820 SET CONSTRUCTION**

[1-3 hours] Through study and practice the student contributes significantly as a scenic carpenter, props person, scene painter or backstage crew on department productions. Students schedule lab time with instructor. Prerequisite: At least one other Theatre or Film course.

**THR 3830 COSTUME CONSTRUCTION**

[1-3 hours] Through study and practice students contribute significantly as members of the costume shop and wardrobe crew on productions. As a laboratory course students must see instructor to arrange lab time. Prerequisite: THR 1050; at least one other Theatre or Film course.

**THR 3840 PRODUCTION LIGHTING**

[1-3 hours] Through study and practice the student contributes significantly as a lighting technician, master electrician or lighting operator on department productions. Students schedule lab time with instructor. Prerequisite: At least one other Theatre or Film course.

**THR 3850 PRODUCTION SOUND**

[1-3 hours] Through study and practice the student contributes significantly as a sound technician, audio engineer or sound operator on department productions. Students schedule lab time with instructor. Prerequisite: At least one other Theatre or Film course.

**THR 3860 PRODUCTION DESIGNER**

[1-3 hours] Through study and practice the student contributes significantly as a production designer or design assistant on department productions. Students schedule lab time with instructor. Prerequisite: At least one other Theatre or Film course.

**THR 4110 MODERN AMERICAN THEATRE**

[3 hours] Developments and trends in the American Theatre since 1945.

**THR 4120 CONTEMPORARY BRITISH AND IRISH THEATRE**

[3 hours] Contemporary British and Irish theatre surveys a diverse group of writers who represent previously silenced voices in those countries, forcing a reexamination of who speaks for British or Irish drama. Prerequisite: ENGL Comp II

**THR 4130 AMERICAN MUSICAL THEATRE**

[3 hours] A history of the American musical theatre from the 19th century to the present. Prerequisite: ENGL Comp II

**THR 4400 SEMINAR TOPICS IN DESIGN**

[3 hours] Individual and group investigations of particular topics in all phases of design and technology, i.e. scene painting, advanced design and rendering technique, new technology.

**THR 4500 PROFESSIONAL ASPECTS OF THEATRE**

[2 hours] Study of the professional theatre as a business: contracts, unions, the theatre marketplace, preparation of resumes, portfolios, audition pieces, interview. Prerequisite: THR 2200

**THR 4620 ACTING: HISTORICAL STYLES**

[3 hours] Advanced training in acting with emphasis on effective vocal and rhetorical techniques and the use of poetic rhythm and imagery in creating a role psychologically as well as physically. Prerequisite: THR 2610, 2620, 2640 or permission of instructor

**THR 4640 DIALECTS FOR STAGE**

[2 hours] Exercises and projects designed to help the student explore the major regional and foreign stage dialects. An introduction to the International Phonetic Alphabet. Prerequisite: THR 2640, 3640 or permission of instructor

## 508 Course Descriptions

### THR 4700 MAJORS SEMINAR

[1 hour] Survey of the full range of professional opportunities and practices in Theatre. Students in designated program tracks are instructed in resume, portfolio and interview processes. Prerequisite: Permission of coordinating instructor.

### THR 4800 SENIOR PROJECT

[3 hours] The student conceives, creates and presents theoretical or executed theatrical productions as part of the requirements for the B.F.A. Prerequisite: Senior standing, approval of adviser and prior approval of a prospectus by faculty one semester in advance of registration.

### THR 4900 SPECIAL TOPICS: THEATRE AND DRAMA

[3 hours] Exploration of a special topic in the history and criticism of theatre and drama - e.g., Modern Theories of Theatre Art or Stanislavski's Heritage or Baroque Theatre Architecture and Its Scenic Conventions.

### THR 4940 INTERNSHIP

[3 hours] Internship with an approved program, company, or agency in theatre or film. Student must submit project proposal for approval by advisor. (Repeatable for 6 hours credit.) Prerequisite: Approval of adviser

### THR 4950 HONORS THESIS

[3 hours] Research or a creative project on a topic in theatre. Required of all candidates seeking department honors. (Repeatable for 6 hours credit.) Prerequisite: Approval of Honors Adviser

### THR 4990 SPECIAL PROJECTS

[1-3 hours] Individual study provides a student an opportunity to work independently on a problem of special interest in theatre under the direction of the faculty. Prerequisite: Prior approval of a prospectus by the faculty. (Seminar forms may be picked up at the department office.)

## TSOC - Theory and Social Foundations

### Department of Foundations of Education (EDU)

#### TSOC 1500 EDUCATION IN A DIVERSE SOCIETY

[2 hours] Introduction to the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.

#### TSOC 2000 DIVERSITY IN CONTEMPORARY SOCIETY

[3 hours] This course analyzes the roles of people in a culturally diverse society through an exploration of issues of race, class, gender, ethnicity and disability. U.S. multicultural course

#### TSOC 2500 HISTORICAL-PHILOSOPHICAL PERSPECTIVES ON EDUCATION

[2 hours] This course uses history and philosophy as lenses through which to inspect and reflect on the developing role of public schooling in the US from colonial times to the present.

#### TSOC 3000 SOCIO-CULTURAL ANALYSES OF TEACHING & SCHOOLING: SCHOOL, COMMUNITY & FAMILY AS CULTURE

[3 hours] The evolving role of education in the US, including the historical and contemporary relationship of schooling to other educational institutions, groups of people and the process of social change. Prerequisite: admission to early childhood licensure program, CIEC 3380 Corequisite: CIEC 3390, CIEC 3350

#### TSOC 3010 EDUCATING THE REFLECTIVE PRACTITIONER

[3 hours] Emphasizes being and teaching others to be "reflective practitioners" in vocational and avocational endeavors. Coping with changing client circumstances, effective thinking, higher levels of learning and self-renewal are also studied.

#### TSOC 3100 INQUIRY AND CREATIVE ACTION

[3 hours] Different approaches to problem solving are examined and students use some to complete real-life projects they have designed. Creativity, logical analysis, personal effectiveness and polarity management will be studied. Prerequisite: TSOC 3010

#### TSOC 3540 EDUCATION AND THE CONSTRUCTION OF SOCIETIES

[3 hours] Examines life long conceptual learning tools from several humanity disciplines that help define and frame action on real life problems of a diverse, global nature. Humanities core course Non-western multicultural course

#### TSOC 4000 SOCIO-CULTURAL AND HISTORICAL INFLUENCES ON U.S. EDUCATION

[3 hours] The evolving role of education in the US, including the historical and contemporary relationship of schooling to other educational institutions, groups of people and the process of social change. Prerequisite: Admission to teacher licensure program

#### TSOC 4100 GROUP PROCESSES IN EDUCATION

[3 hours] Investigation of theory, research and individual interactions which undergird effective actions in groups. Group processes and individual-group relationships are emphasized in education, voluntary and business group settings.

#### TSOC 4130 CHILDREN AND THE LAW

[2 hours] Examines major issues and laws involved in public education and health services, especially the role of advocate for students that the school nurse and other professionals play.

#### TSOC 4150 EDUCATION AND COMMUNITY RELATIONS

[3 hours] Provides a framework, the analysis skills and the action implementation behaviors for understanding community schools and agencies. Develops skills in project management within the context of understanding and valuing diversity.

#### TSOC 4190 WORKSHOP IN EDUCATIONAL THEORY & SOCIAL FOUNDATIONS

[1-5 hours] Practical applications of topics of interest and concern for preservice teachers and other education personnel.

#### TSOC 4940 FIELD EXPERIENCE IN PACS

[1-10 hours] Students will establish and complete an internship focusing on specified objectives, actions and time schedules under both on and off-campus supervision. Progress reports and a summary evaluation are required. Prerequisite: Permission of instructor

#### TSOC 4990 INDEPENDENT STUDY IN EDUCATIONAL THEORY

[1-4 hours] Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

#### TSOC 5100 GROUP PROCESSES IN EDUCATION

[3 hours] Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.

#### TSOC 5110 MODERN EDUCATIONAL CONTROVERSIES

[3 hours] Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.

#### TSOC 5190 SUMMER INSTITUTE ON DIVERSITY IN EDUCATION

[3 hours] School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

#### TSOC 5200 SOCIOLOGICAL FOUNDATIONS OF EDUCATION

[3 hours] Critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.

#### TSOC 5210 MULTICULTURAL NON-SEXIST EDUCATION

[3 hours] Examines how race, class, gender, ethnicity and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.

#### TSOC 5230 INTERGROUP AND INTERCULTURAL EDUCATION

[3 hours] In-depth history of America's racial and ethnic minorities and the role of schooling in assisting their adaptation to and assimilation into American society.

#### TSOC 5300 PHILOSOPHY AND EDUCATION

[3 hours] Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn. Prerequisite: Some background in general philosophy or intellectual history is recommended.

#### TSOC 5400 HISTORY OF SCHOOLING & TEACHING IN THE U.S.

[3 hours] Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.



**TSOC 5950 WORKSHOP IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[3 hours] Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.

**TSOC 6000 WOMEN, CULTURE AND PEDAGOGY**

[3 hours] This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

**TSOC 6120 COMPARATIVE EDUCATION**

[3 hours] The purposes, structure and practice of non-formal and formal education are explored using a wide range of concepts and paradigms of comparative educational analysis throughout the globe. Prerequisite: TSOC 5400/7400 or permission of instructor.

**TSOC 6140 HISTORY OF SOCIO-POLITICAL ISSUES IN SCHOOL-STATE RELATIONS**

[3 hours] An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries. Prerequisite: TSOC 5200/7200 or 5400/7400 or permission of instructor.

**TSOC 6190 SEMINAR IN EDUCATIONAL THEORY/SOCIAL FOUNDATIONS**

[1-3 hours] The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.

**TSOC 6220 PROBLEMS AND ISSUES IN MULTICULTURAL EDUCATION**

[3 hours] Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures. Prerequisite: TSOC 5210/7210

**TSOC 6240 SOCIOLOGICAL ANALYSES OF URBAN EDUCATION**

[3 hours] Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives. Prerequisite: TSOC 5200/7200 or TSOC 5210/7210

**TSOC 6310 MAJOR EDUCATIONAL THEORISTS**

[3 hours] An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.

**TSOC 6320 EDUCATION AND THE DEMOCRATIC ETHIC**

[3 hours] Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society. Prerequisite: TSOC 5400/7400 or 5300/7300 or 5200/7200

**TSOC 6500 ANTHROPOLOGY AND EDUCATION**

[3 hours] Examination of cross-cultural, comparative and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education. Prerequisite: TSOC 5210/7210 or 5200/7200

**TSOC 6960 MASTER'S THESIS IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[1-3 hours] A formal, independent study culminating in a written discourse that advances our understanding of educational theory or social foundations. Prerequisite: Permission of instructor

**TSOC 6980 MASTER'S PROJECT IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[1-3 hours] A formal, independent project applying principles of educational theory or social foundations to analyze a particular problem and culminating in a written discourse. Prerequisite: Permission of instructor

**TSOC 6990 INDEPENDENT STUDY IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[1-3 hours] Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

**TSOC 7100 GROUP PROCESSES IN EDUCATION**

[3 hours] Examines intrapersonal and interpersonal principles of high performing teams, meaningful relationships, and being an effective leader and member of groups. Real-life projects will be designed, implemented and evaluated.

**TSOC 7110 MODERN EDUCATIONAL CONTROVERSIES**

[3 hours] Examines controversial contemporary educational issues, the forces that perpetuate them and the socio-cultural contexts in which they exist. Teachers' work and ethical tenets shaping practice are also examined.

**TSOC 7190 SUMMER INSTITUTE ON DIVERSITY IN EDUCATION**

[3 hours] School personnel collaborate with persons from higher education, the community, and scholars who have created model multicultural/urban education programs to learn new ways of teaching and learning among diverse populations.

**TSOC 7200 SOCIOLOGICAL FOUNDATIONS OF EDUCATION**

[3 hours] Critical examination of the socio-cultural foundations of schooling in the United States, including purposes of schooling in a multicultural society and the resulting nature of teacher work.

**TSOC 7210 MULTICULTURAL NON-SEXIST EDUCATION**

[3 hours] Examines how race, class, gender, ethnicity, and disability intersect with power, culture, knowledge and ideology in American schools to influence the lives of students and teachers in a multicultural society.

**TSOC 7230 INTERGROUP AND INTERCULTURAL EDUCATION**

[3 hours] In-depth history of America's racial and ethnic minorities and the role of schooling in assisting their adaptation to and assimilation into American society.

**TSOC 7300 PHILOSOPHY AND EDUCATION**

[3 hours] Exploring the nature of philosophic inquiry in education and examining competing traditions in the West, particularly in the United States. A distinction between education and schooling will be drawn. Prerequisite: Some background in general philosophy or intellectual history is recommended.

**TSOC 7400 HISTORY OF SCHOOLING & TEACHING IN THE U.S.**

[3 hours] Evolving role of schooling and teaching in the US, using history to reflect on the relationship of schooling to other social institutions, groups of people and the process of social change.

**TSOC 7950 WORKSHOP IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[3 hours] Each workshop is developed around a topic of interest and concern to inservice teachers and other educational personnel. Practical application of workshop topics will be emphasized.

**TSOC 8000 WOMEN, CULTURE, AND PEDAGOGY**

[3 hours] This course surveys works of prominent feminist scholars in order to address the impact of dominant ideology upon the lives of women and girls in American schools.

**TSOC 8120 COMPARATIVE EDUCATION**

[3 hours] The purposes, structure and practice of non-formal and formal education are explored using a wide range of concepts and paradigms of comparative educational analysis throughout the globe. Prerequisite: TSOC 5400/7400 or consent of instructor.

**TSOC 8140 HISTORY OF SOCIO-POLITICAL ISSUES IN SCHOOL-STATE RELATIONS**

[3 hours] An examination of the historical, legal, sociological interaction between state and schooling in US, emphasizing both religious/non-religious issues. These concerns are compared and analyzed with respect to other countries. Prerequisite: TSOC 5200/7200 or 5400/7400 or permission of instructor

**TSOC 8180 INTERDISCIPLINARY SEMINAR IN EDUCATIONAL PSYCHOLOGY, RESEARCH, AND SOCIAL FOUNDATIONS**

[1 hour] The proseminar will enable doctoral students to improve their understanding of the research process. Students will learn to ask research questions, choose alternative methodologies and interpret the validity of conclusions. Prerequisite: Completion of at least two research tools or permission of instructor

**TSOC 8190 SEMINAR IN EDUCATIONAL THEORY/SOCIAL FOUNDATIONS**

[1-3 hours] The collaborative study of a specific topic in educational theory and social foundations by a group of advanced students under the direction of one or more professors.

## 510 Course Descriptions

### **TSOC 8220 PROBLEMS AND ISSUES IN MULTICULTURAL EDUCATION**

[3 hours] 2Application of theoretical assumptions presented in TSOC 5210/7210 to US schools and classrooms, with particular attention given to program and curriculum issues, teachers and teaching policies, practices and procedures. Prerequisite: TSOC 5210/7210

### **TSOC 8240 SOCIOLOGICAL ANALYSES OF URBAN EDUCATION**

[3 hours] Development and dynamics of schooling in urban centers across the United States, including historical and critical analyses of current problems, issues and reform initiatives. Prerequisite: TSOC 5200/7200 or TSOC 5210/7210

### **TSOC 8310 MAJOR EDUCATIONAL THEORISTS**

[3 hours] An examination of selected educational philosophers who have addressed themselves to the problem of the ends and means of education from Classical Hellenic Times to the present.

### **TSOC 8320 EDUCATION AND THE DEMOCRATIC ETHIC**

[3 hours] Examination of the interdependence among education, democracy and ethics in the context of civic life. Applications made to the practice of schooling as cultural production in a democratic society. Prerequisite: TSOC 5400/7400 or 5300/7300 or 5200/7200

### **TSOC 8500 ANTHROPOLOGY AND EDUCATION**

[3 hours] Examination of cross-cultural, comparative, and other studies directed toward understanding processes of cultural transmission and transformation, and implications of anthropological research for contemporary issues in education. Prerequisite: TSOC 5210/7210 or 5200/7200

### **TSOC 8960 DISSERTATION RESEARCH IN FOUNDATIONS OF EDUCATION**

[1-12 hours] A formal, independent study culminating in a written discourse central to the advancement of knowledge in educational theory or social foundations. Prerequisite: Permission of instructor

### **TSOC 8990 INDEPENDENT STUDY IN EDUCATIONAL THEORY AND SOCIAL FOUNDATIONS**

[1-6 hours] Directed study of a current topic in educational theory and social foundations. The student meets with the instructor at arranged intervals without formal classes. Prerequisite: Permission of instructor

## **UC - University College**

### **University College (UNV)**

### **UC 1000 ORIENTATION**

[1 hour] An orientation to college for adults over 25. Provision of information to equip students with the tools for academic success. Open only to students in University College.

### **UC 2010 PORTFOLIO DEVELOPMENT**

[3 hours] Course is designed for non-traditional students whose prior learning experiences will be formatted into a portfolio for faculty assessment with the potential of earning college credit.

### **UC 4980 SPECIAL TOPICS**

[1-4 hours] Topics of interest to University College students offered by various instructors. Open to any University College student.

## **WGST - Women and Gender Studies**

### **Department of Women's and Gender Studies (ARS)**

### **WGST 2010 INTRODUCTION TO GENDER STUDIES: GENDER, SEX AND DIFFERENCE**

[3 hours] Interdisciplinary introduction to gender studies. Critically examines competing theories of gender and sex identification, construction, and biological determinism. Considers ethical issues regarding differences of gender, sex and sexuality. U.S. multicultural course

### **WGST 2400 WOMEN'S ROLES: A GLOBAL PERSPECTIVE**

[3 hours] The course focuses on the current and evolving social, economic and political status of women in the United States and selected non-Western societies. Social Sciences core course Non-western multicultural course

### **WGST 2610 WOMEN IN AMERICAN POLITICS**

[3 hours] An examination of the role of women in the American political system with special attention to the socializing experiences, political power bases and legal status. Prerequisite: PSC 1200 U.S. multicultural course

### **WGST 2640 RACE, CLASS, AND GENDER**

[3 hours] Introduction to the study of race, class and gender as factors in American stratification. Social Sciences core course U.S. multicultural course

### **WGST 2980 SPECIAL TOPICS IN WOMEN'S AND GENDER STUDIES**

[3 hours] Study of selected topics relevant to Women's and Gender Studies. May be repeated for major or minor credit when topic varies.

### **WGST 3010 ISSUES IN WOMEN'S STUDIES**

[3 hours] Required for the major. An interdisciplinary introduction to basic works of feminist thought, feminist methodologies and current issues in the field world-wide. Writing Intensive (WAC) course. Non-western multicultural course

### **WGST 3020 VISUAL CONSTRUCTION OF GENDER**

[3 hours] Writing intensive (WAC) course. This non-studio course focuses on the ways images reflect and shape our understanding of gender. Students will learn to analyze visual material in order to identify and articulate their cultural significance in relation to gender. Prerequisite: 6 hours of English Composition Humanities core course U.S. multicultural course

### **WGST 3200 ISSUES IN LESBIAN, TRANSGENDER, BISEXUAL AND GAY COMMUNITIES**

[3 hours] This course will provide the student with an understanding of current issues facing LTBG communities including historical, developmental, socio-cultural and political perspectives.

### **WGST 3320 PSYCHOLOGY OF WOMEN**

[3 hours] Explore and critique theories and research related to the psychology of women. Life span development in women, the validity of the study of gender differences and selected topics relevant to women's mental health will be addressed. Prerequisite: PSY 1010

### **WGST 3400 FEMINIST APPROACHES TO SOCIAL PROBLEMS**

[3 hours] This course will examine current social problems from a feminist perspective. The course will examine such issues as the feminization of poverty, violence against women, homeless, prostitution, teen pregnancy, HIV/AIDS and addictions.

### **WGST 3550 FEMINISM AND PHILOSOPHY**

[3 hours] An examination of feminist perspectives in philosophy, exploring the relevance of gender to central questions in ethics, political theory and epistemology. U.S. multicultural course

### **WGST 3650 ECONOMICS OF GENDER**

[3 hours] Analysis of labor market outcomes and income distribution characteristics resulting from gender differences; Gender-related economic outcomes; the feminization of poverty, persistent male-female wage differential, expanding proportion of female headed households. Prerequisite: ECON 1150, 1200 U.S. multicultural course

### **WGST 3700 WOMEN'S STUDIES TOPICS IN LITERATURE**

[3 hours] Specific topics vary. Check schedule of classes for specific subject. Prerequisite: WGST 2010, 3010 or permission of instructor. Recommended: ENGL 2700, 2800 or ENGL 3790.

### **WGST 3750 WOMEN AND LITERATURE**

[3 hours] Examines literary works in light of major issues raised by feminist criticism. Specific emphasis varies. Recommended ENGL 2700 or 3790. U.S. multicultural course

### **WGST 3800 SEXUAL POLITICS**

[3 hours] This course examines sexual politics through studying canonical literature of Western political theory, feminism and postmodern theory.

### **WGST 3980 TOPICS IN WOMEN'S STUDIES**

[3 hours] Specific topics vary. Check courses schedules for specific subject.

### **WGST 4000 WOMEN'S STUDIES TOPICS IN MUSIC**

[3 hours] Cross-listings of 4000-level courses with the music department. Specific topics vary. Check schedule of courses for specific subject and prerequisites.

### **WGST 4010 WOMEN'S STUDIES TOPICS IN FILM**

[3 hours] Specific topics vary. Check schedule of classes for specific subject and prerequisites.

### **WGST 4100 WOMEN'S STUDIES TOPICS IN SOCIOLOGY**

[3 hours] Specific topics vary. Check schedule of classes for specific subject and prerequisites.

### **WGST 4130 FAMILY VIOLENCE ACROSS THE LIFE CYCLE**

[3 hours] This course will examine the issues of family violence, including child abuse and elder abuse. Gender and cultural issues will be explored along with the intergenerational nature of family violence.

**WGST 4140 GENDER ROLES**

[3 hours] Sociocultural factors in development of gender identity and behavioral differences between men and women. Sex differentials in participation, power and reward in family, education and work, politics and community. Prerequisite: 6 hours of sociology or 9 hours of social science. U.S. multicultural course

**WGST 4160 HEALTH AND GENDER**

[3 hours] An examination of gender as a predisposing factor of health status, health behavior, health care delivery, and the structure and posture of health care professionals. Writing intensive (WAC) course. Prerequisite: 6 hours of sociology or 9 hours of social science.

**WGST 4170 MENTAL HEALTH AND GENDER**

[3 hours] This course will examine the significance of gender in understanding the historical development of mental health concepts. Contemporary feminist critiques of diagnostic categories will be discussed.

**WGST 4180 GENDER AND WORK**

[3 hours] Analysis of the contemporary position in the U.S. work force focusing on the expansion of the number of women joining the labor force in recent decades, and the persistence of relatively low pay, status and authority in female-dominated occupations. Prerequisite: 6 hours of sociology or 9 hours of social science

**WGST 4190 GENDER IN CROSS-CULTURAL PERSPECTIVE**

[3 hours] Analysis of gender stratification and its impact on culture in various nations and across ethnic groups in the United States. Prerequisite: 6 hours of sociology or 9 hours of social science Non-western multicultural course

**WGST 4200 WOMEN'S STUDIES TOPICS IN SCIENCE**

[3 hours] Cross-listings of 4000-level courses with biology, chemistry, geology, math, natural sciences, physics and pre-med. Specific topics vary. Check schedule of courses for specific subject and prerequisites.

**WGST 4300 WOMEN'S STUDIES TOPICS IN PSYCHOLOGY**

[3 hours] Cross-listings of 4000-level courses with the psychology department. Specific topics vary. Check schedule of courses for specific subject and prerequisites determined by the psychology department.

**WGST 4350 WOMEN'S STUDIES TOPICS IN COMMUNICATION**

[3 hours] Cross-listings of 4000-level courses with the communication department. Specific topics vary. Check schedule of courses for specific subject and prerequisites determined by the department of communication.

**WGST 4410 WOMEN'S STUDIES TOPICS IN FRENCH**

[3 hours] Specific topics vary. Check schedule of courses for specific subject. Prerequisite: FREN 3210, 3220

**WGST 4420 WOMEN'S STUDIES TOPICS IN GERMAN**

[3 hours] Specific topics vary. Check schedule of courses for specific subject. Prerequisite: 2 courses at the 3000 level or permission of the instructor

**WGST 4430 WOMEN'S STUDIES TOPICS IN SPANISH**

[3 hours] Specific topics vary. Check schedule of courses for specific subject. Prerequisite: 2 courses at the 3000 level or permission of the instructor

**WGST 4440 LA PRODUCTION FEMININE**

[3 hours] A study of texts produced by women in the French language in various fields (for example, literary theory, film, literature, philosophy, psychoanalysis, semiotics, post-colonial theory). Prerequisite: FREN 3210 and FREN 3220

**WGST 4500 WOMEN'S STUDIES TOPICS IN HISTORY**

[3 hours] Cross-listings of 4000-level courses with the history department. Specific topics vary. Check schedule of courses for specific subject and prerequisites.

**WGST 4510 WOMEN IN AMERICAN HISTORY**

[3 hours] This course presents American History from early settlement to the present by examining the contributions of women, in interaction with men, to the immensely complex fabric of American life. U.S. multicultural course

**WGST 4540 WITCHCRAFT AND MAGIC IN MEDIEVAL AND EARLY MODERN EUROPE**

[3 hours] Witchcraft, religion and magic in western Europe from the 12th through 17th centuries, focusing on the origins of witchcraft belief, diabolical magic, the witchcraft and its decline.

**WGST 4550 WOMEN'S STUDIES TOPICS IN PHILOSOPHY**

[3 hours] Cross-listings of 4000-level courses with the philosophy department. Specific topics vary. Check schedule of courses for specific subject and prerequisites.

**WGST 4600 WOMEN'S STUDIES TOPICS IN POLITICAL SCIENCE**

[3 hours] Cross-listings of 4000-level courses with the political science department. Specific topics vary. Check schedule of courses for specific subject and prerequisites as determined by the political science department.

**WGST 4610 FEMINIST POLITICAL THEORY**

[3 hours] An analysis and discussion of contemporary feminist theory. Prerequisite: PSC 2800

**WGST 4700 WOMEN'S STUDIES TOPICS IN LITERATURE**

[3 hours] Specific topics vary. Check schedule of courses for specific subject. Prerequisite: WGST 2010, 3010 or permission of instructor. Recommended: ENGL 2700, 2800 or 3790.

**WGST 4760 FEMINIST READINGS OF LITERATURE**

[3 hours] Classic works by diverse American and English men and women considered in light of significant recent feminist scholarship and how such perspectives enhance classroom teaching and academic production. Prerequisite: WGST 2010, 3010 or permission of instructor

**WGST 4770 AMERICAN WOMEN WRITERS**

[3 hours] Author/authors vary with each offering. Consult schedule of courses for specific subject. Recommended ENGL 2700, 2800 or 3790. Prerequisite: WGST 2010, 3010 or permission of instructor

**WGST 4780 BRITISH WOMEN WRITERS**

[3 hours] Author/authors will vary with each offering. Consult schedule of courses for specific subject. Prerequisite: WGST 2010, 3010 or permission of instructor. Recommended ENGL 2700, 2800 or 3790.

**WGST 4810 WOMEN'S HEALTH CARE**

[3 hours] The course is designed to consider those personal health topics of special interest and applicability to women. The focus will be upon the role of self-understanding and self-help in promotion of health and well-being.

**WGST 4870 FEMINISMS**

[3 hours] This introduction to global feminist thought familiarizes students with feminist terminology and a variety of feminist theoretical frameworks. Prerequisite: WGST 2010 OR 3010 Corequisite: WGST 3010

**WGST 4890 WOMEN'S STUDIES RESEARCH AND METHODOLOGIES**

[4 hours] Investigates and applies current trends in Women's Studies as a discipline and the ways in which Women's Studies methodologies inform other disciplines. Requires research project. Prerequisite: WGST 3010

**WGST 4900 SEMINAR IN WOMEN'S STUDIES**

[3 hours] Seminar focused on timely topics in Women's Studies chosen by rotating faculty. Prerequisite: WGST 3010 and permission of instructor

**WGST 4910 HONORS THESIS IN WOMEN'S AND GENDER STUDIES**

[1-3 hours] Supervised research and writing for honors students only. Prerequisite: Permission of departmental honors director, permission of instructor

**WGST 4940 INTERNSHIP IN WOMEN'S STUDIES**

[1-3 hours] Practical field experience applying Women's Studies theories, arranged in conjunction with the department of women's and gender studies. Students must have pre-approval based on detailed written proposal. Prerequisite: WGST 3010 and permission of instructor

**WGST 4980 ADVANCED TOPICS IN WOMEN'S STUDIES**

[3 hours] A course on a special topic in Women's Studies. Consult schedule of courses for topic to be studied and semester offered. Recommended WGST 3010.

**WGST 4990 INDEPENDENT STUDY IN WOMEN'S STUDIES**

[1-4 hours] Supervised independent reading and research on selected topics. Before the end of open registration, students must present the supervising instructor a detailed written proposal and get written approval. Prerequisite: WGST 3010

