ACCOUNTING • ACCT

2000 Survey of Accounting (3) Credit will not be given for both this course and ACCT 2001. Students in non-business curricula are advised to enroll in ACCT 2000 if interested in understanding management accounting processes, but are not required to take ACCT 2000 or ACCT 2001, unless they plan to pursue a business degree at a subsequent date. All students in the E. J. Ourso College of Business are required to take ACCT 2001. Introduction to the meaning of the values presented in financial statements; management accounting concepts and internal decision making; fundamentals of individual income taxes.

2001 Introductory Financial Accounting (3) Prereq.: MATH 1021 or equivalent. An honors course, ACCT 2002, is also available. Credit will not be given for both this course and ACCT 2000 or ACCT 2002. Required of all students in the E. J. Ourso College of Business. Students in nonbusiness curriculum are advised to enroll in ACCT 2000 if they are given the option. ACCT 2001, is also available. Credit will not be given for both this course and ACCT 2001, unless they plan to pursue a business degree at a subsequent date. Financial accounting with emphasis on knowledge required for financial statements, their preparation cycle, including income measurement and financial statement preparation; accounting for current and plant assets, current and long-term liabilities, stockholders’ equity, and cash flows.

2002 HONORS: Introductory Financial Accounting (3) Same as ACCT 2001, with special honors emphasis for qualified students. Credit will not be given for this course and ACCT 2001.

2101 Introductory Managerial Accounting (3) Prereq.: ACCT 2000 or 2001 or equivalent. Not for students majoring in Accounting. An honors course, ACCT 2102, is also available. Credit will not be given for both this course and ACCT 2102. Principles and methods of accounting concerned with data collection and presentation for purposes of internal management evaluation and decision making.

2102 Intermediate Managerial Accounting (3) Same as ACCT 2101, with special honors emphasis for qualified students. Credit will not be given for this course and ACCT 2101.

3001 Intermediate Accounting—Part I (3) Prereq.: grade of “C” or above in ACCT 2001 or equivalent; MATH 1431. College of Business students or permission of department required. Credited will not be given for both this course and ACCT 2002 or ACCT 3002. Accounting principles underlying the preparation of financial statements, their application in measurement and reporting of selected balance-sheet items and related revenue and expense recognition.

3002 HONORS: Intermediate Accounting—Part I (3) Same as ACCT 3001, with special honors emphasis for qualified students. Credit will not be given for this course and ACCT 3001.

3021 Intermediate Accounting—Part II (3) Prereq.: grade of “C” or above in ACCT 3001. Continuation of ACCT 3001. Concepts of accrual-revenue liabilities, income pensions, leases, stockholders’ equity, earnings per share, accounting changes and corrections of errors, and income and balance-sheet presentations.

3121 Cost and Analysis Control (3) Prereq.: grade of “C” or above in ACCT 3001. Nature, objectives, basic systems, and procedures of cost accounting and control for manufacturing firms; cost-volume-profit relationships; standard costs and variance analysis; direct costing; relevant costs; activity-based costing.

3122 Accounting Information Systems (3) Prereq.: grade of “C” or above in ACCT 3001 and IDS 1400. Majors only or permission of department. Analysis and design of standard accounting systems; emphasis on computerized systems and internal control issues.

3201 Fundamental Tax Problems and Tax Planning for Individuals (3) Not open to accounting majors. Not intended to satisfy the requirements to sit for the CPA exam. For students with little or no previous work in accounting. Credit will not be given for both this course and ACCT 3221. General course in taxation; emphasis on aspects of taxation affecting the individual; federal and state income, estate, inheritance, gift, excise, and payroll taxes.

3221 Income Tax Accounting I (3) Prereq.: registration in or grade of “C” or above in ACCT 1001. Credit will not be given for both this course and ACCT 3201. Fundamentals of federal income taxation with respect to individuals and other entities, income inclusions and exclusions, and statutory deductions in arriving at tax liability.

3222 Auditing (3) Prereq.: grade of “C” or above in ACCT 3021 and 3202. Theoretical and practical development of the independent audit function; generally accepted auditing standards; collection of audit evidence; understanding internal control; risk assessment; internal audit, transaction cycles; and reporting.

3231 Internal Auditing (3) Prereq.: ACCT 3001 and 3201. Auditing standards, ethics, concepts, audit techniques, and reporting practices.

4021 Cases in Accounting Policy (3) Prereq.: accounting major with senior standing; Case approach; integrates financial accounting concepts, tax accounting concepts, and management uses of accounting information; emphasis on financial reporting to owners, the financial community, regulatory agencies, and the general public; relationship of accounting to the law.

4022 Advanced Accounting (3) Prereq.: grade of “C” or above in ACCT 3021; MS in accounting students or permission of department. Completion of the core accounting sequence; business combinations, consolidated financial statements, segment reporting, foreign operations, and Securities and Exchange Commission procedures.

4121 Advanced Cost Analysis (3) Prereq.: grade of “C” or above in ACCT 3121. Measurement, interpretation, and application of cost in decision making; cost systems and related control for business; interpretation and evaluation, written report by the professional.

4202 Governmental and Not-For-Profit Accounting (3) Prereq.: grade of “C” or above in ACCT 3001. Credit will not be given for this course and ACCT 4202. Accounting, budgeting, financial statements, and financial records of local, state, and federal governmental bodies and of private nonprofit institutions.

4501 Petroleum Accounting (3) Prereq.: grade of “C” or above in ACCT 3001. Credit will not be given for both this course and ACCT 4501. Technical concepts of petroleum accounting, including application of accounting concepts to the petroleum extraction and production processes, and natural gas exploration, appraisal and development, drilling and development operations, production, and oil and gas revenues.

4502 Advanced Theory of Accounts (3) Prereq.: ACCT 3201 or 3221 or permission of instructor. Corporate financial accounting concepts and practices by management; preparation of financial statements; interpretation of corporate financial reports.

7122 Budgeting, Cost Analysis, and Control (3) Prereq.: grade of “C” or above in ACCT 3221 or permission of department. Accounting systems for decision-making and control.

7201 Tax Aspects of Business Entities (3) Prereq.: ACCT 3201 or equivalent. Basic concepts of business entities, including corporations, partnerships, and S corporations; tax consequences of the formation and operation of a business entity, and distributions to the owners.

7202 Income Taxation of Estates and Trusts (3) Prereq.: ACCT 3221 or equivalent. Credit will not be given for both this course and ACCT 4202. Basic tax concepts of corporations, including creation, operation, ownership changes, acquisitions, liquidations, reorganizations, and consolidations.

7210 Tax Research, Planning and Business Decision Making (3) Prereq.: ACCT 3221 or equivalent. Credit will not be given for both this course and ACCT 4225. Fundamentals tax research methodology based on the Internal Revenue Code, regulations and rulings, judicial interpretations, annotated and topical tax services, computerized tax research methods, and techniques of communicating research results.

7222 Auditing Theory and Standards (3) Prereq.: ACCT 3222. MS in accounting students or permission of instructor. A comprehensive analysis of the theory and practice of independent auditing.

7231 Internship in Accounting (3) Prereq.: permission of instructor and department chair. Required of grade of “C” or above in ACCT 7231. Credit will not be given for both this course and ACCT 7231. Internship experience, credit evaluated by a faculty member and director of an audit, a written report by the professional, and a written report by the student.

7232 Cases in Internal Auditing (3) Prereq.: ACCT 7243. Primarily for MBA and MS students. Theory of internal auditing; efficiency, effectiveness, and economy audits.

7233 Internal Auditing (3) Prereq.: consent of instructor. Primarily for MBA and MS students. Theory of internal auditing; efficiency, effectiveness, and economy audits.

7234 Systems Auditing (3) Prereq.: ACCT 3222 or 3233, or permission of instructor. Credit will not be given for this course and ACCT 4244. Study of risk and controls relative to the deterrence, prevention, and detection of beneficial and detrimental fraud.

7244 Systems Auditing (3) Prereq.: ACCT 3222 or 3233, or permission of instructor. Credit will not be given for this course and ACCT 4244. Study of risk and controls relative to the deterrence, prevention, and detection of beneficial and detrimental fraud.

7250 Current Topics in Federal Income Taxation (3) Prereq.: ACCT 3221 or equivalent. MS in accounting students or permission of instructor. Current topics in the control and audit of computer systems.
7255 Fundamentals of Federal Income Tax (3) Prereq.: ACCT 2221 or equivalent. Taxation of individuals; personal, business, estate, and gift taxes; use of internal revenue service, and the life and work of an Air Force junior officer. 

2011, 2012 Leadership Laboratory II (1,1) F, S


2000 Pre-Dissertation Research (1-9) A

1001 Elementary Swahili Language and Culture I (4) See SWAH 1001.

1002 Elementary Swahili Language and Culture II (4) See SWAH 1002.


AGRICULTURAL ECONOMICS • AGEC

General education courses are marked with stars (*). 2003 Introduction to Agricultural Economics (3) F Nature and scope of agribusiness; application of management and marketing concepts to selected agribusiness problems; exploring agribusiness management as a profession.

3003 Economic Analysis in Agricultural Business (3) F Prereq.: AGEC 2003 or equivalent; MATH 1411, 12 hrs., lecture or lab. Applications of graphical, mathematical, and computer-based microeconomic analysis to problems in the production and marketing of food and agricultural products.

3231 Agribusiness Commodity and Food Products Marketing (3) S Prereq.: AGEC 2003 or equivalent. An overview of the agricultural commodity and food marketing system; marketing, management, and economic principles are applied to the formulation and implementation of marketing plans for agricultural commodities and branded food products; futures market trading principles.

3303 Farm Management (3) F-O Prereq.: AGEC 2003 or equivalent; Fundamental economic and business principles applied to a farm business; comprehensive and integrated treatment of management concepts for successful operation of a farm business.

3411 Agricultural Business Management Decisions (3) F Prereq.: AGEC 2003 or equivalent; Identification of typical decisions of agricultural business firms; development of decision concepts, procedures, and analyses that facilitate planning, organizing, directing, coordinating, and controlling functions within agricultural business firms.

3530 Natural Resource Economics (3) S Prereq.: AGEC 2003 or equivalent. Economic rationale for collective, public action in allocation of natural resources in agriculture; emphasis on economic efficiency, property rights, resource use, legal concepts, institutions, and project evaluation.

3700 Internship (1-3) Prereq.: AGEC 2003 or equivalent and approval of department head. May be taken for a max. of 3 sem. hrs. of credit. Supervised career-oriented experience with a business or organization in the food and fiber system.

3803 Agricultural Law (3) F-O Principles of law and their application to agricultural business firms and institutions; legal processes and relationships relevant to agricultural Louisiana Civil Code and statutes; federal law, including bankruptcy code; analysis and review of cases, documents, and processes.

4203 Intermediate Food and Fiber Products Marketing (3) S Prereq.: AGEC 1001 or equivalent. Industrial organization analysis applied to the food and fiber system; emphasis on structural problems and their control by competition, antitrust, and government.
4213 Economics of Milk Marketing Systems (3) S E-Prereq.: AGEC 1051 or equivalent; Analysis of the milk production and marketing system; market channels, characteristics, institutions, and government regulations in pricing and marketing.

4277 Agricultural Price Analysis (3) S Prereq.: AGEC 2003 or equivalent; MAT 1411; and EXST 2201 or SDS 2001. Economic processes of price discovery and price determination and their influence on input and output markets; emphasis on methods of price analysis and their application to decision processes; analysis of cyclical, trend and seasonal movements in prices.

4303 Agricultural Finance (3) F Prereq.: AGEC 2003 or equivalent. Capital acquisition and use in the agricultural sector; cost and availability of credit; emphasis on financial management concepts for managing growth, leverage, liquidity, risk, and capital investment in agricultural business.

4431 Agricultural Business Planning, Management, and Policy (3) Prereq.: senior standing; AGEC 3003, 3213, 3413, MKT 3440, MGT 3280, and BLAW 3200 or 5201. Integration of management, marketing, and financial concepts for successful planning and implementation of agricultural business decisions; feasibility analysis, marketing policy, personnel policy, marketing mix, pricing decisions, market segmentation, marketing strategy, and financial policy.

4443 Farm and Rural Land Appraisal (3) F-E-Prereq.: AGEC 2003 or equivalent; student has completed AGEC 2430 or equivalent. Theory, methods, and procedures of real estate appraisal applied to rural property; trends in rural real estate markets; factors influencing rural real estate values; approaches used in rural real estate valuation.

4603 Agricultural Policy (3) F Prereq.: AGEC 2003 or equivalent. Role of agriculture in the national economy; how agricultural policy decisions affect the general public; emphasis on economic impacts of policies on producers and consumers of agricultural products; effects of other nations’ policies on American agriculture.

4613 Agricultural Trade (3) S-Prereq.: AGEC 3003 or equivalent. Survey of the role of trade in agricultural production, consumption, and trade; emphasis on trade in agricultural goods and raw resource management.

7000 Internship in Agribusiness Administration (3) F, S, Su Prereq.: prior approval of student’s graduate committee. Open only to graduate agricultural economics master’s students. May be taken for a max. of 3 hrs. credit; 300 hrs. of learning experience. General supervision by a faculty member; direct supervision by an agribusiness professional. Pass/fail grading based on a written evaluation by the professional supervisor, a written report by the student, a final oral defense, and the faculty committee’s evaluation.

7100 Advanced Topics in Agricultural Economics (1-3) F, S, Su Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. New and specialized topics in agricultural economics.

7300 Agricultural Economic Applications (3) S Prereq.: ECON 7700. Applications of economic theory to issues in agricultural production, consumption, and utilization of agricultural goods, and natural resource management.

8000 Thesis Research (1-12 per sem.) S, Su Grading. Research, culminating in an acceptable written report and a seminar presentation.

1001 Introduction to Agriculture (1) F S, Su Prereq.: AGEC 1051. Structure, trade, and practices in exporting and importing regions and nations; policies of major agronomic and educational requirements in all fields of agriculture, and careers in agricultural practice. General education courses are marked with an asterisk (*).

1001 Transportation to Agriculture (1) S F Prereq.: AGEC 1051. Enrollment in this course requires consent of the College of Agriculture or by permission of department. Opportunities and educational requirements in all fields of agriculture, and careers in agricultural practice. General education courses are marked with an asterisk (*).

1001 Science and Society (3) S Prereq.: AGEC 1051. Principles of biology applied in a sociological context; relationships among scientific inquiry, ethics, social values, and public policies for the beginning science and nonscience student.

1001 Special Topics in Agriculture (1-3) Prereq.: permission of department. May be repeated for a max. of 6 sem. hrs. credit. Faculty directed agriculture seminar designed to aid students in becoming aware of the issues facing them as they pursue leadership roles in agriculture fields.

2001 Directed Studies in Agricultural Leadership Development (3) Prereq.: HRE 2723 and permission of department. Faculty directed leadership development program in an agricultural-related activity or program intended to integrate academic learning with practice.

2101 Field Internship in Agricultural Leadership Development (3) Prereq.: HRE 2723 and permission of department. Faculty directed leadership development program in an agricultural-related activity or program intended to integrate academic learning with practice.

2430 Soil Fertility and Soil Management (4) S Prereq.: AGRO 2051. 3 hrs. lecture; 2 hrs. lab. Factors affecting plant growth and utilization of essential elements; mechanisms of nutrient uptake; diagnosis of deficiencies; use of lime and fertilizers; potential nutrient losses.

2455 Chemical Properties of Soil (4) S Prereq.: AGRO 2051 and CHEM 2051. 3 hrs. lecture; 3 hrs. lab. Also offered as EMIS 4055. Chemical and mineralogical properties of soils; their effect on nonpoint source pollution from agriculture; effects of nonhazardous amendments on soil properties.

3046 Microbial Ecology and Nutrient Cycling in Soils (4) S Prereq.: AGRO 2051 and BIOL 2551. 3 hrs. lecture; 3 hrs. lab. Also offered as AGEC 3046 EMIS 4056. Microorganisms in terrestrial environments and biogeochemical processes influencing C, N, and P cycling; role of microorganisms in biological nitrogen fixation, plant nutrient availability, formation of soil humus, and decomposition of organic and inorganic materials; impact of microbial processes on environmental quality.

3105 Soil Morphology and Classification (4) F Prereq.: AGRO 2051. 2 hrs. lecture; 4 hrs. lab (field and mapping). Genesis, profile morphology, processes related to classification and soil taxonomy; relationships of soil process and classification to environmental quality.

3106 Principles of Plant Breeding (4) S Prereq.: AGRI 2072 or equivalent. 3 hrs. lecture; 2 hrs. lab. Also offered as HORT 4064. Methods of plant genetic improvement: hybridization, genetic manipulation, and variety development; selection for insect, disease, and environmental stresses; genetics of crop improvement; breeding for improved food and fiber; biotechnology and its role in modern agriculture.

4201 Soil Science (4) F Prereq.: CHEM 1002 or 1212 or equivalent. 3 hrs. lecture; 2 hrs. lab. Also offered as EMIS 2051. Principles of soil science; properties of soils related to plant growth and the environment.

4206 Introduction to Turfgrass Management (3) See HORT 2471.

3000 Principles of Crop Production (3) F Prereq.: BIOL 1402 or equivalent. Crop production practices relative to major crops grown in Louisiana and the U.S.; seed bed preparation, planting, weed and pest control; harvest and processing practices relative to each major crop group.

3010 Research Problems (3) F S, Su Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Independent research under a faculty member, culminating in an oral and written report.

3011 Fall Crop Production Laboratory (1) F Prereq.: consent or registration in AGRO 3000. Field and laboratory research designed to provide an understanding of the growth and practices involved in production of soybeans, cotton, and sugarcane.

3012 Spring Crop Production Laboratory (1) S Prereq.: AGRO 3000. Field laboratory research designed to provide an understanding of the growth and practices involved in the production of winter small grains.

3013 Summer Crop Production Laboratory (1) Su Prereq.: AGRO 3000. Field and laboratory research designed to provide an understanding of the growth and practices involved in the production of rice, corn, and sugarcane.

4302 Soil Conservation (2) F AGRO 2051. Also offered as EMIS 4054. Soil conservation and sedimentation; their effects on the quality of the environment; methods of reducing erosion and soil environmental pollution.

4309 Agronomic Internship (3) F S Prereq.: overall GPA of 2.30 and written consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Work experience in crop, soil, or environmental growth, and care of soil culminating in acceptable written reports and a seminar presentation.

4005 Foreage Ecology and Management (3) S Forage crop physiology, adaptation, production, utilization, and management; impact on people, animals, and the environment.

4052 Soil Fertility and Soil Management (4) S Prereq.: AGRO 2051. 3 hrs. lecture; 2 hrs. lab. Factors affecting plant growth and utilization of essential elements; mechanisms of nutrient uptake; diagnosis of deficiencies; use of lime and fertilizers; potential nutrient losses.

4055 Chemical Properties of Soil (4) S Prereq.: AGRO 2051 and CHEM 2051. 3 hrs. lecture; 3 hrs. lab. Also offered as EMIS 4055. Chemical and mineralogical properties of soils; their effect on nonpoint source pollution from agriculture; effects of nonhazardous amendments on soil properties.

4056 Microbial Ecology and Nutrient Cycling in Soils (4) S Prereq.: AGRO 2051 and BIOL 2551. 3 hrs. lecture; 3 hrs. lab. Also offered as BIOL 4256 and EMIS 4056. Microorganisms in terrestrial environments and biogeochemical processes influencing C, N, and P cycling; role of microorganisms in biological nitrogen fixation, plant nutrient availability, formation of soil humus, and decomposition of organic and inorganic materials; impact of microbial processes on environmental quality.

4058 Soil Morphology and Classification (4) F Prereq.: 2 hrs. lecture; 4 hrs. lab (field and mapping). Genesis, profile morphology, processes related to classification and soil taxonomy; relationships of soil process and classification to environmental quality.

4064 Principles of Plant Breeding (4) Prereq.: AGRI 2072 or equivalent. 3 hrs. lecture; 2 hrs. lab. Also offered as HORT 4064. Methods of plant genetic improvement: hybridization, genetic manipulation, and variety development; selection for insect, disease, and environmental stress resistance; genetics of crop improvement; breeding for improved food and fiber; biotechnology and its role in modern agriculture.
4071 Advanced Soil Physics (4) F, S hrs. lecture; 2 hrs. lab. Study of general plant ecological principles, reproduction, dormancy, interference, allelopathy, competition, herbicide resistance, and the impact of weed control mechanisms on weed crop and soil systems.

4077 Environmental Soil Physics (3) Prereq.: AGRO 2501. Also offered as EMS 4077. The soil physical system; the soil components and their physical interactions; processes involving water flow in saturated and unsaturated soils, air, and heat; fate and transport of applied chemical and physical profile and processes governing the mobility of contaminants.

4078 Land Use Planning and Land Management (3) S Prereq.: AGRO 3040 or consent of instructor. 2 hrs. lecture; 2 hrs. lab. Principles and management based on chemical, mineralogical, and physical properties of soils; includes applications of soils, plants, hydrology, and remote sensing datasets for advanced GIS analysis; areas of use and management include crops, pasture, forest and woodland, metropolitan, transportation, waste disposal, wetlands, and disturbed lands.

4089 Advanced Crop Production and Management (3) S-O Prereq.: AGRO 1021 and BIOL 3060 or equivalent. Effect of cultural practices on physiological/ecological interactions affecting crop growth, development, and yield.

4090 Agronomic Problem Solving (3) S-E Prereq.: AGRO 2501 or consent of instructor. BIOL 3060 or AGRO 4080; or AGRO 3000 or equivalent. Solutions to specific agronomic problems; emphasis on researching literature, group discussion, and development of answers to hypothetical problems in agronomy.

4091 Special Topics in Crop Science (1-3) Prereq.: written consent of instructor. May be repeated for credit; a total of 6 sem. hrs. may be earned in AGRO 4091 and 4092 combined.

4092 Special Topics in Soil Science (1-3) Prereq.: written consent of instructor. May be repeated for credit; a total of 6 sem. hrs. may be earned in AGRO 4091 and 4092 combined.

7001 Agronomy Seminar (1) May be repeated for credit. 1 hr. seminar; reports.

7040 Research Methods in Plant Science (3) S-E Prereq.: AGRO 3000 or equivalent. Field research experience. Research activities and methodology used to conduct field research in plant science and pest management disciplines from initial planning through publication of results; areas of emphasis include: research proposal preparation and protocol development; selection of experimental design and implementation of research; data analysis, interpretation, and presentation; and manuscript preparation.

7041 Plant-Herbicide Physiology (3) F-E Prereq.: AGRO 4072 or BIOL 3060 or equivalent. Lab project includes several techniques used in plant-herbicide physiology research. Physiological and physical interactions in the plant-herbicide system; emphasis on the specific mode of action, entry, movement, metabolism, and selectivity mechanisms of each chemical family of herbicides.

7042 Soil-Pesticide Interactions (3) E-F Prereq.: AGRO 2051 and AGRO 4070 or equivalent. Chemical, physical, and biological properties of soils as they affect performance and dissipation of pesticides; fate of pesticides in the environment.

7051 Advanced Soil Fertility and Plant Nutrition (4) S-E Prereq.: AGRO 4052 and BIOL 3060 or equivalent. 3 hrs. lecture; 2 hrs. lab. Principles of bioavailability and acquisition of mineral nutrients by crop plants; interactions of plant roots with the soil environment; fertilizer use efficiency.

7052 Micronutrients in Soils and Crops (4-S) 3 hrs. lecture; 2 hrs. lab. Theory and current literature on the micronutrients (boron, copper, zinc, manganese, iron, molybdenum, and cobalt) and their influence on growth of crop plants.

7055 Advanced Soil Chemistry (3) F-O Prereq.: AGRO 4055. MATH 1552, and one semester of physical chemistry. Theory of soil reaction; introduction of specific properties of soils; emphasis on soil solution chemistry and soil environmental properties.

7056 Current Topics in Soil Microbiology (3) F-O Prereq.: AGRO 4056 or equivalent. 2 hrs. lecture; 2 hrs. lab. Role of soil microbial processes in maintaining environmental quality; fate and behavior of introduced microorganisms; methods of development of a laboratory consistent with students’ interests.

7057 Advanced Soil Physics (4) F hrs. lecture; 2 hrs. lab. Also offered as EMS 7057. Physical properties of the soil matrix, soil-water retention, and processes governing water, gas, solute, and heat fluxes in the soil profile.

7058 Advanced Pedology (3) S-O Theory and current literature in pedology; processes responsible for the physical, chemical, and mineralogical properties found in soil environments.

7066 Agronomic Crop Breeding Techniques (1) F,S. 2 hrs. lab. May be repeated in the alternate semester for a max. of 2 hrs. of credit. Practical experience in hybridization of agronomic and horticultural crops; objectives, methodology, and rationale specific breeding programs; selection procedures; computerized record keeping and data management.

7068 Soil Mineralogy (3) F-O Prereq.: GEOL 2082 or AGRO 4055 or equivalent. 2 hrs. lecture; 3 hrs. lab. Variations in soil parent material composition; effects of specific soil properties and interactions; their significance to agriculture and the environment.

7070 Advanced Plant Breeding (4) S-E Prereq.: AGRO 4064 and EXST 7014; or equivalent. 3 hrs. lecture; 2 hrs. lab. Also offered as HORT 7070. Advanced methods of plant breeding; emphasis on breeding for insect, pathogen, and abiotic stress resistance; breeding strategies and theory; resource allocation and evaluation of breeding methodologies.

7071 Advanced Plant Genetics (4) S-O See HORT 7071.

7074 Quantitative Genetic Plant Improvement (3) F-E Prereq.: HORT 7061 or AGRO 7065 and EXST 7202. Also of fered as BIOL 7074. Genotypic and environmental variances, their effects and interactions, homeostasis, stability; variances, covariances, combining ability, genetic advance, selection indices, molecular markers for quantitative trait loci.

7165 Biogeocemetery of Wetland Soils and Sediments S (3) S same as OCS 7165.

8000 Thesis Research (1-12 per semester) "S"/"U" grading.

9001 Research in Crop Science (3-6) Prereq.: consent of department.

9002 Research in Soil Science (3-6) Prereq.: consent of department.

9000 Dissertation Research (1-12 per semester) "S"/"U" grading.

ANIMAL SCIENCE • ANS

1011 Introduction to Animal Science (3) F,S hrs. Science and production of beef cattle, sheep, swine, and horses; their role in American agriculture.

2001 Farm Unit Internship (1) F,S,Su Prereq.: ANSC 1011. 3 hrs. work experience. May be taken for a max. of 5 sem. hrs. of credit, one each in beef, horse, sheep, swine, and meat units.

2133 Growth and Development of Livestock (3) 2 hrs. lecture; 2 hrs. lab. Cell, tissue, and body growth, development, and composition; patterns of tissue deposition in livestock; control and modification of normal and abnormal growth and measurement of composition of beef, sheep, swine, and horses.

3033 Elements of Live Animal and Carcass Evaluation (3) F hrs. lecture; 4 hrs. lab. Basic principles and techniques involved in evaluation of meat animals and their carcasses.

3034 Advanced Live Animal and Carcass Evaluation (3) S hrs. lecture; 4 hrs. lab. On pedogenic processes responsible for the live animal, carcass evaluation; emphasis on cats and dogs; opportunities in the pet-related fields and industries.

2133 Growth and Development of Livestock (3) 2 hrs. lecture; 2 hrs. lab. Cell, tissue, and body growth, development, and composition; patterns of tissue deposition in livestock; control and modification of normal and abnormal growth and measurement of composition of beef, sheep, swine, and horses.

4095 Reproductive Physiology and Management of Zoo, Laboratory, and Companion Animals (4) S-E Prereq.: basic course in biology or zoology; and ANSC 4045 or equivalent. 3 hrs. lecture; 2 hrs. lab. Field trips are required. Reproductive biology of zoo, laboratory, and companion animals, with emphasis on breeding management.

7001 Experimental Methods (2) F Prereq.: consent of instructor. 3 hrs. lecture; consent of instructor. Scientific methods applied to animal science.

7006 Advanced Animal Genetics (3) F Prereq.: DARY 7004 or equivalent. Application of genetic principles and theory to farm livestock populations.

7050 Advanced Animal Physiology and Laboratory Techniques (4) F,E Prereq.: consent of instructor. 3 hrs. lecture; 2 hrs. lab. Physiological processes relating to domestic animal homeostasis and their interaction with production; current laboratory techniques.

7051 Advanced Physiology of Reproduction (3) S-O Prereq.: AGRO 4064 or DARY 4065. Processes of reproduction in farm animals.

7052 Biotechnology of Gamete and Embryo Physiology and Micromanipulation (4) S (even-numbered years) Prereq.: AGRO 4064 or DARY 4065. 3 hrs. lecture; 2 hrs. lab. Procedures for manipulation of mammalian gametes in vitro and general biotechnology techniques; emphasis on application to biological research.
4018 Historical Archaeology (3) Prereq.: Consent of department head. May be taken for credit: max. credit: 6 hrs. for MS degree and 9 hrs. for PhD degree. Research in animal nutrition, breeding, and production systems, industrial and military archaeology, and life in the U.S. S.

4020 Method and Theory in Archaeology (3) Prereq.: ANTH 1005 or equivalent. Empirical method and theory in archaeological research emphasizing the logic of scientific argument; history of American archaeology, a survey of modern archaeological interpretations, types of explanation, logic of archaeological classification, and formation of research designs.

4210 Advanced Field Methods in Archaeology (3-6) Prereq.: ANTH 2015 and 2016 or equivalent and at least one upper-division or graduate course in archaeology. May be taken for a max. of 6 sem. hrs. credit when topics vary. Advanced techniques of surveying, mapping, excavation, soil sampling, and recording.

4023 Latin American Cultures (3) Spanish-American cultures in Latin America; their relationship to current societal changes.

4031 Comparative Religions (3) Also offered as REL 4031. Religious systems in different levels of sociocultural evolution.

4032 Religion, Gender, and Society (3) See REL 4032.

4040 Physical Anthropology (3) Prereq.: ANTH 1001, or BIOL 1002 or BIOL 102. Evolutionary theory, human variation, fossil record of human evolution, and primate behavior.

4050 Black Music in America (3) Cultural and historical survey of musical genres created and developed by black Americans.

4051 Africa (3) Races and cultures of Negro Africa. 4053 African-American Ethnology (3) African-Americans in the western hemisphere; their origins, development, and present distinctiveness.

4054 Pidgin and Creole Languages (3) Prereq.: ANTH 1001 or ENGL 4010 or ENGL 4012 or COM 2030 or equivalent. Also offered as LING 4060. Relationships between various aspects of language and culture.

4064 Pidgin and Creole Languages (3) Prereq.: ANTH 1001 or equivalent. Also offered as FREN 4064 and LING 4064. Linguistic, sociolinguistic, and anthropological study of new languages that emerge in contact situations, particularly among peoples of different races and cultures; languages of slave trade and European commercial expansion from the 16th through 18th centuries.

4074 Place and Culture (3) Also offered as GEOG 4074. Consideration of place and culture as two core concepts in geography and anthropology.

4081 Human Evolution (3) The biological and cultural evolution of the human species.

4082 Social and Cultural Anthropology (3) For graduate students with little or no anthropology background. Culture, society, and language in primitive and complex settings.

4083 Quaternary Paleocology (3) See GEOG 4083.

4085 History and Theory of Ethnology (3) Major theories in all branches of anthropology; emphasis on cultural and social anthropiology.

4086 Human-Environment Interactions (3) See GEOG 4086.

4087 Gender, Place, and Culture (3) Also offered as GEOG 4087. Introduction to the major theories and methodological approaches to the study of gender, place, and culture.

4090 Ethnographic Methodology (3) Theories and techniques of ethnography; emphasis on utilization of informants.

4440 Vernacular Architecture and Material Culture (3) Also offered as ARCH 4440. Subject matter and instructor may vary; additional details available from department. World vernacular architecture, including indigenous and folk buildings; other forms of material culture.

4470 Folklore of the African Diaspora (3) African, Caribbean, and African-American cultures as viewed from the point of view of the diaspora.

4475 American Folklore (3) See ENGL 4475.

4490 Undergraduate Seminar in Anthropology (3) Prereq.: written consent of instructor. May be taken for a max. of 6 sem. hrs. credit when topics vary.

4997 Special Topics (3) Permission of instructor. May be taken for a max. of 6 sem. hrs. when topics vary.

4998 Independent Reading and Research in Anthropology (1-6) Prereq.: written consent of instructor. May be taken for a max. of 9 sem. hrs. An honors course, ANTH 4998, may be repeated for credit when topics vary.

4999 Honors: Independent Reading and Research in Anthropology (1-6) May be taken for a max. of 9 sem. hrs. An honors course, ARCH 1001, 12 hrs. studio. An Honors course, ARCH 1102 is also available. Emphasis on the organization of spaces, form and process, and development of skills in architectural design and modeling.

7060 Conversation and Discourse (3) Prereq.: completion of one course in linguistics. Also offered as LING 7060. Analysis of language in use; conversation, narrative, culturally specific genres; emphasis on discourse structure in naturally occurring discourse.

7074 Poetics of Place (3) Prereq.: ANTH/GEOG 4074 or permission of instructor. Also offered as GEOG 7074. Combination of the observational method of social science with the literary insights of poetry and fiction; understanding of how places where humans live out their lives convey a future of meanings beyond their utilitarian.

7081 Conceptual Issues in Human Evolution (3) Prereq.: Permission of instructor. May be repeated for a max. of 9 hrs. of credit when topics vary. Consideration of the various conceptual issues on human evolution.

7105 Seminar in Historical Archaeology (3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.

7108 Mesoamerican Archaeology Seminar (3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.

7200 Human Fertility (3) Biological, behavioral, and demographic aspects of human reproduction.

7901 Introduction to Graduate Study (1) Same as GEQG 7901. Techniques and methods of the profession for incoming graduate students.

7906 Nature of Culture (3)

7909 Selected Topics in Anthropology (3) Permission of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Also offered as ANTH 7909.

7954 Anthropology of Complex Societies (3) Anthropological assumptions of theory and technique; problems generated by research in contemporary Africa, India, Latin America, and Anglo-America.

7962 Field Methods in Linguistics (3) Prereq.: at least one upper-division or graduate linguistics course. 2 hrs. lecture, 1 hr. individual consultation. Also offered as LING 7962. Recording and analyzing a living non-European language and using a native-speaking informants.

7999 Research in Anthropology (1-6) Prereq.: written consent of instructor. May be repeated for credit. Total credit earned in ANTH 4998 and 7999 cannot exceed 9 sem. hrs. Also offered as LING 7999. Individual supervision of advanced research and field work in anthropology.

8000 Thesis Research (1-2 per sem.) Permission of instructor. “S”/“U” grading.

ARABIC • ARAB

Native speakers of Arabic will not receive credit for courses marked with an asterisk (*).

General education courses are marked with stars (★).

*1101 Beginning Arabic (4) Supplementary work in language laboratory. Introduction to alphabet, vocabulary, and grammar; elementary language study with oral, written, and reading practice.

*1102 Beginning Arabic (4) Prereq.: ARAB 1101 or equivalent. Supplementary work in language laboratory. Continuation of ARAB 1101. Elementary language study with oral, written, and reading practice.

*2101 Intermediate Arabic (4) Prereq.: ARAB 1102. Continuation of the study of Arabic. Supplementary work in language laboratory. Development of writing, reading, and speaking skills.

*2102 Intermediate Arabic (4) Prereq.: ARAB 2101. Continuation of the study of Arabic. Supplementary work in language laboratory. Development of writing, reading, and speaking skills.

ARCHITECTURE • ARCH

General education courses are marked with stars (★).

1001 Architectural Design I (6) Prereq.: permission of department, 12 hrs. studio. Emphasis on two-dimensional representation of three-dimensional forms; development of basic skills in architectural design and modeling.

1002 Architectural Design I (6) Prereq.: ARCH 1001, 12 hrs. studio. An Honors course, ARCH 1102 is also available. Emphasis on the organization of spaces, form and process, and development of skills in architectural design and modeling.
246

Architecture

1102 HONORS: Architectural Design II (6) Prereq.: ARCH 1002. 12 hrs. Same as ARCH 1002, with special emphasis for qualified Honor students.

2001 Architectural Design III (6) Prereq.: ARCH 1002 or 1102; coreq.: ARCH 2003. 12 hrs. studio. An Honor course. ARCH 2102 is also available. Emphasis on abstract and theoretical organizational concepts; space, form, function, and resolution of materials and structural systems.

2002 Architectural Design IV (6) Prereq.: ARCH 2001 or ARCH 2101; coreq.: ARCH 2006. 12 hrs. studio. An Honor course. ARCH 2102 is also available. Required field trip. Students are responsible for paying travel expenses associated with the course. Emphasis on process, materials, theory, site inventory, and analysis and impact of regionalism.


2006 Architectural Topics (3) Prereq.: ARCH 2003; coreq.: ARCH 2002. Use of case studies to contrast the meanings of buildings designed in urban or rural environments.


2145 Louisiana and Gulf Coast Building Culture (3) History and development of Louisiana and gulf coastal architecture from the 17th century to the present.

2401 Appreciation of Architecture (3) S Not open to architecture majors. Architectural concepts and principles; architectural vocabulary, style, symbolic form characteristics, spatial character, and refinements.

2402 Introduction to Structural Forms (3) S Prereq.: enrollment in professional program in architecture or interior design. Nonmathematical survey of structural elements and systems; their integration in the environmental design study of forces and force systems; state of stress; deformation; properties of shapes.

3000 Supervised Independent Study and Research (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit with consent of school director. Investigation of areas of interest not covered in other departmental courses.

3001 Architectural Design V (6) Prereq.: approval for advancement to upper division in architecture. 12 hrs. studio. An Honor course. ARCH 3101 is also available. Required field trip. Students are responsible for paying travel expenses associated with the course. Emphasis on programming, site analysis and planning, functional planning, and resolution of structural and architectural systems.

3002 Architectural Design VI (6) Prereq.: ARCH 3001 or ARCH 3101. 12 hrs. studio. An Honor course. ARCH 3102 is also available. Emphasis on planning buildings while incorporating studies in the technologies of materials, structure, environmental controls, lighting, and acoustics.


3004 Architectural Structures II (3) Prereq.: ARCH 3003. Design and application of timber and steel structures in architecture.

3005 History of Architecture I (3) The development of architectural and spatial forms as they relate to changing perceptions of self, society, and the natural world. From prehistory to the 13th century.

3006 History of Architecture II (3) Prereq.: ARCH 3003. The development of architectural and spatial forms as they relate to changing perceptions of self, society, and the natural world from the Italian Renaissance through modern times.

3007 Architectural Systems (3) Prereq.: approval for advancement to upper division in architecture. Detailed treatment of construction materials and systems, with emphasis on large scale application of enclosure systems and steel and concrete structures.

3008 Environmental Control Systems (3) Prereq.: approval for advancement to upper division in architecture. Principles and practices of selection and design of mechanical systems, including lighting, electrical distributions, acoustics, plumbing, vertical transportation, and fire suppression.

3011 HONORS: Architectural Design V (6) Prereq.: approval for advancement to upper division in architecture. 12 hrs. studio. Required field trip. Students are responsible for paying travel expenses associated with the course. Same as ARCH 3001, with special emphasis for qualified Honor students.

3012 HONORS: Architectural Design VI (6) Prereq.: ARCH 3001 or 3001. 12 hrs. studio. Same as ARCH 3002, with special emphasis for qualified Honor students.

3457 Hands on Materials (3) V Prereq.: ARCH 2134. 6 hrs. studio. Design and physical manipulation, construction, and fabrication of devices or components made primarily (but not necessarily exclusively) of steel.

4001 Architectural Design VII (6) Prereq.: ARCH 3002 or ARCH 3102. 12 hrs. studio. Service-learning course. An Honor course. ARCH 4101 is also available. Emphasis on the development of sustainable communities through analysis, building design, and the study of socially responsible approaches to development and building practice.

4002 Architectural Design VIII (6) Prereq.: ARCH 4001 or ARCH 4101. 12 hrs. studio. Service-learning course. ARCH 4302 is also available. Required field trip. Students are responsible for paying travel expenses associated with the course. Emphasis on the designs of single or multiple buildings in urban environments.

4003 Intensive Studio Design (6) Su Prereq.: admission to the MArch program. 12 hrs. studio. Introduction to design, analysis, and the development of basic architectural skills.


4032 Advanced Architectural Technology (3) Prereq.: ARCH 3008. Seminar relating to topics of architectural technologies including, but not limited to building structures, environmental controls, electronic transfer of information.

4033 Fundamentals of Architectural Technology (2) Su Prereq.: admission to the MArch program or consent of instructor. A survey of the fundamental theories and techniques of mathematical and physical science related to the application of architectural technology.

4041 Issues in Sustainability (3) Examination of issues in sustainability as they relate to the practice of architecture.

4051 Advanced 20th Century Architectural History (3) Prereq.: ARCH 4001, 4011 or 4101. 12 hrs. studio. The development of architectural history and theory; writing component.

4052 Advanced Architectural History (3) Prereq.: ARCH 3005, 3008. Topics on architectural history and theory.

4062 Urban Design and Planning (3) Fundamentals of urban morphology in relation to historical, social, political, and economic systems.

4072 Community Design Studies (3) Study of community design and community-based practice with emphasis on contemporary participatory action research and techniques.

4090 Restoration Studies (3) Theory and methodology of architectural restoration; tools and techniques of restoration.

4101 HONORS: Architectural Design VII (6) Prereq.: ARCH 3002 or 3102. 12 hrs. studio. ARCH 4001, with special emphasis for qualified Honor students.

4102 HONORS: Architectural Design VIII (6) Prereq.: ARCH 4001 or 4101. 12 hrs. studio. Students are responsible for paying travel expenses associated with the course. Same as ARCH 4002, with special emphasis for qualified Honor students.

4155 Recording Historic Structures (3) Prereq.: permission of department. 1 hr. lecture; 2 hrs. lab. Hands-on field and laboratory experience in current methods of documenting historic buildings, including hand methods, photography, and photogrammetry.

4165 Applied Principles of Conservation (3) Prereq.: permission of department. 1 hr. lecture; 4 hrs. lab. Laboratory work will be at the LSU Rural Life Museum. Hands on work with traditional construction materials, tools, and methods: masonry, timber, boulisage, and others.

4211 Selected Topics in Architecture (3) V Prereq.: consent of instructor. Development of aesthetic theory through architectural literature.

4742 Passive Solar Energy Applications for Buildings (3) Design and application of passive solar systems for space heating and cooling of buildings.

4790 Research Methods (3) Major research methods in architecture; hypothesis formulation and testing, data gathering and analysis.

4993 Advanced Computer Aided Architectural Graphics (3) F,S Prereq.: consent of instructor. The development and application of advanced computer-aided architectural design software.

5001 Comprehensive Architectural Design (6) Prereq.: ARCH 4002 or ARCH 4102. 12 hrs. studio. An Honor course. ARCH 5101 is also available. Emphasis on the comprehensive design of a single building integrating material selection, mechanical, acoustical, structural, lighting, and two- and three-dimensional studies.

5002 Architectural Design Concentration (6) Prereq.: ARCH 5001 or ARCH 5101. 12 hrs. studio. Emphasis on architectural problems developed around faculty expertise and emerging opportunities in the profession.

5003 Advanced Architectural Topics (3) Seminar relating to various topics in architecture; writing component.

5004 Concentration Seminar (3) Various topics relating to architectural problems encountered in ARCH 5002.

5005 Advanced Architectural Technologies (3) 1 hr. lecture; 4 hrs. studio. Preparation and correlation of working drawings, specifications, and project manuals, from design development drawing.

5006 Professional Practice (3) Exploration and analysis of project acquisition, contract negotiations, governmental regulations, personnel, office management, and the architect's societal role.

5008 Community Design Practicum (6) Prereq.: ARCH 5001, 5002 or permission of department. Minimum 280 hours of supervised experience. Supervised learning experience in the Office of Community Design and Development or approved community services departments. Emphasis on pre-professional services for community-based projects.

5101 HONORS: Comprehensive Architectural Design (6) Prereq.: ARCH 4002 or 4102. 12 hrs. studio. Same as ARCH 5001, with special emphasis for qualified Honor students.

7001 Graduate Design Studio I (4) F Prereq.: ARCH 4003 or equivalent. 12 hrs. studio. Emphasis on the design of buildings in a variety of physical settings.

7002 Graduate Design Studio II (6) Prereq.: ARCH 7001. 12 hrs. studio. Emphasis on the design of buildings incorporating technologies of materials and various architectural systems.

7004 Graduate Design Studio IV (6) F Prereq.: ARCH 7003. 12 hrs. studio. Emphasis on the design of buildings incorporating technologies of environmental systems.

7005 Graduate Design Studio V (6) Prereq.: ARCH 7004. 12 hrs. studio. Introduction to contextual building design in an urban setting with emphasis on site and context analysis and community planning in a collaborative working environment.

7006 Graduate Design Studio VI (6) Prereq.: ARCH 7005. 12 hrs. studio. Credit will not be given for both this course and ARCH 8000. Emphasis on the synthesis of all issues addressed in previous studios in the comprehensive design of buildings.
7040 Structural Concepts and Forms (3) Relationship between the schematic properties of prototypical building forms and basic types of total system behavior.
7050 Project Planning/Management (3) Relationship of the construction process and project planning to building projects, with the redesign of complexities.
7600 Seminar in Architecture (3) May be taken for a max. of 9 hrs. of credit when topics vary. Selected topics in architecture.
7900 Architectural Studies/Research (3) Prereq.: written consent of the Architecture Graduate Committee. May be taken for a max. of 6 sem. hrs. of credit. Selected readings and/or research under the supervision of graduate faculty.
8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

ART • ART

Registration for all multiple-credit courses taken for over three credits in a given semester will require the prior permission of the instructor. Multiple credit courses are designated with an asterisk (*) following the course number.

General education courses are marked with stars (★).

GENERAL COURSES
★ 1001 Introduction to Fine Arts (3) Fundamental problems and concepts of art in the fields of design, sculpture, graphics, painting, and ceramics, as related to home, community, religion, commerce, and industry.
1008 Introduction to Two-Dimensional Composition (3) 6 hrs. studio. Credit will not be given for both this course and ART 1011. An introduction to two-dimensional art and design practices using a variety of materials and techniques.
1009 Introduction to Three-Dimensional Art (3) 6 hrs. studio. Credit will not be given for both this course and ART 1011. An introduction to two-dimensional art and design practices using a variety of materials and techniques.
1010 Introduction to Drawing (3) 6 hrs. lab. Credit will not be given for both this course and ART 1847. Drawing from observation and invention; various drawing materials, methods, and subjects are explored as a means to develop perceptual ability and descriptive drawing skills; drawing concepts including composition, line, perspective, shape, space, and value.
★ 1011 Art Structure (3) 6 hrs. studio. Disciplines in art, with practice in the various media.
1012 Three-Dimensional Design (3) Prereq.: majors only, 6 hrs. studio. Introduction to the fundamental concepts of three-dimensional art; projects will explore line, plane, spatial organization, surface, and volume; using a variety of materials and techniques.
1013 Studio Art Abroad (3) 6 hrs. studio. Studio art fundamentals within the specific medium of faculty members participating in Academic Programs Abroad.
2050 Digital Art I (3) Prereq.: majors/minors only, ART 1008 or 1011. 2 hrs. lecture/2 hrs. studio. Introduction to digital applications in art.
2055 Digital Art II (3) Prereq.: ART 2050 or permission of instructor. 2 hrs. lecture/ 2 hrs. lab. Introduction to digital animation and multimedia applications.
4029 Special Topics in Studio (3) Prereq.: consent of department. May be taken for a max. of 6 hrs. of credit when topics vary, 6 hrs. studio. Directed studies with a visiting artist.
4044 Gender Aesthetics: Art Theory and Criticism (3) May be taken for a max. of 6 hrs. of credit. Interdisciplinary study of art, writing, and gender; emphasis on the interaction of art and writing about art as it reflects gender.
4050 Digital Art III (3) Prereq.: ART 2055 or equivalent. 6 hrs. studio. Primarily for students majoring in art. Intermediate work in digital animation.
4055 Digital Art IV (3) Prereq.: ART 4050 or equivalent. 6 hrs. studio. Primarily for students majoring in art. Advanced work in digital imaging, video, and animation.
4080 Performance Art (3) Prereq.: completion of studio art fundamental courses and permission of instructor. 6 hrs. studio. Multi-disciplinary “live” art studio problems utilizing a diverse range of media such as drawing and painting, sound and movement, and poetry; lectures and discussions on performance art.
7042 Visiting Artist Seminar (3) May be taken for a max. of 9 hrs. of credit. Seminar with visiting artist: contemporary art, criticism, individual and group projects.
8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

ART HISTORY
★ 1440 Historical Survey of the Arts (3) Prehistoric, Near-Eastern, Greek, Roman, and medieval art.
★ 1441 Historical Survey of the Arts (3) Renaissance to modern art.
★ 2401 Art of the Ancient Near East and Egypt (3) Development of art and architecture in the ancient Near East and Egypt over three millennia; influences of one culture on another and subsequent contributions to Western art.
★ 2411 Survey of Asian Art (3) The arts of China, India, and Japan in relation to philosophical beliefs that affected their production.
2469 Italian Renaissance Art (3) Italian painting, sculpture, and architecture from the 15th to the 17th centuries.
★ 2470 Survey of 20th Century Art (3) Modern art.
2480 Introduction to Museum Studies (3) Introduction to art and history museums, their missions and functions; practical aspects and philosophical issues related to museums.
4001 History of Prints (3) History of prints from the 15th century to the present.
4004 The Art of Rome (3) Development of architecture, sculpture, and painting from Rome's early beginnings (600-200 B.C.) to the end of the 4th century.
4005 Early Christian and Byzantine Art (3) Painting, sculpture, and architecture of the Christian era through 12th century Byzantium.
4006 Romanesque Art (3) Architecture, sculpture, manuscripts, and painting from the 9th through the 12th centuries in France, Germany, and England.
4009 Early Greek Art (3) Greek art to the time of the Persian Wars.
4100 Later Greek Art (3) Greek art from the time of Thermistocles to the age of Augustus.
4112 Gothic Art (3) Architecture, sculpture, and painting of Northern Europe from 1150 to 1450.
4113 Early Netherlandish and German Painting (3) Painting in the Netherlands and Germany in the 15th and 16th centuries.
4220 Studies in Art History (3) May be repeated for credit when topics vary: Advanced work in a pre-determined area of specialization.
4221 History of Western Decorative Arts from the Renaissance to 1850 (3) Development of decorative arts design; emphasis on furniture, with investigations of metals, textiles, ceramics, and glass; materials, constructional techniques, and socioeconomic conditions giving rise to the objects’ fabrication.
4222 History of Modern Design (3) Aesthetic theory and stylistic evolution of decorative arts from mid-19th century to the present; emphasis on crafts, architectural decoration, furniture, interior design, and industrial design; Victorian period, art and crafts movement, art nouveau, Bauhaus, and international style.
4223 Early Renaissance Painting in Italy (3) The origins and early development of Italian Renaissance painting in Florence and Sienna.
4224 High Renaissance and Mannerist Painting in Italy (3) The climax and aftermath of Italian Renaissance painting in Florence, Rome, and Venice.
4225 Renaissance Sculpture in Italy (3) The origins and development of Italian Renaissance sculpture; its function, patronage, and significance within its social and cultural context.
4227 Northern Baroque Painting (3) Dutch, Flemish, and French painting of the 17th century.
4229 Southern Baroque Art (3) Painting, sculpture, and architecture of the 17th century in Italy and neighboring areas.
4335 18th Century European Art (3) European art from the age of absolutism to the beginning of the Napoleonic era, including Rococo art, the influence of Enlightenment thought, the rediscovery of classical antiquity, Neoclassicism, and the impact of the French Revolution on the visual arts.
4344 Chinese Painting (3) History of Chinese painting from prehistoric times through the 20th century.
4345 Japanese Art (3) History of Japanese painting, sculpture, architecture, and ceramics from prehistoric times through the early 20th century.
4346 Indian Art (3) History of Indian painting, sculpture, and architecture from prehistoric times through the 16th century.
4347 Southeast Asian Art (3) History of architecture, sculpture, ceramics, and painting in Burma, Thailand, Cambodia, Indonesia, Vietnam, and Laos from the prehistoric periods through the 18th century.
4348 Chinese Ceramics (3) History of Chinese ceramics from the prehistoric times to the 20th century; hands-on examination of original examples.
4350 19th Century European Painting (3) History of painting in European countries from the French Revolution (1789) to 1900; emphasis on neoclassicism, romanticism, realism, impressionism, post-impressionism, and symbolism.
4351 Early 20th Century European Art (3) History of painting and sculpture in European countries from 1900 to 1914; emphasis on Fauvism, Futurism, Dada and Surrealism, German Expressionism, British figurative art, and the School of Paris.
4346 American Art to 1900 (3) North American painting, architecture, and sculpture from the colonial beginnings to 1900; emphasis on painting.
4348 American Art: 1900-1960 (3) Study of American painters and sculptors between 1900 and 1960; from the Impressionists to the Abstract Expressionists; emphasis on the artists’ connections to social, political, and cultural developments.
4349 Survey of Contemporary Art (3) Major movements in art from World War II through the 1980’s; the wane of modernism and the rise of postmodernism; focus on America and Europe, but Latin American and non-western art also considered.
4347 Latin American Art (3) Pre-Hispanic, colonial, and contemporary architecture, painting, sculpture, and related arts throughout Latin America.
4349 Issues in Contemporary Art (3) Principal issues confronting contemporary artists and the sources and theories behind the issues.
4349 Art of the American South: 1750-1861 (3) History of architecture, painting, sculpture, and decorative arts made in the states below the Mason-Dixon Line.
4347 History of Photography (3) History of photography from its inception in the 1830’s until the present; technological development of the medium and its inherent aesthetics; interrelationships between photography and more traditional media.
4348 Video Art and Theory (3) Sources and origins of artists’ video from the late 1960’s to the present day; consideration of theoretical, political, and technological aspects; survey of single-channel, projected, installation, and Internet formats for video art display.
4348 Digital Art History (3) Survey of art and technology focusing on the development of computer art and digital, interactive and network-based art forms from the 1950s to the present.
4384 New Media Art Theory (3) A reading intensive course that introduces students to issues and theories of new media art.
4330 Independent Study in Art History (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.
4399 Undergraduate Seminar (3) Prereq.: ART 1440, 1441, and any four additional art history courses; only open to art history majors of junior and senior standing. Intensive reading, writing, and classroom discussion; introduction to art-historical research and methodologies.
4345 Art Theory and Criticism (3) Critics; building of art collections from ancient to modern times.
4541 Special Studies in Graphic Design (3) Prereq.: consent of instructor. 6 hrs. studio. Advanced techniques and practical experience with graphic arts equipment.

4550 Digital Imaging for Visual Communications (3) Prereq.: consent of instructor and ART 2551 or equivalent. 2 hrs. lecture; 2 hrs. lab. Basic exploration of digital photographic technology and its application in communications; topics include: scanning, image processing and manipulation, digital filtering, and imaging peripherals; emphasis on emerging technology and preparing images for multimedia applications.

4551 Problems in Graphic Design (3) Prereq.: consent of instructor. 6 hrs. studio. Problems in design related to the professional design field; methods of reproduction, exhibition techniques, and digital applications.

5520 Product Design (3) Prereq.: consent of instructor. 6 hrs. studio. Technology, needs, and market related to the mass-produced article; materials research; human engineering; prototype construction; presentation methods; field trips.

5541 Applied Illustration (3) Prereq.: consent of instructor. 6 hrs. studio. Techniques of general illustration; product illustration; problems of layout and its application within the digital environment.

5545 Advanced Graphic Design (3) Prereq.: consent of instructor. 6 hrs. studio. Principles of visual communication through graphic design; problems in design theory and application.

5556 Advanced Design (5) Prereq.: 3 sem. hrs. in advanced design course and consent of instructor based on review of student's portfolio. 10 hrs. studio. Advanced studio work in a predetermined area of design specialization.

5570 Applied Typographic Design (3) Prereq.: consent of instructor. 6 hrs. studio. Principles of typographic design in print and digital environment; emphasis on design in print and computer.
4880 Figure Painting (3) Prereq.: ART 2879, 2881, or 2882. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Studies from the nude model.

4881 Intermediate Painting (3) Prereq.: ART 2881, 2882 or 2883. 6 hrs. studio. Contemporary concepts in painting; approaches to imagery, symbolism, empathy; individual criticism, class discussion.

4882 Advanced Water Media Painting (3) Prereq.: ART 2883. 6 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Advanced studio work in water-soluble media specialization.

4884 Advanced Painting (3) Prereq.: ART 2881. 6 hrs. studio. May be taken for a max. of 6 sem. hrs. of credit. Research into advanced visual schema through self-initiated studio problems.

4886 Landscape Painting (3) Prereq.: ART 2882. 6 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Ontogenesis and self-development of the landscape studio. Introduction to natural impression in the studio.

4887 Advanced Figure Drawing III (3) Prereq.: ART 2879 or equivalent. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Study of the human figure using various media.

4889 Advanced Drawing Workshop (3) Prereq.: 9 sem. hrs. of drawing. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Directed studies for the advanced student.

7800 Graduate Painting (3) 6 or 12 hrs. May be taken for a max. of 36 sem. hrs. of credit.

7881 Painting Seminar (3) Prereq.: students currently enrolled in the program. 6 hrs. studio. Seminar. Pass/fail grading. May be taken for a max. of 18 sem. hrs. of credit. Discussion of formal and conceptual issues related to the medium.

PHOTOGRAPHY

2985 Basic Photography (3) Prereq.: majors/minors only. ART 1008 or 1011. 6 hrs. studio. Basic concepts and techniques of black and white photography; emphasis on photography as a visual art.

2996 Intermediate Photography (3) Prereq.: ART 2985. 6 hrs. studio. Continued investigation of basic photographic principles, utilizing specific subject areas drawn from major themes in visual art.

3982 Introduction to Digital Photography (3) Prereq.: ART 2371 or equivalent. 6 hrs. studio. Introduction to digital photographic tools and techniques.

3994 Advanced Photography (3) Prereq.: ART 2996 and permission of instructor. 6 hrs. studio. Technical investigation of contemporary materials; critical testing of equipment, films, and printing papers; emphasis on process control as an expressive tool.

3995 Introduction to Digital Art (3) Prereq.: ART 3994, 3996, and permission of instructor. 6 hrs. studio. Introduction to digital photographic tools and techniques.

3996 Advanced Digital Photography (3) Prereq.: ART 2985 and permission of instructor. 6 hrs. studio. Continuation of color technology, color perception, and contemporary color printing materials, utilizing color print portfolio.

3997 Experimental Photography (3) Prereq.: ART 3994 or 3996, and permission of instructor. 6 hrs. studio. Investigation of experimental camera and darkroom techniques; emphasis on the creative possibilities of photographic manipulations.

4941 Special Studies in Photography (3) Prereq.: ART 3994 and permission of instructor. 6 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Individual creative research in a predetermined area of specialization.


4994 Large Format Photography (3) Prereq.: ART 3994 and permission of instructor. 6 hrs. studio. Fundamentals of the new cameras.

4996 Color Photography II (3) Prereq.: ART 3996 and permission of instructor. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Continued investigation of color photography; color negative materials and printing processes.

4997 Nonlens Photography (3) Prereq.: ART 3994 and permission of instructor. 6 hrs. studio. Exploration of historical photographic processes; emphasis on nonlens printmaking techniques.

4999 Senior Project, Photography (3) Prereq.: permission of instructor. 6 hrs. studio. To be taken in the last full semester of the senior year. This course is not offered during the summer term. Proposal for and execution of an independent photography project under the direction of an instructor.

7900 Graduate Photography (3, 6) Prereq.: permission of instructor. May be taken for a max. of 16 sem. hrs. 6 or 12 hrs. of studio. Emphasis on personal vision and contemporary issues in photography.

PRINTMAKING

1361 Introduction to Intaglio (3) Prereq.: majors/minors only. ART 1005 or 1006. 6 hrs. studio. Basic intaglio techniques; work in black and white.

1371 Introduction to Lithography (3) Prereq.: majors/minors only. ART 1008 or 1011 and 1010 or 1847. 6 hrs. studio. Printmaking from stones in black and white.

1381 Introduction to Book Arts (3) Prereq.: ART 1361 or 1371 or consent of instructor. 6 hrs. studio. Basic theory, design, and production in the book arts.

2342 Relief Printmaking (3) Prereq.: ART 1011. 6 hrs. studio. Introduction to the art and technology of making paper by hand.

2352 Relief Printmaking (3) Prereq.: ART 1010 or 1847. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Investigation of relief printing techniques.

2362* Intermediate Intaglio (3, 6) Prereq.: ART 1361. 6 or 12 hrs. studio. Introduction to advanced intaglio techniques.

2372* Intermediate Lithography (3, 6) Prereq.: ART 1361 or 1371 or consent of instructor. 6 hrs. studio. Printmaking from stones and plates in black and white and color.

2382 Intermediate Book Arts (3) Prereq.: ART 1381. 6 hrs. studio. May be taken for a max. of 9 sem. hrs. of credit. Printmaking from stones and plates.

4361* Advanced Intaglio (3, 6) Prereq.: ART 2362. 6 or 12 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Advanced study in intaglio techniques.

4365* Advanced Lithography (3, 6) Prereq.: ART 2372. 6 or 12 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Advanced study in lithography.

4761 Sculpture III: Metal Fabrication (6) Prereq.: ART 2761. 12 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Studies in an area of specialization or consent of instructor.

4762 Sculpture IV: Senior Project (6) Prereq.: ART 4761. 12 hrs. studio. May be taken for a max. of 12 sem. hrs. of credit. Independent study requiring the proposal and execution of a sculpture project, under the direction of a major professor.

7700* Graduate Sculpture (3, 6) 6 or 12 hrs. May be taken for a max. of 54 sem. hrs. of credit.

Astronomy • ASTR

General education courses are marked with stars (*).

★ 1101 The Solar System (3) Prereq.: MATH 1021 or an ACT math score of at least 21. Fundamental principles of the solar system.

★ 1102 Stellar Astronomy (3) Prereq.: MATH 1021 or an ACT math score of at least 21. Fundamental principles of stellar astronomy.

★ 1108 Astronomy Laboratory (1) 2 hrs. lab. Prereq.: credit or registration in ASTR 1101. Laboratory work in light of terrestrial and celestial sources; visual and photographic observations of stars and nebulae; training in the use of telescopes and larger telescopes with multimedia technologies.

2001 Current Topics in Astronomy and Astrophysics (1 to 3) Prereq.: consent of instructor. 1 hr. lecture; 6 hrs. lab. Prereq.: an ACT math score of at least 21. Current topics in astronomy; recent topics include extraterrestrial intelligence, black holes, exploration of the solar system.

4221, 4222 Introductory Astrophysics (3, 3) V Prereq.: PHYS 1202 or 2102 or consent of instructor. ASTR 4221 is prerequisite for 4222. Sun, stars, and stellar systems; results and problems of modern astrophysics.

4261 Modern Observational Techniques (3) V Prereq.: ASTR 1101, and MATH 1532. 1 hr. lecture; 6 hrs. lab. Preparation for modern observatory work in astronomy; selection of the telescope, astronomical photography, spectroscopic and photometric observations and reductions.

4750 Special Topics in Observational Astronomy (3) V May be taken twice for credit when topics vary. One topic scheduled each time course is offered; current topics include astronomical spectroscopy and astronomical photometry.

4997 Problems in Astronomy (1-3) Prereq.: consent of instructor. May be taken for a max. of 3 sem. hrs. of credit. Individual reading and theoretical and/or experimental work on advanced problems.

6011 Astronomy for Teachers (4) Su, V For teachers and graduate students in the College of Education. Cannot be taken for degree credit by physics majors. General astronomy including the solar system, stellar astronomy, and stellar systems.

6108 Astronomy Laboratory for Teachers (1-3) Su V For in-service teachers and graduate students in the College of Education. May not be taken for credit by physics majors. May be taken for a max. of 9 sem. hrs. of credit. 2-9 hrs. lab. Visual observation techniques including the use of star charts and globes; visual and photographic observation of celestial objects such as the sun, moon, stars, and nebulae using small reflectors as well as large telescopes through multimedia technologies.
**BASIC SCIENCES • BASC**

6001 Topics in Physical Science for Elementary School Teachers (3) Su only May be taken for a max. of 12 hrs. of credit when topics vary.

6002 Topics in Biological Science for Elementary School Teachers (3) Prereq.: 8 sem. hrs. of introductory biology. May be taken for a max. of 9 hrs. of credit when topics vary.

6003 Topics in Environmental Science for Elementary School Teachers (3) Su only May be taken for a max. of 9 hrs. of credit. Also offered as PHYS 7777.

7000 Methods of Instruction in College Life Science Laboratories (1) F-Pass/fail grading. Philosophy and practice of life science laboratory education at the college level.

**BIOTECHNOLOGY**

1250 Introduction to Biotechnology (2) F- 6 hrs. lab. Fundamentals of engineering design; presentation of an engineering design; graphical expression of engineering design using computer-aided drafting.

1252 Biology in Biotechnology (2) N Prereq.: credit or registration in BIOL 1201. 1 hr. lecture; 3 hrs. lab. Effect of variability and constraints of biological systems on engineering problem solving and design; engineering units; engineering report writing; oral report presentation; laboratory demonstration of biological engineering analysis.

2307 Elements of Landscape Construction (3) F Prereq.: MATH 1011 or 1022. 2 hrs. lecture; 3 hrs. lab. Theory and use of tape, level, transit, plane table, and compass; principles of area and volume calculations, land slope, drainage grades, legal land descriptions, and topographic mapping.

2350 Experimental Methods for Engineers (3) Prereq.: N BE 2352. 2 hrs. lecture; 3 hrs. lab. Introduction to experimental methods; technical report writing, and instrumentation for engineering applications; measurement of temperature, pressure, flow, strain, and vibration in biological products; microprocessor data loggers and computer-based data systems.

2352 Quantitative Biology in Biotechnology (3) F Prereq.: BE 1252. 2 hrs. lecture; 3 hrs. lab. Characterization of biological phenomena in engineering design; relationships among parameters using linear and nonlinear statistical expressions; case studies of engineering design solutions.

3249 Engineering Practice I (3) Su only Prereq.: consent of instructor. Pass-fail grading. A minimum of six weeks full-time employment in an industry participating in the summer program. Selected engineering problems in an industrial environment.

3250 Engineering Practice II (3) Su only Prereq.: consent of instructor. Pass-fail grading. A minimum of six weeks full-time employment in an industry participating in the summer program. Selected engineering problems in an industrial environment.

3290 Professionalism for Biological Engineers (2) Prereq.: Grad of “C” or better in CE 2450. Ethical standards, certification, philosophy of mechanical design for biological engineering; materials for construction; frame design; power transmission.

3340 Process Design for Biotechnological Engineering (3) S Prereq.: EE 2950, CE 2200, and credit or registration in ME 3333. 2 hrs. lecture; 3 hrs. lab. Design applications in biological engineering using the engineering sciences of fluid mechanics and thermodynamics; electrical machines and controls.

3371 Irrigation Fundamentals and Management (3) Prereq.: credit in ENGR 1111. 2 hrs. lecture; 3 hrs. lab. Irrigation agriculture design, and natural sciences. Cannot be used to fulfill College of Engineering requirements. Turf, landscaping, and urban and ornamental horticulture; design of irrigation systems from water source to application and uptake by plants; covers typical irrigation application techniques: flood, drip, and impact less in system components; irrigation scheduling; and auditing/troubleshooting irrigation system performance.

3381 Nonpoint Nutrient Engineering (3) Prereq.: BE 2352 and E&EG 3110. 2 hrs. lecture; 3 hrs. lab. Water quality criteria and regulations for the agricultural community; production, treatment, and disposal of agricultural and food processing wastes; management of agricultural nutrients; nonpoint source pollution; bi-product utilization; land application; wetland restoration; stream sampling and analysis; and modeling.

4300 Environmental Engineering II (3) F Prereq.: CHEM 2060 (2264), ENG E 2900. See ENG E 3400.

3989 Special Projects in Biological Engineering (1-4) F,S,Su Prereq.: consent of instructor. May be taken for a max. of 6 hrs. credit. Library research, experimental and/or theoretical investigation, and written report in form of engineering report.

4290 Senior Design Engineering and Professionalism (2) F Prereq.: BE 3290. Students work in teams to develop a detailed design to address a technical problem that the team chose in senior design and to develop measurable design objectives and a product design specification, creating multiple design solutions, evaluating design solutions, and completing design.

4292 Senior Design Engineering Laboratory (2) S Prereq.: BE 4290. 6 hrs. lab. Engineering principles used to complete the project set forth in the design outline submitted in BE 4290; design project completion.

4303 Engineering Properties of Biological Materials (3) V Prereq.: MATH 2065. 2 hrs. lecture; 3 hrs. lab. Engineering properties, including rheology, friction, mechanical damage, texture, and thermal, pressure, and flow properties.

4323 Biomechanics for Engineers (3) V Prereq.: CE 2450. 2 hrs. lecture; 3 hrs. lab. Also offered as IE 4465. Mechanical behavior of the human musculoskeletal system and component tissue when physical work is performed; engineering mechanics applied to the activities; fundamental knowledge of human anatomy and physiology; workplace design.

4332 Molecular Methods in Biological Engineering (3) V Prereq.: BIOL 2085, BE 2350, and credit or registration in BE 4303. Fundamentals of the theory and applications of quantitative molecular techniques used in biological systems; analysis of biotechnological processes.

4340 Food and Bioprocess Engineering (3) V Prereq.: BE 2352; credit or registration in BE 3340. 2 hrs. lecture; 3 hrs. lab. Design and operating process for biotechnological materials, with emphasis on food; topics include food science, fluid flow, thermodynamics, and transport phenomena in food; development of food operations, including freezing, extraction, drying, and aspecific processing.

4341 Biological Reactor Systems Design (3) S Prereq.: BIOL 2051 and BE 4352. 2 hrs. lecture; 3 hrs. lab. Microbial and biochemical principles used in design of biological reactors for biotransformation; metabolic output and cellular production; design of batch and continuous flow reactors utilizing microbial kinetic models; attacked and suspended growth systems and eucaryotic and prokaryotic cell growth.

4342 Sugar Process Engineering (3) Prereq.: EE 2950, CE 2200 or ME 3834 or CHE 3110, ME 2344 or 3533 or CHE 1372. Principles of raw and refined sugar; application of scientific and engineering principles to unit operations of evaporation, crystallization, extraction, solidification, centrifuging, clarification, and steam and power generation.

4347 Sugar Factory Design (3) Prereq.: credit or registration in EE 2950. 3 hrs. lab; 3 hrs. P and 1 diagrams for sugar processes and instrumentation/control strategies; detailed process design of heat transfer equipment; theoretical Newtonian flow, prime mover requirements, steam and power use, and reticulation, materials handling systems, utility systems, and materials and equipment.

4352 Transport Phenomena in Biological Engineering (3) F Prereq.: BE 2352, BIOL 2031, credit or registration in CE 2200 and to biotechnological kinetics; temperature-time substrata-substrate growth and death of biological organisms; and heat and mass transfer in engineering design and analysis. Principles of material and energy balances in reactor design.

4360 Mobile Fluid Power Control (3) Prereq.: ME 1834 or equivalent. 2 hrs. lecture; 3 hrs. lab. Principles of design of hydraulic systems and basic components; power steering, hydraulic transmissions, electrohydraulic servovalves, and automatic control systems; design of control systems using full-actuated control valves.

4362 Agricultural Precision Systems (3) 2 hrs. lecture; 3 hrs. lab. Principles and applications of geospatial technologies supporting precision farming and planning for natural resource data management.

4380 Aquacultural Engineering (3) F Prereq.: senior standing. Engineering principles applied to aquatic systems; water chemistry; fluid mechanics; aquatic pumping plants; fish pond design; recirculating aquatic systems; water filtration; disinfection; aeration and degassing.

4383 Natural Resource Engineering (3) Prereq.: CE 2200. Engineering analysis and design of natural resource control systems, including open channels, vegetated waterways, terraces, water control structures, spillways, reservoirs, flood control, surface water quality, and wetlands. 4959 Independent Study in Biological Engineering (1-4) F,S,Su Prereq.: senior standing. Written engineering report required. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

4390 Advanced Agriculture Hydrology (3) V Prereq.: CE 4383. Advanced topics in statistical hydrology, flow theory, evapotranspiration, transport of pollutants, drainage, irrigation, erosion, sediment transport, and sedimentation applied to rural fields and waterways.

4396 Agricultural Systems Engineering (3) V Prereq.: BE 4292 or equivalent. Applications of systems approach to engineering problems in agriculture; queuing theory; modeling and simulation; linear programming; decision support systems and expert systems.

4390 Advanced Food Engineering and Biotechnology (3) V Prereq.: BE 4340. Design and modeling of food and bioprocessing systems; application of advanced thermodynamic principles and transport phenomena with emphasis on numerical techniques in the design, analysis, and modeling of food systems; focus on current research topics in food engineering and food biotechnology.

4395 Advanced Instrumentation and Control for Biological Systems (3) V Prereq.: BE 2350 and MATH 2065. 2 hrs. lecture; 3 hrs. lab. Theory of measurement and feedback integrated with applied design work with biological systems; focus on advanced control technologies supporting precision farming, environmental applications, bioprocess, and biomedical measurement and control concepts.

4395 Advanced Thermal Systems Engineering (3) V Prereq.: BE 4352. Transient heat and mass transfer in biological materials and systems; mathematical modeling and numerical techniques for heat and mass flow in nonideal, heterogeneous systems, including kinetic and thermodynamic considerations.

4391 Biological Reactor Systems for Agricultural Waste Treatment (3) V Prereq.: BE 4341. Design of biological reactor systems for treatment of agricultural wastes; utilizing and developing kinetic models for suspended and attached-growth cultures; characterization of agricultural wastes and wastewaters; consideration of nutrient recovery, pathogen survival, odor reduction, and by-product recovery goals.

4381 Advanced Aquacultural Engineering (3) V Prereq.: 4389. Advanced topics in aquatic culture system design, oxygenation, disinfection of aquatic systems, and aquatic wastewater characterization; integration with traditional agricultural production techniques.

7500 Seminar (1-12) Prereq.: graduate standing in engineering. Only 1 sem. hr. of credit will be allowed toward the degree for seminar credit.

7509 Advanced Topics in Biological Engineering (1-4) F,S,Su Prereq.: consent of instructor. May be taken for a max. of 8 hrs. credit when topics vary.

8000 Thesis Research (1-12 per sem.) S、“C”/U grading.
BIOLOGICAL SCIENCES • BIOL

General education courses are marked with stars (*). In general, with the exception of the specific cases marked with stars, courses cannot be taken for credit for a student majoring in a biological science. General concepts in cell biology, genetics, ecology, and evolution are covered.

1011 General Biology (3) F.S. Credit will not be given for both BIOL 1012 and 1011. For non-science majors. Not for degree credit for a student majoring in a biological science. General concepts in cell biology, genetics, ecology, evolution, diversity, and systems physiology.

1012 Microorganisms and Man (3) * Credit will not be given for both this course and BIOL 1011. For non-science majors. Not for degree credit for a student majoring in a biological science. Diversity, interactions, and life histories of microorganisms, fungi, plants, and animals.

1053 Principles of Biochemistry (4) F.S. Prereq.: BIOL 1202, 1209, and enrollment or credit in CHEM 1202. Fundamental laws of heredity.

1600 Human Physiology (3) F.S. BIOL 1011 or 1201 recommended. Not for degree credit for a student majoring in a biological science or premedical students. Elements of human physiology; controls and functions of the various organ systems.

2280 Introduction to Research in Biological Sciences (1) Prereq.: 6 sem. hrs. of biological sciences and consent of the instructor. Pass/fail grading. Introduction to research with faculty in the Department of Biological Sciences.

2390 Information Retrieval in the Sciences (1) F. Prereq.: CHEM 2261 or equivalent. Modern methods of information transfer and retrieval in science, especially computerized information retrieval systems; proper techniques in data presentation.

2500 Natural History of the Vertebrates (4) F.S. Prereq.: BIOL 2051. Credit will not be given for both this course and BIOL 2051.

3156 Developmental Zoology (4) Prereq.: BIOL 2153 or consent of instructor. Selected topics in animal development emphasizing growth and development, metabolism, transport, and water relations.

3604 Vertebrate Paleontology (4) Prereq.: BIOL 2155 and 2320 or consent of instructor. Functional morphology of vertebrates; development and function of vertebrates; paleontological and ecological significance of vertebrates.

3990 Undergraduate Research in Biological Sciences (1-3) F.S. Prereq.: Permission of department. May be taken for a max. of 6 sem. hrs. of credit. Individual research on problems in the biological sciences.

4001 Physical Chemistry (3) S. Prereq.: CHEM 2262, PHYS 2002, and MATH 1352. Theoretical chemistry. Emphasis on solutions, kinetics, and topics of interest to students in biological sciences.

4002 Insect Biology (3) See ENT 4002.

4003 Science Teaching in Secondary School II: Interactional Strategies in the Science Classroom (1) F. Prereq.: registration in EDCI 4003 or equivalent and credit in EDI 1002 and BIOL 3002, or CHEM 1002, or PHYS 1002. Also offered as CHEM 4003 and PHYS 4003. Model whole-classroom instructional strategies that depart from the lecture style (cooperative learning or open-ended problem exploration); design and presentation of a science lesson using such a strategy; laboratory safety program management.

4004 Seminar in Teaching Secondary School Science (1) F. Prereq.: credit or registration in EDCI 4049 or equivalent, credit or registration in EDCI 4005 or equivalent, and credit in BIOL 4003, or CHEM 4003, or PHYS 4003. Also offered as BIOL 4004 and PHYS 4044.

4015 Conservation Biology (4) Prereq.: 11 sem. hrs. of biological sciences; genetics recommended. See ENT 4015.

4025 Introduction to Insect Physiology (3) S. Prereq.: 12 hrs. of entomology or biological sciences. 1 yr. of organic chemistry or biochemistry. 2 hrs. lecture; 3 hrs. lab. Also offered as ENT 4025.

4028 Toxicology and Ecology of Wetland Plants (4) Prereq.: BIOL 1202 and 1209. 3 hrs. lecture; 3 hrs. lab. Extended field trips. Also offered as RNR 4020. Field service fee. Taxonomy, ecology, and economic significance of wetland plants in Louisiana.

4024 Plant Anatomy (4) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Structure and development of vascular plants; emphasis on seed plants.

4034 Morphology of Vascular Plants (4) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Field service fee. Phylogenetic survey of plant form and development among vascular plants from ferns and related forms through gymnosperms and angiosperms.

4041 Plant Taxonomy (4) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Principles of identification, classification, and nomenclature; their application to select groups of vascular plants.

4042 Projects in Plant Taxonomy (3) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Field service fee. Phylogenetic survey of plant form and development among vascular plants from ferns and related forms through gymnosperms and angiosperms.

4052 Physiology (4) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Field service fee. Physiological survey of plant form and development among vascular plants from ferns and related forms through gymnosperms and angiosperms.

4055 Flora of Louisiana (4) Prereq.: BIOL 1202 and 1209, 2 hrs. lecture; 4 hrs. lab. Two Saturday field trips. Major plant groups and communities of Louisiana and the Gulf region; field and laboratory identification, natural history, ecology, environmental issues relating to natural vegetation, and conservation of natural areas.

4056 Lichenology and Bryology (4) Prereq.: BIOL 1202 and 1209. 2 hrs. lecture; 4 hrs. lab. Field service fee. Lichen and bryophyte morphology, physiology, ecology, and systematics; practice in identification.

4084 Geomicrobiology (3) Prereq.: BIOL 3052 or BIOL 2153 or consent of instructor. Selective field trips. Also offered as BIOL 4084.

4087 Basic Biochemistry (4) F.S. Prereq.: BIOL 2153 and CHEM 2262 or 2462. Credit will not be given for BIOL 4087 and either BIOL 4093 or 4094. Cellular biochemical processes; production and utilization of energy by the cell; major metabolic pathways and their control; molecular biology.

4089 Marine and Environmental Microbiology (3) See OCS 4093.
4993 General Biochemistry 1 (3) F Prereq.: BIOL 2153 and CHEM 2460. Credit will not be given for BIOL 4087 or either 4093 or 4094. Structure and function of proteins, nucleic acids, lipids, and carbohydrates; enzymology; respiration.

4994 General Biochemistry 2 (3) S Prereq.: BIOL 4093. Credit will not be given for both BIOL 4087 or either 4093 and 4094. Metabolic pathways: nucleic acid structure; flow of genetic information; regulation of gene expression; recognition of genetic information; genetics of kinases; protein biosynthesis; nucleic acid chemistry; properties and restriction mapping of plasmids and recombinant DNA; spectrophotometry, chromatography, electrophoresis, centrifugation, and radiosotope labeling.

4010 Plant Systems (3) S Prereq.: BIOL 2072, 4105, and 4109. Concepts of plant nutrition, metabolism, adaptation, and genetics, as related to plant and environment.

4111 Microbial Physiology Laboratory (2) Prereq.: credit or registration in BIOL 4110. 1 hr. lab. Laboratory techniques used to study growth, metabolism, and cellular control of microorganisms.

4123 Immunology (3) F Prereq.: BIOL 2051, BIOL 3090 recommended. Molecular and cellular basis of innate and cell-mediated immunity.

4124 Molecular Microbiology (3) F Prereq.: BIOL 4123. Survey of pathogenic organisms including bacteria, viruses, fungi, and parasites; host responses to pathogens.

4125 Prokaryotic Diversity (3) Prereq.: BIOL 2051. Biology of bacteria and archaea; evolution, diversity assessment, systems ecology; emphasis on molecular approaches.

4154 Molecular Biology of Invertebrates (3) S Prereq.: BIOL 4123 and concurrent enrollment in CHEM 2262 or 2462. Basic concepts in molecular biology of the pathogens, etiology and treatment of various human diseases.

4160 Vertebrate Physiology (3) F Prereq.: BIOL 3090 or 4087 or 4093 and BIOL 2265 or BIOL 2262. Primarily of vertebrate systems physiology; emphasis on mammalian systems.

4161 Vertebrate Physiology Laboratory (1) F Prereq.: credit or concurrent enrollment in BIOL 4160 or equivalent and EXST 2201. 3 hrs. lab. Laboratory exercises in systems physiology.

4162 Food Microbiology (4) See FDS 4162. 3 hrs. lab. Bacterial, fungal, and viral factors and processes involved in food preparation and storage.

4163 Industrial Microbiology (4) F Prereq.: BIOL 4110: equivalent. 2 hrs. lecture; 4 hrs. lab. Also offered as FDS 4163. Microbes used in industrial processes such as production of chemicals, antibiotics, and vitamins.

4165 Environmental Adaptations (3) Prereq.: BIOL 2265. Biochemical and physiological mechanisms adapting organisms to environmental factors; emphasis on the evolutionary biochemical adaptations permitting organisms to inhabit diverse environments.

4172 Plant Microtechnique (3) Prereq.: BIOL 4042 or equivalent. 1 hr. lab. Technique and practice in making permanent slides.

4177 Neurobiology (3) Prereq.: BIOL 3090 or 4160, and CHEM 2262 or 2462. Principles of organization and function in nervous systems; molecular basis of behavior.

4190 Introductory Virology (3) V Prereq.: BIOL 2265. Viruses and their host cells; biochemistry and molecular biology of viral infections.

4194 History of Biology (2) Prereq.: senior standing or consent of instructor.

4200 Microbial Morphogenesis (3) Prereq.: BIOL 2153 and 2151. Cellular morphogenesis in microorganisms and its control by differential gene expression; physiological changes during microbial differentiation; adaptive roles and practical applications.

4210 Biological Modeling and Data Analysis (3) Prereq.: MATH 1558, 16 hrs. of introductory biology; 2 hrs. lecture; 2 hrs. lab. Modeling of biological systems; design and analysis of biological experiments; presentation of data.

4246 Microbial Genes (3) Prereq.: BIOL 2051 and 2153. BIOL 4087 or 4093 recommended. Microbial genetic principles: molecular systems, recombinant DNA technology; bacterial biotechnology and general, recombinant DNA technology.

4253 Principles of Ecology (3) F Prereq.: BIOL 1200, 1209, and MATH 1552 or EXST 2201. Fundamental ecological and environmental principles governing the structure and function of populations, communities, and ecosystems; comparative habitat ecology.

4254 Principles of Ecology Laboratory (1) F Prereq.: credit or registration in BIOL 4253. 3 hrs. lab. Field service fee. Laboratory exercises in ecology.

4256 Microbial Ecology and Nutrient Cycling in Soils (4) See AGRO/EMS 4056.

4261 Microbiology of Water, Sewage, and Industrial Wastes (4) Prereq.: BIOL 4110. 2 hrs. lecture; 4 hrs. lab. Study of microorganisms and mechanisms and control of pollution in aquatic environments.

4262 Marine Communities (3) Prereq.: BIOL 2153. Marine microbiology; ecology of benthic, planktonic, nektonic, estuarine, oceanic, coral, and mangrove communities; emphasis on Louisiana's coastal environments.

4263 Marine Communities Laboratory (1) Prereq.: credit or concurrent enrollment in BIOL 4262 or equivalent. 3 hrs. lab. Field service fee. Laboratory exercises in marine communities.

4270 Animal Behavior (4) S Prereq.: BIOL 2153. 3 hrs. lecture; 3 hrs. lab. Students are responsible for personal expenses associated with mandatory field trips. Introduction to the field of animal behavior with emphasis on how research in this area is performed; topics include physical, psychological, and physiological effects on behavior as well as possible evolutionary causes of present-day behaviors.

4299 Genetics of the Evolutionary Process (4) Prereq.: BIOL 2151 or equivalent. Evolution: the origin of species in the laboratory; principles of microevolution; emphasis on genetic and ecological mechanisms relevant to process of evolution.

4308 Plants in Coastal Environments (3) See OCS 4108.

4385 Biochemistry Laboratory (3) F Prereq.: credit or registration in BIOL 4087 or 4093. 1 hr. lecture; 6 hrs. lab. Techniques including chemistry of amino acids and proteins, purification, immunological techniques of karyotypes; protein biosynthesis; nucleic acid chemistry; properties and restriction mapping of plasmids and recombinant DNA; spectrophotometry, chromatography, electrophoresis, centrifugation, and radiosotope labeling.

4400 Molecular Genetics Laboratory (3) S Prereq.: BIOL 2153 and 6 hrs. of biological sciences at the 4000 level or BIOL 4246 and 3 hrs. of biological sciences at the 4000 level. 1 hr. lecture; 6 hrs. lab. Current techniques used to genetically engineer microorganisms, study gene expression and DNA modification, and identify organisms by specific genetic alleles; computer analysis of DNA and protein sequences.

4444 Seed Physiology (3) S Prereq.: PHLH 4444.

4450 Molecular Regulation of Cell Function (3) F Prereq.: BIOL 4087 or 4093, CHEM 2262 or 2462. BIOL 3090 recommended. Molecular organization of eukaryotic cells; gene structure and function; molecular regulation of signal transduction and cell cycle.

4596 Biophysics of Macromolecules (3) Prereq.: BIOL 2151 and BIOL 4087 or 4093, and BIOL 3090 or equivalent. Theory and application of physical techniques to the study of biological macromolecules; specificity (DNA/IRC, Ryr-NMR, X-ray diffraction) helix-coil theory; theories of ligand binding.

4600 Topics in Marine Zoology (2-6) Su Prereq.: 16 hrs. of biology or zoology including one laboratory course numbered above 3000. See also RN 4600. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Courses to be offered varied from year to year; additional information available from department. Intensive field study of a special topic in marine zoology at the Louisiana Universities Marine Conservation Station.

4653 Marine Physiology (4) Su Prereq.: 12 hrs. in biological science, including some plant biology. Four weeks at Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

4753 Human Molecular Genetics (3) Prereq.: BIOL 2153 and 4087 or 4093. Principles of human genetics, comparative genetics, forensic and molecular genetics.

4890 Selected Topics in Biological Sciences (2-4) Prereq.: 16 sem. hrs. of biological sciences and permission of department. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

6055 Flora of Louisiana for Teachers (4) Prereq.: one year of biological sciences. 2 hrs. lecture; 4 hrs. lab. Student projects are required. Identification and natural history of native vegetation and plant communities of Louisiana.

6147 Selected Topics in Life Science (1-3) Prereq.: BIOL 1001, 1002, 1005, or equivalent. May be taken for a max. of 6 sem. hrs. credit when topics vary. Specific areas of biological sciences; topics offered determined by recent advances in the field, needs of students, and availability of appropriate faculty.

7001 Tropical Ecology (3) Prereq.: BIOL 4253 or equivalent. Ecology, natural history, and biodiversity of tropical environments; emphasis on plant and animal functional and evolutionary adaptations.

7010 Plant Molecular Biology (3) F Prereq.: BIOL 3060, 4093, and 4094 or equivalent. See OCS 7010. The uses of ideas of biological sciences; topics offered determined by recent advances in the field, needs of students, and availability of appropriate faculty.

7022 Marine Microbial Ecology (3) See OCS 7020.

7025 Advanced Plant Anatomy (3) Prereq.: BIOL 4024 or equivalent. Analysis of meristematic activity and growth patterns in vascular plants; basis and mechanisms of differentiation and experimental studies of normal growth processes.

7034 Advanced Plant Taxonomy (4) Prereq.: BIOL 2153 or equivalent. Prerequisite: BIOL 4024 and BIOL 4041. 1 hr. lecture; 4 hrs. lab. Morphology, identification, and economic importance of grasses and grasslike plants.
7061 Plant Growth and Development (3) See PLHL 7061.

7063 Plant Metabolism (3) See PLHL 7063.

7065 Transport Processes in Plants (3) Prereq.: BIOL 3060. Also offered as ENTM 7065. Principles governing the transport of water, mineral nutrients, organic compounds and gases through whole-plant levels of organization and physiological response.

7076 Selected Topics in Plant Physiology (2) Prereq.: consent of instructor. May be repeated for credit. Same as PLHL 7076. Advanced topics focusing on plant morphology and function, plant biochemistry, and plant physiology.

7080 Community Ecology (3) Prereq.: BIOL 2453 or equivalent. Also offered as ENTM 7080. Special topics in community ecology, focusing on species interactions, population dynamics, and ecosystem processes.


7130 Molecular Evolution (3) Prereq.: BIOL 3040 or equivalent. Evolution of genes and genomes; nucleotide substitution rates; positive selection; gene duplication and conversion; transposable elements; evolution of genome size.

7131 Ecological Systematics (4) Prereq.: 3 sem. hrs. of 1600-level biological science courses or equivalent, introductory statistics recommended, 3 hrs. lecture, 2 hrs. lab. Theoretical and empirical aspects of systematics and evolution.

7159 Marine Ecology (3) Prereq.: consent of instructor. 2 hrs. lecture, 3 hrs. lab and field work. Also offered as OCS 7137. Physical, chemical, and biological environmental factors affecting marine animals; communities representative of each of the ecological subdivisions of the world's oceans treated with respect to species composition, life cycles, and seasonal changes; human impact on the marine environment.

7152 Advanced Vein Anatomy (4) Prereq.: BIOL 3152. 2 hrs. lecture; 6 hrs. lab.

7155 Energy Transducing Membrane Proteins (3) Prereq.: BIOL 4110 and 4087 or 4093; or equivalent. Structure and function of energy transducing membrane proteins including bacteriorhodopsin, ATP synthase, cytochrome c oxidase, cytochrome b6f complexes, the bacterial reaction center, photosystem I and II and antenna pigments protein complexes.

7156 Fundamental Embryology (4) Prereq.: BIOL 3156 or equivalent. 2 hrs. lecture; 6 hrs. lab. Field service course. Classic and contemporary theory, techniques, experiments, and spontaneous investigations concerning vertebrate and invertebrate development.

7161 Higher Bacteria (3) V Prereq.: BIOL 4110 or equivalent. Microbial systematics and ecology; emphasis on morphology and physiology of the higher bacteria.

7162 Molecular Biology of Microorganisms (3) Prereq.: BIOL 4246, and either BIOL 4110 or 4094; or equivalent. Synthesis, activity, and interactions of various molecular components of microbial cells; macromolecules and their relationship to cellular function and heredity.

7220 Biochemistry and Toxicology of Metals (3) Prereq.: BIOL 4001; CHEM 2702. 4 hrs. lecture, 2 hrs. lab. Biochemistry and toxicology of metals; emphasis on the role of metalcontaining compounds in human health and disease.

7253 Molecular Population Genetics (4) Prereq.: BIOL 2153 or equivalent. 3 hrs. lecture; 3 hrs. discussion/lab. Molecular genetic variation in natural populations; effects of selection, mutation, genetic drift, migration, and inbreeding on DNA and protein polymorphisms; emphasis in lab on computer-assisted manipulation and analysis of molecular data.

7280 Nucleic Acids (3) V Prereq.: BIOL 4094 or equivalent. Chemistry and biochemistry of nucleic acids; structure, expression, and regulation of genes in prokaryotic and eukaryotic organisms; emphasis on DNA and RNA metabolism.

7284 Proteins (3) V Prereq.: CHEM 4919 or BIOL 4001; and BIOL 4094 or equivalent. Conformations of fibrillar and nonfibrillar proteins; their interactions with small and large molecules.

7285 Advanced Enzymology (3) V Prereq.: one semester of physical chemistry or equivalent in BIOL 4094. Principles involving action of enzymes on a molecular level; includes kinetics, inhibition, pH effects, active site, coenzymes, reaction mechanism, and protein structure of enzymes.

7286 Seminar (1) F,S May be repeated for a max. of 6 sem. hrs. of credit. Reports on topics of current interest in biological sciences.

7288 Lipids and Membranes (3) V Prereq.: BIOL 4094. Chemistry and biochemistry of lipids and membranes; analytical methods for lipids; biosynthesis of complex lipids; organization and function of biological membranes.

7289 Biochemistry of Viruses (3) V Prereq.: BIOL 4094 or equivalent. Also offered as PBS 7410. Biochemistry and molecular biology of viral particles, animal, and plant viruses; virus attachment to and penetration of host cells; replication, transcription, and translation of viral genes; virus morphogenesis and assembly; virus-induced host cell modifications; emphasis on structure-function relationships.

7290 Complex Carbohydrates (3) V Prereq.: BIOL 4094. Chemistry of carbohydrates including stereochemistry, reactions, derivatization, and analysis; biosynthesis and functions of complex carbohydrates; structure and function of complex carbohydrates including polysaccharides, glycoproteins, and glycolipids; immunology and receptorology.

7262 Fundamentals of Carrageenin (3) S, F Prereq.: CBS 7805 or equivalent of instructor. Same as CBS 7622 and ENVS 7622.

7264 Toxicology IV: Genetic Toxicology (3) S, F, E See ENVS 7625.

7442 Museum Field Expedition (6) Prereq.: consent of instructor. One semester in the field under direction of the Museum of Natural Science staff.

7609 Toxicology Seminar (1) See CBS 7699.

7648 Elements of Cost Management (3) Prereq.: ACCT 2001, CBS 7670 or equivalent. Prerequisite of managerial accounting. Topics include cost estimation, and analysis of market structures.

7901 Department Seminar in Biological Sciences (1) May be repeated for a max. of 6 sem. hrs. of credit. Reports on specialized subjects of current interest in the biological sciences.

7902 Departmental Seminar in Biochemistry (1) May be repeated for a max. of 6 sem. hrs. of credit. Reports on specialized subjects of current interest in biochemistry.

7921 Research Presentations in the Biological Sciences (1) May be repeated for credit. Pass/Fail grading. Presentations of individual research projects in the biological sciences.

7946 Seminar in Current Topics in Molecular Evolution (1) Prereq.: course in evolution, genetics, BIOL 4087 or equivalent. Also offered as ENTM 7946. May be taken for a max. of 6 sem. hrs. of credit. Detailed discussions of recent research in the field of molecular evolution.

7978 Tropical Agricultural Ecology (1-3) Intensive eight-week field course in Costa Rica conducted by the Organization for Tropical Studies; includes visits to various research sites to study the application of ecological principles to tropical agriculture.

7979 Tropical Biology: An Ecological Approach (1-8) Eight-week course at research sites in Costa Rica; conducted by Organization for Tropical Studies; also offered as ENTM 7979. Complexities of tropical plants and animals and their interactions.

7990 Independent Research in Biological Sciences (2-8) Prereq.: consent of instructor. May be repeated for a max. of 9 sem. hrs. of credit. Directed research under the guidance of a graduate faculty member.

7995 Independent Readings in Biological Sciences (1-3) Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. Directed independent readings under the guidance of a graduate faculty member.

8000 Thesis Research (1-12 per semester) S, F, V, U grading. Research involving original research in a major phase of a graduate plan of study, with written thesis report of results.

8038 Microbiology for Teachers (4) S, F 2 hrs. lecture; 4 hrs. lab. Relation of microorganisms to everyday living; how knowledge of microorganisms is used in effective teaching of high school science and home economics.

8094 Studies in Microbiology (3) F, S 1 hr. conference; 3 hrs. lab. May be repeated for a max. of 6 hrs. of credit when topics vary. Pass-Fail grading.

8100 Research Participation (3) S for high school science teachers.

9000 Dissertation Research (1-12 per semester) S, U grading.
4190 Chemical Reaction Engineering (3) Prereq.: CHE 3102 and 3175; or equivalent. Basic principles of chemical reaction engineering, principles of reactor design; selection of best design alternatives; achievement of optimum reactor operation.

4191 Process Dynamics (3) S Prereq.: CHE 3171 and Statics 1631 or equivalent. Basic principles and practices of process dynamics and automatic control; mathematical modeling of process dynamics, feedback control, and process stability.

4204 Technology of Petroleum Refining (3) F Prereq.: credit or registration in CHE 4151. Catalytic and thermal processes used in petroleum refining; application of scientific and engineering principles to catalytic cracking, reforming, coking, alkylation, isomerization, and hydroprocessing; emphasis on applied catalysis and its impact on process technology.

4205 Technology of Petrochemical Industry (3) Prereq.: CHE 4151. Processes used in the manufacture of petrochemicals; application of scientific and engineering principles involved in the production of hydrogen, alcohols, olefins, aromatics, aldehydes, ketones, acids, rubber, and other polymers; emphasis on catalysis by transition-metal complexes.

4210 Industrial Catalysis (3) Prereq.: credit or registration in CHE 4190. Principles of the industrial utilization of chemical reactors and catalysis; topics include absorption phenomena, methodology in catalyst preparation, characterization and evaluation of catalysts, diffusion and reaction in industrial catalysis, and a survey of major industrial processes.

4211, 4222 Senior Research (1,2) Prereq.: credit or registration in 3102, 3104, and 3173, gpa of at least 2.8 for CHE majors, in addition to CHE 4211. Not open to graduate students. 1 hr. lecture (4221); 3 hrs. lab (4222). Comprehensive research or development of a theoretical or experimental nature, involving a team effort over two semesters (spring and fall periods).

4253 Introduction to Industrial Pollution Control (3) Prereq.: Equivalent to MATH 1212, 2251, or 2221, and CHE 4151. Course in transport science. Quantitative application of chemical engineering principles to removal of objectionable components from effluents, with emphasis on industrial processing effluents; currently available techniques for controlling air and water pollution and solid wastes; concepts of pollution control systems through basic processes alteration developed by specific examples.

4260 Biochemical Engineering (3) Prereq.: credit or registration in CHE 4190 or equivalent. Application of chemical engineering fundamentals to microbiological and biotechnical systems; problems peculiar to industrial operations involving microbial processes; growth conditions, cultivations, fermentation, product separations, enzyme catalysis, sterilization, and aseptic operations.

4263 Environmental Chemodynamics (3) Prereq.: CHE 3102 or equivalent introductory course in transport science. Environmental chemodynamics: interphase equilibria, reactions, transport processes and related models for anthropogenic processes natural interfaces (air-water-sediment-soil) and associated boundary regions.

4270 Processing of Advanced Materials (3) Prereq.: CHE 3102 or equivalent transport course. Treatment of coupled chemical reaction and mass, energy, and momentum transport in the manufacturing and processing of semiconductors and advanced ceramic materials; engineering models for chemical and physical vapor deposition methods and condensed phase processes.

4272 Chemical Processing of Nanomaterials (3) Prereq.: CHE 3102 or equivalent introductory course in transport science. Chemical engineering principles applied to preparation, handling, and applications of nanomaterials. Emphasis will be on manufacturing and processing steps; methods will be developed to focus on specific device or material applications.

4275 Electrochemical Engineering (3) Prereq.: CHE 3102 or equivalent course in transport science. Principles of electrochemistry applied to engineering problems; potential distribution theory, kinetics, mass transport, and thermodynamic principles; quantification of controlling factors in microfabrication, corrosion, battery design, and electrochemical synthesis.

4285 Principles of High Polymers (3) Prereq.: CHEM 3172 and CHEM 3173. Solution and solid-state properties of high polymers; microstructure of polymer chains and effect on macromolecular physical properties of the final product.

4296 Development of Mathematical Models (3) Prereq.: CHE 2176 and 3102; or equivalent. Mathematical descrip-

tions of systems encountered in chemical engineering developed from basic principles; lumped parameter systems, distributed parameter systems, formulation of ordinary and partial differential equations, continuous and discrete analogs, and matrix formulations; models developed for systems ranging from simple elements to plant-scale.

4410 Special Topics in Chemical Engineering Design (3) May be taken for a max. of 6 sem. hrs. when topic varies. One or more phases of current chemical engineering design.

4420 Special Topics in Chemical Engineering Science (3) May be taken for a max. of 6 sem. hrs. when topic varies. One or more phases of current chemical engineering science.

7100 Chemical Engineering Fluid Mechanics (3) Foundations of continuum fluid mechanics and the equations of motion; solution methods for lubrication flows; boundary layers, laminar flows with strong convection; introduction to selected topics including: turbulence, non-Newtonian fluids, interfacial flows, computational fluid dynamics, microfluidics, polymer solution, droplet dynamics.

7110 Mathematical Methods in Chemical Engineering (3) F Review of physical chemophysical formulation; analytical and approximate techniques for the solution of linear and nonlinear differential equation models in chemical engineering systems.

7120 Chemical Engineering Thermodynamics (3) F Thermodynamics of second law of thermodynamics, entropy, Maxwell relations, and relationship of thermodynamic properties to intermolecular forces; physical properties of fluids; free energy, fugacity, Raoult's law, K-values, equations of state, and activity coefficients; chemical equilibrium and free energies; fundamentals of chemical thermodynamics.

7130 Fundamentals of Transport Phenomena (3) S Foundations of heat and mass transport in continuum; modeling and solution techniques; transport by diffusion, convection, and turbulence, forced convection, buoyancy-driven transport; introduction to computational modeling.

7140 Chemical Reactor Design Methods (3) S Basic principles of chemical kinetics, fluid flow, heat transfer, and mass transfer used in design of chemical reactors; chemical equilibria, chemical kinetics, design of isothermal reactors, chemical equilibria on nonisothermal reactors, and solid-gas catalytic reactions.

7314 Optimization (3) Techniques of optimization including analytical methods, linear and nonlinear programming, geometric and dynamic programming, and variational methods with application to systems of interest to chemical engineers.

7352 Distillation and Other Separation Processes (3) Mathematical models of transport equilibria, and calculation procedures related to design and behavior of distillation columns, absorbers, extractor-settlers, etc.; emphasis on computer techniques.

7512 Advanced Chemical Engineering Analysis (3) Prereq.: CHE 7110 or equivalent. May be taken for a max. of 6 sem. hrs. credit in department. Topics in chemical engineering analysis, such as perturbation methods, matched asymptotic expansions, vector and tensor calculus, and numerical techniques.

7522 Advanced Chemical Engineering Thermodynamics (3) Prereq.: CHE 7120 or equivalent. May be taken for a max. of 6 sem. hrs. credit with consent of department. Thermodynamics of chemical engineering processes, such as nonequilibrium thermodynamic properties.

7532 Advanced Chemical Engineering Fluid Mechanics (3) Prereq.: CHE 7100 or equivalent. May be taken for a max. of 6 sem. hrs. credit with consent of department. Chemical engineering fluid flow processes, such as turbulence, boundary layer theory, hydrodynamic stability, compressible flow, multiphase flow, chemically reacting flows, and non-Newtonian and viscoelastic fluids.

7534 Advanced Chemical Engineering Heat Transfer (3) Prereq.: CHE 7130 or equivalent. May be taken for a max. of 6 sem. hrs. credit with consent of department. Chemical process heat transfer; phase change and moving boundary problems; heat transfer mechanisms, natural and forced convection, radiation, and combined heat and mass transfer.

7536 Advanced Chemical Engineering Mass Transfer (3) Prereq.: CHE 7130 or equivalent. May be taken for a max. of 6 sem. hrs. credit in department. Transport of mass in chemical engineering processes, such as diffusion, convective flows, and self-similar flows.
1200. Credit will not be given for this course and CHEM 1421. For science/engineering curricula. Modern chemical theories and principles; quantitative approach and problem solving; descriptive chemistry of selected elements and their compounds.

1202 General Chemistry (3) Prereq.: CHEM 1201 or 1421. Credit will not be given for both this course and CHEM 1422. For science/engineering curricula. Continuation of CHEM 1201. Additional theory with emphasis on solution chemistry, and a quantitative approach; descriptive chemistry of selected elements and compounds from the main groups and the first transition series.

1212 General Chemistry Laboratory (2) Prereq.: credit or registration in CHEM 1002, 1202, or 1422. 6 hrs. lab. Credit will not be given for both this course and CHEM 1412. Laboratory usage deposit. Basic laboratory operations including selected experiments and introductory inorganic qualitative analysis.

1421 Honors: General Chemistry (3) Prereq.: ACT mathematics score of at least 27 or eligibility for MATH 1550. Credit will not be given for both this course and CHEM 1201. Chemistry majors who qualify should take this course. For well-prepared students with a special interest in chemistry.

1422 Honors: General Chemistry (3) Prereq.: CHEM 1241, or CHEM 1201 with consent of department chair. Chemistry majors who qualify should take this course. Credit will not be given for both this course and CHEM 1202. Continuation of CHEM 1421.

1431 Honors: General Chemistry Laboratory (2) S Prereq.: credit or registration in CHEM 1202, or credit or registration in CHEM 1202, 6 hrs. lab. Credit will not be given for both this course and CHEM 1212. For chemistry majors and other well-prepared students with special interest in chemistry. Laboratory usage deposit. Fundamental chemical operations, a selection of experiments, and elementary quantitative techniques.

2001 Analytical Chemistry (2) Prereq.: CHEM 1202 or 1422. Basic principles and practices of modern methods of analysis.

2002 Analytical Chemistry Laboratory (2) Prereq.: CHEM 2001 and 1212, or 1431. 6 hrs. lab. Credit will not be given for both this course and CHEM 2002. Primarily for chemistry majors. Laboratory usage deposit. Experiments in modern methods of analysis.

2003 Honors: Analytical Chemistry Laboratory (2) Prereq.: CHEM 2001 and 1212 or 1431. 6 hrs. lab. Credit will not be given for both this course and CHEM 2003. Laboratory usage deposit. Experiments in modern methods of analysis.


2606 Survey of Physical Chemistry (3) Prereq.: CHEM 1202 or 1422. Credit will not be given for both this course and CHEM 2261. Aliphatic and aromatic compounds; biological molecules.

2261 Organic Chemistry (3) Prereq.: CHEM 1202 or 1422. Credit will not be given for both this course and CHEM 2261. Organic chemistry.

2262 Organic Chemistry (3) Prereq.: CHEM 2261. Continuation of CHEM 2261.

2364 Organic Chemistry Laboratory (2) Prereq.: CHEM 1212, and CHEM 2606 or credit or registration in CHEM 2262 or 2462. 6 hrs. lab. Same as CHEM 2463. Laboratory usage deposit. Fundamental laboratory operations of organic chemistry.

2461 Honors: Organic Chemistry I (3) Prereq.: a grade of “A” or “B” in CHEM 1202 or CHEM 1422. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for this course and CHEM 2462. Studies of structure, mechanisms, and synthesis in organic chemistry.

2462 Honors: Organic Chemistry II (3) Prereq.: CHEM 2461 or a grade of “A” in CHEM 2461. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for both this course and CHEM 2662. Continuation of CHEM 2461.

2463 Honors: Organic Chemistry Laboratory (2) Prereq.: CHEM 2461 or a grade of “A” in CHEM 2461. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for both this course and CHEM 2662. Continuation of CHEM 2461.

2464 Organic Chemistry Laboratory (2) Prereq.: CHEM 2461 or a grade of “A” in CHEM 2461. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for both this course and CHEM 2662. Continuation of CHEM 2461.

2465 Honors: Organic Chemistry Laboratory (2) Prereq.: CHEM 2461 or a grade of “A” in CHEM 2461. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for both this course and CHEM 2662. Continuation of CHEM 2461.

2466 Honors: Organic Chemistry Laboratory (2) Prereq.: CHEM 2461 or a grade of “A” in CHEM 2461. Chemistry majors should take this course. For well-prepared students with a special interest in chemistry. Credit will not be given for both this course and CHEM 2662. Continuation of CHEM 2461.
other solids, liquids, solutions, and chemical equilibria; advanced topics and areas of current research.

3291 Quantum Chemistry (3) V Methods of quantum mechanics applied to molecular spectra, chemical bonding, and electronic structure of molecules; oscillators, rotors, hydrogen-like wave functions, perturbation and variation theories, configuration interaction, pi-electron systems, spin-spin coupling, and singlet-triplet states.

3292 Special Topics in Chemical Physics (2-3) May be taken 4 times for credit. Specialized areas of physical chemistry.

3699 Toxicology Seminar (1) See CBS 7699.

3750 Special Topics in Analytical Chemistry (2-3) May be taken 4 times for credit. Advanced treatment of areas of current interest in organic chemistry.

3770 Special Topics in Inorganic Chemistry (2-3) May be taken 4 times for credit. Advanced treatment of areas of current interest in modern inorganic chemistry.

3780 Special Topics in Macromolecular Chemistry (2-3) May be taken 4 times for credit. Advanced treatment of specialized subjects of current interest in macromolecular research.

7809 Seminar (1) May be taken 6 times for credit. Pass/Advanced Chinese (Pr): Students are expected to participate in report and discussion groups in field of chemistry of their particular interest.

7901 Speaking of Macromolecules (1) May be taken for a max. of 6 sem. hrs. of credit. Pass-fail grading.

8000 Thesis Research (1-12 per sem.) Students who receive 8 hrs. of credit for this course cannot obtain more than 6 sem. hrs. credit in CHEM 8900, “S”/“U” grading.

8900 Procedures and Problems in Chemical Research (1-12) Open only to students of proven ability or excep-
tional potential; Students who receive 6 hrs. of credit for CHEM 8900 cannot obtain more than 9 hrs. of credit in this course. Pass-fail grading. Experimental research methods, design and execution of experiments, and analysis and comparison of experimental data.

9000 Dissertation Research (1-12 per sem.) Prereq.: 6 hrs. of credit in CHEM 8000 or 8900, “S”/“U” grading.

CHINESE • CHIN
Native speakers of Chinese will not receive credit for courses marked with an asterisk (*).

General education courses are marked with stars (*).

*1101 Beginning Mandarin Chinese (4) Persons with prior knowledge of Mandarin may not take this course for credit. Basic language structure of Chinese, development of speaking and listening skills.

*1102 Beginning Mandarin Chinese (4) Basic lexicon and structural language of Chinese, development of speaking and writing skills.

*2001 Intermediate Mandarin Chinese (4) Prereq.: CHIN 1102. Continuation of study of basic lexicon and structural language of Chinese, development of speaking, writing, and reading skills.


2070 Chinese Cinema (3) Chinese cinema from 1896 to the present; emphasis on the New Chinese cinema since 1980s; screening and analysis of representative films; knowledge of Chinese not required.

3100 Chinese Literature (3) Prereq.: CHIN 2002 or equivalent. Introduction of authentic materials of increasing complexity on a variety of topics; emphasis on the use of relatively sophisticated structures in vocabulary in complex communication.

3102 Advanced Chinese (3) Prereq.: CHIN 3101 or equivalent. Introduction of authentic materials of increasing complexity on a variety of topics; emphasis on the use of relatively sophisticated structures in vocabulary in complex communication.

3801 Traditional East Asian Literature (3) Taught in English; knowledge of East Asian languages not required. Also offered as JAPN 3801. Introduction to the genres, themes, and representative works of traditional Chinese and Japanese literature; emphasis on critical reading.

3802 Modern East Asian Literature (3) Taught in English; knowledge of East Asian languages not required. Also offered as JAPN 3802. Introduction to the genres, themes, and representative works of modern Chinese and Japanese literature; emphasis on critical reading.

4400 Topics in Chinese Culture (3) May be taken for a max. of 6 sem. hrs. in course. Interdisciplinary study of Chinese literary texts, covering such fields as literature, the arts, politics, religion, and society. Advantages of the text vary. 4915 Independent Work (1-3) May be taken for a max. of 6 sem. hrs. of credit. Permission of department required. Directed readings in classical Chinese or Chinese literature.

7001 Chinese Culture and Language (3) Prior knowledge of Chinese language required. Introduction to Chinese culture with a focus on business; basic Chinese language for business.

CIVIL ENGINEERING • CE
In the Department of Civil Engineering, the second digit of the course number denotes the subject area of the course, as follows: 0 (construction, excluding 8000, 9000); 1 (reconnaissance and surveying); 2 (geotechnical engineering); 3 (ground water); 4 (structures); 5 (hydraulics); 6 (tunnelling); 7 (general).

2200 Fluid Mechanics (3) Prereq.: grade of “C” or better in CE 2450. Statics and dynamics of continuous liquids and gases; control volume laws; conservation of mass, momentum, and energy; dimensional analysis and similarity; applications to pipe flows.

2300 Fluid Mechanics Laboratory (3) Prereq.: CE 2200 and CE 2720 (for CE majors, a grade of “C” or better is required in CE 2200). 3 hrs. lab. Measurement and calibration of hydraulic machinery; pump and turbine efficiency; flow in open channels; numerical methods of design and analysis.

2450 Statics (3) Prereq.: grade of “C” or better in MATH 1550, 1552 and PHYS 2101. Vectorial treatment of resultant and equilibrium of force systems, centroids and centers of gravity, fluid statics, friction.

2460 Dynamics and Vibrations (3) Prereq.: grade of “C” or better in CE 2450 and credit or registration in MATH 2063. Credit will not be given for this course and M.E. 3133. Treatment of kinematics and kinetics of particles and rigid bodies; force, movement, velocity, acceleration; impulse and momentum; work and energy; dynamics and vibration; concepts applied to structural and machine components.

2700 Introduction to Civil Engineering Practice (2) Designed for civil engineering majors; open to nonmajors by consent of department. 1 hr. lecture; 3 hrs. lab. Credit will not be given for this course and EVEG 2000. Students will conduct three individual projects including civil engineering construction descriptions. Basic technical and professional aspects of civil engineering education and practice.

2720 Computational Methods in Civil and Environmental Engineering (3) Prereq.: MATH 1550 (for CE and EYEY majors, a grade of “C” or better is required in MATH 2063). Credit will not be given for this course and ME 3133. Introduction to numerical and statistical techniques; descriptive statistics; correlation and regression analysis; numerical interpolation; numerical integration; design and manufacturing; and statistical analysis of physical systems.

3200 Hydraulics (3) Prereq.: CE 2200 and CE 2720 (for CE and EYEY majors, a grade of “C” or better is required in CE 2200). Fundamentals of fluid mechanics applied to problems in the field of water; steady and unsteady flow in closed conduits, flow in open channels, measurement of flowing water, and turbine machinery; emphasis on computer methods.

3300 Geotechnical Engineering I (3) Prereq.: GSOI 1001, CHEM 1202, CE 2200, and credit or registration in CE 3330 (for CE and EYEY majors, a grade of “C” or better is required in CHEM 1202 and CE 2200).

3000 Geotechnical Engineering II: Shallow Foundations (3) Prereq.: CE 3300 or 3350, and credit or registration in CE 4410. Fundamentals of geotechnical engineering applied to design and analysis of shallow foundations, excavations, retaining structures, and slopes; selection of soil improvement and vibration; emphasis on computer utilization.

3410 Geotechnical Engineering III: Deep Foundations (3) Prereq.: CE 3300 and 3350. Fundamentals of geotechnical engineering applied to design and analysis of deep soil-structure systems; single piles and pile groups under axial load; caisson and piles; effects of lateral loads; computer utilization.

3500 Coastal Engineering I (3) Prereq.: CE 3300 or equivalent. Introduction to涛波学原理; wave action, coastal processes, sediment movement; environmental forces due to waves, currents, and winds; offshore soil geotechnical properties, vertical and lateral pile capacities, design methods for submarine pipelines and offshore platforms; engineering case studies.

4400 Principles of Highway and Traffic Engineering (3) Prereq.: CE 3300. Basic traffic characteristics; highway capacity analysis; geometric design of highways; route location, traffic operations, and signalized intersection design.

4700 Engineering Materials Laboratory I (1) Prereq.: credit or registration in CE 3400 or equivalent. 3 hrs. lab. Design and properties of concrete and bituminous mixes.

4704 Independent Studies in Civil Engineering (3) Prereq.: CE 3400 or equivalent. May be taken 4 times for credit.

4705 Ground Water (3) Prereq.: CE 2200 (for CE and EYEY majors, a grade of “C” or better is required in CE 2200). Occurrence of ground water; properties and classification of water-bearing formations; origin, discharge, and methods of evaluating direction and rate of ground water movement; Darcy’s Law, Theis Equation, analysis of aquifer tests, and “safe yield”; legal aspects, side effects of aquifer development, and the economics of ground water.

4800 Hydrology (3) Prereq.: CE 2200 (for CE and EYEY majors, a grade of “C” or better is required in CE 2200). Water movement from arrival on land surface until it reaches the sea; additional concept of frequency, maximum probable runoff of rainfall, mass curves, and other statistical methods of hydrologic engineering.

4850 Design and/or Development of a Component, System, Process, or Software Package.

4906 Design of Hydrologic Systems (3) Prereq.: CE 3200, 4200, and CE 4750 or equivalent. Hydrologic design of water resources projects; analysis of project benefits; analysis techniques, and design parameters.

5000 Geotechnical Engineering II: Shallow Foundations (3) Prereq.: CE 3300, 3350, and credit or registration in CE 4410. Fundamentals of geotechnical engineering applied to design and analysis of shallow foundations, excavations, retaining structures, and slopes; selected topics on soil improvement and vibration; emphasis on computer utilization.

5100 Geotechnical Engineering III: Deep Foundations (3) Prereq.: CE 3300 and 3350. Fundamentals of geotechnical engineering applied to design and analysis of deep soil-structure systems; single piles and pile groups under axial load; caisson and piles; effects of lateral loads; computer utilization.

5200 Coastal Engineering III (3) Prereq.: CE 3300 or equivalent. Engineering problems of the coastal zone; coastal processes, wave action, coastal processes, sediment movement; environmental forces due to waves, currents, and winds; offshore soil geotechnical properties, vertical and lateral pile capacities, design methods for submarine pipelines and offshore platforms; engineering case studies.

4400 Principles of Steel Design (3) Prereq.: CE 3415. Analysis and design of elements of steel structures, elastic and plastic design, critical comparison of specifications with theory.
4410 Principles of Reinforced Concrete (3) Prereq.: CE 3435. Water quality treatment, analysis, and design of solutions for urban, industrial, and other water treatment systems. Includes modeling of chemical and biological processes and design criteria for the treatment of industrial and municipal wastewater. 4710 Operations and Processes in Sanitary Engineering (3) Prereq.: ECE 3130 and 3132; or equivalent understanding preparation. Principles and design of wastewater treatment processes. 7115 Water Quality Management (3) Current environmental engineering topics, with emphasis on water quality; governmental agencies, regulations, and technological limits affecting water and wastewater treatment, solid wastes, hazardous wastes, and air pollution. 7120 Sanitary Engineering Operations and Processes (3) Prereq.: CE 4130, 7100, and credit or registration in CE 7110. 1 hr. lecture; 6 hrs. lab. Laboratory and pilot plant studies of water and wastewater treatment processes. 7315 Advanced Topics in Biodegradation (3) Biological waste treatment applications in civil and environmental engineering, including current and emerging technologies for characterization, analysis, control, and mathematical modeling of biological processes in municipal and industrial waste treatment systems. 7410 Fundamentals of Aquaculture Systems (3) Theory, design, and management of fixed and floating aquaculture systems used to provide tertiary treatment of domestic and industrial wastewater characterized by low substrate regimes. 7100 Water Quality Simulations (3) Prereq.: CE 4130. Water quality modeling from hydrologic, ecological, water quality, and environmental engineering system models; data gathering and analysis; extraction of design and practice for rural and urban environments; and uncertainty analysis; reliability analysis and estimation; risk analysis and estimation; modeling selection and reliability of civil and/or environmental engineering design. 4745 Natural Hazards and the Built Environment (3) Prereq.: junior standing. Credit will not be given for both this course and CE 3035. Environmental engineering impacts and implications of natural hazards, floods, greenhouse gases, and other natural hazards on the built environment; effects of hazards on buildings and infrastructures; design of buildings and structures; design of building and infrastructure systems; principles of wind, flood, and seismic resistant design; hurricane evacuation and sheltering; engineering preparedness, response, and recovery strategies; design strategies for safety and damage mitigation; building codes, land use zoning, floodplain management, and insurance as mitigation tools. 4750 Professional Issues and Concept Design in Civil Engineering (2) Prereq.: CE 2700 and senior standing. 1 hr. lecture; 2 hrs. lab. Civil engineering design processes and professional and ethical responsibilities of professionals; use of standards, specifications, codes, and contracts; project management; professional standards; ethical, legal, and social implications of engineering practice. 4770 Professionalism and Engineering Ethics (3) Prereq.: senior standing in civil engineering. Role of professionalism in engineering education and practice; the civil engineer's responsibility in preserving the environment and protecting the safety, health, and welfare of the public. 4780 Special Topics in Civil Engineering (3) Prereq.: consent of instructor. 1 hr. lecture; 2 hrs. lab. Special topics in civil engineering. 4781 Special Topics in Civil Engineering (3) Prereq.: senior standing and departmental approval. May be taken for a max. of 6 hrs. of credit. More than one section may be taken concurrently for credit if topics differ. Topics in specialized civil engineering technical or analysis areas.
improvement techniques; properties of mineral and organic substances; dissolution; methods of soil placement and improvement; chemical stabilization of soils, lime columns, stone columns, ultimate strength and bearing capacity; cement columns, compression by surcharging and drain, dynamic consolidation, vibro stabilization, thermal properties of soils, thermal stabilization.

7340 Theory and Practice of Geotechnical Laboratory Experiments (3) Prereq.: CE 1100, 1150, and 4300 or equivalent. 2 hrs. lecture, 3 hrs. lab. Theory and practice of laboratory experimental techniques used in geotechnical design and analyses.

7345 In-Situ Soil Testing and Evaluation (3) Prereq.: CE 7340. Theory and practice of new and advanced geotechnical in-situ testing methods (e.g. piezo-cone penetrometer, TRM, boring, dilatometer, etc.)

7350 Soil Dynamics and Introduction to Earthquake Engineering (3) Prereq.: CE 7310. Theory and practice related to soil-strucutre systems subject to time dependent loadings; wave propagation in various media, steady state and transient vibration of foundations, measurement of dynamic soil parameters, analysis and design procedures; influence of soils on ground motion characteristics; causes of soil failure during earthquakes; liquefaction.

7355 Environmental Geotechnics (3) Prereq.: CE 3300, 4350. Geotechnical aspects of waste management, solution transport in saturated media, flow in partially saturated media, diffusion in soil, sorption, hydraulic conductivity, soil-water relations, soil structure, compaction, clay and flexible membrane liners, slope stability setlements, remediation techniques.

7405 Statically Indeterminate Structures (3) Prereq.: CE 3310, 3311. Analysis of statically indeterminate structures by modern methods.

7409 Advanced Concrete Theory (3) Analysis and design of reinforced concrete structural elements according to ultimate and serviceability strength design theories; prestressed indeterminate structures, shrinkage, and creep.

7420 Limit Analysis and Design (3) Prereq.: credit or registration in CE 3310. Analysis of steel structural behavior beyond elastic limit; design for ultimate load and use of load factors; application of linear programming and other computational optimization of structures designed by aid of concepts of limit analysis.

7430 Structural Design for Dynamic Loads (3) Sources, intensities, and methods of transmission of dynamic loads; response of structural systems to dynamic loading; modern computation techniques.

7455 Finite Element Method in Engineering (3) Prereq.: CE 4450. Finite element method as an extended Ritz technique based on variational concepts for continua with applications to heat transfer, flow through porous media, fluid dynamics, elasticity, plasticity, and stability and vibration of elastic systems.

7460 Theory of Plates (3) Prereq.: credit or registration in CE 4440. Laterally loaded plates with various boundary conditions, approximate methods of plate analysis; large deflections of plates; elastic stability of plates.

7470 Theory of Elastic and Plastic Stability (3) Prereq.: credit or registration in 4443. Beam columns, elastic and plastic buckling of bars and frames, torsional buckling, lateral buckling of beams, elastic and plastic stability of frames, plate and shell buckling, approximate and special methods, and high speed computation.

7475 Solid Mechanics (3) Prereq.: CE 4440 and credit or registration in MATH 4038 or MATH 4430 or ME 4563. Mathematical approach to statics and dynamics of deformable solids; tensors in curvilinear coordinates and variational calculus used to formulate elasticity and viscoelasticity theory; energy theorems and conservation laws.

7480 Finite Elements and Applications (3) Prereq.: CE 4440. Elements of the theory of elasticity; yield criteria and stress-strain relations for perfectly plastic and rigid-plastic materials; boundary value problems of plasticity; the slip-line theory and applications; constitutive equations of viscoelastic bodies and methods of solution of the boundary value problems of viscoelasticity.

7485 Mechanics of Composite Materials (3) Prereq.: CE 3400. Modeling of the mechanical behavior of fibrous composites used in architectural structural components; emphasis on interlaminar stresses, strength and failure theories, thermal effects, nonlinear material response, test methods of volume, and micromechanics.

7490 Damage Mechanics in Metals and Matrix Composites (3) Prereq.: CE 7480 and 7485 or equivalent. Theoretical formulation and application of the different constitutive models to metals and metal matrix composites, but with consideration of other materials; analysis of isotropic and anisotropic damage in materials.

7500 Remote Sensing in Engineering Research (3) Prereq.: CE 4450. Physical measurements, characteristics of present techniques for television and field instrumentation; computer analysis of spectra data to include classification algorithms, enhancement, calibration, geometric referencing, and computer image processing; environmental applications.

7600 Transportation Engineering Data Collection Methods (3) Prereq.: CE 7000 or equivalent. Application of sampling theory and data collections for transportation studies; determination of sample sizes; calculation of sampling error; expansion of sample surveys, surveys, and applications, including interviews, counting programs, moving observer surveys, self-administered surveys, Simple panel surveys, etc.; design of survey instruments; conduct of data collection activities; data reduction techniques.

7610 Traffic Engineering Operations and Control (3) Prereq.: CE 3400 or equivalent. Traffic regulations, operational problems, and engineering organization; theory and practice of application, design, operation, and maintenance of traffic control devices; methods and devices studied include signing, markings, delimitation and illumination, signs and signal systems, one-way street and balanced-flow street operations, speed zoning, and freeway management systems.

7612 Traffic Flow and Analysis (3) S-O Prereq.: CE 4450 or consent of instructor. Traffic flow theory and the techniques used in transportation and highway capacity; theoretical aspects of traffic flow, including current research in the field; application of analytical procedures used to assess the efficiency of highway operations.

7614 Intelligent Transportation Systems (3) V Theories and applications of Intelligent Transportation Systems (ITS).

7615 Advanced Highway Design and Traffic Safety (3) S-O Prereq.: CE 4450 or consent of instructor. Theoretical development and application of highway design principles, particularly as they relate to safety, accident analysis statistics, diagnosis of high-hazard locations, risk management, traffic liability, and design treatments to achieve acceptable conditions; design principles of traffic calming, highway-railroad grade crossings, highway work zones, and roadway cross sections.

7621 Mass Transit Systems (3) Prereq.: CE 3500 or equivalent. Historical development, role in society, federal participation, and institutional and legislative development of transit; description of various forms, and characteristics of users; planning, vehicle scheduling, environmental impact and energy consumption; system costs, pricing and financing; future systems and policies.

7640 Urban Transportation Policy and Planning (3) Prereq.: CE 3400. Public policy and definition of transportation planning; transportation planning context; characteristics of travel, politics, decision making and models of decision makers; system analytic approaches to transportation planning; inventory, data management, and spatial representation of data; land use and transportation; inputs to traffic forecasting.

7641 Urban Transportation Planning Models (4) S-E Prereq.: CE 7640, ECON 5560, EXST 7003, or equivalent. 3 hrs. lecture, 2 hrs. lab. Theories of travel demand modeling; conventional four-step modeling procedures; network development for highways, transit, high-capacity vehicles; development of trip generation, distribution, and assignment of highway and transit assignment procedures; use of current software for microcomputers.

7645 Transportation Systems Analysis (3) S-O Prereq.: CE 7640 or equivalent. Quantitative methods for investigation of transportation systems; basic network algorithms; macroscopic and microscopic traffic simulation models; dynamic traffic assignment approaches; network design problems with travel demand uncertainty; optimization concepts in transportation network modeling.

7650 Bituminous Materials and Mixtures (3) S-O Prereq.: CE 7000 or equivalent. 2 hrs. lecture, 3 hrs. lab. Properties of asphalts and tars used in bituminous materials; historical developments; properties and design of bituminous mixtures; theory and practice of asphalt concrete mix design for pavements and bases including specification and construction methods for hot-mixes and surface treatments.

7652 Transportation Engineering—Materials (3) Prereq.: CE 4450 or equivalent. Earthen materials—fills and subgrades; aggregates—types, properties, and performance; introduction to asphalt and asphalt concrete; introduction to cement and cement concrete; variability, OC Curves; stabilization principles and practices; unsealed roads.

7655 Pavement Materials Characterization (4) F-O Prereq.: CE 3700 or equivalent. 3 hrs. lecture, 3 hrs. lab. Laboratory and field test methods for determining engineering properties of pavement materials; interpretation of test data for selecting proper mix design. Use of fundamental engineering properties in design and analysis of pavement response to environmental and vehicular loads.


7673 Pavement Maintenance and Rehabilitation (3) S-E Prereq.: CE 3700 or equivalent. Concepts of pavement maintenance and rehabilitation; pavement evaluation techniques; maintenance versus rehabilitation versus replacement.

7700, 7701 Special Topics in Civil Engineering (3, 3) Prereq.: permission of department. Each course may be taken for a max. of 6 hrs. of credit. Specialized civil engineering projects.

7740 Master’s Report (3) Comprehensive report with oral defense on subject approved by the major professor.

7750 Seminar (1) All graduate students are expected to enroll every semester. One credit hour of credit will be allowed toward degree. Pass-fail grading.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

9000 Dissertation Research (1-12 per sem.) “S”/“U” grading.

CLASSICAL STUDIES • CLST

General education courses are marked with stars (*)

2070 Ancient World in the Cinema (3) An examination of how the cinema has interpreted the history and myths of Greece and Rome.

2080 Women in Antiquity (3) Knowledge of Greek or Latin not required. The role of women in Greek and Roman society; readings from historical, legal, medical, and religious documents.

2090 Greek and Roman Mythology (3) Taught in English; knowledge of the Greek and Latin languages not required. Survey of the principal myths of the Greeks and Romans.

2092 Greek and Latin Word Study (3) No previous knowledge of Greek or Latin is required. Survey of the principal words of the ancient Greek and Latin languages.

2101 Ancient Greek Civilization (3) Knowledge of Greek and Latin languages not required. Credit will not be given for both this course and HNRS 1001-1003. Survey of literature, philosophy, art, and culture of ancient Greece from its beginnings to the death of Alexander the Great.

2102 Ancient Roman Civilization (3) Knowledge of Greek and Latin languages not required. A survey of the literature, philosophy, art, and culture of ancient Rome from its beginnings to the death of Marcus Aurelius.

3015 The Archaeology of Ancient Greece (3) Also offered as ANTH 3015. Material culture of the great civilization of ancient Greece; includes Neolithic Age, Bronze Age (Mycenean-Minoan), Classical Age, and the Age of Alexander the Great.

3020 Classical Epic in Translation (3) Knowledge of Greek and Latin languages not required. Growth and development of the Greek and Latin epic; basic themes, the nature of a hero, and conflict.

3032 Greek and Roman Tragedy in English Translation (3) Taught in English; knowledge of Greek and Latin languages not required. Drama of Greece and Rome, including, major examples, and representative plays of Aeschylus, Sophocles, Euripides, and Seneca.
**COMMUNICATION DISORDERS**

General education courses are marked with stars (*).

1080 Survey of Communication Science and Disorders (3)
   For students interested in the study of human communication. Emphasis on anatomical, physiological, and behavior of normal and disordered verbal communication.

1050 Introduction to Language (3)
   Linguistic study of the principles and interrelated levels of language structure: phonetics, phonology, morphology, syntax, and semantics; related topics such as writing systems and dialects.

2051 Introduction to Manual Communication (4)
   A 4-credit laboratory course in sign language as an alternative basis of communication for hearing impaired individuals. May be repeated for a max. of 6 sem. hrs. of credit when topics vary.

2090 Comparative Mythology (3)
   Prereq.: CLST 2090 or permission of instructor. Introduction to myths from around the world with comparisons to Greek and Roman mythology.

4490 Audiologic Assessment (3)
   Prereq.: COMD 4250, 4153. Principles of audiology; middle-ear measurements, differential diagnosis; physiological tests including audiatory evoked potentials.

4590 Auditory Rehabilitation in Children (3)
   Prereq.: COMD 4153, 4190. Methods of management including modes of communication, auditory and speech reading training, amplification issues, selection and evaluation, and educational placement.

6811 Clinical Preparation and Observation Laboratory (1)
   2 hrs. lab. for majors in communication sciences and disorders. Procedures include selection and evaluation, codes of ethics; observation of various types of therapy and evaluation.

6822 Introduction to Clinical Practicum (2)
   F.S. For majors in communication sciences and disorders. Techniques for test administration, therapeutic methods, report writing, counseling/conferencing, behavior management.

6843, 6844, 4685 Clinical Practice: Therapeutic Techniques (1-6 each)
   Prereq.: COMD 4682 and credit in course work related to practicum-specific speech, language, or hearing disorder. May be taken for a max. of 8 sem. hrs. of credit each. On- and off-campus practica in speech, language, and hearing disorders.

6750 Independent Research in Speech Science or Linguistics (1-3)
   May be taken for a max. of 3 hrs. of credit. Also offered as LING 4750. Readings in speech science or linguistics directed by individual.

6751 Special Topics in Communication Disorders (3)
   May be taken for a max. of 6 hrs. undergraduate or graduate credit when topics vary.

7151 Speech Science (3)
   Motor and articularatory phonetics, including palatography, acoustic phonetics, and aspects of signal detection and perception.

7152 Instrumentation and Methods for Speech and Hearing (4)
   Prereq.: COMD 4153 or equivalent. 3 hrs. lecture; 2 hrs. lab. Instrumentation techniques for assessment and research in speech and hearing; both theory and application are emphasized.

7153 Research Design in Communication Science and Disorders (3)
   Prereq.: EXST 4001, 4006 or equivalent. Empirical research design problems in speech and hearing; emphasis on measurement validity and reliability.

7191 Hearing Science (3)
   Prereq.: COMD 4250. Auditory transmission and processing from the outer ear to the cortical area; psychophysical phenomena germane to human audition.

7192 Hearing Aids: Electroacoustics and Fitting (3)
   Prereq.: COMD 7191, 7490. Electroacoustic analysis of hearing aids, earmold design, selection and evaluation procedures, special devices, and problems in communication and speech processing.

7200 Neuroanatomical Bases of Speech and Hearing (3)
   Prereq.: BIOL 2150 and COMD 4250 or equivalent. Study of neuroanatomy and physiology of the central nervous system as it relates to sensory/motor and cognitive processes underlying speech and hearing.

7381 Language and Learning Disorders (3)
   Prereq.: COMD 4382. Language disorders and the communicative aspect of language; current research and treatment models for language intervention; relationship between language and learning; emphasis on school-aged child.

7382 Voice Disorders (3)
   Prereq.: COMD 4384. Incidence, etiology, concomitant problems; assessment and management of vocal dysphonias, aphonia, and laryngectomy.

7383 Cleft Palate/Orofacial Disorders (3)
   Prereq.: COMD 4250, 4380. Orofacial anatomy, physiology, and embryology; etiology and classification of orofacial cleft; surgical, dental, speech, hearing, and psychosocial concomitants and their management.

7384 Early Communicative Intervention (3)
   Prereq.: COMD 4382 or equivalent. For clinical practicum, take COMD 7684 or 7685. Early intervention strategy and conditions associated with “high risk” for communicative disorders; intervention approaches (prevention, evaluation, direct stimulation of child/caregiver interactions) and service delivery models (home-based, center-based).

7385 Neuropathologies of Speech (3)
   Prereq.: COMD 4250, 4381, and 7280; or equivalent. Physiological and anatomical bases of dystharia, apraxia, and related speech disorders due to neuropsychology in the adult population; emphasis on diagnosis, description, and clinical management.

7386 Introduction to Augmentative/Alternative Communication (3)
   Current issues, terminology, and technological developments; augmentative and system components, including various sign and symbol systems; augmentative communication assessment; intervention guidelines and procedures.

7387 Aphasia in Adults (3)
   Prereq.: COMD 7280 or equivalent and consent of instructor. Neurological bases of aphasia and related disorders; appropriate therapeutic methodologies.

7388 Learning Disorders II (3)
   Prereq.: COMD 4383 or equivalent. Etiology and nature of speech fluency disorders.

7399 Communicative Rehabilitation of Severely/Multily Handicapped Individuals (2) Medical bases of severely handicapping conditions; alternate communication systems; assessment and intervention processes; pragmatics of interpersonal communication involving individuals who use nonspeech modalities.

7399 Industrial Audiology and Hearing Conservation (3)
   Prereq.: COMD 7490. Audiological practices in industry and all professional hours count for professional certification. 2-8 hrs. clinic. On- and off-campus graduate practicum in specific areas (articulation, language, fluency, voice, audiological, rehabilitation, early communicative, auditory, oral-facial anomalies, neurological disorders).

7751 Quantitative Measurement of Speech (3)
   Prereq.: completion of 12 hr. of speech and hearing disorder. Rationale for and clinical utility of objective measures of speech and language function; emphasis on use of types of electronic instruments.

7752 Special Topics in Linguistics (3)
   May be taken two times for credit for the master's degree and four times for the doctorate when topics vary. Also offered as LING 7750. Topics to be announced.

7752 Seminar in Linguistics (3) Also offered as LING 7752. May be taken for a max. of 6 hrs. for the master's degree and 12 hrs. for the doctoral degree when topics vary. Problems in analysis of language; emphasis on phonology and semantics.

7775 Psycholinguistics: Linguistic Perspectives (3)
   Prereq.: ENGL 4019 or equivalent. Also offered as LING 7754 and LING 7754. Theories of constituent structure and their application; discourse/semantic principles and their application to speech and language universals.

7785 English for Speakers of Languages: Methods and Materials (3) Also offered as LING 7785. Problems of teaching English to speakers of other languages; assessment and production of languages for spoken and written language; discourse analysis, theoretical foundations, second language acquisition, and development of a teaching syllabus; work with international students.

7786 Independent Research: Phonetics and Linguistics (1-3)
   Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on an individual problem exclusive of a thesis or dissertation. Also offered as LING 7756.
7780 Seminar in Communication Disorders (3) Prereq.: consent of instructor. May be repeated for max. of 6 sem. hrs. credit when topics vary. Selected topics in communicative disorders.

7781 Independent Research: Speech Science (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7782 Individual Research in Communication Disorders (1-3) Prereq.: consent of instructor. May be taken for a max. of 5 sem. hrs. of credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7783 Dysphagia (3) Prereq.: COMD 4230, 7280. Characteristics, assessment, and management of swallowing disorders in children and adults occurring secondary to neurological or structural deficits.

7790 Seminar in Hearing Disorders (3) Prereq.: consent of instructor. May be repeated for credit. Exploration of current professional/scientific topics in clinical practice/research.

7791 Independent Research: Audiology (1-3) Prereq.: consent of instructor. May be taken for a max. of 5 sem. hrs. credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7850 Experimental Phonetics (3) Prereq.: PhD standing and permission of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Current research and modeling of the quantitative representation of human speech.

7855 Psycholinguistics (4) Prereq.: COMD 7191. 3 hrs. lecture; 3 hrs. lab. Admission to PhD program required. Class considers standard readings about perception of sound; examination of psycholinguistic methods, signal detection theory, frequency processing, pitch perception, intermodal implications, binaural hearing and temporal acuity.

7854 Physiological Acoustics (3) Prereq.: COMD 7191 and admission to doctoral program. Auditory system structure and function; physiological acoustics and psychoacoustic correlates.

7880 Advanced Seminar in Language Disorders (3) May be taken for max 6 sem. hrs. credit when topics vary. Theory, contemporary issues, and research related to language disorders as a method of inquiry and intervention; evaluation of research methodology.

7882 Advanced Individual Research in Communication Science and Disorders (1-6) Prereq.: admission to PhD program and consent of instructor. May be taken for a max. of 6 hrs. of credit. Research topics ancillary or extraneous to dissertation research.

8000 Thesis Research (1-2 per sem.) “S”/“U” grading.

9000 Dissertation Research (1-12 per sem.) “S”/“U” grading.

COMMUNICATION STUDIES

CMST

General education courses are marked with stars (★).

1061 Fundamentals of Communication (3) The practice of rhetoric, performance studies, and communication theory; extensive practical and performance applications of communication skills in addition to lectures and readings.

1150 Introduction to Communication Studies (3) Not a substitute for CMST 1061, 2010, 2040, 2060, or 2064. Fundamental principles and subject areas in the study of human communication.

★ 2010 Interpersonal Communication (3) Theories and research in human communication; one-to-one interactions.

2012 Introduction to Film (4) 1 hr. lecture; 3 hrs. lab. Nature and function of film as a mode of communication; basic language of cinema; selected films screened and studied.

★ 2040 Introduction to Performing Literature (3) The study of literature through performance; reading, analysis, and performance of prose, poetry, and drama.

★ 2060 Public Speaking (3) Theory and skills needed by the effective communicator and critical consumer of speech; analysis of other speakers and practice in speaking.

2061 Communication for Business and the Professions (3) For students in the professional colleges, particularly the E. J. Ourse College of Business. Communication used in business and professional organizations; proposal presentations, group decision making, parliamentary procedure, and interviewing.

★ 2063 Argumentation and Debate (3) Prereq.: CMST 1061 or 2060. Preparation, execution and defense of analysis, briefing, evidence, reasoning, and refutation; debating on vital questions.

2064 Small Group Communication (3) Aspects of group leadership, group decision making, and the problems of communication in human relations.

2200 Practicum in Communication Studies (1-3) Prereq.: consent of instructor. May be taken for a max. of 3 sem. hrs.; however, no more than a total of 3 sem. hrs. in CMST 2200 and CMST 4200 may be taken for undergraduate credit. Practical experience in major interdepartmental activities outside the classroom under direct faculty supervision.

★ 2862 HONORS: Contemporary Public Address (3) Effectiveness of public address in contemporary society; limitations on free speech; influence of mass communications on public address; rhetorical practices in politics, education, religion, business, and minority and pressure groups.

3012 History of Film (4) 1 hr. lecture; 3 hrs. lab. Historical, cultural, artistic, and technological development of the film industry; selected films screened and studied.

3013 Topics in Film Genres (4) 1 hr. lecture; 3 hrs. lab. May be taken for a max. of 4 sem. hrs. of credit when topics vary. Study of the rhetorical and aesthetic elements of solo and group performance; including performances of literature, cultural performances, and experimental performances.

3041 Performance in Everyday Life (3) Communication-centered study of performance and theatricity in daily life.

3060 Advanced Public Speaking (3) Prereq.: grade of “B” or better in CMST 1061 or 2060. Refined development in platform speaking.

3106 Communication and Power (3) How power is created, maintained, and subverted through the strategic use of discourse.

3107 Rhetoric of the Contemporary Media (3) Various forms of media (television, pulp novels, pop music); their promotion of cultural values and modes of conduct; study of major rhetorical critics and theorists.

3113 Conversation (3) Analysis of verbal processes in conversation; emphasis on theory and research concerning language, message, and social interaction.

3114 Communication Research (3) Techniques and procedures in communication research; topical development, research design, data collection; data analysis; examination of recent research in the field of verbal and non-verbal communication.

3115 Communication and Gender (3) Prereq.: CMST 2010 or equivalent. Gender differences, sex roles, and sexual stereotypes in communication.

3118 Intercultural Communication (3) Rhetoric and Social Change (3) Role of oratory in the formation, mobilization, and destruction of human communities from ancient to modern times.

3168 Rhetoric of Propaganda (3) Prereq.: CMST 2060, 2063, or 2602. Common persuasive strategies employed in propagandistic discourse.

3169 The Rhetoric of Social Movements (3) Prereq.: CMST 2663, 2662, 3106, 3107, or 3167. Persuasive strategies used to build social identities and collectively agitate for social change.

3210 Computer Mediated Communication (3) Prereq.: CMST 2010. Theories of communication as they apply to communication by computerized means. The effects of CMC on daily human activity, interpersonal relationships, and work life.

3300 Rhetorical Criticism (3) Prereq.: CMST 2060. History and practice of criticism as a means of inquiry in rhetorical studies. Theoretical and methodological underpinnings of major schools of criticism examined.

3810 Independent Study (1-3) May be taken for a max. of 5 hrs. of credit on a communication topic not duplicated in regular course offerings. Course may be taken for a max. of 4 hrs. of credit when topics vary.

3900 Selected Topics in Speech (3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Consult Schedule of Classes for current offerings.

4012 Communication and Relationships (3) Prereq.: CMST 2010 or equivalent. Survey of theories of interpersonal communication and misunderstandings in relational development and deterioration; more effective communication.

4010 Political Communication (3) Factors and strategies in contemporary political communication in the U.S.; emphasis on electronic communication, candidates and images, campaign management, speechmaking, and advertising; study of recent and current elections.

4011 Organizational Communication (3) Prereq.: CMST 1060. Theories surrounding people communicating within the organizational setting, as well as how communication relates to the process of organizing; examines relevant theories and research.

4107 Communication as Culture (3) Prereq.: CMST 3106, 3107, or 3167. Creation, maintenance, and alteration of cultural norms, institutions, and values through both mass mediated spectacle and intimate communication ritual.

4112 Health Communication (3) Communication in the healthcare context; application of communication theories and strategies in the healthcare industry; critical examination of health messages in popular culture.

4113 Communication and Leadership in Teams (3) Analysis of communication processes in groups and teams; includes examination of theories and research findings; addresses individual and team participation, leadership, and decision-making skills.

4114 Contemporary Theories of Communication (3) Current methods and theories of human communication; research literature; behavioral antecedents and consequences of messages and their variations; how messages interact with communicators to produce behavioral-outcome.

4118 Modelling Communication Within Marital and Family Relationships (3) Prereq.: CMST 2010. Also offered as SOCIL 4402. Role of communication within marriages and other family arrangements.

4119 Nonverbal Communication (3) Prereq.: CMST 2010 or equivalent. Nonverbal systems such as kinesics and proxemics; relationship between nonverbal and verbal communication.

4140 Analysis and Performance of Poetry (3) Prereq.: CMST 2040. Advanced study of selected forms, styles, and genres of oral and written poetry through solo and group performance.

4141 Analysis and Performance of Narrative (3) Prereq.: CMST 2040. Advanced study of selected novels, short stories, and oral narratives through solo and group performance; stylistic and rhetorical analyses.

4142 Selected Topics in Performance Studies (3) Prereq.: CMST 2040 and 3840 or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary.

4143 Performance of Southern Fiction (3) Prereq.: CMST 2040 or equivalent. Study of selected texts of contemporary southern fiction through solo and group performance; literary criticism of texts performed; relevant narrative and performance theory.

4144 Performance Art (3) Prereq.: CMST 2040 and 3840 or equivalent. Also offered as THTR 4144. History, theory, criticism, and practice of 20th century avant-garde performance and performance art.

4145 Group Performance (3) Prereq.: CMST 2040 and 3840 or equivalent. Theories and practices of adapting and staging nondramatic literature and other materials for group performance; directing for Reader's Theatre, Chamber Theatre, Story Theatre, and other forms.

4147 Body Performance Culture (3) Prereq.: CMST 2040 and 3840 or equivalent. Theories and uses of the body as a site of cultural production and communication in everyday life and more formal performance events.

4160 Persuasive Communication (3) Prereq.: CMST 1061, 2060, 2063, or equivalent. Nature of persuasive speaking.

4164 Advanced Argumentation (3) Prereq.: CMST 2063 or 4160 or equivalent. Argumentation in different types of speaking situations; trends in argumentation theory; argumentation in practice.
social institutions; the Internet, e-mail, news groups, ftp, telnet, World Wide Web, multimedia, word processing, spreadsheets, databases.

1200 Ethics in Computing (1) For majors only.
Introduction to ethics theory, ethical decision-making as it relates to computer professionals, licensing, intellectual property, conflicts of interest, freedom of information and privacy, security.

1240 Syntax and Graphics with MATLAB (3)
Prereq.: MATH 1021 or placement in MATH 1022, 1023, 1431, 1530 or 1551. 2 hrs. lecture; 2 hrs. lab. Credit will not be given for both this course and CSC 1242 or 2262 or 2353. Not for degree credit for computer science majors. Introduction to MATLAB programming with applications in statistics and graphics.

1248 Programming With Applications in Statistics (3)
Prereq.: MATH 1021 or placement in MATH 1022, 1023, 1431, 1530 or 1551. 2 hrs. lecture; 2 hrs. lab. Basic digital circuits; Boolean algebra and combinational logic, data representation and transfer, and digital arithmetic; digital storage and accessing, computer input/ output facilities, system organization, and reliability; description and simulation techniques; features needed for multiprocessing, multiprocessor systems; other advanced topics and alternate organizations.

2533 Introduction to Engineering Computation (3)
Prereq.: MATH 1550. 2 hrs. lecture; 3 hrs. lab. Also offered as ENGR 2353. Credit will not be given for both this course and CSC 1240. Problem solving techniques and structured programming tools for engineering synthesis and analysis; application of symbolic solvers and technical computing tools.

2700 Special Topics in Computer Science (1-3)
Prereq.: CSC 1253 or 1350 or 1551 or 2533 or 4362 or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary. Total credit earned in CSC 2700 and 4700 should not exceed 9 hrs. Specialized areas of current interest in computer science.

3102 Advanced Data Structures and Algorithm Analysis (3)
Prereq.: CSC 1245 or 1351 or credit or concurrent enrollment in CSC 2229 or EE 2720. Description and utilization of formal ADT representations, especially those on lists, sets, and graphs; time and space analysis of recursive algorithms, including graph and sorting algorithms; algorithm design techniques.

3380 Object Oriented Design (3)
Prereq.: CSC 1245 or 1351. Advanced object-oriented programming emphasizing the use of the unified modeling language as a design tool.

3501 Computer Organization and Design (3)
Prereq.: CSC 2259. Credit will not be given for both this course and CSC 2240 or EE 3750 or 3755. Computer arithmetic, design of high-speed adders and multipliers, CPU concepts, instruction fetching and decoding, hardware control, microprogramming control, main memory, I/O organization, assembly language programming techniques, CPU instruction set design.

3990 HONORS: Undergraduate Research in Computer Science (3)
Prereq.: CSC 3102; consent of department; admission to Upper Division Honors Program. Individual research on problems in computer science.

3992 HONORS: Thesis in Computer Science (3)
Prereq.: CSC 3991; consent of department; admission to Upper Division Honors Program. Writing and formal defense of a research thesis in computer science. Defense committee of three faculty members must be approved by department. May be repeated with new topics up to a max. of 6 hrs. of credit when topics vary. Total credit earned in CSC 3991 and 4700 should not exceed 9 hrs. Specialized areas of current interest in computer science.

4002 Introduction to Database Management Systems (3)
Prereq.: CSC 3102. Network, hierarchical, and relational and entity-relationship models; data definition, manipulation languages, and conversion among these models; relational database design theory, efficient query evaluation, elementary query optimization techniques.

4444 Artificial Intelligence (3)
Prereq.: CSC 3401. Theorem proving and inferencing techniques, production systems, knowledge representation, approximate reasoning, nonmonotonic reasoning, expert systems, language understanding, scene analysis, planning, game playing, and learning.

4446 Fuzzy Sets and Applications (3)
Prereq.: permission of department. Fuzzy sets, operations, fuzzy logic, and fuzzy rule-based systems; applications to engineering and decision making; emphasis on systematic methodology to construct fuzzy application software and simulations tools in solving real-world problems using fuzzy-set techniques.

4501 Computer Networks (3)
Prereq.: CSC 4103. Introduction to local, metropolitan, and wide area networks using the standard OSI reference model as a framework; introduction to the Internet protocol suite and network programming; discussion of various networking technologies.

4601 Computer and Network Security (3)
Prereq.: CSC 3102. Information security’s role, threats, elements of cryptography, protocols, architectures, and technologies for secure systems and services.

4602 Fundamental Computer Science for Teachers (3)
Prereq.: ELRK 1410 (or prior programming experience) and credit in an education methods course numbered 3800 or above. Also offered as ELRK 4512. Advanced programming techniques; emphasis on structured programming, software development tools, data structures, graphics, and other topics to prepare students to teach computer science in secondary schools.

4700 Special Topics in Computer Science (3)
Prereq.: CSC 3102 or permission of department. May be taken for a max. of 4 hrs. of credit when topics vary. Total hrs earned in CSC 3102 and 4700 should not exceed 6 hrs. Specialized areas of current interest in computer science.

4890 Introduction to Theory of Computation (3)
Prereq.: CSC 2259. Introduction to finite automata, regular expressions and languages; push-down automata and context-free languages; selected advanced language theoretical topics; emphasis on technique.

4999 Advanced Independent Undergraduate Research (1-3)
Prereq.: consent of department chair. May be taken for a max. of 4 hrs. of credit. Individual readings, conferences, and program development in computer science.

6100 Advanced Elements of Computer Science for Teachers (3)
Prereq.: computer science programming course or knowledge of a programming language required. Advanced programming techniques using a high-level, structured language; data structures and computer systems software.

7080 Computer Architecture (3)
Prereq.: CSC 7002 or equivalent. Background in computer organization. Functional architecture of modern digital computer systems; detailed description of instruction set implementation with memory access and multiprocessor design and analysis of instruction sets and control structures.
12131 Materials, Methods, and Equipment II (Heavy and Structural Construction) (3) Prereq.: CM 2121. Continuation of CM 2121. Emphasis on both heavy and industrial equipment.

12141 Construction Planning and Scheduling (3) Prereq.: CM 2040 and CM 2121 or CE 1002. Fundamentals of planning and scheduling techniques used in the construction industry to manage construction projects.

13000 Construction Safety (3) Construction safety relating to accident causation; contractual obligations; project management and coordination.

13100 Construction Surveying (3) Prereq.: CM 2121. 2 hrs. lecture; 2 hrs. lab. Principles of construction surveying, fundamental measuring procedures, error analysis, leveling, traverse measurements, horizontal surveys, vertical curves, and earthwork calculations.


13131 Industrial Construction Estimating (3) Prereq.: CM 2115 and 3121. 2 hrs. lecture; 2 hrs. lab. Principles of estimating including quantity surveys, pricing analysis, and bid package preparation for industrial construction.

13141 Highway Construction (3) Prereq.: CM 3100. Basic principles of highway construction including: earthmoving, drainage, road paving, bridge, and retaining walls; interpretation of plans and specifications; materials, methods, and construction analyzing.

13210 Advanced Computer Applications for Construction Management (3) Prereq.: CM 2141. Application of software programs currently being used in the construction industry.

13303 Mechanical and Electrical Systems (3) Prereq.: CM 2122 and PHYS 2092. Mechanical and electrical systems in residential and commercial buildings; nomenclature and design consideration; emphasis on management, quality control, and installation procedures.

13400 Construction Materials (3) Prereq.: CM 2122. Fundamentals involved in design, evaluation, testing, and construction of asphalt, concrete, aggregates, steel, timber, and masonry; properties of soils, compaction, and slope stability; construction of shallow and deep foundations, and retaining walls.

13505 Structural Technology I (3) Prereq.: MATH 1550 and PHYS 2101. Rigid and deformable body structural mechanics for construction management majors focusing on determination of the nature, magnitudes, and equilibrium requirements of forces acting on structures and the internal load effects (stress and deformation) of these forces on structural members.

13506 Structural Technology II (3) Prereq.: CM 3505. Structural design of ordinary timber, steel, and reinforced concrete structural members in accordance with appropriate design code specifications; emphasizes allowable stress design provisions to achieve safe and serviceable structural resistance to vertical and lateral load effects.

14200 Construction Administration (3) Prereq.: CM 2141 and registration in CM 3080. Principles and theory of ownership, organization, contracts, insurance, bonding, and labor relations pertaining to the construction industry.

14201 Construction Law (3) Prereq.: CM 4200. The law of business and current legal problems, roles, and responsibilities associated with the construction industry; emphasis on claims avoidance.

14202 Construction Enterprise (3) Prereq.: CM 3210 and 4200. Open to Construction Management majors only. A comprehensive study of construction management as it relates to a single construction enterprise.

14206 Special Topics in Construction Management (3) May be taken for a max. of 6 sem. hrs. when topics vary. Advanced topics, current issues, or recent developments in the construction industry.

14207 Independent Study (3) Prereq.: consent of a faculty member. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Research on a construction topic as chosen by the student under direct supervision of a chosen faculty member.

CURRICULUM AND INSTRUCTION • ED CI

Admission to courses at the 3000-level and above is restricted to students admitted to a teacher education program/concentration. Formal admission includes 2.50 LSG and cumulative grade point averages and passing scores on a minimum of an ACT composite score of 22 or a minimum SAT composite score of 1030.


1001 Introduction to College Study (3) Intended for entering freshmen. College-level readings and techniques for organizing text and lecture information for effective study; critical thinking and reading; time management; preparation for tests.

2001 Education, Schooling, and Society (3) Introduction to contemporary educational issues, especially as these are structured historically, culturally, socially, and politically; topics include history, theory, and politics of education, especially as related to gender, race, class, and technology.

2025 Foundations and Principles of Teaching in Elementary School (3) 2 hrs. lecture; 2 hrs. field experience in elementary schools. Experience that join theory to practice as it operates in an elementary school culture; a reflective approach to pedagogy; discussions of teaching in the historical and philosophical dimensions of discourse practice.


2045 Principles and Practices in K-12 Programs (4) Prereq.: ED CI 1000 and enrollment in a program leading to teacher certification. 2 hrs. lecture; 2 hrs. field experience in multicultural settings. Managerial aspects of instruction; application of learning principles to the classroom setting.

2081 PK-3 Program Overview (1) Pass/fail grading. The nature of PK-3 instruction and expectations of the PK-3 teacher in the PK-3 learning environment of the classroom, with attention to individual and group motivation, social interactions, integration of technology, and classroom management.

3112 Reading Instruction in the Elementary School (6) Prereq.: ED CI 2025; concurrent registration in ED CI 3112. 6 hrs. lab/field experience in multicultural settings. Current instructional materials and methods in teaching reading at the elementary school level; reading diagnosis and skills in a laboratory situation in the public schools.

3113 Materials and Methods in Teaching Communicative Skills in the Elementary School (2) Prereq.: ED CI 2025; concurrent registration in ED CI 3113. 2 hrs. lab/field experience in multicultural settings. Instructional materials and methods in teaching language arts communicative skills at the elementary school level; understanding and skills in a laboratory situation in the public school.

3124 Curriculum Discipline: Mathematics Theory and Practice (6) Prereq.: CM 2121 and 2141. 12 sem. hrs. of mathematics, including MATH 1201 and 1202; 11 sem. hrs. of natural science; and concurrent enrollment in ED CI 3124 and MATH 2201. 3 hrs. lecture; 6 hrs. lab/field experience in multicultural, multilevel settings. Structures of the discipline of mathematics applied to teaching mathematics in grades 1-6; standards-based pedagogical strategies, techniques, and materials are coordinated with basic principles of learning.

3125 Curriculum Discipline: Science (3) Prereq.: CM 2121 and 2141. 12 sem. hrs. of natural science, 12 sem. hrs. mathematics, and concurrent enrollment in ED CI 3124 and MATH 2201. 2 hrs. lecture; 6 hrs. lab/field experience in multicultural, multilevel settings. Structures of science discipline applied to teaching science in grades 1-6; standards-based pedagogical strategies, techniques, and materials are coordinated with basic principles of learning.

3126 Curriculum Disciplines: Mathematics (3) Prereq.: CM 2121 and 2141. 6 sem. hrs. of credit in mathematics courses, and concurrent enrollment in ED CI 3125 and 3127. 2 hrs. lecture; 6 hrs. lab/field experience in multicultural settings. Structures of mathematical disciplines for teaching in lower/upper elementary school; student teaching in multicultural, multilevel settings.

3127 Curriculum Disciplines: Social Studies (3) Prereq.: ED CI 2400, 3000, and concurrent enrollment in ED CI 3209, 3127, and 4460. 2 hrs. lecture; 6 hrs. lab/field experience in multicultural, multilevel settings. Structures of the social science disciplines applied to teaching social studies in grades 4-5; standards-based pedagogical strategies, techniques, and materials are coordinated with basic rationales and principles of learning.

3135 Teaching Reading in the Junior and Senior High School (3) Prereq.: ED CI 2040 or 2045 or equivalent. Approaches for teaching reading; general review of reading approaches and materials.

3136 Reading in the Content Areas (3) Prereq.: ED CI 3115 or equivalent. Content area reading problems and solutions; the reading process, approaches, skills, and materials.

3137 Assessing and Guiding Classroom Reading Instruction (3) Prereq.: ED CI 2400, 3000, and concurrent enrollment in ED CI 3209, 3127, and 4460. 2 hrs. lecture; 6 hrs. lab/field experience in multicultural settings. Advanced reading instruction experience with particular emphasis on assessment in diverse and multicultural settings.

3142 Materials and Methods in Secondary School English (3) Prereq.: ED CI 2040 and credit for or registration in 21 of the 24 sem. hrs. of English courses required for a teaching minor in secondary school English; 2 hrs. lecture; 2 hrs. lab/field experience in multicultural settings.

3143 Materials and Methods in Secondary School French (3) Prereq.: ED CI 2040 and credit for or registration in 23 of the 26 sem. hrs. of French courses required for a teaching minor in secondary school French; 2 hrs. lecture; 2 hrs. lab/field experience in multicultural settings.

3147 Materials and Methods in Secondary School Social Studies (3) Prereq.: ED CI 2040 and credit for or registration in 21 of the 26 sem. hrs. of the social studies courses required for a teaching minor in secondary school social studies; 2 hrs. lecture; 2 hrs. lab/field experience in multicultural settings.
4800 Special Topics in Education (3) Prereq.: ED CI 4481. Permission of instructor. May be taken for a max. of 9 sem. hrs. of credit. Topics (1-3) when credit varies.

4801 Reading (3) Prereq.: ED CI 3125 or equivalent. Specific topics include: reading in content areas; the reading process; materials and research; instructional techniques; current trends and issues in service provision.

4802 Trends and Issues in Emotional and Behavioral Disturbance (3) F-E An in-depth study of the meaning and concepts associated with the field of learning disabilities and the divergent characteristics of children with language, academic, and cognitive impairments.

4803 Trends and Issues in Behavioral and Emotional Disturbance (3) F-O An in-depth examination of issues and trends in emotional and behavioral disturbance including diagnosis, etiology, current theory, and delivery systems.

4804 Advanced Evaluation and Assessment for Students at Risk (3) F Prereq.: ED CI 3701 or equivalent. Requires practical field experience with students with disabilities in a school environment. Identification and diagnosis of learning and behavior problems; IDEA Section 504 legal requirements; administration and interpretation of individually administered standardized tests; design of classroom-based assessment and diagnostic evaluation; comparative analysis; instructional and service recommendations based on multifaceted assessment.

4805 Advanced Practicum in Evaluation and Assessment (3) S Prereq.: ED CI 7099. Supervised experience in educational evaluation and assessment; practical and in-depth approach; procedures for preterferential screening; procedures for comprehensive individual assessments, including evaluating for eligibility, interpreting data for instructional decision-making, and for designing ongoing data collection system.

7011 Administration and Supervision in Special Education (3) Prereq.: 3 sem. hrs. in computer science or equivalent. 3 hrs. lecture plus field experience. Materials and general principles for the assessment of educational programs; management and coordination of special education programs; instructional, programmatic, and professional responsibilities, including the CEC and CASE standards for professional practice.

7014 Advocacy for Individuals with Disabilities (3) F Family/caregiver involvement and participation; the individual with disabilities as a member of the community; and legal issues specific to a free appropriate education for the child and parent. Prereq.: ED CI 4701, 4704, or equivalent.

7017 Explicit Instructional Models for Students with Disabilities (3) F Prereq.: ELRC 4249. 2 hrs. lecture; 2 hrs. lab. Emphasizing the research base and theory supporting the use of instructional and assessment models, including Direct Instruction Model and curriculum-based assessment.

7018 Strategic Instructional Models for Students with Disabilities (3) S Prereq.: ELRC 4249. 2 hrs. lecture; 2 hrs. lab. Evaluating the research base and theories supporting the use of strategic instructional and assessment models; emphasis on the use of strategic instruction with students with mild to moderate disabilities.

7019 Teaching Social and Functional Skills to Students with Disabilities (3) Prereq.: ED CI 7105. Instructional planning and methods for teaching functional and social behavior to students with disabilities.

7021 Legal and Ethical Issues in Special Education (3) Prereq.: ED CI 7105 or 7141. Legal and ethical issues in special education; specific emphasis on IDEA, Section 504, case law, regulatory issues, professional ethics, and CEC standards for professional practice.

7024 Seminar on Transition for Students with Disabilities (3) S An in-depth examination of the secondary/postsecondary transition of students with mild disabilities.

7033 Quality Assurance in Special Education (3) Prereq.: ED CA 7105 or equivalent. 3 hrs. lecture; 1 hr. lab. The design and implementation of quality assurance and compliance monitoring for programs serving students with disabilities; focus on the federal and state program requirements and quality assurance approaches prevalent in the field of disabilities.

7105 Teaching Reading in the Elementary School (3) Current instructional procedures and research in reading instruction in the elementary school; approaches and ideas for teaching reading to culturally different students.

7106 Teaching Reading to Students with Diverse Cultural Backgrounds (3) Prereq.: ED CI 7105 or 7135 or consent of instructor. Teaching reading to students from different cultural settings; analysis of methods and materials that support reading instruction for these students.

7107 Topics in Reading Education (3) Prereq.: ED CI 7105 or 7135 or consent of instructor. 2 hrs. lecture; 1 hr. lab. Taken for a max. of 4 sem. hrs. of credit when topics vary. Issues and practices in elementary through adult reading instruction.

7108 Studies in the Teaching of Elementary School Mathematics (3) Prereq.: ED CI 7125 or equivalent. Theoretical foundations, instructional skills, and materials for teaching elementary school mathematics.

7109 Studies in the Teaching of Elementary School Mathematics (3) Prereq.: ED CI 7125 or equivalent. Theoretical foundations, instructional skills, and materials for teaching elementary school mathematics; relationship between learning theories and acquisition of mathematical skills and concepts.

7110 Studies in the Teaching of Elementary School Social Studies (3) Methods and materials for teaching elementary-level social studies.

7111 Studies in the Teaching of Elementary School Language Arts (3) Prereq.: ED CI 7125 or equivalent. Methods and materials for teaching reading; writing, and language in the classroom; various teaching theories and approaches for teaching reading.

71125 Teaching English as a Second Language (3) F Instructional strategies for teaching English as a second language; teacher, collaborative consultation, co-teaching, and building effective communications among educators, parents, and other professionals in providing education and other services to children with exceptionalities.

7479 Student Teaching in Special Education: Mild/Moderate Disabilities (9) F-S Prereq.: credit or registration in ED CI 4705. 1 hr. seminar; 30 hrs. lab. 30 hrs. lab. Planning and implementing special education programs for students with mild to moderate disabilities.

8000 Teaching in the Multicultural Classroom (3) Strategies and resources for teaching student of cultural diversity in the classroom; development of units and activities of cultural variety.

8001 Special Topics in Curriculum and Instruction (1-3) F-O Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. Methods, trends, and issues in curriculum and instruction.

8002 Special Topics in Education (1-3) F-O Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. New methods, trends, and techniques.

8003 Trends and Issues in Mental Retardation (3) An in-depth examination of issues in mental retardation, including diagnosis, etiology, current theory, and delivery systems.

8005 Trends and Issues in Emotional and Behavioral Disturbance (3) F-E An in-depth study of the meaning and concepts associated with the field of learning disabilities and the divergent characteristics of children with language, academic, and cognitive impairments.

8008 Trends and Issues in Emotional and Behavioral Disturbance (3) F-O An in-depth examination of issues and trends in emotional and behavioral disturbance including diagnosis, etiology, current theory, and delivery systems.

8009 Advanced Evaluation and Assessment for Students at Risk (3) F Prereq.: ED CI 3701 or equivalent. Requires practical field experience with students with disabilities in a school environment. Identification and diagnosis of learning and behavior problems; IDEA Section 504 legal requirements; administration and interpretation of individually administered standardized tests; design of classroom-based assessments and diagnostic evaluation; comparative analysis; instructional and service recommendations based on multifaceted assessment.

8010 Advanced Practicum in Evaluation and Assessment (3) S Prereq.: ED CI 7099. Supervised experience in educational evaluation and assessment; practical and in-depth approach; procedures for preterferential screening; procedures for comprehensive individual assessments, including evaluating for eligibility, interpreting data for instructional decision-making, and for designing ongoing data collection system.

7135 Techniques for Teaching Reading in the Middle and Secondary School (3) Reading skills appropriate for the upper levels; approaches for teaching reading; techniques for improving the school reading program.

7140 Studies in the Teaching of Social Studies in Secondary Schools (3) Theory and research with practical application to areas of study needed to teach social studies in the secondary school.

7141 Studies in the Teaching of Mathematics in Secondary Schools (3) Prerequisites and issues in techniques and materials for teaching mathematics in secondary schools; relationship between learning theories and acquisition of mathematical skills and curriculum.

7142 Studies in the Teaching of English in Secondary Schools (3)

7143 The Teaching of Literature in Secondary Schools (3)

7147 Studies in the Teaching of Secondary School Science (3) Prereq.: ED CI 3147 or equivalent; and science teaching experience. Instructional materials, evaluation practices, and science teaching skills for grades 6-12.

7149 Studies in the Teaching of Foreign Languages (3) Prereq.: completion of an undergraduate foreign language methods course and/or teaching experience; or consent of instructor. Principles and current research related to the teaching of foreign languages.

7205 Critical Analysis of Current Research in Reading (3) Prereq.: 12 hours of graduate reading courses or equivalent. Evaluation of educational research and needed research; application of research findings in the instructional program.

7247 Teaching in the Science Laboratory (3) Prereq.: ED CI 3147 or equivalent. 2 hrs. lecture; 2 hrs. lab. Interpreting research in laboratory science instruction; use of results to generate creative laboratory activities.

7269 Foundations of Art Education (3) Prereq.: graduate standing in an art education or consent of instructor. Development of theory and philosophy leading to contemporary practices in art education.

7271, 7272 Development and Administration of an Art Education Curriculum (3, 3)

7307 Topics in Curriculum and Instruction (3) May be taken for a max. of 6 hrs. of credit when topics vary.

7308 Topics in Science Education (3) Prereq.: ED CI 3147 or 7108; or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary.

7309 Topics in Mathematics Education (3) Prereq.: ED CI 7109 or 7141 or consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.

7310 Topics in Social Studies Education (3) Prereq.: ED CI 7110 or 7141; or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary.

7311 Topics in Language Arts Education (3) Prereq.: ED CI 7111 or 7142; or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary.

7312 Diagnostic and Prescriptive Teaching in Mathematics (3) Prereq.: ED CI 7109 or equivalent. Techniques for assessing students’ skill levels and understanding in K-12 mathematics and for tailoring instruction to individual needs.

7313 Teaching Literature in the Elementary School (3) Role of literature in elementary education; relevant teaching issues and strategies; integration of literature into the elementary curriculum.

7314 Teaching Written Composition in the Elementary School (3) Prereq.: ED CI 3113 or equivalent. Practices and curricula in the teaching of written composition in the elementary school; its relationship to language arts instruction.

7315 Teaching Multicultural Children’s Literature (3) Multicultural literature for elementary through junior high school; historical and contemporary perspectives; implications for the classroom.

7450 Designing and Delivering the Secondary or K-12 Curriculum (3) Prereq.: ED CI 4450 or 4455. Principles of education applied to vital aspects of teaching practice in all content areas: language, literature, and reading; student needs and characteristics; multicultural and global education; uses of technology; assessment and evaluation.

7455 Foundations of Secondary or K-12 Educational Technology Policy, and Practice (3) Prereq.: cohort membership and completion of ED CI 7460, 7461; or consent of instructor. Social contexts, history, and philosophy of
EDUCATION • EDUC

2000 Special Topics in Education (1-3) Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. Methods, trends, and issues in education.

EDUCATIONAL LEADERSHIP, RESEARCH, AND COUNSELING • ELRC

GENERAL COURSES

5880 Special Topics in Education (1-3) V Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit when topics vary. Direction and assistance for the practitioner in solving special problems in school organization.

7299 Introduction to Scholarship in Education (3) Restricted to PhD or EdS students in the department, or permission of instructor. Introduction to scholarship in education and to demands and expectations of doctoral study.

7612 Student Development Theory (3) Explores the development of students in the higher education environment, including theories and research related to intellectual, moral, ego, psychosocial, career, and spiritual development.

7811 Seminar in Current Trends in Education (3) Open only to students who have completed qualifying examination for the doctoral degree. Current issues and trends, sources, bibliography, and research in the student's major.

7900 Independent Study (1-6) May be taken for a max. of 12 sem. hrs. of credit. Open to advanced graduate students. Directed individual study under the guidance of a graduate faculty member.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

8900 Pre-dissertation Research (1-9) Prereq.: consent of department.

8901 Dissertation Research (1-12 per sem.) "S"/"U" grading.

COUNSELOR EDUCATION

4360 Foundations, Functions, and Administration of Counseling and Guidance Services (3) V Multi-disciplinary foundations of guidance; major guidance functions; administration of guidance programs.

4361 Counseling Children (3) V Introduction to methods and procedures.

4365 Basic Course in Interpersonal Communication (3) F,S,Su Prereq.: Introduction to basic communication skills and counseling techniques.

4609 Counseling for Disabling Conditions (3) V Etiology, identification, and counseling interventions for counselors and clients which result in disablement and impaired functioning.

4601 Management of Counseling Services (3) V Su Case and program management procedures for client rehabilitation.

5380 Special Problems in Guidance and Counseling (3) V Prereq.: consent of instructor. 1 hr. lecture; 4 hrs. lab. May be taken for a max. of 9 hrs. of credit when topics vary.

7301 Orientation to the World of Work (3) V Prereq.: ELRC 7332. Also offered as HRE 7301. For elementary school counselors. Basic concepts underlying orientation, awareness, and exploration phases of the career development process.

7302 Group Dynamics and Techniques in the Elementary Schools (3) V Prereq.: ELRC 4361 and 4365. For elementary school counselors. Dynamics of small group behavior; emphasis on classroom consultation and demonstration procedure.

7339 Group Techniques and Dynamics in Counseling (3) V S Dynamics of small group processes, theories of group counseling, and basic group leadership skills.

7331 Counseling Theory and Techniques (3) F Review of major counseling theories and intervention methods.

7332 Educational and Occupational Information (3) V See HRE 7332.

7333 Analysis of the Individual (3) Su Overview of selection, administration, interpretation, and use of assessment and evaluation instruments and techniques in counseling.

7334 Vocational Counseling (3) V Prereq.: ELRC 7332 or equivalent. Also offered as HRE 7334. Materials and techniques in vocational counseling of adolescents and adults.

7360 Counseling Practicum in Elementary Schools (3-6) F,S Prereq.: consent of instructor. 2 hrs. conf.; 6-18 hrs. lab in work setting. Supervised experience in elementary schools.

7362 Practicum in School Counseling (3-6) F,S Prereq.: ELRC 4365, 4365, 7330, 7331, 7335, and consent of instructor. 6-18 hrs. lab in work setting. Supervised experience in elementary, middle, or high school settings.

7364 Community Agency Counseling Practicum (3-6) F,S Prereq.: ELRC 4365, 4600, 4600, 7330, 7331, 7395, and consent of instructor. 2 hrs. conf.; 1 hr. lab; 6-18 hrs. lab in a work setting. Supervised clinical experience in community agency settings (e.g., counseling center, mental health centers).

7365 Seminar in Counseling (3) Prereq.: ELRC 4365 and 7331; or equivalent. May be taken for a max. of 6 hrs. of credit when topics vary. Consultation with professor and peers regarding problems encountered in implementing counseling services.

7390 Advanced Counseling Theory and Techniques (3) Su Prereq.: ELRC 7332. Theories, principles, and applications of counseling theories.

7391 Multicultural Counseling (3) Su Overview of cross-cultural counseling skills and review of factors which influence the behaviors of individuals from diverse populations.

7394 Advanced Group Counseling (3) S Prereq.: ELRC 7330 or equivalent. Small group counseling approaches.

7395 Family Counseling (3) F,S,Su Prereq.: Introduction to family system principles and their application to problem assessment, intervention, family assessment, developmental stages, ethical and cultural issues.

7396 Advanced Family Counseling (3) S Prereq.: ELRC 7395 or equivalent. Practice in assessing family dynamics; supervised experience in developing and implementing therapeutic interventions.

7397 Special Topics in Counseling (3) F,S,Su Prereq.: consent of instructor. 1 hr. lecture; 4 hrs. lab. May be taken for a max. of 6 hrs. of credit when topics vary.

7398 Field Experiences in Vocational Counseling (3) F,S,Su Prereq.: ELRC 7332 and 7334. 1 hr. lecture; 4 hrs. lab. May be taken for a max. of 6 hrs. of credit. Also offered as HRE 7398.

7399 Supervised Counseling Internship (3-9) F,S,Su Prereq.: ELRC 7330, 7351, or ELRC 7394 and consent of instructor. 2 hrs. conf. 1 hr. lab. A minimum of 100 hrs. week at a clinical setting, serving children, adolescents, adults, or families. May be taken for a max. of 9 hrs. of credit.

EDUCATIONAL ADMINISTRATION

4400 Introduction to Educational Administration (3) F,S,Su Organization of the American educational enterprise; economic, political, social, and cultural forces that affect the administration of American education.

7400 Problems of Educational Finance (3) F,S,Su Financing public elementary and secondary schools in terms of federal, state, and local sources of revenue, tax structures, budget preparation, and cost analysis.

7401 Administration of School Personnel (3) S,Su Role of the school administrator in personnel planning, staff development, and employee relationships.

7402 Organizational Research in Educational Administration (3) Prereq.: ELRC 4400 and consent of instructor. Primarily for graduate students in educational administration. Research, bibliography, and source materials; critical examination of organizational research studies.

7403 The Principalship in Elementary and Secondary Schools (3) S,Su ELRC 4400 or equivalent. Duties and responsibilities of the principal for organization, administration, and supervision of elementary and secondary schools.

7404 Internship in Educational Administration (3-6) F,S,Su Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. For advanced graduate students qualified for internship in educational administration. Pass-fail grading.

7406 Supervision of Child Welfare and Attendance (3) V Prereq.: ELRC 4400 and 7430; or equivalent. Role and function of the supervising staff of welfare and attendance; seminars, field study, and individual research; legal provisions, history, and philosophy.

7407 Politics, Policy, and Administration in Education (5) Prereq.: ELRC 4400 and consent of instructor. Primarily for doctoral students in educational administration. Critical analysis of educational policy and its development.

7408 School and Community Relations (3) F,S,Su Prereq.: ELRC 4400. Analysis of community demands on schools; organizational response from social science perspectives.

7409 Seminar in Educational Leadership (3) Prereq.: ELRC 4400. Exploration of theories of leadership, leading and empowerment, cultural thinking, school practice, and school administration; school restructuring, leadership in unique contexts, and directions in educational change and reform.

7410 Cultural and Political Issues in Urban School Leadership (3) Focus on the role of leaders, including the principal, in urban schools; impact of societal factors on school leaders in urban elementary and secondary schools.

7422 Introduction to School Improvement/Action Research (3) F School effectiveness research; teacher effectiveness research; school action research; based on the knowledge of these literatures, students will be required to develop a research proposal whose objective is to improve school and/or faculty performance.

7423 Advanced School Improvement/Action Research (3) S Prereq.: ELRC 7422. Students refine and administer an action research project at a selected school site. Students will assess the success of their interventions through multiple measures and write a research report that reflects their experiences throughout the semester. In class discussions focusing on methodological difficulties that students encounter and how to overcome them.

7430 Best Practices of School Leadership I (6) Knowledge and experiential base to support decision making and action at a level of whole school responsibility.

7431 Best Practices of School Leadership II (6) F,S,Su Prereq.: ELRC 7430. Second course in a two course sequence. Provides a knowledge and experiential base to support decision making and action at a level of whole school responsibility.

7450 Supervision of Instruction in Elementary and Secondary Schools (3) F,S,Su Principles, and practices concerning the role of the supervisor in today's multicentral school setting.

7451 Supervision of Student Teaching (3) F,S,Su Principles of planning, observing, and evaluating student teaching; participation in student conferences.

7452 Organization and Administration of Higher Education (3) S,Su Organization and administration of postsecondary education in the United States and abroad; organizational theory; organization and governance structure of American higher education; patterns of institutional administration.

7800 Economics of Education (3) Prereq.: ELRC 7400 or equivalent. Introduction to human capital theory; emphasis on costs and benefits of education, benefit-cost analysis; educational productivity; education and economic growth; and educational planning.

7802 Theory Development in Educational Administration (3) Prereq.: ELRC 7006, 7402, and 7407, or equivalent; and consent of instructor. Primarily for doctoral students in educational administration. Critical analysis of approaches to inquiry; development of theory in educational administration.

7805 Perspectives on Leadership (3) F,S,Su Examines theories and practices of leadership from multiple perspectives.

7806 Leadership for Learning (3) Prereq.: 7805 or equivalent. Primarily for doctoral students in educational leadership and technology. Examination of leadership theories and practices relevant to K-12 school settings.

7840 Educational Facility Planning (3) F,S,Su For school administrators. Principles of school construction.

EDUCATIONAL FOUNDATIONS

3600 Women, Gender, and Leadership (3) Also offered as WGS 3600.

4000 History of Education (3) F,S

4001 History of American Education (3) F,S,Su

4002 Survey of Philosophy of Education (3) F,S,Su

4003 Cultural Pluralism in American Education (3) Basic features of major cultures in American society; their impact on American education; historical approaches to educating persons of different cultures; changing roles of schools in responding to cultural pluralism.

7000 Seminar in Philosophy of Education (3) Prereq.: ELRC 4002. Theories of education and schooling with special focus on the context of pluralistic societies.

7001 Ethics and Educational Leadership (3) S,Su

4006 Introduction to Applied Statistics in Educational Research (3) F,S,Su

EDUCATIONAL RESEARCH

3200 Classroom Assessment (3) F,S,Su Prereq.: credit or registration in a methods course appropriate to the student's teaching level or major or minor. Principles and techniques in assessment, development, scoring, and interpretation of written, performance-based, and other forms of classroom assessment; applications of technology in classroom assessment.

3201 Classroom Assessment and Evaluation II (3) F,S,Su

3249 Undergraduate and Graduate Research in Education (3) F,S,Su

3249A Undergraduate Research in Education (3) F,S,Su

3249B Graduate Research in Education (3) F,S,Su

7001 Women and Gender (3) F,S

EDUCATIONAL TECHNOLOGY

2505 Introduction to Classroom Technology (3) F,S

2507 Educational Telecommunications and the Internet (3) F,S

EDUCATIONAL RESOURCES

7890 Seminar: Educational Administration (1-3) Prereq.: must have at least 9 sem. hrs. of credit when topics vary. Advanced topics in educational administration.

EDUCATIONAL FOUNDATIONS

3600 Women, Gender, and Leadership (3) Also offered as WGS 3600.

4000 History of Education (3) F,S

4001 History of American Education (3) F,S,Su

4002 Survey of Philosophy of Education (3) F,S,Su

4003 Cultural Pluralism in American Education (3) Basic features of major cultures in American society; their impact on American education; historical approaches to educating persons of different cultures; changing roles of schools in responding to cultural pluralism.

7000 Seminar in Philosophy of Education (3) Prereq.: ELRC 4002. Theories of education and schooling with special focus on the context of pluralistic societies.

7001 Ethics and Educational Leadership (3) S,Su

4006 Introduction to Applied Statistics in Educational Research (3) F,S,Su

EDUCATIONAL RESEARCH

3200 Classroom Assessment (3) F,S,Su Prereq.: credit or registration in a methods course appropriate to the student's teaching level or major or minor. Principles and techniques in assessment, development, scoring, and interpretation of written, performance-based, and other forms of classroom assessment; applications of technology in classroom assessment.

3201 Classroom Assessment and Evaluation II (3) F,S,Su

3249 Undergraduate and Graduate Research in Education (3) F,S,Su

3249A Undergraduate Research in Education (3) F,S,Su

3249B Graduate Research in Education (3) F,S,Su

7001 Women and Gender (3) F,S

EDUCATIONAL TECHNOLOGY

2505 Introduction to Classroom Technology (3) F,S

2507 Educational Telecommunications and the Internet (3) F,S

EDUCATIONAL RESOURCES

7890 Seminar: Educational Administration (1-3) Prereq.: must have at least 9 sem. hrs. of credit when topics vary. Advanced topics in educational administration.
Electrical Engineering

2120 Circuits I (3) Prereq.: credit or registration in MATH 2090 and PHYS 2102 required or consent of department. Time-domain analysis of electrical networks.

2130 Circuits II (3) Prereq.: EE 2210 and MATH 2900. Frequency-domain analysis of electrical networks.

2230 Electronics I (3) Prereq.: EE 2210. Terminal behavior of semiconductor devices and basic circuits.

2311 Electronics Laboratory I (2) Prereq.: concurrent registration in EE 2210. 1 hr. lecture; 2 hrs. lab.

2720 Digital Logic I (2) Prereq.: permission in the College of Engineering. Boolean algebra; logic gates; minimization methods; analysis and synthesis of combinational logic circuits. Examples.

2730 Digital Logic II (2) Prereq.: EE 2270. Analysis and design of sequential circuits; practical impact of design choices.

2731 Digital Logic Laboratory (2) Prereq.: EE 2730. 1 hr. lecture; 2 hrs. lab. Familiarization with conventional logic gates and flip-flops; design and testing of various combinational logic circuits.

2950 Comprehensive Electrical Engineering (3) Prereq.: MATH 1552 or equivalent. For non-electrical engineering majors. Elementary circuits, devices, and systems of electrical engineering.

3060, 3061 Special Projects (2,2) Prereq.: consent of department. Pass/fail grading. Individual work with instructor on special project selected by instructor and student.

3070 Engineering Practice (3) Prereq.: permission of department and completion of one co-op session or six months of full-time work in an appropriate area. Pass/fail grading. Written final report required. Work experience in solving electrical and computer engineering problems and providing solutions.

3140 Probability for Electrical and Computer Engineering (3) Prereq.: MATH 2900. Basic concepts of probability theory with application to electrical and computer engineering; probability axioms; continuous, discrete, and conditional probability density and distribution functions; expectations and characteristic functions; introduction to statistical inference and stochastic processes.

3160 Introduction to Digital Signal Processing (3) Prereq.: EE 3610 or equivalent. Digital processing of continuous-time signals. Fourier transforms; z-transform, signals and systems in the transform domains; Digital filter design techniques; Discrete Fourier transform and FFT algorithms.

3204 Electronics II (1) Prereq.: EE 2130 and 2231. Analysis and design of electronic circuits; emphasis on concepts and device models.

3211 Electronics Laboratory II (2) Prereq.: EE 2231 and concurrent registration in EE 3220. 1 hr. lecture; 2 hrs. lab.

3222 Solid State Devices I (3) Prereq.: EE 2230 and 2140. Physics and analysis of basic semiconductor devices; principles of integrated circuit fabrication.

3232 Solid State Devices II (3) Prereq.: EE 2230, 3220, and 3221. CREDIT OR REGISTRATION IN EE 3220, 3 hrs. lecture; 2 hrs. lab. ABET category: 1 hr. engineering design. CREDIT OR REGISTRATION IN EE 3221. 2 hrs. lecture; 2 hrs. lab. ABET category: 1 hr. engineering design. ABET category: 2 hrs. design; 1 hr. engineering science. Design and implementation of logic gates for application-specific integrated circuits; system design methodology using CMOS technology. ABET category: 1 hr. engineering design. ABET category: 2 hrs. design; 1 hr. engineering science. Design and implementation of digital integrated circuit logic gates in bipolar and MOS technology; semiconductor memories and their operation.

3250 Digital Integrated Circuits (3) Prereq.: EE 3220, 3221, and 3252. 2 hrs. lecture; 2 hrs. lab. ABET category: 1 hr. engineering design. ABET category: 2 hrs. design; 1 hr. engineering science. Analysis and design of digital integrated circuit logic gates in bipolar and MOS technology.

3270 Optoelectronic Materials (3) Prereq.: EE 3210 or equivalent. 2 hrs. lecture; 2 hrs. lab. Interaction of optical radiation with various media; bulk measurements and microscopic analysis of semiconductor materials; optical properties of semiconductors; classification of optical materials; determination of optical properties.

3280 Microwave Engineering (4) Prereq.: EE 3210 or equivalent. 3 hrs. lecture; 3 hrs. lab. Wave propagation and interaction in optical fibers; application of electromagnetic theory to microwave and optical systems. ABET category: 2 hrs. design; 1 hr. engineering science. Design and construction of term projects.

3290 Microwave Engineering (4) Prereq.: EE 3210 or equivalent. 3 hrs. lecture; 3 hrs. lab. Wave propagation and interaction in optical fibers; application of electromagnetic theory to microwave and optical systems. ABET category: 2 hrs. design; 1 hr. engineering science. Design and construction of term projects.

3400 Special Topics in Electrical Engineering (3) May be taken for a max. of 6 hrs. of credit when topics vary. Students in curricula other than electrical engineering should consult the instructor. ABET category: 1 hr. design; 1 hr. engineering science. Selected topics of current interest.

4001 Special Topics in Electrical Engineering (3) May be taken for a max. of 6 hrs. of credit when topics vary. Students in curricula other than electrical engineering should consult the instructor. ABET category: 1 hr. design; 1 hr. engineering science. Selected topics of current interest.
and dynamic conditions using a simulation on PC and lab experiments.

4430 Power System Analysis (3) Prereq.: EE 3410 or equivalent. Power system analysis using computer methods; power flow, economic power dispatch, and faults.

4445 Power Electronics (3) Prereq.: EE 3410 or equivalent. Introduction to power electronics and control of interconnected utility grid transmission systems, utility distribution systems, and large industrial power systems.

4450 Distribution System Design (3) Prereq.: EE 3410 or equivalent. Power distribution systems; emphasis on design and applications.

4460 Power Electronics (3) Prereq.: EE 3240 and 3410. 2 hrs. lecture; 2 hrs. lab. ABET category: 2 hrs. design; 1 hr. engineering science. Design of power semiconductor converters including controlled rectifiers, inverters, active voltage regulators, and DC-DC converters.

470 Harmonic Filter and Compensator Design (3) Prereq.: EE 3220 and 3410 or equivalent. ABET category: 2 hrs. engineering design; 1 hr. engineering science. Design of compensator and harmonic filters for power distribution systems with nonsinusoidal voltages and currents.

4480 Non-Sinusoidal Power System Analysis (3) Prereq.: EE 3410 or equivalent. Analysis of non-sinusoidal systems: harmonic generation, compensation, and filtering.

4490 Adjustable Speed Drives (3) Prereq.: EE 3410, EE 3530. 2 hrs. lecture; 2 hrs. lab. ABET category: 2 hrs. design; 1 hr. engineering science. Design of test and DC and AC motor variable speed drives combined with an analysis of power quality and power system effects.

4560 Introduction to Modern Control (3) Prereq.: EE 3530. State variable methods for analysis and design of control systems: realization, stability, and stabilization; observers, control design.

4580 Topics in Control System Design (3) Prereq.: EE 3530. ABET category: 2 hrs. design; 1 hr. engineering science. Compensation of single loop and multiloop systems; state feedback and state variable feedback; application to industrial controllers; design using computer simulation packages.

4585 Discet Control System Design (3) Prereq.: EE 3530. ABET category: 2 hrs. design; 1 hr. engineering science. Sampling and reconstruction of signals; analysis and design of sampled data systems; discrete time systems and controllers.

4610 Analog Communication (3) Prereq.: EE 3610 and 3104. Amplitude, frequency, phase and pulse modulation, noise in analog modulation, applications.

4625 Digital Communication and Networking (3) Prereq.: EE 3610 and 3140 or equivalent. Digital coding of analog information, baseband transmission, decision theory, modulation techniques, error correction.

4660 Random Processes (3) Prereq.: EE 3410 or equivalent. Probability spaces; random variables and processes; second order processes; spectral analysis; filtering.

470 Special Topics in Computer Engineering (3) May be taken for credit only when topics vary. Students in curricula other than computer engineering should consult the instructor. ABET category: 5 hrs. engineering science. Selected topics of current interest.

4701 Special Topics in Computer Engineering (3) May be taken for a max. of 6 hrs. of credit when topics vary. Students in curricula other than computer engineering should consult the instructor. ABET category: 5 hrs. design; 2 hrs. engineering science. Selected topics of current interest.

4702 Special Topics in Computer Engineering (3) May be taken for a max. of 6 hrs. of credit when topics vary. Students in curricula other than computer engineering should consult the instructor. ABET category: 5 hrs. design; 2 hrs. engineering science. Selected topics of current interest.

4710 Communications in Computing (3) Prereq.: EE 2730 and 3140 or equivalent. Theoretical and practical factors in designing computer communications networks; communication principles and codes; network topology and architecture; protocol layers; current and advanced applications.

4720 Computer Architecture (3) Prereq.: EE 3730 and 3735 or equivalent. Memory hierarchy; pipelining; computer architecture; design philosophies; parallel computing fundamentals.

4740 Discrete Structures for Computer Engineering (3) Prereq.: EE 2730 or equivalent. Mathematical logic and proof methods; graph theory; complexity of algorithms; algebraic structures in computer engineering.

4745 Neural Computing (3) Prereq.: EE 3730 and MATH 2090. ABET category: 2 hrs. design; 1 hr. engineering science. Neural networks and automata; network design techniques for machine learning; applications to signal processing, vision, speech, and robotics; VLSI implementations.

750 Microwave Interfacing Techniques (4) Prereq.: EE 3751. 2 hrs. lecture; 6 hrs. lab. ABET category: 2 hrs. design; 2 hrs. engineering science. Theory and design techniques for the interfacing of microwave components to memory and input/output devices.

4760 Introduction to Compiler Optimization (3) Prereq.: EE 3735 or equivalent; 2 hrs. design; 1 hr. engineering science. Compiler architecture, source program analysis, compiler optimization techniques, complete design.


4780 Introduction to Computer Vision (3) Prereq.: EE 3750 or equivalent. ABET category: 2 hrs. design; 1 hr. engineering science. Computer processing of images, including image acquisition systems and computer systems for processing images; techniques; image segmentation; emphasis on design of image processing software.

4785 Introduction to Expert Systems (3) Prereq.: EE 3750 or equivalent. Introduction to expert systems, including rule-based systems; search strategies; representation and knowledge engineering.

4790 Structure of Computers and Computations I (3) Prereq.: CSC 3102 and EE 3755. Hardware and software complexity analyses; structures of both computers and computations.

4810 Senior Design I (3) Prereq.: EE 3220, EE 3751, senior standing. Course of Computer Engineering, and one of EE 4140, 3530, 3610, or 3755. 2 hrs. lecture, 2 hrs. lab. Senior design projects.

4820 Senior Design II (3) Prereq.: EE 4160. 6 hrs. lab. Continuation of senior design projects from EE 4810. Construction and test.

7000 Advanced Topics in Electrical Engineering (3) May be taken for a max. of 12 hrs. of credit when topics vary.

7091, 7092 Electrical Engineering Research (3, 3) Prereq.: permission of department and completion of 12 sem. hrs. in the graduate program. Pass-fail grading. Individual study.

7100 Advanced Topics in Signal Processing (3) May be taken for a max. of 12 hrs. of credit when topics vary.


7120 Linear Active Network Analysis and Synthesis (3) Prereq.: consent of instructor. Active network analysis and design, multipoles, networks, pathological elements, inductorless filter theory.


7150 Theory and Application of Digital Signal Processing (3) Prereq.: EE 3160 or equivalent. Digital filter design; spectrum analysis, digital hardware implementations, and applications.

7200 Advanced Topics in Electronics (3) May be taken for a max. of 12 hrs. of credit when topics vary.

7210 Semiconductor Device Modeling (3) Systematic modeling of active and passive solid-state devices; modeling theory to relate device physics to circuit performance; selected circuit applications.

7220 Semiconductor Devices I: Bipolar (3) Prereq.: EE 3532 or equivalent. Semiconductor material properties, equilibrium and nonequilibrium processes, physical principles of p-n junctions, and quasi-neutral material; modeling of diodes and bipolar transistors.

7222 Semiconductor Devices II: Field Effect (3) Prereq.: EE 3532 or equivalent. Surface effects; metal- insulator-semiconductor structure; modeling of MOS capacitors and IGFTs.

7230 Physics of Device Electronics (3) Semiconductor physics and necessary device analysis; elements of statistical physics, transport phenomena in solids, band theory of solids, and semiconductor junctions.

7240 Small-Gap and High-Speed Devices (3) Prereq.: EE 7230 or equivalent. Charge carrier transport in small and high-electron mobility semiconductor devices, hot-electron effects, series-resistance considerations, heterostructures, heterostructure devices, tunneling devices, ballistic transport devices, and surfaces and interfaces in heterostructures.

7240 Integrated Circuit Engineering (3) Fabrication processes and device design for monolithic integrated circuits; relation to circuit performance; thin- and thick-film circuits.

7241 VLSI Systems I (3) Prereq.: consent of instructor. VLSI design and implementation of analog and mixed analog-digital integrated circuits for signal processing including applications; mixed-signal integrated circuit testing and measurements.

7250 Semiconductor Power Devices (3) Prereq.: EE 3320 or equivalent. Operation and characteristics of semiconductor energy conversion devices with emphasis on physical mechanisms involved; fabrication of energy conversion devices.

7260 Semiconductor Materials (3) Theory and application of crystal growth from melt and chemical vapor deposition; preparation and purification of elemental and compound semiconductors; structural properties and their effect on electrical and physical parameters; amorphous semiconductors.

7310 Magnetic Materials and Devices (3) Prereq.: EE 3320 or equivalent. Theory of magnetism, domain structures, and magnetic memory; current developments and applications of magnetic devices.

7310 Electromagnetic Theory and Techniques (3) Electromagnetic theory applied to radio propagation, waveguides, and microwave systems.

7350 Boundary Value Problems in Engineering (3) Prereq.: consent of instructor. Separation of variables method for solving certain classical partial differential equations, including properties of special functions and their applications to engineering problems.

7400 Advanced Topics in Power Systems (3) May be taken for a max. of 12 hrs. of credit when topics vary.

7410 Faulted Power System Analysis (3) Development of positive, negative, and zero-sequence fault analysis methods for power system components and their application in a variety of power system fault conditions.

7420 Power System Dynamics (3) Modern approach to power system transient and dynamic stability studies; detailed synchronous machine models; their linearizations, excitation systems, and multimachine system stability analysis.

7422 Advanced Electric Machines (3) Prereq.: EE 4422 or consent of instructor. Topics on special-purpose electric motors used in automation, robots, and electrically levitated vehicles.

7430 Power System Reliability (3) Reliability analysis of power plants, including generation, transmission, and distribution.

7440 Power Transmission and Control (3) Prereq.: EE 4460 or equivalent. Analysis of HVDC transmission systems; high power switches and limitations; converter circuits, modeling control, and stabilization of dc transmission systems; operation of converters, controllers, and filters.

7450 Power System Protection (3) Identification of conditions requiring protection; special problems associated with protection of various system components; protection devices, and their application.

7460 Static Power Converters (3) Prereq.: EE 4460 or equivalent. Design of power converters and ac drives, including voltage controllers, PWM inverters, cycloconverter and switched-mode inverters, ac drives, and filters.

7470 Power Generation and Control (3) Prereq.: EE 4430 or equivalent. Economic dispatch for thermal and hydroelectric power generation systems; control of power generation.
2824 HONORS: Seminar (3) 
Prereq.: permission of instructor. Credit will be given for only one of the following: ENGL 3002, 3003, 3102. Training in skills required of practicing scientists, engineers, and technical managers. 
3002 Technical Writing (3) 
Prereq.: junior status. Credit will be given for only one of the following: ENGL 3002, 3003, 3102. This course will not substitute for ENGL 3002 requirement. Formats and processes of writing found in business, science, government, and industry.

3004 Writing the Advanced Expository Prose (3) Experimentation with different styles of writing in a workshop format. 
315 Composition Tutoring (3) Prereq.: consent of instructor. 1 hr. lecture; 6 hrs. lab. Composition theory as applicable to undergraduate tutoring. 
3200 British Literature I: The Middle Ages, Renaissance, and 18th Century (3) Survey of English literature from the Anglo-Saxon period through Chaucer, Shakespeare, the 17th and 18th centuries. 
3202 British Literature II: Romantics, Victorians, and Moderns (3) Survey of British literature from the French Revolution through the Industrial Revolution into the 20th century. 
3204 Criticism (3) Influential works of literary criticism from the classics; authors and developments. 
3700 American Literature I: Forging a Nation (3) Emergence of an American literature and national consciousness in major writings from the Colonial era to the Civil War. 
3702 American Literature II: Coming of Age (3) American literature from the Civil War to the present; realism, naturalism, modernism; effects of industrialization, immigration, the Chinese Exclusion Act; the civil rights struggle, the world wars. 
3800 Post-colonial Literature (3) Survey of literature from former British colonies in South Asia, Africa, and the Caribbean; colonialism; nationalism; independence; diaspora; transnationalism; hybridity; women’s rights; building a new nation, etc. 
3804 Modern Criticism (3) Influential works of literary criticism and theory written in the 20th century. 
3806 Contemporary Fiction (3) Survey of contemporary fiction focusing on a variety of characters such as Achebe, Bellow, Garcia Marquez, Lessing, Morrison, Pynchon, Updike; developments in magical realism, minimalism, cyberpunk. 
3101 Legal Writing (3) Credit will not be given for both this course and ENGL 2901. Discussions and writing assignments tailored to forms of writing common in law and in related fields; emphasis on writing clear, precise, effective prose. 
3106 Technical Writing for International Students (3) Prereq.: junior status. Credit will be given for only one of the following: ENGL 3002, 3003, 3102. Training for non-native speakers of English in skills required of practicing scientists, engineers, and technical managers. 
3124 The Literature of the English Bible (3) Also offered as REL 3124. Literary forms and the themes in the King James version and in the grant proposal to underwrite the translation into the English Bible on later literature. 
3133 Language Development and Diversity (1) Prereq.: ENGL 2901. Concurrent enrollment in EDCI 3082. 3 hrs. lab/field experience in multicultural settings. Language development and diversity of adolescent speakers, writers, and readers of English. 
3151 Dynamics of Learning in the English Classroom (1) Prereq.: EDCI 3001 and ENGL 3201. Concurrent enrollment in EDCI 3082. 3 hrs. lab/field experience in multicultural settings. Dynamics of learning in middle school and high school English classes, including small group and whole class instruction, including integration of technology. 
3202 Major Themes in Literature (3) May be taken for a maximum of 6 sem. hrs. of credit when topics vary. Explores in a wide variety of projects that basic courses are unable to accommodate. 
3401 Writing Essays and Reviews (3) Prereq.: at least one 2000-level course in creative writing. Essays and reviews as literary forms, with guided practice in writing both. 
3402 Scientific and Professional Writing for Peers (3) Individual instruction. Students must have well-defined problem, hypothesis, and procedure; guided practice in writing in academic and professional settings; emphasis on translating research results into publishable articles and effective reports. 
3403 Special Topics in Professional Writing (3) Prereq.: permission of instructor. May be taken for a maximum of 6 sem. hrs. of credit when topics vary. Explores in a wide variety of projects that basic courses are unable to accommodate. 
3406 Writing the Novel (3) Prereq.: at least one 2000-level course in creative writing. Guided practice in writing the novel; techniques involved. 
3408 Writing Poetry (3) Prereq.: ENGL 2907. Guided practice in writing poetry; technicalities involved. 
4004 Practicum in Technical Writing (3) Prereq.: ENGL 3002 or 3003 and 4002 or 4003 or permission of department; 3 hrs. lab. Supervised writing and editing projects. 
4005 Short Story Writing (3) Prereq.: ENGL 2905. Guided practice in short story writing; techniques involved. 
4006 Writing the Novel (3) Prereq.: at least one 2000-level course in creative writing. Guided practice in writing the novel; techniques involved. 
4008 Writing Poetry (3) Prereq.: ENGL 2907. Guided practice in writing poetry; technicalities involved. 
4009 Advanced Screenwriting Workshop (3) Prereq.: consent of instructor and ENGL 3919. Open to advanced screenwriting students; will be offered to write a full-length screenplay or teleplay. 
4011 Advanced Screenwriting (1) Prereq.: ENGL 3001 or 3002 or equivalent. Practical experience in editing and preparing technical manuscripts; general instruction in functions of the technical editor. 
4021 Capstone Seminar in Creative Writing (3) Prereq.: for English Majors with 92 total credit hrs. and 27 hrs. in English beyond the intermediate level or permission of instructor. Advanced seminar in which students
consolidate their knowledge in English and obtain a perspective on the significance of that knowledge. Independent research project. Course topics will vary.

4022 Studies in the Short Story (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Flannery O’Connor, Toni Morrison, Jamaica Kincaid, and Zadie Smith; topics may include: “The Postcolonial Short Story,” “Women in the Short Story,” “The Short Story in World Literature,” “The Short Story in America,” “The Short Story in the 21st Century.”

4086 Studies in the Short Story (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Chekhov, Joyce, Hemingway, Cather, Woolf, Garcia Márquez, Flannery O’Connor; problems such as short story sequences, beginnings and endings, compression, conflict.

4104 Capstone Seminar in Literature (3) Prereq.: for English Majors with 90 total credit hrs. and 27 hrs. in English beyond ENGL 2000, or permission of instructor. Advanced seminar in which students consolidate their knowledge in English and obtain a perspective on the significance of that knowledge. Independent research project. Course topics will vary.

4120 Studies in Major Authors (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Topics such as “Literature and the King’s Peace,” “The Development of the Pastoral,” “From Romantic to Victorian: A Study of Influence and Society,” “Women’s Literature: From Neoclassicism to Victorian Gothic,” “Milton and Miltonism,” “Milton and the Renaissance.”

4122 Topics in Interdisciplinary Studies (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Literature topics may be selected in connection to other academic disciplines; topics such as “Fictions of the Working Class,” “Race in Literature and Culture,” “Modernism in Fiction and Film.”

4124 Studies in Critical Traditions and Problems (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Topics such as “Popular Fiction and Film,” “Film and Literature: From Neoclassicism to Victorian Gothic,” “Imagination and Creation,” “Feminist Literary Theory,” “Philosophy and Literature,” “Constructing Literary History.”

4137 Studies in Chaucer (3) Attention to poetry and plays, literary and cultural significance; topics such as “The Canterbury Tales,” “The Tragic Vision,” “The Tragic Vision and Courtly Love.”

4147 Studies in Milton (3) Attention to Paradise Lost, Paradise Regained, Areopagitica; their literary and cultural significance; topics such as “Paradise Lost and the Christianization of the Epic,” “Milton and Women,” “Milton and Revolution.”

4148 Studies in Shakespeare (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Attention to poetry and plays, literary and cultural significance; topics such as “The Comedies and Histories,” “The Tragedies,” “Shakespeare and Film,” “Shakespeare and Gender.”

4173 Studies in Southern Literature (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Topics such as “Chopin, Faulkner, Wright, Welty, Tchekhov, Women’s Literature,” “The Female Gothic,” “Women and Ethnicity,” “Early Modern Women Writers.”

4234 Studies in Literature and Politics (3) Also offered as POLI 4234. May be taken for a max. of 6.5 hrs. of credit when topics vary. Literature representations of politics; historical role of literature in politics and society such as “Literature and Politics of the Modern American South,” “The Role of Literature in the Atlantic World.”

4236 Studies in Literature and Religion (3) Also offered as REL 4236. May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Sophocles, Dante, Shakespeare, Donne, Yeats, Stevens, Morris; topics such as “Major Religious Novelists,” “Literature of Illness and Death,” “Moral Universes of Greek and Christian Tragedy,” “Creative Postmodernism.”

4300 Studies in Rhetorical Theory (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Topics such as “Body and Mind in Rhetoric,” “Rhetoric of Political Discourse.”

4301 Studies in Composition Theory (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Modern composition theory as it relates to the teaching of writing; topics such as “Social Theories of Composition.”

4302 Studies in Literary Theory (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Varied perspectives on literary, especially written literary, issues raised by its complex and problematic nature.

4304 Capstone Seminar in Writing and Culture (3) Prereq.: for English Majors with 90 total credit hrs. and 27 hrs. in English beyond ENGL 2000, or permission of instructor. Advanced seminar in which students consolidate their knowledge in English and obtain a perspective on the significance of that knowledge. Independent research project. Course topics will vary.

4310 Studies in Language (3) Also offered as LING 4310. May be taken for a max. of 6.5 hrs. of credit when topics vary. A writing-intensive course. Devoted to special topics, such as “African-American English,” “English-based Creoles and Pidgins,” “African American Linguistic Theory,” “Issues in Applied Linguistics and Language Learning.”

4316 Introduction to Literary Style (3) Stylistic analysis of the language of literature; emphasis on major rhetorical, literary, and linguistic theories of style and their concerns with author, reader, text, and context.

4375 Studies in Women and Literature (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Blake, Woolf, Scott, Austen; topics such as “Slave Narratives,” “The Harlem Renaissance,” “The Black Arts Movement,” “The Black Diaspora,” “African Survivals.”

4475 American Folklore (3) Also offered as ANTH 4475. Folklore of the U.S., including regional, racial, ethnic, and occupational groups; relation of folklore to other aspects of American vernacular culture and to American literature.

4480 Folklore and Literature (3) Interrelationships between folklore and literature; use of folklore by writers; similarities and differences between “oral literature” and “written literature.”

4489 Women and Folklore (3) Examination of folk material as a basis for understanding oral genres, music, art, and artifacts; focus on how and why information about women in folk culture has been transmitted.

4593 Studies in Women and Literature (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Behn, Woolf, Chopin, Atwood, Clift; topics such as “Renaissance Drama and Writing for Women,” “The Female Gothic,” “Women and Ethnicity,” “Early Modern Women Writers.”

4674 Studies in African-American Literature (3) May be taken for a max. of 6.5 hrs. of credit when topics vary. Authors such as Behn, Woolf, Chopin, Atwood, Clift; topics such as “Slave Narratives,” “The Harlem Renaissance,” “The Black Arts Movement,” “The Black Diaspora,” “African Survivals.”
Environmental Engineering

7978 Cross-Cultural Souths (3) Southern literature and culture in relation to other cultures of the United States and neighboring regions. May be repeated for credit.

7981 Topics in Modern and Contemporary Literature (3) May be taken for a max. of 9 sem. hrs. of credit when topics vary. Intensive study of works in modern and contemporary literature; topics include "Modern Irish Literature," "Postmodernism," "Contemporary Australian Literature." May be repeated for credit.

7982 Topics in Ethnic and Postcolonial Literatures (3) May be taken for a max. of 9 sem. hrs. of credit when topics vary. Detailed study of different aspects of American ethnic literatures such as Asian American, Native American, Latino/Chicano, and postcolonial literatures such as Indian, African, West Indian, Transnational.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

8900 Independent Study (1-3) May be taken for a max. of 3 hrs. in an MA program, 6 sem. hrs. in an MFA program, and 9 sem. hrs. in a PhD program. Directed individual readings guided by the graduate faculty.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.

ENTOMOLOGY • ENT

2001 Insects in the Environment (3) F Preq.: BIOL 1201, 1208; and either BIOL 1402 or BIOL 1502, or BIOL 1001, 1002, 1003, 1004; or equivalent. 2 hrs. lecture; 2 hrs. lab. Recognition, classification, and identification of species. May be repeated for credit.

2002 Insect Biology (3) F-O Preq.: BIOL 1001, 1002, 1003, 1004. Laboratory techniques for insect identification and study of insect behaviors. May be repeated for credit.

2003 Introduction to Pest Management (4) See PLHL 2050.

3000 Pest Management Internship (3) Su See PLHL 3000.

3002 Pest Management Seminar (3) F See PLHL 3002.

4001 Household and Structural Pests (3) F-O Preq.: ENT 2001, 2 hrs. lecture; 2 hrs. lab. Recognition, biology, and methods of control of pests found in households.

4002 Insect Biology (3) F-O Preq.: BIOL 4002, Preq.: BIOL 2153 or consent of instructor. No entomology training necessary. Biological, biochemical, and physiological principles as they relate to the success of insects.

4005 Insect Taxonomy (4) S Preq.: ENT 2001, 2 hrs. lecture, 4 hrs. lab. A collection is required. Identification, nomenclature, phylogenetic relationships, and life histories of insects at the family level.

4060 Fundamentals of Applied Entomology (3) S Preq.: ENT 2001 or ENT 2002. 2 hrs. lecture; 2 hrs. lab. Principles and methodology of managing insect pests; emphasis on field crop insect pest management; interdisciplinary perspective.

4072 Forensic Entomology (3) S Preq.: ENT 2001, 2 hrs. lecture; 2 hrs. lab. Determination of the origin of insects by analyzing the evidence they leave at a crime scene or in the environment.

4111 Biology and Management of the Honey Bee (3) S-E Preq.: BIOL 1201, 1208 and either BIOL 1402 or BIOL 1502; or BIOL 1001, 1002, 1003, 1004 or consent of instructor. 2 hrs. lecture; 2 hrs. lab. Behavior, genetics, pollination, pathology, and practical management of honey bees for agricultural and scientific purposes.

4122 Fundamentals of Horticultural Entomology (3) S Preq.: ENT 2001, 2 hrs. lecture; 2 hrs. lab. Principles of insect control for pest control in vegetable crops and ornamental species; insecticides and miticides and their injury to horticultural plants; economic and aesthetic injury thresholds; methods of control including identification and utilization of beneficial species.

4152 Conservation Biology (4) F Preq.: 11 sem. hrs. biology; genetics; genetic recombinants; permission of department: 3 hrs. lecture *1 hr. discussion. Sampl. AS BIOL 4105. Underlying principles and concepts of conservation biology; practical applications to preserves and human society; threats to and importance of biodiversity; human responsibilities as global land stewards.

4161 Introduction to Insect Physiology (3) S-E Preq.: 12 hrs. of ENTM or biological sciences. 1 yr. of organic chemistry or biochemistry. 2 hrs. lecture; 3 hrs. lab. Also offered as BIOL 4016. Basic functions of insects; principles of physiology, including metabolism, growth, development, and chemical communication systems.

4081 Forest Insects and Diseases (4) F Preq.: BIOL 1502, 1509; or BIOL 1402; or BIOL 1201, 1208. Also offered as PLHL 4016. 3 hrs. lecture; 2 hrs. lab. One day-long field trip on insect-plant interactions, epidemiology, and control of forest insects and diseases.

4100 Insect Ecology (3) S Preq.: BIOL 1201 and 1208 or equivalent. Lab counts and field trips: Service learning component. Ecological principles pertaining to insect populations, communities, and their role in the ecosystem; emphasis on history strategies and behavior.

4099 Undergraduate Entomological Research (1-3) F,S,Su Preq.: ENT 2001 or 2050 or 4018 or equivalent. No credit may be taken for a max. of 4 hrs. of credit. Supervised entomological research in a laboratory or field setting; data collection and interpretation of data; introduction to entomology at the ordinal level.

7002 Plant Resistance to Arthropods (4) F-O Preq.: consent of instructor. 3 hrs. lecture; 3 hrs. lab. Detailed examination of the mechanisms of plant-insect interactions, with special reference to host-plant resistance in agricultural systems; integrates relevant concepts from diverse fields including insect physiology, plant physiology, plant biochemistry, and ecology; evaluation of the current theoretical basis for research in plant-insect interactions; laboratory demonstrations and exercises emphasize the techniques used in host-plant resistance research.

7003 Medical/Veterinary Entomology (4) F-O Preq.: ENT 2001 or equivalent. 3 hrs. lecture; 3 hrs. lab. Relationship of insects and other arthropods to human and animal health.

7005 Classification of Immature Forms of Insects (3) O Preq.: ENTM 4005 or equivalent. 2 hrs. lecture; 2 hrs. lab. Principles and methodology of insects and their development. May be repeated for credit.

7006 Advanced Insect Pest Management (3) F Preq.: ENTM 4006 or both 4000 and higher level statistical course (EXST 4050, 7056, 7004, 7005, 7013, 7014, 7015, and 7031) or consent of the coordinator. Ecological and economic basis of pest management; advances in major pest management tactics; insect sampling; environmental and geographical information system in pest management.

7011 Seminar in Entomology (1) F May be repeated for credit. 1 sem. hr. of credit required for each grade degree in entomology.

7017 Introduction to Insecticidal Toxicology (3) F Preq.: consent of the course coordinator. May be taken for a max. of 2 hrs. of credit. Students will gain knowledge of insecticides; bioassays, risk assessment, mode of action, pharmacokinetics, insecticide resistance and selectivity.

7600 Entomology Extension Practicum (1-2) S Preq.: consent of the course coordinator. This course may be taken for a max. of 2 hrs. of credit. Students will gain knowledge of extension entomology. Emphasis on land-grant institution service, technology transfer, and initiating and evaluating an extension entomology project.

8000 Seminar (1-2 per sem.) "S"/"U" grading.

ENVIRONMENTAL ENGINEERING • EVEG

2000 Introduction to Environmental Engineering (3) Preq.: CHEM 1402 and MATH 1550. Basic principles of calculations in environmental engineering; overview of professional ethics; regulations and multimedia aspects of environmental problem solving with emphasis on fundamental concepts and definitions.

3100 Water Distribution and Wastewater Collection (3) Preq.: CE 1230. Principles and experiences used in analysis and design of water supply systems and storm and wastewater collection systems.

3110 Water and Wastewater Treatment (3) Preq.: CE 2200 (for CE and EVEG majors, a grade of "C" or better is required in CE 2200). Physical, chemical, and biological characteristics of water and wastewater; water quality regulation; basic reactor engineering; operation and simple design of physical, chemical, and biological unit processes in water and wastewater treatment.

3271 Independent Undergraduate Research Project (1-4) Preq.: EVEG 4135 and consent of department. Independent research project in their minor discipline. Proponent. May be taken for a max. of 6 sem. hrs. credit when topics vary. Lecture and/or labs on advanced topics in entomology not covered in other coursework.

4000 Environmental Engineering II (3) F Preq.: CHEM 2060 (2061); EVEG 2000. Also offered as BI 3040. Fundamentals of biotechnology, enzyme kinetics, and biochemical engineering. Applications to biological wastewater treatment, bioremediation of soil, air, surface and ground waters, landfill, and natural systems.

4105 Quantitative Water Management (3) Preq.: EVEG 3110. Quantitative tools used to solve water management problems based upon hydraulic, mass balance, stoichiometric, kinetic, and equilibrium phenomena.
ENVIRONMENTAL ENGINEERING

3102 Mathematical Methods in Science (3) Prereq.: MATH 1550, 1552, and ENVS 1011. Introduction to numerical methods, data analysis, error propagation, box models, linear and nonlinear least squares; perturbation theory, numerical analysis. 3 hrs lecture. 3 hrs lab. 

3999 Undergraduate Research (1-4) F,S,Su. Prereq.: permission of instructor. May be taken for a max. of 4 hrs. of credit. Individual study of a specific environmental problem or individual laboratory research. 3 hrs lab. 3 hrs lecture. 

4010 Applied Ecology (2) Prereq.: minimum of 10 sem. hrs. of biological and/or physical science. Also offered as EM S 4010. The biosphere, air, land, and water environments; development of alternative techniques for correcting environmental pollution; environmental risk assessment and management analysis. 3 hrs lecture. 

4035 Aquatic Pollution (3) Prereq.: ENVS 1126 or OCS 1005 or OCS 1006; or OCS 2008 and 2009 or equivalent. Same as ENVS 4035 with special honors emphasis. 3 hrs lecture. 

4011 Environmental Chemistry (3) See CHEM 4150. 

4112 Concepts in Coastal Ecotoxicology (3) Prereq.: ENVS 4141. Coastal pollution and toxicology of industrial and non-point source materials related to ecological risk in near shore and inland coastal areas. 

4114 Radioecology (3) See NS 4141. 

4149 Design of Environmental Management Systems (3) Environmental systems planning at local, national, and international levels; identification of system requirements and available resources; definition of constraints, establishment of evaluation criteria; evaluation of alternative concepts and plans for subsystems; implementation using qualitative tradeoffs, mathematical models, and computer simulations. 

4261 Energy and the Environment (3) Methods of stationary power generation; pollution related to fuel production, transportation, and use; energy use and pollution problems related to transportation; energy resources, regulatory aspects, and control technology related to stationary and moving sources of air pollution. 

4262 Environmental Hazards Analysis (3) Systematic framework for examining the nature and consequences of natural and man-made hazards; strategies that may be taken to plan, respond, recover, prevent, or mitigate hazards. 

4264 Regulation of Environmental Hazards (3) Federal, state, and local regulation for mitigating the occurrence and effects of hazardous events, including the National Flood Insurance Act, Emergency Planning and Community Right to Know Act, and government planning and zoning authority. 

4266 Ocean Policy (3) National and state ocean policy; Law of the Sea; regulation of coastal areas; law of pollution, marine resources, and marine scientific research; other related topics. 

4477 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4508 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Health Effects of Environmental Pollutants (3) Prereq.: minimum of 6 sem. hrs. of chemistry and 6 sem. hrs. of either biology or zoology. Effects of environmental pollutants on human health and quality of life. 

4509 Environmental Toxicology: Introduction and Applications (3) Prereq.: 6 hrs. of chemistry, 6 hrs. of life sciences, and permission of instructor. Introduction to the basic principles of environmental toxicology; applications of these principles in industrial and other job related environments; regulatory perspectives; spills; anthropogenic pollution problems; human risk management overview of classes of toxic agents, routes of exposure, target tissues (human mammalian), and toxicological testing. 

4509 Environment and Technology: Design of Environmentally-Compatible Human-Environment Systems (3) Prereq.: CHEM 3110. An introduction to the scientific basis of environmental science; current environmental problems; principles of environmental science; and the role of technology in solving environmental problems.
4950 Special Topics in Environmental Sciences (1-3) Prereq.: DEPARTMENT. May be taken for a maximum of 6 hours of credit. More than one section may be taken for credit concurrently when topics differ. Special topics in environmental issues, problems, techniques, and/or methods.

6010 Topics in Environmental Science for Teachers (2-4) May be taken for a max. of 8 sem. hrs. credit when topics differ. Topics in environmental sciences with an emphasis on inquiry-based scientific learning and on issues of importance to Louisiana; hands-on activities and field trips will be major components of the class.

7010 Mathematical Modeling in Energy and Environmental Management (3) Prereq.: OCS 4410 or equivalent advanced studies in the development of models of energy and environmental systems.

7040 Environmental Planning and Management (3) Prereq.: ENVS 4149. Environmental systems planning and management at local, state, and federal government levels using problem identification; design of alternative solutions, evaluation of alternatives, political action, decision processes, and implementation and monitoring.

7041 Experimental Statistics (3) Prereq.: EXST 7003 or 7004 or 7005. Experimental management-oriented approach to major phases of environmental policy; formulation, implementation, evaluation; theoretical bases and analytical techniques.

7042 Environmental Conflict Resolution (3) Practical approaches and techniques commonly used to mediate environmental disputes and to facilitate participatory group decision making among stakeholders.

7043 Environmental Law and Regulation (3) Introduction to basic principles of federal and state laws, regulations, and court decisions involving pollution of the environment, including the National Environmental Policy Act, Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, Oil Pollution Act; current topical legal developments.

7044 Regulation of Toxic Substances (3) Federal laws, regulations, judicial decisions, and policies regarding the development, production, use and disposal of toxic substances, including the Toxic Substances Control Act, Federal Hazardous Substances Act, and Fungicide Act, and the Food, Drug, and Cosmetic Act; toxic tort lawsuits will be reviewed.

7045 Land Use Law and Regulation (3) Federal, state, and local laws, regulations, judicial decisions, and policies regarding land use, land use planning, and environmental regulation of land use, including: zoning; subdivision regulation; planned unit development (PUD); comprehensive land use plans; limits on growth and urban sprawl; and regulatory "takings.

7046 International Environmental Law (3) International and comparative law approaches to controlling pollution and depletion of natural resources; relationship between international trade agreements and environmental quality; other international environmental issues.

7047 Environmental Economics and Policy (3) Prereq.: ECON 4720 or equivalent or consent of instructor. Application of economic concepts to the development of appropriate policies to achieve environmental protection goals; emphasis given to linkages between economics and the environment, the role of market failure, and economic instruments that can be used to address environmental concerns.

7050 Spatial Modeling of Environmental Data (3) Prereq.: EXST 7003 or 7004 or equivalent. Development of an approach to analyze spatial and temporal processes for environmental data modeling.

7061 Water Quality Management and Policy (3) Also offered as NR 7061. Physical, chemical, and biological characteristics of surface water in natural systems; sources and effects of water pollutants; water quality standards and criteria; recreational quality standards; federal water quality regulations; watershed approach and application of mathematical models to water quality management.

7060 Environmental Impact Assessment (3) Prereq.: CRS 4001. Technical, ecological, and economic considerations relating to air, water, and soil contamination; classification and detection of environmental toxicants; their biological effects on current and future trends in agribusiness and the chemical, transport, and power industries.

7100 Toxicology of Aquatic Environments (3) Prereq.: ENVS 4149. Development of aquatic toxicology as a discipline.

7110 Toxicology of Aquatic Environments (3) Prereq.: ENVS 4149. The study of biological, ecological, and behavioral factors affecting the fate of toxicants in marine and freshwater coastal areas.

7112 Concepts in Marine Ecotoxicology (3) Prereq.: ENVS 7100 or equivalent. Problems in marine toxicology and the effects of organic and inorganic compounds on marine ecosystems and on human health. May be offered as OCS 7112. Marine pollution and toxicology of industrial and non-point source materials related to ecological risk assessment in coastal and marine areas; historical processes and wastes in the ocean; biochemical processes and wastes in the laboratory and in the marine environment; toxic effects on non-target species; chemical properties, chemical structure, and chemical activity; long-term and short-term fate and transport of pollutants; chemical and biological effects of pollutants; interactions of pollutants; hydrodynamic and chemical factors affecting the fate of pollutants in marine and freshwater coastal areas.

7200 Comparative Metabolism of Environmental Pollutants (3) Prereq.: BIOL 4094 or consent of instructor. Biochemical systems from various invertebrate, vertebrate, and plant species involved in xenobiotic activation and detoxification of xenobiotic substances; use of these systems as biomarkers of pollution impact.

7220 Biochemistry and Toxicology of Metals (3) Prereq.: BIOL 4093, 4094, CHEM 2262. Also offered as BIOL 7220. Biochemical systems from various invertebrate, vertebrate, and plant species involved in xenobiotic activation and detoxification of xenobiotic substances; use of these systems as biomarkers of pollution impact.

7335 Water Quality Modeling for Management (3) Prereq.: ENVS 4149. Instructor. Methods and approaches in water quality modeling, with particular attention to model uncertainty, model choice, and applications to water resources. Practical applications of mechanistic, empirical models, modern statistical methods and uncertainty analysis applied to problems of eutrophication, toxic substances, and trend assessment.

7385 Decision Theory and Environmental Risk Analysis (3) Fundamental principles and techniques involved in decision making and environmental risk analysis; methods for identifying decisions that optimize outcomes; rationality (utility) and interactive (game theory) decision theory, and application of decision theory to natural resources and environmental policy-making.

7622 Fundamentals of Carcinogenesis (3) Prereq.: EXST 7003 or consent of instructor. Principles of carcinogenesis in animal and human systems.

7623 Toxicology I (3) Prereq.: ENVS 4477 or consent of instructor. Fundamental principles of toxicology, dose response relationship, design and conduct of acute and chronic toxicity tests, basic analytical toxicology, biochemical markers, basic principles of hazard evaluation and risk assessment, industrial toxicology, principles of toxicology applied to environmental problems, and ecosystems.

7624 Toxicology II (3) Prereq.: EXST 7623 or consent of instructor. Toxicokinetics; xenobiotic transport, distribution, metabolism, excretion; principles of receptor interaction.

7625 Toxicology III (3) Prereq.: EXST 7623 or consent of instructor. Toxicology of major organ systems, to include dermatological, pulmonary, renal, neural, with both CNS and PNS, immune, gastrointestinal, and reproductive target organs and the toxicokinetic and toxicodynamic study of the pathophysiology of classic and prototype toxicants.

7626 Toxicology IV: Genetic Toxicology (3) Prereq.: ENVS 7625 or approval of instructor. Emphasis on mechanisms of genotoxic effects and their relevance to environmental problems.

7699 Toxicology Seminar (1) See CBS 7699.

7700 Integrated Environmental Issues (3) Multidisciplinary analysis of a current environmental issue. Discussion of topics from the perspectives of natural science, economics, social science, and political science. Integration and synthesis of information to develop a science-based, integrated view of the environmental decision-making process.

7700 Special Problems in Environmental Sciences (1-4) May be taken for a max. of 4 hrs. credit. Individual study of a specific environmental problem.

7750 Special Topics in Environmental Sciences (1-6) F,S Science Research and methodological review of current topics.

7895 Environmental Seminar (1) F,S Reports and discussions of student/faculty activities in environmental sciences.

7998 Environmental Colloquium (2) Non-thesis students only. May only be taken during semester of graduation. Written and oral presentations on a selected environmental issue, as approved by the departmental non-thesis committee.

8000 Thesis Research (1-12 per semester) "S*" "U*" grading. GENERAL EDUCATION CREDIT: 6000-8000 Level Courses

EXPERIMENTAL STATISTICS

• EXST 3201 Introduction to Statistical Analysis (4) Prereq.: EXST 2201 or equivalent. Descriptive statistics; inferential statistical methods including confidence interval estimation and hypothesis testing for two population means and proportions; one-way analysis of variance; simple linear regression and correlation; analysis of categorical data. Kar. 3205 Exploratory Statistical Analysis (4) Prereq.: EXST 2201 or equivalent. 2 hrs. lecture; 2 hrs. lab. Graphical analysis, perception, and construction rules; descriptive statistics; graphs for data exploration and decision making.

3201 Statistical Analysis I (4) Prereq.: EXST 2201 or equivalent. 3 hrs. lecture. Application of statistical modeling: multiple regression, variable selection, serial correlation, repeated measures, multivariate logistic, dummy regression, blocking, and factorial design, categorical data analysis, and nonparametric techniques.

3999 Supervised Independent Study and Research (1-4) Prereq.: consent of instructor. May be taken for a max. of 8 sem. hrs. of credit with consent of department head. Investigation of areas of interest not covered in other departmental courses, under the guidance of departmental faculty.

4012 Introduction to Sampling Techniques (3) Prereq.: EXST 2201 or equivalent. Simple random, stratified random, cluster, systematic, multistage, multistage, and unequal probability sampling procedures and methods and applications; ratio and regression estimation; non-response and non-sampling errors.

4025 SAS Programming (3) Prereq.: EXST 2201 or equivalent. Reading, processing, transforming, and outputting data in various formats; descriptive and summary statistics procedures; subsetting and combining data sets; macros and arrays; industry standard programming practices.

4050 Principles and Theory of Statistics (4) Prereq.: ENVS 4477 or consent of instructor. 3 hrs. lecture; 2 hrs. lab. Probability distributions as models for real-world processes; sampling distributions and the central limit theorem; estimation and confidence region methods; principles of hypothesis testing; modeling; emphasis on links between theory, methodology, and application.

4085 Seminar in Statistics (1) Prereq.: consent of instructor. May be repeated for credit when topics vary. Topics not covered in other experimental statistics courses.

4087 Special Topics in Applied Statistics (3) Prereq.: EXST 2201 or equivalent. May be taken for a max. of 6 hrs. credit. Same as EXST 7003. 3 hrs. lab. 2 hrs. lecture.

7003 Statistical Inference I (4) F,S 3 hrs. lecture; 2 hrs. lab. Prereq.: MATH 3021 or equivalent. Credit will be given for only one of the following: EXST 7003, 7004, 7005, 7009. Basic concepts of descriptive and inferential methods; normal, t, chi-square, and F distributions; tests of hypothesis and correlation; analysis of variance; regression, analysis of categorical data; emphasis on social and behavioral sciences research problems; computer software applications.

7004 Experimental Statistics I (4) F,S 3 hrs. lecture; 2 hrs. lab. Prereq.: MATH 3021 or equivalent. Credit will be given for only one of the following: EXST 7003, 7004, 7005, 7009. Basic concepts of statistical models and use of samples; measures of variation and central tendency.
normal, t, chi-square, and F distributions; test of hypothesis, analysis of variance, regression, and correlation; emphasis on laboratory-oriented sciences research problems and applications.

7005 Statistical Techniques I (4) F,S 3 hrs. lecture; 2 hrs. lab. Pass-fail grading. Credit will be given for only one of the following: EXST 7003, 7004, 7005, 7009. Basic concepts of statistical models and sampling methods, descriptive statistical measures, distribution, and hypothesis testing; analysis of variance, regression, correlation, and chi-square; emphasis on field-oriented life sciences research problems; computer software applications.

7009 Statistical Methods I—Web-Based (3) V Prereq.: MATH 2012 or equivalent and knowledge of SAS statistical analysis software. Credit will be given for only one of the following: EXST 7003, 7004, 7005, 7009. Basic concepts of statistical models and use of samples; measures of variation and central tendency, normal, t, chi-square, and F distributions; tests of hypothesis; emphasis on analysis of variance, regression, and correlation; emphasis on field-oriented life sciences research problems; computer software applications.

7011 Nonparametric Statistics (3) S Prereq.: EXST 7003 or 7004 or 7005 or equivalent. Nonparametric one- and two-sample procedures, including binomial, chi-square, Kolmogorov-Smirnov, Mann-Whitney U, Wilcoxon; analyses of variance, including Cochran’s, Friedman; correlation and regression, including Kendall’s tau, Spearman’s rho, and point biserial.

7012 Fundamentals of Experimental Techniques (3) S Prereq.: EXST 7003 or 7004 or 7005 or equivalent. Simple and stratified random sampling; ratio and regression estimation, cluster sampling, and multiphase sampling procedures; systematic sampling; nonresponse and nonsampling errors; links between methodology and application.

7013 Statistical Inference II (4) S Prereq.: EXST 7003 or 7004 or 7005 or equivalent. 3 hrs. lecture; 2 hrs. lab. Credit will be given for only one of the following: EXST 7014, 7015, 7019. Analyses of variance and experimental designs; completely randomized and complete block designs; Latin square designs; experimental designs; multiple comparisons; covariance analysis; multiple and curvilinear regression techniques; emphasis on social and behavioral sciences.

7014 Experimental Statistics (4) F Prereq.: EXST 7004 or 7005 or equivalent. 3 hrs. lecture; 2 hrs. lab. Credit will be given for only one of the following: EXST 7014, 7015, 7019. Multiple classification analysis of variance and covariance, individual degrees of freedom, factorial arrangement of treatments, and multiple regression; emphasis on social science laboratory research problems.

7015 Statistical Techniques II (4) F,S 3 hrs. lecture; 2 hrs. lab. Credit will be given for only one of the following: EXST 7015, 7014, 7015, 7019. Multiple classification analyses of variance and covariance, sampling designs, parameter estimation, multiple regression, and correlation; tests of specific hypotheses, and factorial experiments; emphasis on field-oriented life sciences research problems.

7021 Advanced Topics in Experimental Design (1) V Prereq.: EXST 7003 or 7004 or 7005 or equivalent and knowledge of SAS statistical analysis software. Credit will be given for only one of the following: EXST 7014, 7015, 7019. Multiple classification analyses of variance and covariance, sampling designs, parameter estimation, multiple regression, and correlation; tests of specific hypotheses, and factorial experiments; emphasis on field-oriented life sciences research problems.

7022 Statistical Aspects of Quantitative Genetics (3) V Prereq.: EXST 7014 or equivalent and AGRI 2072 or equivalent. Statistical aspects of quantitative inheritance; partitioning of variance; multiple regression and correlation; theory of inbreeding; estimation and testing of genetic parameters; best linear prediction of genetic merit; mixed model application; selection theory.

7023 Advanced Topics in Statistical Genetics (3) V Prereq.: EXST 4409 or equivalent and 7022. Topics not covered in other experimental design courses, such as best linear unbiased prediction of genetic merit; likelihood-based methods for genetic parameter estimation; analysis of selection response; methods for quantitative genetic analysis of discrete data.

7024 Biological Population Statistics I (5) V Prereq.: EXST 7003 or equivalent. Advanced sampling for estimation of animal and population parameters including density and abundance, survival, recruitment, space-use, and methods used to include quadrats, line transects, plots, sampling techniques, change-in-ratio estimators including capture-recapture and exploitation or catch-per-effort estimators, and home range models.

7025 Biological Population Statistics II (3) V Prereq.: EXST 7015 or equivalent. Extensive development and application of statistical techniques to parameter estimation in both experimental and observational studies; role of model building in population management.

7031 Experimental Design 3 (3) V Prereq.: EXST 7015 or 7014 or 7015 or equivalent. Analysis of designs, models, and analyses; emphasis on factorial experiments, complete and incomplete block designs, and confounding.

7032 Survey Design (3) V Prereq.: EXST 7015 or equivalent. Comparison of experimental and quasi-experimental designs; repeated measures, covariance analysis, and multiple regression; emphasis on social and behavioral science research problems.

7034 Regression Analysis 3 (F) Prereq.: EXST 7013 or 7014 or 7015 or equivalent; and knowledge of matrix algebra. Fundamentals of regression analysis, stressing an understanding of underlying principles; regression diagnostics, variable selection techniques, and nonlinear regression.

7035 Applied Least-Squares (3) S Prereq.: EXST 7013 or 7014 or 7015 or equivalent. Applications of least squares methods; usual constraints, no constraints, and means model constraints to unbalanced cross classified and nested designs; emphasis on analysis of variance and covariance for fixed effects models.

7036 Categorical Data Analysis (3) S Prereq.: EXST 7013 or 7014 or 7015 or equivalent. Statistical methods used in analyzing data from discrete distributions; contingency tables, loglinear and log models, logistic regression, and repeated nominal and ordinal data; emphasis on computer analysis and interpretation.

7037 Multivariate Statistics (3) F Prereq.: EXST 7013 or 7014 or 7015 or equivalent; and knowledge of matrix algebra. Comparison of multivariate techniques and analysis; emphasis on discriminant analysis, factor analysis and principal components analysis, canonical correlation, cluster analysis, and multivariate analysis of variance.

7038 Statistical Methods for Spatial Data (3) F Prereq.: EXST 7013, 7014, 7015 or 7019. Overview of statistical methods for spatial data with emphasis on data analysis: fixed and random effects; area data; topics include spatial correlation, variograms, kriging and spatial prediction; spatial sampling; and spatial experimental designs; application of statistical models is encouraged, course work includes relevant statistical software and term project.

7039 Statistical Methods for Reliability and Survival Data (3) S Prereq.: EXST 7013 or 7014 or 7015. Characteristics of lifetime data; nonparametric methods including Kaplan Meier estimation; lifetime parametric models, parametric methods for single distribution data; planning life test; system reliability concepts; failure time regression; accelerated testing.

7060 Probability and Statistics (3) V Prereq.: MATH 2057 or equivalent. Probability, random variables, discrete and continuous distribution functions; expected values, moment generating functions; functions of random variables.

7061 Statistical Theory (3) S Prereq.: EXST 7060 or equivalent. Probability density function; interval estimation; large sample theory; modern developments in statistical inference.

7062 Advanced Topics in Statistical Theory (3) V Prereq.: EXST 7061. May be repeated for credit when topics vary. Topics of current interest; emphasis on theoretical development of statistical methodology.

7083 Practicum in Statistical Consulting I (2) V Prereq.: EXST 7013 or 7014 or 7015, and permission of instructor: 4 hrs. independent study. Pass-fail grading. Supervised application of statistical techniques to research problems; readings, oral presentations, and discussions on statistical consulting; problem-solving; mock consulting sessions; participation in real-life statistical consulting sessions under faculty supervision.

7084 Practicum in Statistical Consulting II (2) F,S,Su Prereq.: EXST 7083 and permission of instructor. 4 hrs. independent study. Pass-fail grading. May be taken for a maximum of 6 hrs. credit. Emphasis on statistical consulting projects under the supervision of graduate faculty.


7086 Advanced Seminar in Statistics (1) F,S,Su Prereq.: consent of instructor. May be repeated for credit when topics vary. Pass-fail grading. Develop and present a 50-minute seminar on an advanced topic in statistics as a part of the department’s seminar series.

7087 Advanced Topics in Statistics (1-3) V Prereq.: consent of instructor. May be repeated for credit when topics vary. Lectures on advanced topics in statistics not covered in other experimental model building and role of model building in population management.

7124 Statistical Data Mining (3) F Prereq.: EXST 7013, 7014, 7015, 7019, or equivalent. Data preparation tools; model prediction; project and data selection; and variable classification.

7151 Bayesian Data Analysis (3) V Prereq.: EXST 7013 or 7014 or 7015 or equivalent; or department head. Introduction to Bayesian statistical methods and their application in fields such as agriculture, biology, engineering, and medicine; topics include noninformative, conjugate and elicited priors; posterior development; common single and multiple parameter models such as binomial, normal, hierarchical; exponential; hierarchical models; hypothesis testing and credible sets; posterior simulation via Markov Chain Monte Carlo; and performance of Bayesian procedures.

7999 Independent Study (1-3) F,S,Su Prereq.: permission of instructor. May be taken for a maximum of 9 sem. hrs. of credit when topics vary. Independent study under the graduate faculty.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.
methods to personal and business risks arising from life, health, property, and liability contingencies; influence of public policy on risk treatment.

3441 Life and Health Insurance (3) Prereq.: FIN 3440. Analysis of insurance protecting against economic loss caused by termination of earning capacity through premature death, disability, or old age; determination of premiums, reserves, benefits; legal aspects; operational features of contracts and provisions; disability income protection.

3442 Property and Liability Insurance (3) Prereq.: FIN 3440. Property and liability risks; insurance coverages available to meet these risks; basic insurance principles that apply in various property and liability insurance contracts; functional aspects of insurance company operations.

3460 Risk Management (3) Prereq.: FIN 3715. Risk management from the business environment's viewpoint; insurance and financial market methods of pooling and managing risk; identification and evaluation of risk; hedging, self-insurance, reinsurance, and organizational design.

3621 Bank Administration (3) Prereq.: FIN 3715. For students interested in commercial banking careers or in the role of banks within the American enterprise system. Economic role and evolution of banks; structure of banking; lending and investment techniques; bank organization and regulation; asset and liability management; credit risk management; bank performance analysis.

3630 Financial Markets and Institutions (3) Prereq.: FIN 3630. Characteristics and functions of financial markets and institutions; process of financial intermediation and allocation of financial resources; analysis of the financial environment in financial institutions and in money and capital markets; factors in interest rate determination; management of credit risk, interest rate risk, and lending and investment strategies.

3715 Business Finance (3) Prereq.: ECON 2000 and 2010, or 2030, and ACCT 2000 or 2010; credit will not be given for this course and FIN 3804. Finance function within the business enterprise: techniques of financial management, concepts of capital structure and dividend policy, working capital management, capital budgeting, investment decision making, and management of financial risk.

3717 Advanced Business Finance (3) Prereq.: FIN 3715. Open only to Finance majors; open to others with permission of department. Presented in real-world cases. Hands on applications of financial tools introduced in FIN 3715; financial analysis, forecasting, valuation, and investment evaluation.

3718 Multinational Managerial Finance (3) Prereq.: FIN 3715. Multinational financial management; nature of international finance system; financing, investment, and risk management alternatives; international capital market issues.

3820 Investments (3) Prereq.: FIN 3715. Open only to Finance majors; open to others with permission of the department. Characteristics and valuation of common stocks, bonds, options, and efficiency of U.S. securities markets; theory and practice of portfolio selection.

3840 Fixed Income Securities (3) Prereq.: FIN 3820. Mechanics of fixed-income markets and securities; valuation of fixed-income securities and contingent claims; interest rate risk, term structure, product fundamentals, and bond portfolio strategies.

3845 Student Managed Investment Fund (3) Prereq.: FIN 3715 or equivalent and permission of instructor. Course may be repeated for a max. of 9 sem. hrs. of credit. Analysis of equity investment opportunities in conjunction with the management of the Student Managed Investment Fund; development of valuation techniques and fundamental analysis; operation of investment reporting systems.

3900 Directed Study and Research (1-6) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Research under direction of faculty member; written proposal must be approved by faculty member prior to registration; course of study must be approved by department faculty prior to registration; written report of semester's activities and findings required for credit.

Finance 283

7310 Real Estate Finance Decisions (3) Questions concerning real estate finance and valuation; risk-return trade-offs under varying conditions of financial leverage; refinancing; selecting between alternative financing methods; mortgage design, sale-leaseback, construction lending, secondary mortgage markets, and the pricing of financing instruments.

7320 Advanced Topics in Real Estate (3) Prereq.: FIN 7310 or consent of instructor. May be taken for a max. of 6 sem. hrs. of credit.

7400 Financial Risk Management (3) Prereq.: BADM 7090 or equivalent. Risk management of corporations, financial institutions, governments, and non-profit organizations; financial risks of real estate contracts and markets and applications of these contracts to risk management problems; the value of risk management, measuring exposures, financial contracts for managing risk, the enterprise risk management industry, and the accounting and regulatory framework; market and credit risks are the primary focus, but some attention is also given to operational and other sources of risk.

7520 Seminar in Financial Research Methods (3) Primarily for doctoral students. Financial economics; empirical behavior of financial markets; topics including trading rules and the efficient market hypothesis; market microstructure; event studies.

7550 Theories of Value (3) Prereq.: ECON 7610 or equivalent. Theory of choice under certainty and uncertainty; time-state preference models of risk allocation; mean-variance asset pricing models; arbitrage pricing models; option pricing models; discrete and continuous time models.

7585 Advanced Topics in Financial Economics (3) Prereq.: consent of instructor. May be taken for a max. of 9 sem. hrs. of credit. Also offered as ECON 7585. Specific areas in finance and financial economics; emphasis on rigorous empirical methodology and theory.

7632 Seminar in Commercial Banking (3) Commercial banking theory and history, quantitative techniques applied to bank asset and liability management, banking structure, markets and competition, capital adequacy and profitability.
Must replace this with actual content.
GEOGRAPHY • GEOG

General education courses are marked with stars (★).

CORE CURRICULUM

(Rquired of majors.)
★ 1001 Human Geography: Americas and Europe (3) 1001 and 1003 need not be taken in numerical order. Credit will not be given for this course and GEOG 2052. Principal themes of human geography, including the spatial distributions and interactions of culture, history, economy, population, and environment, with a regional emphasis on the Americas and Europe.
★ 1003 Human Geography: Africa and Asia (3) 1001 and 1003 need not be taken in numerical order. Credit will not be given for this course and GEOG 2052. Principal themes of human geography, including the spatial distributions and interactions of culture, history, economy, population, and environment, with a regional emphasis on Africa and Asia.
★ 2050 Physical Geography: The Atmosphere (3) Credit will not be given for both this course and GEOG 2051. May be taken for elective geography credit. Physical principles, processes, and operations in the atmosphere; world climatic realms.
★ 2051 Physical Geography: Land and Water Surfaces, Plates, and their Movements (3) Credit will not be given for both this course and GEOG 2051. Surface elements of the earth’s environment; relationships among these elements. 2055 Map Reading (3) 2 hrs. lecture; 2 hrs. lab. Nature and interpretation of topographic maps.

MAPPING SCIENCES

(All majors select three courses.)
Cartography
2039 Cartographic Drafting and Graphic Presentation (3) 2 hrs. lecture; 2 hrs. lab. Drafting instruments and techniques necessary for preparation of maps and scientific graphics.
2040 Advanced Cartography (3) Prerequisite: GEOG 2039 or equivalent. Cartographic history; map projection; advanced techniques of data presentation and cartographic production.
2044 Computer Cartography (3) No programming knowledge necessary. Introduction to selected mapping packages.
2049 Advanced Computer Cartography (3) Prerequisite: CSC 1250 or 1253 and GEOG 4044. Use of computer mapping programs; theory and methods of display of point, line, and area; cartographic maps; algorithmic, involved in encoding, editing, storing, retrieving, and displaying data from a digital cartographic data base.
Remote Sensing
2019 Aerial Photo Interpretation of Cultural Features (3) 2 hrs. lecture; 2 hrs. lab. Credit will not be given for both this course and GEOG 4020. Analysis of land use/land cover, urban, industrial, and military aspects from aerial photographs.
2020 Aerial Photo Interpretation (3) Prerequisite: GEOG 1001 and 1003 or GEOG 2053. Credit will not be given for both this course and GEOG 4019. 2 hrs. lecture; 2 hrs. lab. Analysis and mapping of geostructural, lithology, and landforms from aerial photographs.
2045 Environmental Remote Sensing (3) Prerequisite: consent of instructor. May be taken for elective geography credit. 2 hrs. lab. Basic energy and matter relationships; principles of remote sensors; environment studied via remote sensing techniques.

GISTechniques
2041 Field Methods in Geography (3) 1 hr. lecture; 4 hrs. lab. Cannot be repeated for credit. Students must have Saturdays free. Fall semester emphasis on interpretation of the rural landscape; spring semester emphasis on the physical landscape.
2042 Enterprise Geographic Information Systems (3) The use of vector-based GIS application software for the input, management, analysis, and presentation of geospatial data. Emphasis is placed on how the GIS relates to database management systems as part of building an enterprise-wide GIS.
2046 Webmapping (3) The creation of Web sites for the presentation of geospatial data via the World Wide Web. Emphasis is placed on how the technologies of Internet Web servers, GIS application software, and database management systems form a symbiotic relationship to make such Web sites possible. 2047 Geographic Information Systems (3) Prerequisite: CSC 1250 or 1253 or equivalent. Geographic information systems used in land resource management and planning; data structures and algorithms for automated retrieval and analysis of spatial data; structuring cartographic data into spatial data; integration of remotely sensed data into geographic information systems.
2048 Methods of Spatial Analysis (3) Prerequisite: EXST 4091 or equivalent. Mathematical, statistical, and spatial analytical methods for handling and interpreting data related to geography.

HUMAN GEOGRAPHY

(8A candidates select two systematic and one regional course.)
Systematic
2010 Human Geography (3) Survey of patterns and processes of variation in cultural landscapes.
2040 Advanced Physical Geography (3) Exploration of geographic concepts that underlie nature-society relationships and human dimensions of environmental change.
2012 Elements of Cultural Geography (3) Culturally oriented processes in African geographical thought during the present century.
2040 Advanced Political Geography (3) Systematic, cultural-political geography; emphasis on technical and philosophical aspects and on American political landscapes; territorial political entities (cadastral, civil, national, imperial); role of the lands and seas, nature and objects of war; impacts of political entities on the landscape.
2042 Urban Historical Geography (3) Spatial evolution of cities and city-systems in western civilization through the classical, medieval, mercantile, and industrial periods to 1945.
2043 Urban Geography (3) Internal arrangement, external relations, and locational aspects of urban places, with emphasis on U.S.; urban places identified by presence of tertiary economic activities.
2044 Place and Culture (3) See ANTH 4074.
2047 Economic Geography (3) Location, characteristics, and relationships of primary, secondary, and tertiary economic activity; measurements and theories of location of economic endeavor.
2048 Environment and Development (3) Geophysical theories and methods for analyzing relationship between environment and development.
2049 Geographical Interaction (3) Also offered as REL 4079. Theory and methods of analyzing the culture and movement of religious rituals and traditions over space and time.
2050 Historical Geography (3) Advanced concepts and principles of historical geography.
2056 Human-Environment Interactions (3) Also offered as ANTH 4086. Cultural adaptation to difficult and distinctive environments, including mountains and highlands, the arctic, deserts, the humid tropics, and grasslands; subsistence strategies, local knowledge, household economies, land use practices, and resource management institutions.
2042 Gender, Place, and Culture (3) Also offered as ANTH 4087 and WGS 4087. The geographies of everyday life showing how notions of maleness and femaleness influence how we understand and relate to the world around us, from our built environment, to the places we invest with meaning, and the very ways we live, work, travel, and explore.
Regional
3001 Geography of Louisiana (3) Development and current distribution of physical and human geography of Louisiana.
4000 Modern India: Society and Culture (3) See SW 4009.
4002 South Asian Society, Polity, and Culture (3) See INTL 4002.
4031 Latin America and the Caribbean (3) Physical and cultural geography of Latin America and the Caribbean.
4033 Geography of Central Asia and Afghanistan (3) Also offered as INTL 4033. Survey of the geography of Central Asia and Afghanistan; emphasis on geographic elements of the history, ecology, environment, economy, and strategic importance of the region.
4035 Geographical Survey of East Asia (3) General survey of the physical and cultural geography of the region; focus on economic development and international relations.
4037 Geography of China (3) Geographic survey of natural environment, population and economy of China and its relationships to the rest of the world.
4050 Historical Geography of the South (3) Physical and cultural geography of the southern U.S.; emphasis on geographical elements identified with the south and their historical development; environment, exploration, population, agriculture, and cultural landscape.
4051 North Africa and the Middle East (3) Also offered as INTL 4051. Survey of the geography of North Africa and the Middle East; emphasis on the geographic elements of the history, ecology, economy, and politics of the region.
4052 Geography of the United States and Canada (3) Physical and cultural geography of the United States and Canada.
4055 Geography of Europe (3) Geographical survey of the natural, cultural, and economic resources of Europe and their relationships to the rest of the world.

PHYSICAL GEOGRAPHY

(B5 candidates select any three courses.)
Climatology
4013 Meteorology (3) May be taken for elective geography credit. Temporal and areal variations in composition and structure of the atmosphere; meteorological instruments and measurements. 2014 Climatology (3) Climatic phenomena; methods in development of regional climatology.
4015 Physical Climatology (3) Prerequisite: GEOG 4019 or equivalent and MATH 1552 or equivalent. May be taken for elective geography credit. Exchanges of radiation, energy, matter and momentum between the earth’s surface and the atmosphere that produce characteristic environmental conditions near the ground important to both natural and human uses.
2016 Methods of Climatological Analysis (2) Prerequisite: GEOG 4019 or equivalent. Analysis and interpretation of climatological data and application to physical and human problems.
2017 World Climates (3) Prerequisite: GEOG 2050 or equivalent. Analysis of atmospheric circulation processes that produce differences in climates throughout the world; the earth’s problem climates and climatically sensitive zones most susceptible to floods, droughts, and other environmental stresses.
4018 Geographical Hydrology (3) Prerequisite: MATH 1021 or equivalent. 2 hrs. lecture; 2 hrs. lab. Analysis of basic hydrologic processes with geographic perspectives, variability of runoff and groundwater; floods and droughts; climatic and land use impacts on local and global water resources.
2021 The Tropical Atmosphere (3) Prerequisite: GEOG 4019 or 4044. Comparative analysis of the tropical and mid-latitude atmospheric circulation systems, including monsoon systems, tropical cyclones, and easterly waves; elements of interannual tropical variability such as El Niño-Southern Oscillation.
Geography and Coastal
4021 Alluvial Morphology (3) Prerequisite: GEOG 1001, 1003. May be taken for elective geography credit. Processes that originate and change land and hydrographic forms of alluvial surfaces; emphasis on Louisiana.
4022 Geomorphology (3) Prerequisite: GEOG 1001, 1003. May be taken for elective geography credit. Basic principles underlying the study of land forms; emphasis on processes shaping the natural landscape.
4024 Coastal Morphodynamics (3) Prerequisite: MATH 1021, 1022, or 1024. See OCS 4024.
4027 Coastal Resources and Management (3) Introduction to coastal environments and contemporary global coastal and estuarine management.
Biogeography and Environment
4070 Environmental Conservation (3) Factors governing human use of the earth and its resources.
4092 Biogeography (3) Differential approaches to description and interpretation of plant and soil distribution patterns.
4083 Quaternary Paleocology (3) Prereq.: GEOG 4082 and a basic course in historical geology, or equivalent. 2 hrs. lecture; 4 hrs. lab. Also offered as ANTH 4083. Theory and method of reconstructing climatic, biological, geological, and human history during the Pleistocene and Holocene Epochs.

4085 Tropical and Subtropical Biogeography (3) Prereq.: GEOG 4082 or equivalent. Includes field trip during spring vacation. Principles of tropical ecology and biogeography taught as preparation for an expedition to tropical America where field methods will be illustrated and ecological diversity studied.

OTHER COURSES

2061 Physical Geography (3) Either GEOG 2050 or 2051 may be substituted for this course. Credit will not be given for both this course and GEOG 2050 or 2051.

Analysis of landforms, hydrology, climate, vegetation, and soil; emphasis on world regional patterns.

4023 Coastal and Shallow-Marine Depositional Systems (3) See GEOG 4023. May be taken for elective geology credit.

4090 The History of Geography (3) 3 hrs. lecture and seminar discussion. Development of geography since ancient times; emphasis on the 19th and 20th centuries.

4164 Deltaic Geology (3) See GEOG 4164.

4997 Special Topics in Geography (1-4) Permission of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.

4999 Independent Reading and Research in Geography (1-6) Permission of instructor. Same as GEOG 4999, with special honors emphasis for qualified advanced students.

1000 Honors: Independent Reading and Research in Geography (1-6) Permission of instructor. Same as GEOG 4999, with special honors emphasis for qualified advanced students.

1001 History of National Parks Areas (3) Credit will not be given for this course and either GEOG 1000 or GEOG 1002. Geologic and cultural history of the National Park Service. Areas covered will include most of the National Parks and Monuments, and many other federally owned areas.

1002 Honors: General Geography (3) Same as GEOG 1001, with special honors emphasis for qualified students.

1066 Dinosaurs, Extinctions, and Biogeography (3) Not for major credit for geography majors. History of dinosaur discoveries and methods of study; dinosaurs’ relationship to birds and mammals; place of dinosaurs in earth’s geological history; emphasis on catastrophes and patterns of life change.

1110 Geology of the Rocky Mountains (3) Credit will not be given for this course and either GEOG 1000 or GEOG 1002. Geology of the Rockies.

1111 Geology of Natural Park Areas (3) Credit will not be given for this course and either GEOG 1000 or GEOG 1002. Geology of the National Park Service. Areas covered will include most of the National Parks and Monuments, and many other federally owned areas.

1601 Physical Geography Laboratory (1) Prereq.: consent of instructor. May be repeated for credit. 2 hrs. lecture; 3 hrs. lab.

1603 Historical Geography (3) Prereq.: consent of instructor. May be repeated for credit. 2 hrs. lecture; 3 hrs. lab.

7074 Poetry of Place (3) Same as ANTH 7074.

7101 Introduction to Graduate Study (1) Same as ANTH 7001. Techniques and methods of their profession for incoming masters students.

7502 Techniques of Seismology (1) Same as ANTH 7502. Techniques and methods of interpreting data related to geodynamic phenomena occurring in coastal areas.

7510 Process-Response in Geologic Environments (3) V

7511 Selected Topics in Geography (3) Permission of instructor. May be taken for a max. of 9 hrs. when topics vary.

7515 Advanced Physical Geography (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7519 Field Geology (3) Permission of instructor. May be taken for a max. of 9 hrs. of credit when topics vary.

7911 Historical Geography (3) May be taken for a max. of 9 hrs. of credit with consent of department.

7924 Coastal Climatology (3) Prereq.: GEOG 4028 and a basic course in either meteorology or climatology, or consent of instructor. Meteorologic and climatologic phenomena occurring in coastal areas.

7964 Coastal and Estuarine Resources (3) Prereq.: GEOG 4028 and 4029; or equivalent. Nature of coastal and estuarine resources and their perception, evaluation, and exploitation.

7950 Problems in the Geography of Latin America (3) Prereq.: reading knowledge of Spanish or Portuguese. Problems in the cultural and economic geography of Latin America.

7960 Hydroclimatology (3) Prereq.: GEOG 4014 or 4015 or equivalent. 1 hr. lecture; 4 hrs. lab. Field measurements and laboratory analyses of radiation and water balance in urban environments; emphasis on evapotranspiration rates and climatic consequences.

7973 Advanced Geographical Information Systems (3) Prereq.: GEOG 4028; or consent of instructor. Theory and methods of design, development, implementation, and applications of geographic information systems.

7977 Advanced Remote Sensing Seminar (3) V Prereq.: GEOG 4045 or equivalent. May be taken for a max. of 9 hrs. of credit when topics vary. Selected topics in remote sensing.

8000 Thesis Research (1-12 sem.) Permission of instructor. "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) Permission of instructor. "S"/"U" grading.

GEOLGY

General education courses are marked with stars (★).

★ 1001 General Geography: Physical (3) An honors course, GEOG 1002, is also available. Earth materials and land forms; processes at work on and within the earth.

★ 1002 Honors: General Geography (3) Same as GEOG 1001, with special honors emphasis for qualified students.

★ 1003 History of National Parks Areas (3) An honors course, GEOG 1004, is also available. History of the earth and life on it, as deciphered from study of its rocks and fossils.

★ 1004 Honors: General Geography: Historical (3) Same as GEOG 1003, with special honors emphasis for qualified students.

★ 1066 Dinosaurs, Extinctions, and Biogeography (3) Not for major credit for geography majors. History of dinosaur discoveries and methods of study; dinosaurs’ relationship to birds and mammals; place of dinosaurs in earth’s geological history; emphasis on catastrophes and patterns of life change.

★ 1601 Physical Geography Laboratory (1) Prereq.: consent of instructor. May be repeated for credit. 2 hrs. lecture; 3 hrs. lab.

★ 1603 Historical Geography (3) Prereq.: consent of instructor. May be repeated for credit. 2 hrs. lecture; 3 hrs. lab.

★ 1919 Honors: Independent Reading and Research in Geography (1-6) Permission of instructor. Same as GEOG 4999, with special honors emphasis for qualified advanced students.

★ 2061 Continental Drift and Global Tectonics (3) Prereq.: GEOG 1000. Fundamental concepts of plate tectonics; evolution of the continents and ocean basins; observational evidence for continental drift; historical development of plate tectonics as a scientific hypothesis.

★ 2081 Geology of the Rocky Mountains (3) Credit will not be given for this course and either GEOG 1000 or GEOG 1002. Geology of the Rockies.

★ 2100 Earth History (3) Prereq.: GEOG 1000. 1602; BIOL 1001. 2 hrs. lecture; 3 hrs. lab. One or two field trips required. Characteristics and geologic history of selected taxa with significant fossil records; use of paleontologic and other methods to interpret ancient environments.

★ 2106 Continental Drift and Global Tectonics (3) Prereq.: GEOG 1000. Fundamental concepts of plate tectonics; evolution of the continents and ocean basins; observational evidence for continental drift; historical development of plate tectonics as a scientific hypothesis.

★ 2101 History of the Biosphere (3) Prereq.: GEOG 1000, 1602; BIOL 1001. 2 hrs. lecture; 3 hrs. lab. One or two field trips required. Characteristics and geologic history of selected taxa with significant fossil records; use of paleontologic and other methods to interpret ancient environments.

★ 2106 Continental Drift and Global Tectonics (3) Prereq.: GEOG 1000. Fundamental concepts of plate tectonics; evolution of the continents and ocean basins; observational evidence for continental drift; historical development of plate tectonics as a scientific hypothesis.

★ 2101 History of the Biosphere (3) Prereq.: GEOG 1000, 1602; BIOL 1001. 2 hrs. lecture; 3 hrs. lab. One or two field trips required. Characteristics and geologic history of selected taxa with significant fossil records; use of paleontologic and other methods to interpret ancient environments.

★ 2106 Continental Drift and Global Tectonics (3) Prereq.: GEOG 1000. Fundamental concepts of plate tectonics; evolution of the continents and ocean basins; observational evidence for continental drift; historical development of plate tectonics as a scientific hypothesis.

★ 2101 History of the Biosphere (3) Prereq.: GEOG 1000, 1602; BIOL 1001. 2 hrs. lecture; 3 hrs. lab. One or two field trips required. Characteristics and geologic history of selected taxa with significant fossil records; use of paleontologic and other methods to interpret ancient environments.

★ 2106 Continental Drift and Global Tectonics (3) Prereq.: GEOG 1000. Fundamental concepts of plate tectonics; evolution of the continents and ocean basins; observational evidence for continental drift; historical development of plate tectonics as a scientific hypothesis.

★ 2101 History of the Biosphere (3) Prereq.: GEOG 1000, 1602; BIOL 1001. 2 hrs. lecture; 3 hrs. lab. One or two field trips required. Characteristics and geologic history of selected taxa with significant fossil records; use of paleontologic and other methods to interpret ancient environments.
major elements, trace elements, heavy metals, dissolved gases, and nutrients in estuarine and open-ocean systems.

4083 Introduction to Isotope Geology (3) Prereq.: GEOL 2081 or equivalent. Principles of isotope geology, radioactive decay, and isotopic fractionation processes; radiometric dating techniques and stable isotopic systems.

4084 Geochemistry of Sediments and Natural Waters (3) Prereq.: GEOL 2081 or BIOL 2051 or consent of instructor. Also offered as BIOL 4084. Microbial control of chemical and physical properties of marine sedimentary systems; interactions of fluid-rock interactions in the geochemical evolution of sedimentary rocks, the ocean, and the atmosphere; major geological cycles.

4111 Vertebrate Paleontology (3) Prereq.: consent of instructor. 2 hrs. lecture; 2 hrs. lab. Phylogenetic survey of fossil vertebrates; their origins and transitions; vertebrate taphonomy, biostatigraphy, and fossil collection and preparation.

4131 Basin Analysis (3) Prereq.: GEOL 4031. Basic environment of sediment deposition; sedimentological models and their relationships within depositional basins; analysis of the sedimentary basin models and comparison with modern and ancient sedimentary basins.

4164 Deltaic Geology (3) Prereq.: consent of instructor. 2 hrs. lecture, 2 hrs. lab. Analysis of fluvial systems, processes, and deposits; detailed study of the Mississippi Delta.

4165 Subsurface Geology (3) Prereq.: GEOL 1001, 1003, 1601, 1602; PETE 4088 strongly recommended. 2 hrs. lecture; 1 hr. methods of exploration, analysis, and interpretation. Use of borehole data, electric logs, and samples of rocks and fluids; construction of geological maps showing sediment facies, geological structure, geotemperature, fluid pressure and water salinity; analysis of fluid migration, oil and gas accumulations, and their potential applications. Stress on computer techniques; emphasis on the interrelation of tectonics and sedimentation processes.

4182 Physical Hydrogeology (3) Prereq.: GEOL 3012 or equivalent. Processes of subsurface fluid movement, emphasis on hydrological controls of the origin and migration of pore water, including saline brines, in sedimentary basins; topics include fluid flow, groundwater, and thermal resources.

4466 Coastal Field Geology (4) Su only. Prereq.: consent of instructor. Also offered as QCC 4466. Camp fee. Four-week field course on the Louisiana coast utilizing facilities operated by Louisiana Universities Marine Consortium. Sedimentary environments, coastal processes, and environmental petrographical problems of the Mississippi delta plain.

6001 Topics in Earth Science for Teachers (3) Su May be taken a max. of 9 sem. hrs. when topics vary. Consent of instructor is required for the second and third times. Various aspects of the earth sciences for elementary, middle, and high school science teachers.

7031 Deep-water Depositional Environments (3) Prereq.: introductory course in sedimentology, e.g. GEOL 4031. Different types of sediment in deep water and on various transport processes; emphasis on submarine fan systems, their lithologic and seismic response; genetic factors responsible for variation in end products.

7032 Fluvial Processes and Systems (3) Prereq.: consent of instructor. Fluid flow, sediment transport, and fluvial depositional processes; river systems as conveyors for sediment delivery to sedimentary basins; fluvial sediments in the stratigraphic record.

7043 Advanced Igneous Petrology (3) Prereq.: GEOL 4034 or equivalent. 2 hrs. lecture; 3 hrs. lab. Phase diagrams, magmatic origin of igneous rocks, and evolution of igneous provinces.

7044 Advanced Metamorphic Petrology (3) Prereq.: GEOL 4034 or equivalent. 2 hrs. lecture; 3 hrs. lab. Facies concept, theoretical and field relations, textures, and their significance.

7061 Sequence Stratigraphy (3) Prereq.: GEOL 4031 or equivalent. One-week field trip to the southern Rocky Mountains is required. Principles of physical stratigraphy with emphasis on contemporary concepts about the interaction of tectonic and sedimentary systems and the role of eustasy in generating a predictable architecture of sedimentary basin fills.

7062 Seismic Stratigraphy (3) Prereq.: GEOL 3071 or equivalent. Interpretation of seismic reflection data in terms of sedimentary facies, stratigraphic sequences, and implications for resource-level investigations.

7064 Numerical Methods in the Geologic Sciences (3) Prereq.: CSC 2262, MATH 1552, and GEOL 4084; or equivalent. Numerical methods applied to geological research; interpolation and extrapolation, nonlinear equations, numerical solutions of differential equations, Fourier transforms.

7065 Geodynamics (3) Prereq.: MATH 2507 and 2991 or equivalent; and GEOL 4064 or equivalent. Fundamental physical processes involved in plate tectonics and other geodynamic processes of great importance to German-Canadian relations; these topics are illustrated with application to the study of geodynamic processes.

7068 Mass Spectrometry for Isotope Geology (3) Prereq.: GEOL 4085 or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Mass spectrometry; stable isotope fractionation in natural systems; emphasis on oxygen, hydrogen, and carbon isotope-ratio variation in modern water; advanced techniques utilizes with application to the solution of petrologic problems.

7070 Palynology (3) Prereq.: consent of instructor. 2 hrs. lecture; 2 hrs. lab. Analysis and interpretation. Emphasis on biostratigraphy of sedimentary rock successions; use of palynomorphs for paleoenvironmental reconstruction.

7071 Biostatigraphy (3) Prereq.: GEOL 4064 or equivalent. 2 hrs. lecture; 2 hrs. lab. Stratigraphic correlation, modern and ancient, using oxygen isotope data; techniques of statistical analysis used in correlation studies.

7085 Petroleum Geology (3) Prereq.: consent of instructor. Fluid flow, sediment transport, and fluvial depositional processes; river systems as conveyors for sediment delivery to sedimentary basins; fluvial sediments in the stratigraphic record.

7111 Advanced MicroPaleontology (3) Prereq.: consent of instructor. 2 hrs. lecture, 2 hrs. lab. Analysis and interpretation. Use of fossils, their occurrence, and their systematic relationships. Emphasis on modern microfossil technology.

7115 Palaeogeology (3) Prereq.: GEOL 2061 and 4031. 2 hrs. lecture, 2 hrs. lab. Simplification of physical geologic processes and techniques in a modern computerized environment.

7117 Biostatigraphy (3) Prereq.: GEOL 2061 or equivalent. 2 hrs. lecture; 2 hrs. lab. Stratiographic correlation, modern and ancient, using oxygen isotope data; techniques of statistical analysis used in correlation studies.

7120 Palaeoecology (3) Prereq.: GEOL 3071 or equivalent. Principles of palaeoecology and their practical application to the study of fossil communities; emphasis on modern communities and their paleoecological relationships.

7131 Petrology of Sandstones (3) 2 hrs. lecture; 3 hrs. lab. Petrology and petrography of terrigenous sandstones; applications of sedimentary facies and texture to the analysis of environmental, deposition, and diagenesis; emphasis on the relationship of tectonics and sedimentary processes.

7132 Dynamics of Sedimentation (3) 2 hrs. lecture; 3 hrs. lab. Fluid mechanics as applied to sedimentation. Basic physical concepts of sediment transport and sedimentary basins; fluid and solid flow, fluid and solid deposits, deposition and sedimentation processes; sedimentary environments, and unitary processes in sedimentary basins; hydraulic principles of sediment transport.

7133 Sedimentary Petrology of Carbonates (3) 2 hrs. lecture; 3 hrs. lab. Principles governing formation, deposition, diagenesis, and alteration of sediments and sedimentary rocks; strata, strata and subsurface textile, fabric, and mineral relationships and interpretation of depositional and environmental processes; mineralogy of ancient carbonate sequences.

7134 Clay Mineralogy (3) 2 hrs. lecture; 3 hrs. lab. Minerals and mineralogy; clay minerals and their properties.

7183 Physical Geochemistry of Burial Diagenesis (3) Prereq.: GEOL 4895 or equivalent. Qualitative techniques in thermodynamics, kinetics, and mass transport applied to problems of burial diagenesis of sedimentary minerals and rocks.

7195 Reservoir Characterization (3) Prereq.: GEOL 4182 or PETE 4051 or consent of instructor. 2 hrs. lecture; 2 hrs. lab. Principles of reservoir geology; types of reservoirs; properties, rock properties, drilling, exploration, and appraisal, reservoir flow modeling and production engineering; emphasis on advanced applications of geology, geophysics, and petroleum engineering.

7200 Scientific Communication and Visualization (3) Prereq.: GEOL 4060. Methods for written communication with an emphasis on scientific approaches, analysis and presentation of scientific quantitative information. 7000 Special Topics (3) Prereq.: GEOL 2155 or equivalent. Readings from, and an historical overview of,
the Middle Ages, the Renaissance, the Reformation, and the Baroque periods.

3082 Survey of German Literature and Culture: 1700-20th C. May be taken for a max. of 6 hrs. of credit when topics vary. Readings from, and an overview of, the Enlightenment, Storm and Stress, Weimar Classicism, and Romanticism.

3083 Survey of German Literature and Culture: 18th-19th C. May be taken for a max. of 6 hrs. of credit when topics vary. Readings from, and a historical overview of, Biedermier/Vormärz, Realism, and Naturalism.

3084 Survey of German Literature and Culture: 19th-20th C. May be taken for a max. of 6 hrs. of credit when topics vary. Readings from major works of literature in the context of the three periods of productivity and evolution of his thought.

3091 Special Topics in German Literature in Translation (3) Knowledge of German not required. May be taken for a max. of 6 hrs. of credit when topics vary.

4005 German for Reading Knowledge (5) Specialized course intended to satisfy departmental foreign language reading requirement for graduate students. This course will not count toward a graduate degree. Undergraduates may enroll on a pass-fail basis only. Does not count toward satisfying foreign language requirements for undergraduates, although hours may count toward baccalaureate. Credit will not be given for both this course and introductory German courses.

4030 German Drama (3) Dramatic literature in German.

4031 German Poetry (3) Study of German poetic expression.

4032 German Prose (3) Emphasis on stylistic analyses and narrative theory.

4041 Special Topics in Older Germanic Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4042 Special Topics in 18th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4043 Special Topics in 19th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4044 Special Topics in 20th Century German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4045 Special Topics in Contemporary German Literature and Culture (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4046 German Film (3) Knowledge of German not required. German film in its socio-historic contexts with some attention to cinematic technique.

4062 Advanced German Discourse (3) Prereq.: GERMAN 2001 or equivalent. Intensive practice in complex grammar and structures. Analysis and synthesis of authentic German material with focus on reading and writing.

4091 Special Topics in German Literature and Culture in Translation (3) May be taken for a max. of 6 hrs. of credit when topics vary. Knowledge of German not required.

4195 Independent Work (1-3) May be taken for a max. of 3 sem. hrs. credit. Permission of department required.

HEBREW • HEBR

General education courses are marked with stars (★).

1001 Beginning Hebrew (4) Also offered as REL 1001. This course counts toward the fulfillment of a foreign language requirement only when taken under the HEBR rubric. The alphabet, basic grammar, and vocabulary of classical Hebrew; simple prose passages from the Bible. ★ 1002 Beginning Hebrew (4) Also offered as REL 1002. Prereq.: HEBR/REL 1001 or equivalent. This course will count toward the fulfillment of a foreign language requirement only when taken under the HEBR rubric. Basic grammar and vocabulary of classical Hebrew; simple prose readings from the Bible. ★ 2003 Intermediate Hebrew (4) Also offered as REL 2003. Prereq.: HEBR/REL 1002 or equivalent. This course counts toward the fulfillment of a foreign language requirement only when taken under the HEBR rubric. Biblical narratives; details of syntax; development of vocabulary. ★ 2004 Intermediate Hebrew (4) Also offered as REL 2004. Prereq.: HEBR/REL 2003 or equivalent. This course counts toward the fulfillment of a foreign language requirement only when taken under the HEBR rubric. Biblical narratives and poetry; details of syntax; development of vocabulary; textual criticism.

HISTORY • HIST

General education courses are marked with stars (★).

1001 Western Civilization to 1500 (3) An honors course, HIST 1902, is also available. Ideas, trends, and institutions in western civilization from earliest times to the Reformation. ★ 1002 HONORS: Western Civilization to 1500 (3) Same as HIST 1901, with special honors emphasis for qualified students. Supervised reading, discussion, research, and writing.

1003 Western Civilization Since 1500 (3) An honors course, HIST 1903, is offered. Development of western civilization from the Reformation to the present.

1004 HONORS: Western Civilization Since 1500 (3) Same as HIST 1903, with special honors emphasis for qualified students. Supervised reading, discussion, research, and writing.

1005 World History to 1500 (3) Developments and interactions among Asian, African, European, Amerindian, and Oceanian cultures in the pre-modern age.

1007 World History Since 1500 (3) Interdisciplinary and cultural approach to the civilization of Asia, particularly China and Japan, from antiquity to early contacts with the West.

1009 East Asian Civilization to 1800 (3) Interdisciplinary and cultural approach to the civilization of China, Japan, Korea and Vietnam, from antiquity to early contacts with the West.

1090 World History Since 1800 (3) An honors course, HIST 1908, is also available. Development of institutions and thought in the earliest civilizations of the Near East and Greece (3)

Development of institutions and thought in the earliest civilizations of the Near East and Greece (3)

2001 The Ancient Near East and Greece (3) Development of institutions and thought in the earliest civilizations of the Near East and Greece (3)

2002 Rome: Republic and Empire (3) Development of the Roman state, society, and thought from the prehistory of Italy to St. Augustine.

2011 England: Roman Times through 1068 (3)

2012 Britain from 1689 to the Present (3)

2020 Medieval Europe (3) Social, cultural, religious, and political history of medieval Europe from the reign of Charlemagne to the fall of Constantinople in 1453.

2021 Modern Europe (3) Political, economic, and social developments and diplomacy from the Renaissance to 1848.

2022 Modern Europe (3) Political, economic, and social developments and diplomacy from 1848 to the present.

2023 The World Since 1940 (3) Major events since 1940 in the U.S., S.U.R., and selected nations of Europe, the Middle East, Latin America, Africa, and Asia; emphasis on social, economic, political, and national security issues.

2055 The United States to 1865 (3) An honors course, HIST 2055, is also available.

2056 HONORS: The United States (3) Same as HIST 2055, with special honors emphasis for qualified students.

2057 The United States from 1865 to the Present (3) An honors course, HIST 2058, is also available.

2058 HONORS: The United States (3) Same as HIST 2057, with special honors emphasis for qualified students.

2061 African American History (3) Social, cultural, and economic role of African Americans in the U.S. from 1619 to the present.

2075 German Civilization (3) See GERM 2075.

2085 Colonial Latin America (3) Colonial period emphasizing the Hispanic background, explorations, political and economic systems, and wars of independence.

2086 Latin America Since Independence (3) Latin American countries in the 19th and 20th centuries; search for political stability, economic and social progress, and international relations.

2088 East Asian Civilization to 1800 (3) Interdisciplinary and cultural approach to the civilization of East Asia, particularly China and Japan, from antiquity to early contacts with the West.

2096 East Asian Civilization Since 1800 (3) Modern Asian civilization; emphasis on contact with the West, and the rise of nationalism and communism.

2135 Introduction to Russian Culture and Civilization (3) See RUSS 2135.

2195 Topics in History (3) May be taken for a max. of 6 sem. hrs. of credit when topics vary.

3001 History and the Social Sciences I (1) Prereq.: EDCI 2091 concurrent enrollment in EDCI 2091. Supervised tutorial experience in local middle or high schools. Introduction to the role of the social sciences in the study of history; course will assist student in the teaching of social studies to small groups in middle and high schools.

3071 Louisiana (3) Political, economic, social, and cultural development.

3115 Introduction to Historical Method (3) Survey of different methods and perspectives used in the research and writing of history.

3117 Undergraduate Proseminar in World History (3) Prereq.: consent of instructor. Open to students with at least 6 sem. hrs. of credit in history and with an overall 3.00 gpa. May be taken for a max. of 9 hrs. of credit when topics vary. Supervised reading and research in an assigned field of historical study.

3118 Undergraduate Proseminar in European History (3) Prereq.: consent of instructor. Open to students with at least 6 sem. hrs. of credit in history and with an overall 3.00 gpa. May be taken for a max. of 9 hrs. of credit when topics vary. Supervised reading and research in an assigned field of historical study.

3119 Undergraduate Proseminar in United States History (3) Prereq.: consent of instructor. Open to students with at least 6 sem. hrs. of credit in history and with an overall 3.00 gpa. May be taken for a max. of 9 hrs.
equivalent to ENGL 2090. Interdisciplinary presentation of development of the modern world to 1820, integrating literature and culture with political, economic, and social history.

2204 Lectures in Colonial and Early National America (3-4) Prereq.: HNR 2010. Interdisciplinary presentation of development of the modern world from the Renaissance through the Enlightenment; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. 2094. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.

2093 Western Civilization from 1789: The Modern World (4) Continuation of HNR 2092. Interdisciplinary presentation of development of western civilization from the era of revolution to the present; literature, history, philosophy, religion, government, and fine arts.
2014 Food Fundamentals (4) F Preq.: credit or registration in HUEC 2010. 3 hrs. lecture; 3 hrs. lab. For majors and minors only or consent of instructor. Principles of food selection, management, and relationships and principles of planning, organizing, leading, and controlling; applications to food service systems, clinical dietetics, and community program.

4027 Practicum in Dietetics (1-3) Prereq.: dietetics majors only; 60 hrs. in dietetics curriculum; overall GPA of 2.50; must be major in dietetics; pass credit or registration in HUEC 2110. May be taken for a max. of 3 hrs. of credit. Supervised professional experience designed to integrate academic learning with practice in dietetics.

4110 Capstone in Nutritional Sciences (3) Prereq.: EXST 2201; HUEC 2019; credit or registration in HUEC 3110 or equivalent. Nutritional sciences major; 60 hrs. lecture; 3 hrs. lab/field work. Research methods used in nutritional sciences; research project is included.

7080 Dietetics Internship (1) Prereq.: departmental approval, successful defense of the MS thesis. May be taken for a max. of 8 hrs. credit. Pass-fail grading. Preprofessional field experience in clinical dietetics, state systems management, and community nutrition that meets the registration eligibility requirements of the American Dietetic Association.

7001 Macronutrients (3) Nutritional aspects of protein, lipids, and carbohydrates; deficiencies, interrelationships, requirements, and metabolic pathways.

7002 Topics in Micronutrients (2) May be taken for a max. of 8 hrs. credit when the topic varies. An integrated presentation of the functions and functions of vitamins and minerals in nutrition. Epidemiological to molecular aspects discussed.

7004 Molecular Nutrition I (2) F Preq.: BIOL 4087 or 4094 or permission of the instructor. The development of current concepts of nutritional effects on health and disease, the use of cellular and molecular tools.

7005 Molecular and Clinical Nutrition II (2) F Preq.: HUEC 4087. Principles of nutritional effects on health and disease through the use of cellular, molecular, genetic, and epigenetic tools.

7010 Food and Nutrition in Health and Disease (4-6) May be taken for a max. of 6 hrs. credit when topics vary. Reports and discussion of current literature and research.

7011 Current Concepts in Food and Nutrition (1-4) May be taken for a max. of 9 hrs. credit when topics vary. Recent research and developments in food, nutrition, dietetics, and integrative health care.

7017 Advanced Human Nutrition III (F Preq.: HUEC 4010 and BIOL 4087, or consent of instructor. Human requirements, evaluation of nutritional status, and problems related to kind and amount of food consumed.

7019 Advanced Medical Nutrition Therapy (3) S Prereq.: HUEC 4014 or equivalent or consent of instructor. Progressive, updated information on medical nutrition therapy and intervention strategies in specific clinical conditions; rationale for biochemical and physiological bases of diseases.

7094 Seminar in Nutrition (1) S Same as FDSC 7904. May be taken for a max. of 2 hrs. of credit. Prereq.: ANC 3070. Required to be taken in its entirety.

8035 Apparel Structure and Fit (4) Prereq.: for students in the Apparel Design concentration only or consent of instructor; credit or registration in HUEC 2041. 4 hrs. lab. Literature, symbolic, figurative, and functional aspects of garment assembly and the relationships between garment design, fabric characteristics, and production processes; analysis of fit; alteration and finishing systems.

8040 Textile Science (3) F S Basic physical, biological, and chemical characteristics of fibers, yarns, and fabrics; selection, evaluation, and selection of textiles.

8041 Textile Science Laboratory (1) F Preq.: credit or registration in HUEC 2040. 3 hrs. lab. Introduction to basic physical and chemical testing of textiles and significance to the textile/apparel industry. Arranged on individual basis for students with limited or no industry experience.

8044 Early Experience in the Textile/Apparel Industry (1) 4 hrs. practicum; 32 hrs. of supervised experience. Participants must work a minimum of 10 hrs./w. as a paid employee of the textile/apparel industry. Arranged on individual basis for students with limited or no industry experience.

3030 Field Experience (3) Prereq.: credit in fashion design or textile science. May be taken for a max. of 6 hrs. credit if field site varies. 2 hrs. lecture; 3 hrs. lab. Offered through Continuing Education. 28 hrs. of on-campus seminars. Fee to cover expenses. Structured educational experiences in retail and industry centers in the U.S. and abroad.


3067 Intermediate Apparel Product Design (4) Prereq.: HUEC 2037. 2 hrs. lecture; 4 hrs. lab. Principles and application of two-dimensional or flat pattern design; development of foundation blocks for use in designing and developing new fashion styles and design conceptualization and execution of original garment design.

3042 Apparel Merchandise Buying and Management (3) F Prereq.: majors only. HUEC 4043 and MATH 1022. Relates to computer and management principles in buying and marketing of apparel,兼含 merchandising and purchasing strategies; role and responsibilities of merchandisers, buyers, and retail buyers; domestic and foreign merchandise resources and negotiation.

3043 Apparel Merchandising Strategies and Assortment Planning (3) Prereq.: majors only. HUEC 3042 and computer literacy, 2 hrs. lecture; 2 hrs. lab. Assortment planning and sales strategies; advanced quantitative concepts and procedures used in apparel buying, management and interpretation of data related to merchandising and sales.

3045 Merchandising and Marketing Strategies (3) Prereq.: HUEC 2943. Display elements and techniques; visual merchandising; special events strategies; public relations and Internet promotion.

3230 Pattern Design with Computer Application (4) S Prereq.: HUEC 3037. 2 hrs. lecture; 4 hrs. lab. Application of technical design and pattern making computer software to apparel design and production.

3232 Apparel Design Studio (3) Prereq.: HUEC 2032. 2037, ART 1847 or 1848. 1 hr. lecture; 4 hrs. studio. Studio: creative techniques and inspirational themes to designs for diversified apparel markets; pre-portfolio development; use of an industry-specific CAD system.

3034 Textile and Apparel Product Evaluation (3) F S Prereq.: HUEC 2041. 2 hrs. lecture; 2 hrs. lab. Fabric and apparel structure and their relationships to performance and end-use characteristics; textile and apparel product standards and specifications; standard test methods for evaluating physical, aesthetic comfort, performance, and functional aspects.

3047 Advanced Apparel Product Design (4) Prereq.: HUEC 2230. 2 hrs. lecture; 4 hrs. lab. Principles and application of three-dimensional pattern design.

4041 History of Textiles (3) S-O Cultural, functional, and technological developments of textiles by selected periods and cultures.

4045 Synthesis: Textile and Apparel Product Processes (3) S Prereq.: HUEC 3032, ECON 2589. Application and analysis of economic concepts and principles associated with the textiles and apparel industry; overview of global economics and contemporary trade policy.

4046 Advanced Topics in Apparel Merchandising (3) F Prereq.: HUEC 3042 and 3045. Application of principles of product development, buying and management of apparel merchandise; current industry issues and trends; emphasis on theory and policy related strategies.

4047 Internship in Textiles, Apparel, and Merchandising (1-3) Prereq.: credit in apparel design standing with a GPA of at least 2.30 on all HUEC courses taken at LSU and permission of department; participation in orientation and Merchandising prior to enrollment. MKT 3401.

4038 Merchandising: credit in HUEC 3043 and 3045; apparel design concentration: credit in HUEC 3043 and 3045; apparel design concentration: credit in HUEC 3043 and 3045; apparel design concentration: credit in HUEC 3043 and 3045. Each hour of credit requires 40 hrs. of supervised experience. Not for graduate credit. May be taken more than once for a maximum of 8 hrs. credit. Professional experience designed to integrate academic learning with professional practice.
4070 Entrepreneurship in Human Ecology (3) Prereq.: MKT 3401 or consent of instructor. Application of entrepreneurial skills in the setting up, management, and marketing of home-based and/or microbusinesses; case studies of successful and unsuccessful ventures.

4071 History of Dress and Adornment Prior to 1700 (3) Emphasis on styles of western civilization; how dress functions for individuals within culture and society; relationships of gender, environment, technology, economics, religion, and aesthetics to dress.

4072 History of Dress and Adornment After 1700 (3) Emphasis on styles of western civilization; how dress functions for individuals within culture and society; relationships of gender, environment, technology, economics, religion, and aesthetics to dress.

4078 Consumer Behavior in Fashion (3) Study of dress and appearance with emphasis on cultural, aesthetic, psychological, and marketing aspects. Meanings of dress and appearance, creation and diffusion of fashion and consumer culture, consumer characteristics, and fashion implications.

4232 CAD for Textiles and Apparel (3) Prereq.: HUEC 3232. 1 hr. lecture; 4 hrs. lab. Application of computer-aided design technology to the design and presentation of textile and apparel collections.

7031 Social-Psychological Theories of Dress, Appearance, and Consumer Behavior (3) Examination and analysis of interdisciplinary and theoretical approaches to dress, appearance, and fashion as a social and economic force.

7032 Aesthetics in Dress and Culture (3) F. Also offered as ANTH 7032. Relationship between people and dress in different cultural settings, e.g., environment, religion, ethnicity, and the impact of cultural change and western culture on world dress, ethnic, and field traditions in dress.

7035 Apparel Macromarketing (3) Prereq.: HUEC 4043; and 7000-level statistics course. In-depth study of mass production of textiles, with a detailed analysis of manufacturing technology, quality control methods, and end-use performance evaluation and application.

7036 Apparel Merchandising and Global Expansion (3) International merchandising; examination of theoretical foundations, principles, and applications within select international settings; development of international apparel merchandising strategies; assessment of global issues that affect apparel merchandising.

7037 Consumer Behavior in the Apparel Merchandising Environment (3) Examination of consumer behavior theories and their applications to apparel purchase and patronage decisions and merchandising research.

7040 Bio-based Composites: Production and Evaluation (3) Bio-based material products and applications, with case studies to illustrate end-use evaluation of related agricultural materials.

7041 Introduction to Research in Textiles, Apparel Design, and Merchandising (3) F. Introduction to research in textiles, apparel design, and merchandising.

7042 Research in Textiles (3) 1 hr. lecture; 4 hrs. lab. Research methods in textile, fabric analysis and testing, trends and recent developments.

7043 Seminar: Textiles, Apparel Design, and Merchandising (1) May be taken a max. of 2 hrs. of credit if topics vary. Reports and discussion of current literature and research.

7044 Selected Topics in Textiles, Apparel Design, and Merchandising (3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Analysis and discussion of selected research and creative topics.

7046 Microscopy of Fibers and Polymers (3) Analysis and characterization of fibers and polymers by microscopy, microscopic techniques; emphasis on textile fibers and fabrics, including modern, historic, and archaeological specimens.

7047 Modern Fiber Science and Technology (3) 2 hrs. lecture; 2 hrs. lab. New techniques for obtaining fiber forms of entrepreneurship with an emphasis on lyocell and plant derived polyesters; examination of polymeric materials used for the development of high performance fibers for space and other industrial applications.

7048 Thermal Characterization of Fibers and Polymers (3) Analysis and characterization of fibers and polymers using thermal, thermo-electrical, and thermo-mechanical techniques; examination of textile fibers and fabrics including bio-derived materials and classical specimens.

7049 Advanced Individual Field Experience in Textiles, Apparel Design, and Merchandising (3) Prereq. or Coreq.: HUEC 7091; or consent of instructor. May be taken for a max. of 5 hrs. of credit when topics vary. Advanced individual, supervised, field-based study in selected areas of textiles, apparel design, and merchandising; emphasis on analysis, synthesis and application of research data and practical work within selected businesses, industries, agencies or institutions.

7518 Studies in American and European Dress (3) See also THTR 7518. May be taken for a max. of 6 hrs. of credit when topics vary.

7519 Seminar in American Dress: 18th Century to 1800 (3) See THTR 7520.

7520 Seminar in American Dress: 1800 to the Present (3) See THTR 7520.

HUMAN RESOURCE EDUCATION • HRE

1000 Keyboarding (1) 2 hrs. lab. Presentation of the complete keyboard; keyboarding using the “touch” system; common keyboarding symbols; introduction to simple letter styles, tabulations, manuscripts, and simple business forms.

1100 Machine Engines: Maintenance and Repair (3) V 6 hrs. lab. Design, construction, operation, and maintenance principles of industrial engines, including electrical, cooling, lubricating, and fuel systems.

1105 Keyboarding and Data Processing (2) Prereq.: HRE 1000 or equivalent. 1 hr. lecture; 2 hrs. lab. Students are expected to be familiar with Microsoft Office Processing software packages. Students are also expected to know how to navigate in a document, select text, edit text, print documents, and send documents via email. Offered through correspondence study only. Applying basic skills to the formatting of letters, reports, tables, memos, and other kinds of personal and business communications.

2000 Document Production (3) Prereq.: HRE 1003 or equivalent. 2 hrs. lecture; 2 hrs. lab. Application of advanced word processing functions to the production of letters, documents, and reports; specialized documents and terms (legal, medical, technical); emphasis on production skills.

2001 Foundations of Human Resource Education (3) F 2 hrs. lecture; 2 hrs. lab. Foundation of the economic, sociological, and political influences on the historical development of workplace education; organization and delivery of workplace education programs and practices at the secondary and post-secondary levels.

2008 Individual Field Experience in Occupational Home Economics (1-3) Prereq.: consent of instructor. A max. of 3 yrs. of credit may be earned in each occupational area. Pass-fail grading. Individual, supervised, field-based study in selected businesses and industries; emphasis on business practices, procedures, and regulations in a specific occupational home economics area.

2102 Woodworking Technology (3) V 6 hrs. lab. Advanced machine tool operations, job procedures, design and finishing.

2102 Advanced Metals (3) V 6 hrs. lab. Founding, forging, heat treatment, and machine tool work.

2103 Electrical Energy (1) 3 hrs. lecture; 3 hrs. lab. Fundamental principles of electricity; alternating and direct currents.

2103 Basic Electronics (3) V 6 hrs. lab. Basic electronic principles and circuitry as applied to diodes, vacuum tubes, power transformers, inductors, capacitors, resistors, and rectifiers.

2400 Technical Drawing, Reading, Sketching, and Takeoff (3) V 1 hr. lecture; 4 hrs. lab. Blueprint reading of the mechanical and building trades; hand tool sketching, materials takeoff, and estimating.

2401 Industrial Crafts (3) V 6 hrs. lab. Techniques of art metalwork, plastics, and leather-craft.

2405 Fundamentals of Air Conditioning and Refrigeration (3) V 4 hrs. lab. Principles, parts, components, functions, and application of air conditioning and refrigeration systems; problems in equipment performance, operation, inspection, repair and maintenance.

2405 Occupational Safety (3) F S Identification of accident-producing conditions and practices in plant facilities, materials handling, machine safeguarding, hand tools, and occupational health.

2700 Business Communication (3) Prereq.: ENGL 1002. Communication theory and its application to business; basic forms of business communication.

2620 Practicum in Business and Office Education (2) One-hour weekly seminar with instructor to discuss topics related to student’s job. Students work at least 10 hrs. per week providing on-the-job training in a clerical or secretarial setting.

2621 Practicum in Distributive Education (2) One-hour weekly seminar with instructor to discuss topics related to student’s job. Students work at least 10 hrs. per week in a selected function in an appropriate setting.

2723 Introduction to Leadership Development (3) F An honors course, HRE 2724, is also available. Introduction to leadership and leadership development; emphasis on understanding the job, the leader, the characteristics, and development tasks as a foundation for leadership development.

2724 HNORE: Introduction to Leadership Development (3) F Prereq.: HNORE 2723 with special honors emphasis. Same as HRE 2723 with special honors emphasis.

3000 Word Processing (3) Prereq.: HRE 2000 or equivalent. 2 hrs. lecture; 2 hrs. lab. Word processing concepts and skills, systems, procedures, equipment, and careers.

3010 Internship in Cooperative Extension Service (6) Su only Open to selected students completing their junior year who are considering a career with the cooperative extension service. Seven-week period of study, observation, and practicum in a parish Louisiana Cooperative Extension Service office plus a 2-week period of classes in extension education. Permission of instructor.

3043 Industrial Arts for Elementary Teachers (3) V 1 hr. lecture; 4 hrs. lab. Organization and construction of handcrafts activity units and methods of correlating with subject matter of elementary grades.

3055 Occupational Analysis Techniques (3) V Essential elements of an occupation; job activity identified for purposes of job classification and instruction.

3061 Industrial Supervisory Practice (3) V The supervisor as a key person in the industrial organization; duties, responsibilities, and successful supervisory practices.

3062 Principles of Industrial Training (3) V Functions of a training department; duties and responsibilities of a director; and teaching methods used to develop goals of teamwork and production in business and industry.

3065 Industrial Safety Management (3) V Prereq.: HRE 2553 or equivalent. Management practices applied to loss prevention and control; analysis of loss prevention programs; certification, professional ethics; functions of the safety professional.


3101 Instructional/Curriculum Design for Human Resource Education (3) V Curriculum, course unit, and lesson plan development in human resource; selection and evaluation of instructional materials and methods.

3171 Instructional Design for Training (3) S Prereq.: HRE 3071. Principles and practices of instructional design for developing effective training; course, unit, and lesson development.

3200 Records Management (3) Principles of records creation, retention, transfer, and disposal; organization and management of stored records; coding, microfilming, and retrieval of information; manual, mechanical, and computer means of storing and retrieving information.

3201 Presentation Methods in Human Resource Education (3) S Recognized methods of group presentation and individual training.

3271 Leading Learning in Human Resource Development (3) S Prereq.: HRE 3071. Introduction to the principles and practices of instructional delivery strategies to facilitate learning in training and development; methods for leading learning in traditional classroom training; on-the-job training; small group learning; and individual learning.

3331 Strategic Career Development/Planning (3) Prereq.: Sophomore standing or higher consent of instructor. Career development and planning through career decision-making, networking and linking personal competencies to organizations. Applying skills required for a successful job search and making the transition from college to work.
3409 Principles of Industrial Hygiene (3) V Prereq.: HRE 2001 or equivalent. Hazard analysis of work place factors related to industrial hygiene; emphasis on recognition and control of hazardous environments.

4069 Principles of Industrial Hygiene (3) V Prereq.: HRE 2001 or equivalent. Hazard analysis of work place factors related to industrial hygiene; emphasis on recognition and control of hazardous environments.

4070 Teaching: Construction Industries (3) V An activity-oriented, teacher directed construction education curriculum, incorporating methods and materials of The World of Construction as developed by the Industrial Arts Curriculum Project.

4077 Development of Agriculture in America (3) V Organization and development of agriculture in America from the colonial times to the present.


4080 Teaching: Manufacturing Industries (3) V An activity-oriented, conceptually based teacher education curriculum, incorporating methods and materials of The World of Construction as developed by the Industrial Arts Curriculum Project.

4150 Teaching Cooperative Education (3) V Organization and administration of cooperative education programs in public secondary education; historical foundations; relevant federal legislation.

4210 Teaching in Human Resource Education Content Area (3) Prereq.: HRE 2001, 3101, and 3291. Teaching human resource education in the formal classroom; emphasis on content area, selection of materials, and planning instruction.


4252 Instruction and Information Technology (3) V 2 hrs. lecture; 2 hrs. lab. Broad introduction to the vast array of information technologies as well as a survey of the global, ethical, political, cultural, social, and environmental issues raised by information technology; building skills in integrating information technologies into a workforce curriculum.

4281 Foundations of Distance Learning (3) V Prereq.: HRE 3101 or 3171. Overview of the theories, models, and systems of distance learning; focus on understanding the foundations of distance learning, the design and delivery methodologies, and the role of the instructor and learner.

4293 Advanced Distance Learning Strategies (3) V Prereq.: HRE 4281 or permission of instructor. Overview of the theories and practices surrounding online interaction environments; focus on understanding the community development and sustainability required for success online learning.

4301 Assessment, Career Development, and Productivity (3) V A survey of the needs of the human resource education student; procedures used to evaluate student preferences, career potential, and occupational placement.

4464 Adult and Nonformal Home Economics Principles (3) V 2 hrs. lecture; 2 hrs. lab. Working with adults and youth in community agencies and other programs with clientele outside the school.

4504 Youth Leadership Development (3) V Principles and practices in planning, organizing, and conducting youth organization activities.

4571 Technology in Human Resource Development (3) V Survey of the use of computer, information and telecommunication technology in human resource development; emphasis on the analysis, design, development, implementation, evaluation, and management of human resource development technology intervention in the workplace.

4573 Managing the Human Resource Development Function (3) Prereq. Study of human resource development (HRD) in organizations with employees on practical application of principles for effective leadership, management, and administration of the HRD function.

4575 Ethical and Legal Issues in Human Resource Education (3) V Ethical and legal issues and problems faced by human resource development professionals practicing in public and private sector organizations.

4579 Training in Global Organizations (3) V Introduction to the problems, practices, ethical, social-cultural, and cross-cultural training; focus on the nature, content, and function of cross-cultural training in organizations.

4585 Consulting in Organizations (3) V Practical look at the skills to be an effective internal or external consultant in organizations; emphasis on consulting process rather than any specific area of consulting expertise.

4601 Workforce Education Learner Assessment (3) V Assessment of progress of workforce education students in psychomotor, cognitive, and affective skills.


4604 Field Experiences in Human Resource Classroom Management (1) V Prereq.: concurrent registration in HRE 3602 and 3603. Observation and evaluation of classroom management techniques.

4704 Time Management Techniques in Human Resource Education (3) S Methods of planning and procedures for using time efficiently in conducting the human resource education program.

4777 Entrepreneurship, Business, and Organizational Development (3) V Principles and strategies involved in establishing and operating small businesses; emphasis on resources available to small business owner in bridging the gap between business and entrepreneurship.

4723 Advanced Leadership Development (3) S Prereq.: HRE 2723 and 3723. An honors course, HRE 4724, is also offered in the same semester.

4801 Teaching Internship: Professional (3) V Prereq.: concurrent registration in HRE 4801. Field work placement with a cooperating teacher. Permission of instructor. Not for graduate credit. Professional responsibilities; teacher association work; teaching parent and student organization activities; school visits and certification.

4802 Internship: Preparation (3) V Prereq.: concurrent enrollment in HRE 4801 and 4803. Permission of instructor. Not for graduate credit. Evaluation of student's ability to operate and maintain an instructional laboratory; development of curriculum materials for organizing and evaluating the teaching environment.

4803 Internship: Delivery (3) V Prereq.: concurrent enrollment in HRE 4801 and 4802. Permission of instructor. Not for graduate credit. Evaluation of the student's lesson preparation, demonstration ability; laboratory organization, participation in class activities, and evaluation in coaching environment.

4804 Professional Development Internship (3-12) Fr, Su May be taken for a max. of 12 sem. hrs. of credit. Not for graduate credit. Permission of instructor. Not for graduate credit. Professional development internship. Focus on professional and personal growth in the workplace. Students may be placed in any work setting, working in community agencies and other organizations with clientele outside the school.

4807 Field Experience in Human Resource Classroom Management (1) V Prereq.: concurrent registration in HRE 4801 and 4802. Permission of instructor. Not for graduate credit. Evaluation of student's ability to operate and maintain an instructional laboratory; development of curriculum materials for organizing and evaluating the teaching environment.

4810 Internship: Preparation (3) V Prereq.: concurrent enrollment in HRE 4801 and 4803. Permission of instructor. Not for graduate credit. Evaluation of student's ability to operate and maintain an instructional laboratory; development of curriculum materials for organizing and evaluating the teaching environment.

4819 Special Topics in Agricultural Education (1-3) V May be taken for a max. of 6 sem. hrs. of credit when topics vary. Individual and group study of selected topics under the direction of a faculty member.

4849 Special Topics in Industrial Education (1-3) V May be taken for a max. of 6 sem. hrs. of credit when topics vary. Individual and group study of selected topics under the direction of a faculty member.
INDUSTRIAL ENGINEERING • IE

1002 Industrial Engineering Fundamentals (3) Design; introduction to computers; description of the profession.

2060 Introduction to the Use of Computers (3) Prereq.: eligibility to take MATH 1530 or equivalent; and credit or registration in IE 1002. 2 hrs. lecture; 3 hrs. lab. Principles of digital programming; application of subroutines; application of electronic computers to typical engineering problems; OS operation, Microsoft Office, and Groupware.

3201 Principles of Engineering Economy (3) Planning economy studies for decision making, including considerations of rate of return, cost and yield studies, depreciation and tax relationships, increment costs, replacement, and introduction to alternative studies.

3302 Engineering Statistics (3) Prereq.: Grade of C or better required in MATH 1552 and PHYS 2102 or CSC 2239. Probability, discrete and continuous distributions, functions of random variable, theory of tests of hypotheses including goodness-of-fit and independence.

3528 Supply Chain Logistics I (3) Prereq.: IE 1002, MATH 2090, and grade of C or better in IE 3302. Introduction to Supply Chain Logistics Resource Optimization: linear programming; Logistics network and flow problems: transportation problems, shortest path and vehicle routing, maximum flow problems; Project and resource management, and operations sequencing and resource scheduling.

4362 Advanced Engineering Statistics (3) Prereq.: Grade of C or better required in IE 3302. Linear Regression and correlation, curvilinear regression, analysis of variance, and factorial experiments.

4425 Information Systems Engineering (3) Prereq.: IE 2060; 2 hrs. lecture; 3 hrs. lab. Analysis and design of information systems; projects relating comprehensive computer systems to typical industrial and service applications; ethics and professionalism.

4426 Distributed Information Systems Engineering (3) Prereq.: IE 4425 or equivalent. 2 hrs. lecture; 3 hrs. lab. Interfacing programs to databases; analysis and development of client-server applications in industrial and business settings; interfacing databases and industrial applications to the Internet; analysis, design, and implementation of client-server architecture of databases and networks.

4435 Quality Control & Six Sigma (3) Prereq.: grade of C or better in IE 3302. Principles and practice of quality assurance and quality control; statistical quality control; design and related economic analysis; Quality Systems; Six Sigma principles and practice.

4461 Human Factors Engineering (3) Prereq.: senior standing or consent of instructor. Basic principles of human factors; human ability and learning, work and control, and related economic analysis; Quality Systems; Six Sigma principles and practice.

4466 Human Computer Interaction (3) Prereq.: IE 2060 or equivalent. Design, analysis, and development of human-computer interaction (HCI) systems and applications; practical application of HCI systems and applications; design, implementation, and evaluation of user-centered software systems.

4503 Human/Machine Engineering (3) Prereq.: Grade of C or better required in IE 3302. Principles of human factors and ergonomics as applied to engineering systems including advanced techniques for design and analysis of simulation experiments, and variance reduction techniques.

4505 Advanced Information Systems Engineering (3) Prereq.: IE 4425 or equivalent. Advanced concepts of information systems engineering with emphasis on middleware architectures/technologies for integrating distributed components; design and implementation of developing distributed systems; and design and implementation of data warehouses and online analytical processing (OLAP) systems.

4506 Advanced Quality Control (3) Prereq.: IE 4503 or equivalent. Advanced techniques of quality control in industry, including quality control data, economic aspects of quality assurance, human element in quality control, and relationship of quality control to productivity and to ability of American products to compete in world markets.

4641 Ergonomics in Work Design (3) Prereq.: IE 4461 or equivalent. 2 hrs. lecture; 3 hrs. lab. Introduction to anthropometry, functional anatomy and physiology, and their application in work design and task assessment.

4645 Industrial Hygiene Engineering (3) Prereq.: IE 3302 or equivalent. Design and control of industrial environments; noise and vibration, industrial illumination, radiation, thermal stresses, air quality, and comfort; design of work environments for the police, firemen, and medical professionals.

4646 Work Physiology (3) Prereq.: IE 4641 or equivalent. Study of worker's physiological responses (cardiovascular, pulmonary, muscular) to workable to task, postural analysis, energy expenditure, selection and placement, and work-rest scheduling.

4646 Occupational Biomechanics (3) Prereq.: IE 4641 or equivalent. Design and implementation of computer programs applied to human movement; applications to work systems such as manual materials handling and tool design.

4646 Human Interaction with Computers (3) Prereq.: IE 3302 or equivalent. An introduction to human-computer interfaces for interactive computer systems; general characteristics and requirements of people-oriented computer systems from the perspectives of different disciplines and tasks, e.g., text editing.

4767 Cognitive Ergonomics and Work Environments (3) Prereq.: IE 3302 and 4461; or equivalent. Topics in cognitive ergonomics relating to information processing, visual and auditory displays, and aspects of the work environment such as noise, socio-technical systems, and psychosocial factors. Application to various work settings including construction, healthcare, and the service sector.

4790 Artificial Intelligence Manufacturing Systems (3) Prereq.: IE 4425 or equivalent. Application of artificial intelligence tools and techniques to integrated computer-aided manufacturing systems including maintenance, product design, process planning, factory scheduling and control, robotics, and intelligent warehousing.

4790 Automation and Computer-Aided Manufacturing (3) Prereq.: IE 5201 and MATH 1532; or equivalent. Automation of line production using computer-aided design, industrial robots, computer-aided manufacturing, process monitoring and control, group technology, flexible manufacturing systems, and material requirements planning.

4794 Advanced Reliability Engineering (3) Prereq.: IE 4503 or equivalent. Analysis of reliability, maintainability, and availability of large production facilities; applications to a variety of manufacturing environments.

4751 Linear Programming Algorithms (3) Prereq.: IE 3520 or equivalent. Optimization of linear objective functions subject to linear constraints; vector spaces, convex analysis, polyhedral analysis, matrix version of simplex, reduced gradient, bounded variables, duality theory and primal-dual simplex algorithms; postoptimal and parametric analysis; decomposition, and cutting plane algorithms.

4751 Queueing Theory (3) Prereq.: IE 3520 or equivalent. Fundamentals of queueing processes, transient and limiting behavior, measures of effectiveness, performance measures, single and multi-server queues, priorities, blocking, batch arrivals, and services; matrix representation of certain queueing systems; applications, statistical inference, design and control of queues.

4756 Programming Methods in Operations Research (3) Prereq.: IE 3520 or equivalent. Aspects of advanced programming methods for unconstrained and constrained optimization, development of goal programming, goal multiple objective programming with application to industrial processes and planning.
1102 Introduction to Management Information Systems
Prereq.: ISDS 2000 or equivalent.
This course will introduce management information systems in business including the development and use of information systems, hardware and software, the strategic impact of IT for business, and the nature of the IT career; utilization of management information systems to improve managerial decision making.

2000 Introduction to Business Statistics (3) Prereq.: MATH 1431 or 1432, OR, ISDS 2002. Credit will not be given for both this course and ISDS 2010. Statistical description and inference; determination, basic probability theory; probability distributions, including normal and binomial; sampling distributions; inferential statistics including estimation, one- and two-sample hypothesis tests for means, and chi-square test of independence.

2011 Statistical Methods and Models (3) Prereq.: ISDS 2000 or equivalent. Continuation of ISDS 2000. An honors course, ISDS 2011, is also available. Credit will not be given for both this course and ISDS 2011. Advanced statistical methods and models including ANOVA and linear regression of business management system models such as utility functions, decision analysis, math programming, waiting line models and simulation.

3000 Statistical Methods and Models III (3) Prereq.: ISDS 2001, with special honors emphasis for qualified students. Credit will not be given for this course and ISDS 2001.

3007 Independent Research and Reading in Informations Systems and Decision Sciences (1-6) Prereq.: ISDS 3100 and consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Student is responsible for registering with a faculty member and selecting an area of reading and/or research.

3075 Introduction to Information Systems and Decision Sciences (3) Prereq.: permission of instructor and department chair required. Pass/fail grading. At least the equivalent of 144 hours per semester (9 credits) of learning experience in information systems under the general supervision of an ISDS faculty member and direct supervision of an information systems or decision sciences professional grading based on the faculty member's evaluation, a written report by the professional supervisor, and a written report by the student.

4010 Honors: Introduction to Operations Management (3) Prereq.: ISDS 3100 or equivalent. Laboratory practice includes use of a particular software system. Business decision making; constructing a decision support system (DSS); DSS development tools; executive information systems; expert systems (ES) in business; building ES; process, tools, and strategy; integration of DSS and ES. An honors course, ISDS 4100, is also available. Credit will not be given for both this course and ISDS 4100.

4100 Introduction to Statistical Theory (3) Prereq.: ISDS 3101 or equivalent. Single-equation multiple regression and time series modeling procedures for business and economic forecasting; using time series data in regression models; time series modeling, including classical decomposition procedures and exponential smoothing; executive computer programs for regression and time series modeling and forecasting.

4110 Sample Survey Methods (3) Prereq.: ISDS 3000 or equivalent. Designing sampling systems; alternative sample designs; problems of bias; techniques of inference from alternative designs; criteria for selecting optimal sampling plans; methods and application.

1100 Introduction to Management Information Systems
Prereq.: ISDS 2000 or ISDS 2010, with special honors emphasis for qualified students. Credit will not be given for both this course and ISDS 2100 or ISDS 2102.

1101 Honors: Introduction to Management Information Systems
Prereq.: ISDS 2100 or ISDS 2102, with special honors emphasis for qualified students. Credit will not be given for both this course and ISDS 2100 or ISDS 2102.
411 Information Technology Project Management (3) Prereq.: ISDS 3110. Topics on effectively managing information technology projects including setting goals and objectives; work breakdown structures; project scheduling; managing project resources; evaluation and control; risk management; project accounting; extensive use of case studies involving hands-on computer analyses with state-of-the-art project management software.

4114 Software Quality Assurance (3) Prereq.: ISDS 3100. Modern practices of software quality management; topics include computer languages; software quality metrics, basic quality tools, software reliability models, customer satisfaction measures, and the ISO 9000 quality standard.  2 hrs. lecture; 2 hrs. laboratory. Open only to students in the MPAs program. See IE 7210.

4120 Business and Computer Applications (3) Prereq.: ISDS 3160 or CSC 1350. Telecommunications in business, including both voice and data communication, technical details (hardwired, network and wireless configurations), network management, and security issues.


4125 Analysis and Design of Management Information Systems (3) Prereq.: ISDS 3110, 3200. Design methodologies and techniques for the creation of information systems for management decision making; conceptual design of actual systems.

4141 Introduction to Data Mining (3) Prereq.: ISDS 3160. Fundamental methodology and techniques used in data mining, with particular emphasis on business applications; topics include market basket analysis, memory-based reasoning, cluster detection, link analysis, decision trees and rule induction, neural networks, and genetic algorithms.

4160 Soothing in China (3) Network clusters; cost competitiveness, demand satisfaction, value added suppliers; negotiation strategy; brand, design, and manufacturing; factory and supply chain audits; protecting intellectual property; valuation; industry standards; global sourcing; repositioning; sourcing practices and cases in industries.

4165 Operation of Service and Distribution Systems (3) Prereq.: ISDS 3160. Service operations management concepts and techniques in service and distribution organizations; service system design and control, including location, layout, capacity expansion, staffing and scheduling; special attention to structure design and operational control of distribution systems and interfaces with other functional areas.

4167 Operations Planning and Control (3) Prereq.: ISDS 3115 or equivalent. Planning and control of operations in manufacturing and service organizations; aggregate planning, master scheduling, requirements planning, and activity control; emphasis on developing skills through case studies and computer models.

4168 Supply Chain Management (3) Prereq.: ISDS 4163. Planning and controlling the efficient, cost-effective flow and storage of raw material, in-process products, finished products, and related information in a supply channel; resource/material management; supply strategy; inventory planning and control; just-in-time systems; customer service; logistics and interfaces with other functional areas; emphasis on concepts, model development, and analysis.

4180 Business Analysis in Practice (3) Prereq.: senior standing or permission of instructor. Contemporary problems emphasizing logical analysis and professional; emphasis on case analysis and use of business analysis skills and computer technology to solve business problems.

4200 Quality Management (3) Prereq.: ISDS 3115. Credit will not be given for this course and ISDS 4453. Principles and practices of statistical quality control in industry; control charts for variables and for attributes; process capability analysis; acceptance sampling for variables and for attributes; design of experiments; Taguchi methods; and ISO 9000 standards.

4244 Information Systems Auditing (3) Credit will not be given for this course and ISDS 1224. The class will focus on the IS Audit process, IT Governance, Systems and Infrastructure Life Cycle Management, and theories of protection and detection of Information Assets, and Business Continuity and Disaster Recovery. Emphasis will be placed on current practices and computer-aided technology audit environment.

4501 Systems Modeling and Analysis I (3) Prereq. ISDS 2001. Final project involves the application of discrete-event simulation to a real-world problem. Modeling and analysis of production and service systems using discrete-event computer simulation; discrete-event simulation mechanics; model structure, model building, modeling of complex systems; verification and validation; arrival processes; design of simulation experiments; statistical analysis of terminating and steady-state systems.

4502 Systems Modeling and Analysis II (3) Prereq.: ISDS 2001. Advanced applications of computer simulation concepts to dynamic systems and processes using software packages to simulation modeling; discrete-event, hybrid discrete/continuous, system dynamics, simulations, and template approaches to modeling and analysis skills; advanced analysis concepts including variance-reduction, simulation meta-models and simulation optimization.

4511 Industrial Simulation (3) Prereq.: IE 3310, 2600, credit or registration in IE 4312, or equivalents. 2 hrs. lecture; 2 hrs. lab. Only to students in the MPA program.

4701 Technological Entrepreneurship (3) Prereq.: ISDS 1100 or equivalent. Also, offered as MGT 4701. The competitive environment; technological evolution; finding the fertile ground of technological market; entrepreneurial process; marketing the technological venture; managing the venture; intellectual property rights; appropriating the returns to technological innovation.

5010 Statistical Methods for Public Administration (3) Prereq.: college algebra. 2 hrs. lecture; 2 hrs. lab. Open only to students in the MPA program. Also offered as PADM 5010.

7000 Statistical Theory (3) Prereq.: ISDS 4400 or equivalent; and consent of instructor. Continuation of ISDS 4400. Theoretical basis for topics in statistical inference including tests of hypotheses, experimental design, regression analysis, general linear models, nonparametric statistics; sequential tests of hypotheses, and complex sample designs.

7010 Decision Models for Public Administration (3) Open only to students in the MPA program. See PADM 7010.


7021 Sample Design and Analysis (3) Prereq.: ISDS 7020 or equivalent. Methodology for sampling and survey design; alternative methods for email and internet survey samples; and data collection, and evaluation criteria including efficiency and bias; emphasis on applications with theoretical foundations.

7022 Multivariate Data Analysis (3) Prereq.: ISDS 7020 or equivalent. Multivariate methods, including principal components, canonical correlation, factor analysis, discriminant, and cluster procedures.

7024 Advanced Statistical Analysis for Research I (3) Prereq.: proficiency in calculus, linear algebra, basic statistical methods, and computer programming. Methods of statistical information testing hypotheses about single and multiple means and proportions; simple and multiple linear regression; design of simple random, stratified, and cluster samples, extensive use of statistical computer programs.

7025 Advanced Statistical Analysis for Research II (3) Prereq.: ISDS 7020 or equivalent. Continuation of ISDS 7024. Advanced regression concepts; experimental design and analysis of variance; nonparametric methods; multivariate techniques; extensive use of statistical computer packages.

7070 Seminar in Advanced Business Problems (3) May be taken for a max. of 6 hrs. of credit when topics vary. Special topics in statistics and quantitative methods.

7080 Survey of Information Systems Research (3) Prereq.: advanced PhD standing or consent of instructor. Exploration of current research streams in information systems; relationships of IS to other disciplines; historical overview of the field.

7081 Critical Analysis of Information Systems Research (3) Prereq.: advanced PhD standing or consent of instructor. Development of research design, writing research papers, and evaluating research in the field of information systems.

7101 Introduction to Operations Research Methods (1.5) Prereq.: ISDS 7020 or equivalent. Topics cover models that support managerial decision-making including decision analysis, simulation, risk analysis, linear programming, and integer programming. Excel spreadsheet is used extensively.

7102 Survey of Operations Research: Deterministic Models (3) Prereq.: ISDS 7101. Integer and mixed-integer programming, extensions of classical optimization, quadratic programming, separable programming, and dynamic programming; applications of more advanced mathematical programming; techniques with emphasis on applications.

7103 Survey of Operations Research: Stochastic Methods (3) Prereq.: ISDS 7101 or 4021. Extensions of decision theory, game theory, integer programming, Markovian decision processes, reliability models, queuing models; probabilistic methods in operations research.

7106 Multiple Criteria Decision Making (3) Prereq.: ISDS 7103. Theory of the displaced ideal, linear multi-objective programming, goal programming, compromise programming, and multi-attribute utility measurement. Credit will not be given for this course and ISDS 3100.

7107 Dynamic Programming (3) Prereq.: ISDS 7102. Theory and computational techniques of dynamic programming; single and multidimensional problems; relationship to classical optimization techniques.

7200 Quality and Productivity Management (3) Contemporary topics in total quality management; quality in software and system design and implementation; problem solving tools; process control; quality deployment and FMEA; team building and quality standards and awards; control charts for variables and for attributes; process capability analysis; acceptance sampling plans; design of experiments; Taguchi methods and ISO 9000 standards.

7210 Process and Planning Control (3) Prereq.: ISDS 7210. Integration of operations planning and control with other business functions of an enterprise; enterprise resource planning (ERP) systems and techniques to plan and schedule business processes in industrial and service areas; decision problems and appropriate tools; hands-on experience with ERP software; cross-functional case projects.

7211 Process and Planning Control II (1.5) Prereq.: ISDS 7210. Cases and management techniques to control business processes in industrial and service areas; decision problems and appropriate tools; hands-on experience with computer analyses with state-of-the-art project management software.

7220 Supply Chain Management (3) Prereq.: ISDS 7220 or equivalent. Supply chain process analysis and control; critical issues in revolutionizing management of the entire supply chain; system productivity analysis, demand management, inventory management; distribution planning; integration in supply chain; emphasis on case study, spreadsheets, and software applications; network design, warehouse location, outsourcing, global supply chain strategy, and information, EDI and DSS technologies in supply chain management; case study and SCM software.

7230 Project Management (3) Prereq.: ISDS 7210 or equivalent. Topics of effectively managing projects including setting goals and objectives; project planning, evaluation and review; incentives and qualitative analysis, and project accounting; extensive use of case involving hands-on computer analyses with state-of-the-art project management software.

7272 Operations Strategy (3) Prereq.: ISDS 7210 or equivalent. Perspectives for managing operations strategy into an overall business strategy; issues in selection of the capabilities, characteristics, and configuration of facilities; use of technology, aggregate capacity; vertical integration; operations structure;
organizational structure and jobs; extensive use of case analysis and simulation in manufacturing industries.  

7275 Advanced Operations Management (3) Prereq.: BADM 7120. May be taken for a max. of 9 hrs. of credit when topics vary. Topics such as material requirements planning, project control, scheduling, facilities location and layout, quality control, job design, industrial design, network analysis; emphasis on application of techniques.

7501 Information Systems (3) Prereq.: ISTD 1100 or equivalent. Contemporary topics in information systems; survey of information system analysis and design; introduction to business data communication; database management and knowledge based systems; enterprise-wide systems and information systems control.  

7505 Information Technology and Entrepreneurship (3) Prereq.: BADM 7050 or equivalent. Information technology, globalization and outsourcing, information technology-based business opportunities, technological entrepreneurship, entrepreneurial process, entrepreneurial thinking, process of discovering, causation, knowledge management, technological entrepreneurship.  

7510 Database Management (3) Prereq.: BADM 7050. Analysis, design, and implementation of databases based on the relational database model; data modeling using entity-relationship (E-R) diagramming; logical and physical database design, SQL, hardware/software architecture considerations; data and database administration; emerging database technologies and advanced database applications.  

7511 Advanced Database Management (3) Prereq.: ISDS 7510 or equivalent. Information system, database economy, globalization and outsourcing, information technology-based business opportunities, technological entrepreneurship, entrepreneurial process, entrepreneurial thinking, process of discovering, causation, knowledge management, technological entrepreneurship.  

7520 Network Information Systems (3) Prereq.: BADM 7050. Broad overview of network technologies including protocols, network operating systems, and network management. LAN, WAN design; Internet technology; network security.  

7522 Interior Design Systems Development (3) Prereq.: ISTD 7290. Interpreting applications architecture, server-side programming, web/database connectivity, integration of Web and other business applications, and Web-based systems. Emphasis on self-management, cross-project coordination, technology and time management; construct Internet based systems and manage Internet based systems development.  

7530 Information Systems Analysis and Design (3) Prereq.: BADM 7050, ISDS 7310. Both courses may be taken concurrently. Analysis and design of information systems from a management perspective; software development methodology; topics include requirements determination; feasibility determination; project management; evaluation of a software development strategy and application; modeling using UML diagrams, and DFDs; systems implementation.  

7535 Information Technology Management (3) Prereq.: BADM 7050. Interpreting applications architecture, server-side programming, web/database connectivity, integration of Web and other business applications, and Web-based systems. Emphasis on self-management, cross-project coordination, technology and time management; construct Internet based systems and manage Internet based systems development.  

7540 Electronic Commerce (3) Prereq.: BADM 7050. Use of information technology and the Internet in creating new forms of business organization; creating a marketplace; disintermediation/ reintermediation; and virtual organization.  

7543 Electronic Commerce II (1.5) Prereq.: ISDS 7400. Content and advanced management issues, organizing principles and technologies; working in electronic communities; newsgroups, virtual communities, extranet and intranet.

7545 Collaborative Computing (1.5) Prereq.: BADM 7050. Foundation of collaborative computing; issues of motivation, synchronicity, anonymity, group size, group proximity, and group task.

7550 Enterprise Systems (3) Prereq.: BADM 7050. Study of the broad area of Integrated Enterprise-wide Systems; extends and refines concepts and capabilities of enterprise systems and their related technologies, the methodologies used to implement these systems in organizations, and the implications of their deployment in organizations.  

7553 Business and Business Change (3) Prereq.: ISDS 7330. Foundation of critical issues in the design and implementation of business and information systems change including the impact of project and change management, and information systems design and management; emphasis on the perspectives of business and the IT, on the enabling emerging and disruptive technologies and systems permit that have the greatest impact on business and industries.

7555 Auditing Enterprise Systems (1.5) Prereq.: ISDS 7530 and ACCT 7213. Principles of auditing enterprise-wide information systems in business; audit plans; controls and security issues.  

7560 Social and Organizational Issues in MIS (3) Prereq.: BADM 7050. Examination of organizations; implications of design choices on business; ethical considerations.  

7565 Global Information Technology Management (3) Prereq.: BADM 7050. National IT policies; IT and national culture; IT management in multinational companies; IT diffusion in developed versus developing countries; IT and national development; global electronic commerce; global telecommunications infrastructure; and competitive advantage through global IT management.

7900 Contemporary Issues in Statistics and Management Science (3) Prereq.: advanced PhD study and consent of instructor. Philosophical foundations of science and their implications for contemporary management science.  

7910 Contemporary Issues in Production/Operations Management (3) Prereq.: advanced PhD standing or consent of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Philosophical foundations and contemporary issues in production/operations management.

7920 Contemporary Issues in Management Information Systems (3) Prereq.: advanced PhD standing or consent of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Philosophical foundations and contemporary issues in management information systems.

7950 Research Seminar in Information Systems Topics (3) Required for all PhD students. May be taken for a max. of 6 sem. hrs. of credit. Contemporary research and critical issues in information systems.

7990 Project (3-6) Prereq.: permission of instructor. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Controversial research and critical issues in information systems.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

8990 Pre-dissertation Research (1-9) May be repeated for credit.

9000 Dissertation Research (1-12 per sem.) “S”/“U” grading.

INTERIOR DESIGN • ID

General education courses are marked with stars (★).  

★ 1051 Introduction to Interior Design (3) Contemporary practice of interior design as a profession; responsibilities of the interior designer.

1711 Basic Design Foundation (3) V Prereq.: controlled admission to program in interior design at first year entry level or permission of department. 6 hrs. studio. Credit will not be given for this course and ART 1011. Basic design problems with an emphasis on two-dimensional principles and elements; foundation for the graphic exploration of interior space.

1780 Interior Design Technical Drawing (3) F, Su-V Prereq.: controlled admission to program in interior design at first year entry level or permission of department. 1 hr. lecture; 4 hrs. studio. Introduction to the graphic tools, techniques, and equipment used in communication, presentation, and architectural design; an immersion in the graphic language of drawing.

2712 Interior Design Awareness I (3) ★ V Not open to interior design majors. Discipline of interior design; principles presented in historical and philosophical contexts; analysis of the use of spatial elements.

2750 Interior Design Studio I (4) F Prereq.: admission to program in interior design or permission of department. Concurrent enrollment in ID 2781. 8 hrs. studio. Basic problems in the planning and design of interior space; emphasis on design process, form and principles of spatial organization.

2751 Interior Design Studio II (4) S Prereq.: ID 2730 or equivalent. 8 hrs. studio. Exploration and analysis of design decisions related to interior space.

2770 Color and Illumination I (3) S Prereq.: sophomore standing or permission of instructor only. 1 hr. lecture; 4 hrs. studio. Nature, theory, and art of color and light applied to two- and three-dimensional basic design principles.

2774 Interior Construction and Systems (3) F Prereq.: admission to professional program. Building systems and construction methods; code requirements for interiors.

2775 Interior Materials, Finishes, and Furnishings (3) S Prereq.: ID 2774 or equivalent. Types and sources of materials; finishes and furnishings used in interior spaces.

2781 Interior Design Graphics (3) F Prereq.: admission to professional program. Concurrent enrollment in ID 2750. 6 hrs. studio. Graphic representation methods used to illustrate and investigate form, spatial order, and the design process.

2785 Computer Visualization (3) F Prereq.: admission to professional program or consent of instructor. Credit will not be given for this course and ARCH 2173, JE 2185, or LA 2185. 1 hr. lecture; 4 hrs. lab. Computer drafting and three-dimensional modeling for spatial designers.  

★ 3741 History of Interior Design and Decoration I (3) F Development of interior design, decoration and furnishings through the early 19th century; design as an expression of cultural values.

★ 3742 History of Interior Design and Decoration II (3) F Design, decoration, and furnishings of 19th and 20th century interiors; social, industrial, and technological influences on modern design.

3751 Interior Component Design (3) F, S, V Prereq.: ID 2750 or equivalent 1 hr. for 6 hrs. studio. Design, materials, and construction techniques of interior components; scale model and computer simulated design prototypes.

3752 Interior Design Studio III (4) F Prereq.: ID 2751 and ID 2775 or equivalent. 8 hrs. studio. Formulation of design concepts; design implications of function, space, and scale.

3753 Interior Design Studio IV (4) S Prereq.: ID 3752 or equivalent. 8 hrs. studio. Design development of interior environments.

3759 Special Studies in Interior Design (1-6) F, S, Su-V Prereq.: permission of instructor. May be taken for a max. of 6 sem. hrs. of credit. Advanced studio work in predetermined areas of specialization.

3761 Interior Design Internship (3) F, S, Su-V Prereq.: completion of all 2000-level interior design courses and consent of instructor. Pass-fail grading. At least 20 hours of work per week (35 hours per week in summer session) supervised by an interior design faculty member and a professional designer in an approved firm.

3765 Field Studies in Interior Design (1-6) F, S, Su-V Prereq.: selective admission into the professional program in interior design at the sophomore year or permission of instructor. Intensive travel experiences in a variety of locales; participation in local, national, and/or international journeys with an emphasis on the built environment.

3770 Color and Illumination II (3) F, S, V Prereq.: junior standing in major; nonmajors by consent of instructor only. 1 hr. lecture; 4 hrs. studio. Quantitative and qualitative aspects of color/light; application to interior design.

3782 Interior Design Construction Documents (3) Prereq.: ID 2751 or equivalent. 1 hr. lecture; 4 hrs. studio. Development of construction documents for interior projects; design and documentation of interior architectural details.

3786 Advanced Computer Visualization (3) F, S, Su-V Prereq.: admission to professional program or permission of instructor. 1 hr. lecture; 4 hrs. lab. Advanced topics in computer drafting and three-dimensional modeling for spatial designers.

4270 Seminar in Interior Design (3) F, S, V Prereq.: ID 3752 or equivalent. Research, discussion, and presentations related to contemporary issues in interior design.

4754 Interior Design Studio V (4) F Prereq.: ID 3753 or equivalent. 8 hrs. studio. Advanced application of the design process; development of comprehensive solutions to complex interior design problems.
**INTERNATIONAL STUDIES • INTL**

★ 2000 Contemporary Global Issues (3) Survey of current world issues from an interdisciplinary perspective.

3001 Gateway to International Studies (3) Prereq.: ANTH 1001 or 2051, GEOG 1001 or 1003, HIST 1007, POLI 2057. Required for all international studies majors. Modernity, colonialism, and globalization in regional perspective.

3002 Independent Study in International Studies (3) May be taken for a max. of 6 hrs. of credit when topics vary. Independent study relevant to the field of international studies.

3002 Fundamentals and Religious Nationalism (3) See REL 3092.

3099 Undergraduate Internship in International Studies (3) Students who have completed two semesters and/or two quarters in international studies but not toward fulfilling field requirements. May be taken for a max. of 6 hrs. of credit when topics vary. Program of study, research, and work in governmental or private agencies concerned with international policy.

3786 Religion of Islam (3) See REL 3786.

3991 Study Abroad in Africa (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of Africa.

3992 Study Abroad in the Middle East (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of the Middle East.

3993 Study Abroad in Asia (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of Asia.

3994 Study Abroad in Europe (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of Europe.

3995 Study Abroad in Latin America (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of Latin America.

3996 Study Abroad in Russia and Central Asia (1-6) May be repeated for up to 12 hours credit when topics vary. Studies in the history, culture, economics, politics, or geography of Russia and/or Central Asia.

4000 International Studies Workshop (3) For international studies majors in junior or senior year. Prereq.: consent of instructor. Development of research project in international studies—prospectus, annotated bibliography, and research proposal.

4002 South Asian Society, Polity, and Culture (3) Cross-listed with ANTH 4002, GEOG 4002, and REL 4002. Historical and cultural evolution of South Asia examining the four major cultural traditions (Hindu-Buddhist, Islamic, British, and nationalistic) which currently shape the politics of nationalism, development, ethnicity, caste, and gender in the region.

4003 International Studies Senior Seminar (3) Prereq.: INTL 3001 and 9 hrs. of additional upper level courses in an area of concentration. Required for all international studies majors, seniors only. Advanced theory and case studies of globalization in an interdisciplinary perspective.

4010 A History of Geopolitics (3) History of European geopolitical thought from Thucydides through the end of the Cold War.

4033 Geography of Central Asia and Afghanistan (3) The region.

4051 North Africa and the Middle East (3) See GEOG 4031, 4095 The Middle East to 1800 (3) See HIST 4093.

4096 The Modern Middle East (3) See HIST 4096.

4100 Migration, Diasporas, and Identity (3) An interdisciplinary survey of global migration in the modern era and the resultant subnational and transnational forms of community, identity, and subjectivity: colonists, exiles, immigrants, refugees, and transients.

4997 Special Topics in International Studies (3) May be repeated for a max. of 6 hrs. of credit when topics vary.

ITALIAN • ITAL

Native speakers of Italian will not receive credit for courses marked with an asterisk (*).

General education courses are marked with stars (**).

*1001 Elementary Italian (4) F,S Supplementary work in language laboratory. Basic lexicon and structure of Italian; emphasis on communicative language use.

*1002 Elementary Italian (4) F,S Supplementary work in language laboratory. Basic lexicon and structure of Italian; emphasis on communicative language use.

2002 Italian for Travelers (3) F,S,D Does not count toward satisfying the foreign language requirement for undergraduates. Basic communication patterns; practical everyday vocabulary; exercises in comprehension and conversation.

2028 Italian for Music (3) Prereq.: music majors are expected to have taken MUS 2018 and 2019 before enrolling in this course. Study of Italian language with major emphasis on opera libretti and song texts.

★ 2101 Intermediate Italian (3) F,S Supplementary work in language laboratory. Basic lexicon and structure of Italian; emphasis on communicative language use.

★ 2102 Intermediate Italian (3) F,S Supplementary work in language laboratory. Basic lexicon and structure of Italian; emphasis on communicative language use.

3072 Survey of Italian Literature (3) Prereq.: ITAL 2101. Supplementary work in language laboratory. Basic lexicon and structure of Italian; emphasis on communicative language use.

3802 Modern East Asian Literature (3) See CHIN 3801.

JAPANESE • JAPN

Native speakers of Japanese will not receive credit for courses marked with an asterisk (*).

General education courses are marked with stars (**).

*1001 Beginning Japanese (5) Students with prior knowledge of Japanese may not take this course for credit. Language laboratory work required.

★ 1002 Beginning Japanese (5) JAPN 1001 or equivalent. Language laboratory work required.


3001 Traditional East Asian Literature (3) See CHIN 3801.

KINESIOLOGY • KIN

Courses offered are of two types: (1) basic activity courses such as tennis, golf, etc. open to all students of the University; and (2) professional courses in kinesiology. All basic activity courses are offered on a pass/fail grade basis.

**BASIC ACTIVITY COURSES**

Students in these classes must furnish and wear clothing suitable to the activity.

1123 to 1160 Beginning Courses (1 sem. hr. each) Pass/fail grading.

1123 Archery

1124 Tennis

1125 Golf

1126 Gymnastics

1128 Riffey

1129 Badminton

1130 Bowling

1132 Ballroom Dance

1133 Children's Rhythms For elementary grades, physical education, or special education majors.

1134 International Folk Dance

1135 Golf for Business and Life

1136 Swimming

1140 Scuba Diving Prereq.: KIN 1236 or consent of instructor.

1142 Conditioning Exercises

1144 Aerobic Dance

1146 Weight Training

1147 Chinese Kung Fu

1148 Chinese Self Defense

1150 Recreational Dance

1151 Racquetball

1152 Tai Chi I

1154 Martial Arts

1155 Jogging

1156 Outdoor Living Skills American Red Cross Standard First Aid Certificate recommended.

1157 Aerobic Swimming Prereq.: KIN 1236 or intermediate swimming skills.

1158 Canoeing Prereq.: must be able to swim 50 yards with a personal flotation device; tread water for one minute and swim 50 yards without a personal flotation device.

1160 Adapted Physical Education For students who cannot participate in vigorous physical exercise due to physical disability or other handicapping condition.

1224 to 1257 Intermediate Courses (1 sem. hr. each) Pass/fail grading.
1224 Tennis
1236 Swimming
1244 Aerobic Dance
1246 Group Exercise
1251 Racquetball
1252 Swimming and Exercise in Public Pools
1254 Martial Arts
1255 Jogging
1257 Aerobic Swimming
1336 to 1338 Advanced Courses (1 sem. hr. each)
Pass/fail grading.
1336 Swimming
1337 Advanced Life-saving PreReq: KIN 1236 and 1336 or Advanced Lifesaving Certificate.
1338 Water Safety Instructor’s Course PreReq: valid Advanced Lifesaving Certificate.

PROFESSIONAL COURSES

In the Department of Kinesiology, the second digit of the course number denotes the area of interest for professional courses, as follows: 4—kinesiology activity for majors; 5—kinesiology theory; 6—health.

1405 Track and Field (1) 3 hrs. lab. For kinesiology majors or minors.
1406 Basketball (1) 3 hrs. lab. For kinesiology majors or minors.
1407 Softball (1) 3 hrs. lab. For kinesiology majors or minors.
1408 Volleyball (1) 1 hr. For kinesiology majors or minors.
1409 Flag Football (1) 1 hr. lab. For kinesiology majors or minors.
1410 Field Sports (3) 3 hrs. lab. For kinesiology majors or minors.
1412 Tennis (1) 1 hr. lab. For kinesiology majors or minors.
1413 Field Hockey (1) 3 hrs. lab. For kinesiology majors or minors.
1427 Physical Activity I: Volleyball and Basketball (1) For kinesiology majors or minors. 3 hrs. lab. Identification, analysis, and practice of skills, techniques, and fundamental concepts associated with volleyball and basketball; rules, strategies, and advanced game concepts.
1600 Personal and Community Health Problems (3) Content and theory related to basic health information; critical health issues; improving and maintaining optimal health and wellness.
1801 Movement Fundamentals for Physical Activity (2) 1 hr. lecture; 2 hrs. lab. For kinesiology majors. Movement concepts associated with space and time and how these concepts can be organized into a learning environment.
1802 Individual/Lifet ime Activities (2) 1 hr. lecture; 2 hrs. lab. For kinesiology majors. Identification, analysis, and practice of skills, techniques and fundamental concepts associated with individual lifetime activities.
1803 Team Activities (2) 1 hr. lecture; 2 hrs. lab. For kinesiology majors. Identification, analysis, and practice of skills, techniques and fundamental concepts associated with team activities.
1804 Aerobic and Strength Activities (2) 1 hr. lecture; 2 hrs. lab. For kinesiology majors. Major concepts of aerobic and strength training including safety, technique, age appropriate activities, and training principles.
1999 Special Topics (1) May be taken for a max. of 4 hrs. credit when topics vary. 3 hrs. lab. Identification, analysis, and practice of skills and techniques fundamental to sports; rules, strategies, and appropriate safety procedures.
2500 Human Anatomy (3) Micro and macroscopic study of the human body.
2501 History and Philosophy of Kinesiology (3) Developments in kinesiology and health from ancient times to the present.
2502 Practicum in Sports Studies (3) PreReq: For students minoring in sports studies. Pass/fail grading. Observation and practical application in a sport or sport-related setting. Students work in a professional capacity under the guidance of an on-site coordinator.
2503 Basic Athletic Training (2) 1 hr. lecture; 2 hrs. lab. Athletic training room procedure; first aid treatment of injuries; use of athletic training room equipment; protective equipment for all sports.
2504 Principles of Conditioning (2) 2 hrs. lecture; 2 hrs. lab. Methods and concepts of training and conditioning; physical fitness and current trends; participation in a fitness training lab including fitness assessments and training methods designed to promote fitness; planning physical education programs for community and commercial organizations, education institutions, and social agencies.
2505 Orthopedic Injury Evaluation Techniques (3) PreReq: BIOL 1201, 1208; KIN 2503; or permission of instructor. 2 hrs. lecture; 2 hrs. lab. For students in the professional area of concentration. Specialized course in the initial on-field and clinical evaluation of orthopedic injuries and conditions of the lower extremities and the spine, including emergency care procedures and signs/symptoms/treatment of various injuries/conditions.
2506 Orthopedic Injury Evaluation Techniques II (3) PreReq: BIOL 1202, 1209; KIN 2503, 2505; or permission of instructor. For students in the professional phase of the Athletic Training program of concentration. Specialized course in the initial on-field and clinical evaluation of orthopedic injuries and conditions of the upper extremities, cervical spine, head, and face; including emergency care procedures and signs/symptoms/treatment of various injuries/conditions.
2507 Methods and Materials in Physical Education for the Elementary School (4) 2 hrs. lecture; 4 hrs. lab. For elementary teachers. Progressively graded programs of activities for elementary schools.
2509 Medical Terminology for Kinesiology (3) Majors only or permission of instructor. In-depth introduction to medical terminology, with a focus on body systems, medical specialties, and medical communication.
2510 Introduction to Sport and Leisure Administration (3) Introduction to the academic and professional field of sport administration.
2511 Sports Officiating (2) PreReq: proficiency in sports (indicated by behaviors interpreting 4的技术s of officiating basketball, volleyball, and softball.
2515 The Coaching of Track and Field (2) 1 hr. lecture; 2 hrs. lab. Principles of coaching track and field; organization and administration of practice and various levels of competition.
2516 The Coaching of Baseball/Softball (2) 1 hr. lecture; 2 hrs. lab. Principles and techniques of coaching baseball; organization and administration of practice and various levels of competition.
2517 The Coaching of Baseball/Softball (2) 1 hr. lecture; 2 hrs. lab. Techniques of coaching baseball/softball; organization and administration of practice and various levels of competition.
2518 The Coaching of Volleyball (2) 1 hr. lecture; 2 hrs. lab. Techniques of coaching volleyball; organization and administration of practice and various levels of competition.
2519 The Coaching of Football (2) PreReq: 1 hr. lecture; 2 hrs. lab. Techniques of coaching football; organization and administration of practice and various levels of competition.
2525 Practicum in the Coaching of Individual and Team Sports (1-3) 3-9 hrs. lab. May be taken for credit when sports vary.
2526 Psychology of Coaching (3) Psychological perspectives in coaching; coaching personalities, athletic personalities, psychological injuries, motivation, mental preparation, relaxation techniques, and stress-reduction techniques.
2530 Sport in Society (3) Interdisciplinary study of sport as a mirror of society reflecting the dynamics of human social existence and emphasizing process through which individuals formulate their identity from youth to old age.
2540 Introducing Physical Education for Individuals with Disabilities (3) Principles and practices of physical activity opportunities for people with disabilities; laws affecting those with disabilities; motor abilities of individuals with disabilities; adjusting programs to suit the needs and interests of these individuals.
2577 Health and Physical Education for the Elementary School (4) 1 hr. lecture; 2 hrs. lab. Basic principles and concepts of a healthy lifestyle; nutrition, exercise, study and analysis of movement.
2490 Haman’s Model (3) For students enrolled in the athletic training area of concentration. For students in the Advanced Life Saving and Advanced Swimming Concentration. Organization. A study of the American Athletic Training Program including budget, facilities, equipment, and professional areas. For students enrolled in the athletic training area of concentration. A study of the American Athletic Training Program including budget, facilities, equipment, and professional areas.
2591 Therapeutic Exercise and Rehabilitation in Athletic Training (3) PreReq: KIN 2503, 2506; or permission of instructor. 2 hrs. lecture; 2 hrs. lab. For students in the Athletic Training area of concentration. Basic concepts of designing and implementing physical rehabilitation programs; rationale use and application of therapeutic exercise techniques in injury rehabilitation.
3510 Techniques and Methods of Teaching Physical Education (3) PreReq: KIN 2504 and competency in four activities: Concurrent enrollment in KIN 3516. Education majors only. 2 hrs. lecture; 3 hrs. lab. Microteaching and field experience required. Current teaching methods and materials in physical education; teaching styles, aids, and formulation of lesson and unit plans.
3511 The Physical Education Program in Elementary Schools (3) 2 hrs. lecture; 2 hrs. lab. Field experiences in multicultural settings. For kinesiology majors or minors. Must be taken concurrently with KIN 3516. Students must be enrolled in the School of Education. Progressively graded programs of activities.
3512 Therapeutic Modalities (3) Limited to students enrolled in the athletic training area of concentration or by permission of instructor. For students majoring in kinesiology and health, and effective skills for therapeutic modalities in treatment of athletic injuries; topics include principles of tissue trauma, wound healing, pain management, electromechanical modalities, mechanical modalities, and electromechanical modalities.
3513 Introduction to Motor Learning (3) Motor skills learning principles that can be applied to instructional and rehabilitation situations; psychological and physiological characteristics that influence skill learning; behavioral changes related to the stages of skill learning; the influence of various types of practice conditions on skill learning.
3514 Biomechanical Basis of Kinesiology (3) PreReq.: MATH 1022, KIN 2500, PHYS 2001 or equivalent. Education majors only. Anatomical and mechanical analysis of human movement; emphasis on structure and function of bone and muscle, statics, dynamics, kinematics, kinetics, and projectile motion.
3515 The Physiological Basis of Activity (3) PreReq: KIN 2500, 2504. BIOL 1201. Essentials of the physiological concepts of the muscular, cardiac, neurovascular, and circulatory systems; behavior of each system in relation to exercise; determination of normal and abnormal physical responses to exercise; development of a philosophy of scientific inquiry.
3516 Curriculum Construction in Physical Education (3) Concurrent enrollment in KIN 3510 or 3511. Education majors only. Curriculum construction and planning content for elementary and secondary schools.
3517 Neurosensor Motor Control of Human Movement (3) PreReq: KIN 2500. Muscle dynamics; sensory and motor neural pathways; sensory-motor reflex arcs; supraspinal mechanisms; behavioral issues.
3518 Classroom Culture in Physical Education (3) PreReq: KIN 2521. For majors and non-majors in the teaching processes of students in the social learning environment of
the physical education classroom. Focus will be on individual and group motivation, social interaction, integration of technology, and classroom management.

3519 Cadaver Dissection (Prereq.: KIN 2500, for Kinesiology majors or consent of instructor). Active review of human anatomical structures using cadaveric tissues.

3525 Laboratory Techniques in Exercise Physiology (Prereq.: credit or registration in KIN 3515. 2 hrs. lab. Laboratory study examining the physiological effect of different types of exercise on the functions of the human body.

3529 Scientific Basis for Exercise (Prereq.: KIN 3515. Two hrs. lecture; 2 hrs. lab. Historical development of chronic disease risk factors; contraindications and valid uses of exercise prescription.

3535 Exercise Testing and Prescription (Prereq.: KIN 3529, 3534, 2 hrs. lecture; 2 hrs. lab. For students in the fitness studies concentration. Theory and practice of fitness testing, exercise prescription, health promotion, and related concerns.

3540 Mild/Moderate Impairment and Physical Activity (3) Prereq.: EDCI 2700 and KIN 2540. Substantial observation in schools required. Focus on individuals who exhibit mild/moderate developmental disabilities including intellectual disabilities; learning disabilities; behavioral disabilities; behavioral disorders; and mild/moderate physical, sensory, and learning disabilities.

3541 Severe Disabilities and Physical Activity (3) Prereq.: EDCI 2700 and KIN 2540. Substantial observation in schools required. Focus on individuals with severe intellectual, behavioral, physical, and sensory disabilities.

3545 Individuals with Disabilities in Physical Activity Programs (3) Prereq.: EDCI 2700. Credit will not be given for both this course and KIN 2540. Not open to kinesiology majors. Use of physical education concepts and principles in developing program for individuals with disabilities; curriculum implementation specified in federal and state legislation.

3602 Instructor’s Course in First Aid (2) 1 hr. lecture; 2 hrs. lab. For persons qualifying to teach the junior and standard Red Cross courses in aid to the injured.

3603 Organization of the School Health Program (3) Prereq.: KIN 1600. Organization of school health programs involving healthful school living, school environment, school health administration, and evaluation of school health programs.

3604 Methods of Teaching Secondary Health Education (3) Prereq.: KIN 1600. 2 hrs. lecture; 2 hrs. field experiences in multicultural settings. Structure of school health education and its relationship to official and voluntary health agencies and to professional associations; modern health resources suitable for teaching health.

3605 Health and the Aging Process (3) Health conservation and emphasis on understanding attitudes and practices related to health in the aging process.

3608 Cognitively and Noncommunicable Diseases (3) Etiology, prophylaxis, and control of communicable and noncommunicable diseases and impairments; cancer, diabetes, and cardiovascular diseases; osteoporosis, arthritis, and sexually transmitted diseases.

3609 Methods of Teaching Wellness Education (3) Prereq.: KIN 2500, 2 hrs. lecture; 2 hrs. lab. Required knowledge and skills for successful teaching of wellness education in K-12 settings.

3660 The Holistic Health Approach to Stress (3) Sources of stress; evaluation of stress-related diseases; techniques for promoting stress reduction; prevention of stress-related diseases.

3800 Ethical and Legal Issues in Sport (3) Introduction to basic ethical and legal principles required to successfully address managerial situations that arise in sport industry settings; ethical concepts and theories that provide the foundation for the rendering of comprehensive decisions, including, but not limited to, those involving Title IX, the use of drugs, antitrust, labor, intellectual property, and religion.

3801 Sport Strategies and Planning (3) Principles and procedures involved with strategies and planning of professional and intercollegiate athletics.

3802 Program and Event Management (3) Basic concepts pertaining to the production of amateur, professional, and recreational sporting events.

3804 Financial and Event Management (Basic concepts involving Title IX, that use of drugs, antitrust, labor, intellectual property, and religion.

3501 Special Topics in Kinesiology (3) May be repeated for a max. of 6 sem. hrs. of credit when topics vary. For students interested in additional study in specific aspects of kinesiology.

4001 Community Health Issues (3) Community health aspects and implications of tobacco, alcohol, drugs, venereal disease and other communicable diseases; other community health issues.

4002 Community Safety Education (3) Covers all grade levels in the school health program; community programs; home, traffic, and industrial safety; emphasis on organization and administration of these programs.

4005 Habituating and Addictive Drugs in Our Culture (3) Prereq.: KIN 2500 or consent of instructor. A non-mandatory course that is designed to be taken by students who should be aware of the influence of addictive drugs on their behavior, either voluntarily or as a result of necessity. It is a substantial introduction to the subject of addictive behaviors and a discussion of the effects of alcohol, nicotine, caffeine, and other drugs on the physical and psychological well-being of the individual.

4006 Introduction to Health Promotion (Prereq.: PSYCH 1010. 3 hrs. lecture; 2 hrs. lab). Psychological and behavioral perspectives of health promotion; theories and research related to health behavior change; key variables in influencing health behavior change designed to promote health behavior change.

4800 African Americans in Sport (3) African American experiences in sport, including a survey of the history of African Americans in sport and its larger effect on African American culture in general; introduction to sociological, economic, psychological, and geographical issues of sport unique to African Americans.

4835 Practicum in Sport and Leisure Administration (6) Prereq.: Sport Administration majors only; students should have completed the major, and pass all core courses. Credit will not be given for both this course and KIN 3715. Pass/fail grading. Practical applications of administrative techniques in a sport, leisure, or sport-related setting.

4900 Independent Study (1-3) May be taken for a max. of 6 sem. hrs. of credit. Open to advanced undergraduate or graduate students. Research, reading, and/or field work on selected topics.

5700 Practicum in Sport Management (3,6,9) Prereq.: a minimum of 21 sem. hrs. from the sport management MS program, a letter of agreement from prospective on-site supervisor, and consent of faculty advisor. Practical application of management techniques in a sport or sport-related setting; students work in a professional capacity for 10-30 hrs. per week during the semester under the guidance of the on-site supervisor.

5701 Advanced Research Methods (3) Analysis of multivariate research methods and statistical analysis used in kinesiology, sport, and exercise research.

5702 Curriculum Construction in Physical Education (3) Contemporary educational trends in curriculum theory, issues, philosophical orientation, and models derived from research and experience.

5703 Dimensions of Aging (3) Focus on physical, cognitive, and emotional aspects of biological aging; role of physical activity and lifestyle issues and their interaction with chronological aging and functional ability.

5704 Tests and Measurement (3) Measurement theory applied to testing in educational, fitness, and other kinesiology settings.

5705 Problems in Kinesiology (3) May be taken for a max. of 6 hrs. of credit when topics vary. Individual study.

5707 Historical and Philosophical Foundations of Kinesiology (3)

5708 Analysis of Human Movement (3) Mechanisms involved in the production of human movement and the techniques available for scientific analysis of such movement.

5710 Motor Learning (3) Cognitive and motor processes influencing the learning of motor skills; emphasis on assessing learning, changes during learning, attention, augmented feedback, transfer of learning, and practice conditions, with implications for a variety of skill instruction and rehabilitation contexts.

5711 Administrative Problems in Kinesiology (3) Organization and management theory and techniques for administration of programs in educational and fitness settings.

5712 Motor Control (3) Prereq.: consent of instructor. Neurophysiological and behavioral issues in control of human movement; emphasis on contrast between ecological and constructionist approaches.

5713 Seminar in Physical Education Professional Preparation (3) Issues and trends in physical education; emphasis on undergraduate and graduate professional preparation.

5714 Pedagogy in Physical Education (3) Prereq.: KIN 7502 and admission to the doctoral program. Theory and research relating to systematized instruction in physical education.

5715 Theories of Achievement Motivation in Physical Activity (3) Theories of achievement motivation as they apply in a variety of physical activity settings including motor skill acquisition, sports, exercise behavior, and rehabilitation.

5717 Advanced Topics in Motor Control (3) Prereq.: KIN 7512 or consent of instructor. May be repeated for a max. of 6 sem. hrs. when topics vary. Linking advanced motor control topics across disciplines, medicine and research.

5718 African American Sport (3) Examination of the social construction of sport and the systemic issues connected to contemporary sport.

5720 Motor Development (3) 2 hrs. lecture; 2 hrs. lab. Psychomotor development of children; implications for skill learning; analyzing and planning motor development research; motor information processing; research on youth sports; evaluation and assessment; and perceptual-motor development.

5721 Laboratory Techniques in Motor Behavior (3) Prereq.: KIN 7508 or equivalent and consent of instructor. 2 hrs. lecture; 2 hrs. lab. Techniques and equipment used in motor behavior labs; data acquisition and processing techniques; hardware and
7551 Exercise Electrocardiography: Principles and Practice (3) Prereq.: KIN 7530 or consent of instructor. Physiological bases, practical considerations, and rhythm identification of resting and exercise electrocardiograms.

7560 Fall Practicum in Health and Physical Education (5) Prereq.: physical education cohort membership or consent of instructor. 1 hr. lecture; 8 hrs. lab. Pass-fail grading. First teaching practicum in local schools.

7564 Spring Practicum in Health and Physical Education (5) Prereq.: physical education cohort membership or consent of instructor. 1 hr. lecture; 8 hrs. lab. Pass-fail grading. Second teaching practicum in local schools.

7570 Critical Issues in Teaching Health and Physical Education (3) Prereq.: physical education cohort membership or consent of instructor. Analysis of teacher-researcher literature; application to teaching health and physical education.

7580 Research Project in Health and Physical Education (3) Prereq.: physical education cohort membership and completion of KIN 7500 and 7561 or consent of instructor, 2 hrs. lecture; 2 hrs. lab. Development of a research proposal in a research problem of interest, practical experience in conducting and reporting research.

7601 Changing Health Behavior (3) Motivation and determinants of health behavior; behavior change strategies designed for promoting health education programs; promoting innovative health education programs in schools and the community.

7620 Epidemiology for Community Health (3) Prereq.: EXST 4001 or equivalent. Vital health statistics via the disease model and its determinants, community health education, introduction to the development of community health education, both qualitatively and quantitatively.

7690 Introduction to Research Methods (3)

7999 Seminar in Selected Topics in Kinesiology (1) May be taken for a max. of 6 sem. hrs. credit. Topics vary.

9000 Thesis Research (1-2 per sem.) "S"/"U" grading.

9000 Dissertation Research (1-2 per sem.) "S"/"U" grading.

LANDSCAPE ARCHITECTURE • LA

1101 Landscape Representation I (3) 6 hrs. studio. Freedhand and mechanical representation and observational skills development, surveying and the cultural basis on the landscape. Development of a vocabulary, basic skills, and techniques of landscape architecture representation.

1102 Landscape Design I (Prereq.: LA 1101). 6 hrs. studio. Developing skills in computer-aided visualization and illustrative documentation of landscapes; introduction to digital imaging, drafting, and photo manipulation.

1201 Introduction to Landscape Architecture (3) General education courses are marked with stars (★).

1101 Landscape Representation I (3) 6 hrs. studio. Freedhand and mechanical representation and observational skills development, surveying and the cultural basis on the landscape. Development of a vocabulary, basic skills, and techniques of landscape architecture representation.

1102 Landscape Design I (Prereq.: LA 1101). 6 hrs. studio. Developing skills in computer-aided visualization and illustrative documentation of landscapes; introduction to digital imaging, drafting, and photo manipulation.

★ 1201 Introduction to Landscape Architecture (3) General education courses are marked with stars (★).

1101 Landscape Representation I (3) 6 hrs. studio. Freedhand and mechanical representation and observational skills development, surveying and the cultural basis on the landscape. Development of a vocabulary, basic skills, and techniques of landscape architecture representation.

1102 Landscape Design I (Prereq.: LA 1101). 6 hrs. studio. Developing skills in computer-aided visualization and illustrative documentation of landscapes; introduction to digital imaging, drafting, and photo manipulation.

★ 1201 Introduction to Landscape Architecture (3) General education courses are marked with stars (★).
LANDSCAPE ARCHITECTURE

4208 Reading the Louisiana Landscape (3) Advanced seminar exploring the use of diverse sources to research and understand regional landscapes and apply these findings to project-based design.

4204 Planning Disaster Resilient Communities (3) Theory and methods of planning disaster resilient communities. Topics include: earthquakes, cyclones, tsunamis, and landslides; planning for coastal defense; vulnerability assessment of the built environment; and urban design strategies for disaster resilience.

4301 Landscape Technology IV: Specialization (3) Prereg.: LA 3001 or equivalent. 2 hrs. lecture; 2 hrs. studio. Specialization in design concepts related to specific landscape elements.

4501 Field Studies in Landscape Architecture (1-3) May be taken for credit. May be repeated up to 6 credit hours. Basic field trip. Students are responsible for paying travel expenses associated with this course. Field trip to landscape architectural office, projects, historic sites, and schools throughout the U.S. and abroad.

4502 Independent Study in Landscape Architecture (3) Prereg.: consent of School Director. Independent study proposals must be pre-approved by the supervising faculty member. Program of individual study under faculty guidance, including auditing lectures, reading, and exercises as needed to develop skills in methods of inquiry related to the area of specialty.

4503 Advanced Projects in Landscape Architecture (3) Prereg.: consent of instructor. Faculty directed projects for small groups of students investigating specific areas of research and design.

4504 Advanced Elective in Landscape Architecture (3) Prereg.: permission of instructor. Research practice and application in landscape architecture; small groups will use lectures, discussions, presentations, and other formats to explore advanced topics.

4505 Special Studies in Landscape Architecture (1-2) Prereg.: consent of School Director. Program of study under faculty guidance. Independent study proposals must be pre-approved by supervising faculty member and the School Director.

5001 Landscape Design VII: Urban Landscape Design (6) Prereg.: LA 4001, 4201. 12 hrs. studio. Required field trip. Students are responsible for paying travel expenses associated with the course. Investigation of urban structure and systems and design of urban landscapes and elements.

5002 Landscape Design VIII: Case Study Project (6) Prereg.: LA 4001, 4201. 12 hrs. studio. Intensive development of a comprehensive landscape design and/or independent design project.

5201 Research Seminar (3) Prereg.: LA 3201, 4201. Critical and intensive review of major landscape theories and issues; identification and preparation for a comprehensive final project.

5301 The Practice of Landscape Architecture (3) Prereg.: LA 3302, or consent of instructor. Professional practice for landscape architects including issues associated with materials, professional services, business developments, contracts, and project management.

7001 Graduate Landscape Design I: Basic Design (6) Prereg.: consent of the school. 12 hrs. studio. Introduction to two- and three-dimensional design, spatial sequence, meaning and dynamic change; application to simple landscape designs.

7002 Graduate Landscape Design II: Site Design (6) Prereg.: LA 7001. 12 hrs. studio. Arrangement of buildings, circulation, and other landscape design elements; emphasis on earthwork and drainage.

7003 Graduate Landscape Design III: Community Design (6) Prereg.: LA 7002 and 7101 or consent of the school. 12 hrs. studio. Landscape planning and design at the community and neighborhood scale; emphasis on relationships of uses, transportation infrastructure, green infrastructure, public services, and a mix of housing and commercial activities.

7004 Graduate Landscape Design IV: Landscape Planning and Development (6) Prereg.: consent of the school. 12 hrs. studio. Investigation of urban systems and design of urban landscapes and systems.

7005 Graduate Landscape Design V: Urban Landscape Design (6) Prereg.: LA 7004. 12 hrs. studio. Investigation of urban structures and systems and design of urban landscapes and systems.

7006 Graduate Landscape Design VI: Final Project (6) Prereg.: LA 7005, 7201. 12 hrs. studio. Intensive development of a comprehensive landscape design and/or independent design project.

7101 Graduate Landscape Representation I (3) 6 hrs. studio. Freehand and mechanical representation techniques, tools, and media used in designing and illustrating landscape architecture; emphasis on the development of a vocabulary, basic skills, and theory of landscape architectural representation.

7102 Graduate Landscape Representation II (3) Prereg.: LA 1102 and 7101. 6 hrs. studio. Advanced representation techniques developing skills of visualization and representation in freehand, mechanical, and digital imaging design projects.

7201 Research Methods (3) Concepts of qualitative research; skills in finding and using research materials; landscape architectural research trends; evaluation of research; application of research to landscape design.

7401 Graduate Landscape Ecology (3) Required field trips for which a deposit is required at registration. Basic principles of ecology and environmental systems; application of ecological principles and relationships to resource, recreation, and landscape planning, with attention to conservation ethics and local regulations leading to sustainability of the landscape.

8000 Thesis Research (1-12 per sem.) 5-7 credit grading.

LATIN • LATN

General education courses are marked with stars (*).

1001 Elementary Latin (4) Nonlaboratory reading course in the classical Latin language rather than grammar; repetition of controlled vocabulary and contextual clues used to read extensive passages of simple Latin.

**2051 Intermediate Latin I (4) Prereg.: LA 1001 or equivalent. Reading comprehension approach to language continued. For students who have difficulty with vocabulary building and basic Latin grammatical constructions.

**2053 Intermediate Latin II (3) Prereg.: LA 2051 or equivalent. Nonlaboratory comprehension approach includes material of the difficulty of 1st century Latin poetry and prose.

**2065 Golden Age Narrative Poetry (3) Prereg.: LA 2053 or equivalent. Readings from the narrative poets, including excerpts from Vergil’s Aeneid and Ovid’s Metamorphoses.

**2066 Golden Age Prose (3) Prereg.: LA 2053 or equivalent. Readings from Roman prose writers (excluding the historians); the major speeches, letters, and philosophical works of Cicero.

2073 Roman Historians (3) Prereg.: LA 2053 or equivalent. Readings from Roman historians; selections from Livy and Tacitus; prose style and philosophy of history of the author(s).

**2074 Golden Age Lyric Poetry (3) Prereg.: LA 2053 or equivalent. Readings from the lyric poets; selections from the Carmina of Catullus and the Odes of Horace, with attention to contextual clues used to read extensive passages of simple Latin.

**2075 Golden Age Satire (3) Prereg.: LA 2053 or equivalent. Readings from Petronius’ Satyricon, Martial, and Juvenal for their humor, with attention to evidence of the lives and language of ordinary Roman people.

4001 Intensive Latin Language (3) A specialized course intended to provide a reading knowledge of Latin. For graduate students whose background is limited and who are interested in using Latin for the study of Latin literature and the classical world in general.

4003 Readings in the History of Latin (3) Selections from the literature of the Latin world and the English-speaking world pertinent to the study and translation course. Emphasis will be placed on the historical significance.

4004 Roman Comedy (3) Reading of representative plays of Plautus and Terence, with attention to dramatic techniques and stylistic differences.

4006 Medieval and Renaissance Latin (3) Readings from the time of the medieval Latin writers to Milton.

4007 Latin Prose Composition (3) Practice in writing Latin prose; emphasis on grammar and syntax of classical Latin, using Ciceronian prose style as the model.

4010 Survey of Latin Literature (3) Readings in major Latin authors from the beginning to Ammianus Marcellinus; supplementary readings in English in the literary, political, and social history of Rome.

4023 Special Topics in Latin Poetry (3) Prereg. may be taken for a max. of 6 sem. hrs. of credit. Readings and studies in the works of one or more of the major prose writers of the Roman Republic or Roman Empire.

LIBERAL ARTS • LIBA

7000 Liberal Arts: Methods of Inquiry (3) Interdisciplinary study in the liberal arts; modes of inquiry in different disciplines, common themes in the humanities, and means of integrating these into the whole.

7005 Special Topics in Latin Literature (3) Prereg.: credit in LIBA 7000 or consent of instructor. May be taken for a max. of 6 sem. hrs. of credit when topic varies.

7900 Independent Study (1-3) Prereg.: credit or concurrent enrollment in LIBA 7000. May be taken for a max. of 6 sem. hrs. of credit. Directed individual readings by the graduate faculty.

8000 Thesis Research (1-12 per sem.) 5-7 credit grading.

LIBRARY AND INFORMATION SCIENCE • LIS

1001 Library Research Methods and Materials (1) Fundamentals of college-level research; location, evaluation, and use of information for research needs; introduction to the library and to the organization, access, and retrieval of information; hands-on experience in a variety of printed and electronic resources.

2001 Introduction to Information Technologies (3) Credit will not be given for this course and CSC 1100, EXST 2300, and EDS 1100. Introduction to hardware, software, networking, and telecommunications issues; use of application software, electronic databases, and search engines.

2002 Information Services (3) Prereg.: major or permission of department. Preparation for reference and bibliographic services; selection and use of general, scholarly, and specialized reference resources in various subject fields.

7003 Principles of Collection Management (3) Basic principles of collection development and management, including community and user needs analysis, selection strategies, and tools.

7004 Principles of Management for Librarians and Information Specialists (3) Prereg.: major or permission of department. Basic functions of management and their application to the operations of libraries and information service agencies.

7005 Foundations of Library and Information Science (3) Prereg.: major or permission of department. Must be taken in the first semester of residence or prior to registration for the tenth hour of course work to be counted for the MLIS degree, whichever occurs first. History, theory, practice, philosophy, and current organization of the information professions.

7008 Information Technologies (3) Prereg.: major or permission of department. Hardware, software, networking, and telecommunications technologies used in libraries and information settings; experience with appropriate software packages and search systems.

7011 Information Needs Analysis (3) Prereg.: major or permission of department. User-centered approaches to meeting information needs of individuals and communities; community analysis, user studies, and reference interview.
7912 Special Topics in Library Science (1-3) May be taken for a max. of 18 sem. hrs. of credit when topics vary.
7913 Field Experience in Archives (3) Prereq.: completion of 36 hrs. of LIS courses including LIS 7693, and permission of instructor. Preparation for course begins semester prior to registration. 120 hrs. per semester at field site. Experience in administration and management of archives.
7914 Field Directed Independent Study (1-3) Prereq.: MLS or equivalent. May be taken for a max. of 12 sem. hrs. credit.

8000 Thesis Research (1-9 per semester) "S"/"U" grading.

LIFE COURSE AND AGING • LCA
2000 Interdisciplinary Seminar in Aging (1) Contemporary issues in aging; preparation for the study of aging in contemporary society.

LINGUISTICS • LING
1051 Spoken American English (3) Prereq.: consent of instructor or international student counselor. Undergraduates only. Weekly individual work in the Speech Laboratory. Theoretical and practical treatment of pronunciation of American English for students of other languages; phonology, stress, intonation, and rhythm through drills, exercises, and public speaking.
8008 History of the German Language (3) See GER 4091.
4011 Topics in Advanced Logic (3) Prereq.: PHIL 4010. See PHIL 4011.
4060 Language and Culture (3) See ANTH 4060.
4064 Pilgrims and Creole Languages (3) See ANTH 4064 and FREN 4064.
4150 Phonetics (4) See COMD 4150.
4151 Acoustics of Speech and Hearing (3) See COMD 4155.
4130 Studies in Language (3) See ENGL 4130.
3200 Speech and Language Development (3) See COMD 4130.
4600 Introduction to Russian Linguistics (3) See RUSS 3600.
4710 Introduction to Linguistics (3) See ENGL 4710.
4711 History of the English Language (3) See ENGL 4711.
4712 Roots of English (3) See ENGL 4712.
4713 Syntax (3) See ENGL 4713.
4714 Phonology (3) See ENGL 4714.
4715 Semantics (3) See ENGL 4715.
4716 Introduction to Sociolinguistics (3) See ENGL 4716.
5750 Independent Research in Speech Science or Linguistics (1-3) See COMD 4750.
4914 Philosophy of Language (3) See PHIL 4914.
7069 Conversation and Discourse (3) See ANTH 7069.
7112 Topics in Historical Linguistics (3) See ENGL 7112.
7113 Topics in Syntax and Semantics (3) See ENGL 7113.
7114 Topics in Sociolinguistics (3) See ENGL 7114.
7115 Topics in Language Acquisition (3) See ENGL 7115.
7172 Social Language (3) See ENGL 7172.
7175 Social Language (3) See COMD 7750.
7572 Seminar in Linguistics (3) See COMD 7752.
7754 Psycholinguistics: Linguistic Perspectives (3) See COMD 7754 and PSYC 7754.
7755 English for Speakers of Other Languages: Methods and Materials (3) See COMD 7755.
7756 Independent Research: Phonetics and Linguistics (1-3) See COMD 7756.
7908 Selected Topics in Anthropology (3) See ANTH 7908.
7910 Seminar (3) See PHIL 7910.
7912 Field Methods in Linguistics (3) See ANTH 7912.
7999 Research in Anthropology (1-6) See ANTH 7999.
8000 Thesis Research (1-12 per semester) "S"/"U" grading.
9000 Dissertation Research (1-12 per semester) "S"/"U" grading.

LOUISIANA STATE UNIVERSITY • LSU
1001 Freshman Seminar (1) Open to freshmen only. Integration into the academic life of the campus, including orientation to the university's policies and resources, its history, and traditions; development of essential academic skills, personal growth/self-awareness, and career exploration; instill a sense of community on campus and beyond.

MANAGEMENT • MGT
2000 Innovation and Creativity (3) Prereq.: Admission into the College of Business and Entrepreneurship Concentration or permission of instructor. The course focuses on the role of creativity and innovation in product, service, or idea generation that may eventually lead to business formation and commercialization; barriers to creativity and innovation; alternative problem-solving approaches.
3000 Petroleum Land Management Practice (1) Open only to petroleum land management majors. Required of petroleum land management majors; waived only by consent of department. Pass/fail grading. A minimum of 6 weeks of full-time employment by a firm participating in the program.
3001 Petroleum Land Management (3) V Practical and evidentiary aspects of petroleum land management; principles and techniques derived from a synthesis of legal and geographical sciences; legal effects of various procedures of boundary locations for petroleum properties; petroleum land jurisdiction concerning unionization, a real association, and environmental impacts of drilling activity; use of topographical and historic maps, map compilations, historical cartography, aerial surveys, records, and field techniques; some focus on coastal Louisiana and the Gulf South.
3010 Family Business Management (3) Prereq.: ACCT 2001 and 2101 or ECON 2000, 2100; IDS 1100; MGT 4740. Family business culture; entrepreneurial influences; key issues and conflicts; career planning; counseling and consulting; professional support relationships; survival skills as a son or daughter in a family business.
3111 Entrepreneurship (3) Prereq.: IDS 2009, FIN 3715, MGT 3401 (credit or concurrent enrollment) or permission of instructor. Principles of entrepreneurship; feasibility studies; financial and location analysis; marketing; promotion; management; venture capitalism; legal considerations.
3115 Financing and Legal Aspects of Entrepreneurship (3) See FIN 3115.
3200 Principles of Management (3) Management functions, including planning, organizing, staffing, human resource management, leadership/interpersonal influence, and controlling in international and transnational settings.
3203 Independent Study: Advanced Management Topics (1-6) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. by consent and independent research under direction of a faculty member.
3211 Business and Society (3) Prereq.: senior standing. Open only to College of Business students; open to others with permission of department. Social roles of organizations whose primary function is the accumulation of profit; emphasis on current issues; historical development of business-society relationships.
3280 Management Internship (3) Prereq.: junior or senior standing. May be taken for a max. of 6 sem. hrs. of credit. Students, supervised by a management faculty member and an approved business executive, will follow a predetermined schedule of activities while working for a business firm. Hands-on experience in the fields of management, human resource management, organizational behavior, and business administration, entrepreneurial, and administrative practices.
3320 Human Resource Management (3) Prereq.: MGT 3200. Human resource functions, including planning, recruitment, selection, development, maintenance, and reward of employees; relationships with environment and employer associations.
3500 Introduction to Labor Relations (3) F S Prereq.: Open only to College of Business students; open to others with permission of department. Management's response to organized labor in the workplace; emphasis on U.S. unionization development; government regulation of labor-management relations; union structure, political activities, collective bargaining, and contractual terms. Theoretical, practical, and case law.
3512 Public Sector Labor Relations (3) S Prereq.: MGT 3500. Labor-management relations in government employment; variations in labor regulations in federal, state, and local government; role of third-party neutrals in public sector bargaining.
3513 Labor-Management Conflict and Cooperation (3) F Prereq.: Open only to College of Business students; open to others with permission of department. Examination of issues important to workplace conflict resolution; topics include, but are not limited to, negotiation strategies and tactics, alternative dispute procedures, employee-management cooperation, and/or collective bargaining.
3830 Strategically Managing Organizations (3) Prereq.: FIN 3715, MGT 3200, and MGT 3401 or 3402. Open only to College of Business students; open to others during the final semester of course work. An honors course, MGT 3831, is also available. Credit will not be given for both this course and MGT 3831. May be taken only during the final semester of course work. Analyzing strategic situations and decision making based on these analyses to ensure the success of for-profit and non-profit organizations.
3831 HONORS: Strategically Managing Organizations (3) Same as MGT 3830, with special honors emphasis for graduate credit. Credit will not be given for this course and MGT 3830.
4010 Special Topics in Entrepreneurship (3) Prereq.: MGT 3111 or permission of instructor. May be taken for a max. of 6 sem. hrs. of credit when special topics coverage of special topics.
4020 Internship in Entrepreneurship (3) Prereq.: MGT 3111. Permission of instructor. May be repeated for a max. of 6 sem. hrs. Credit when topics vary. Detailed study of a specific aspect of entrepreneurship.
4100 Consulting Field Project (3) Prereq.: MGT 3111. Senior standing, or permission of instructor. Strategic focused field based project learning experiences and opportunities in public and private organizations. Team-based approach to offering consulting advice to organizations with the goal of improving their performance. Emphasis on experiential approaches that provide a participative type of learning about the crucial issues faced by organizations.
4113 Small Business Management (3) F Prereq.: senior standing. A multidisciplinary approach to small business; business start-ups, accounting, finance, marketing, management, promotion, layout, retail management, location analysis, and international small business.
4114 Franchising Management (3) S Prereq.: senior standing. Understanding the franchising process; becoming a franchisee or franchisee; franchisee startup, venture capital, finance, legal compliance, disclosure documents, franchise agreements, franchisee start-ups, franchise-franchise relationships, anti-trust laws, and international franchising.
4120 Social Entrepreneurship (3) Prereq.: MGT 3111 or permission of instructor. The course is designed to provide broad theoretical and practical framework for understanding social entrepreneurs and the social ventures they create ranging from local social entrepreneurs to large international social ventures leading global change. Introduction to the possibilities of social entrepreneurship and an introduction to the entire social venture creation process and life cycle.
4322 Employee Selection and Placement (3) S Prereq.: IDS 3000, or equivalent and MGT 3320. Staffing requirements, recruitment strategies, development and validation of selection procedures, classification and placement of employees; problems associated with human resource management.
4323 Compensation Administration (3) F Prereq.: MGT 3200 or equivalent. Compensation system evaluation; wage level, wage structure, incentive plans, issues of employee compensation.
4420 Multinational Management (3) Prereq.: MGT 3200 or equivalent. Management concepts and philosophical bases for international management operations; environmental dynamics, multinational business organizations, cultural constraints in systems and processes, and conceptual systems of international operations.
4523 Legal Issues in Human Resource Management (3) S Prereq.: MGT 3320. An examination of the most significant laws and court rulings influencing companies employment practices; topics include: anti-discrimination statutes, affirmative action, common committed workplace torts, occupational safety and health laws, workers' compensation, and wrongful termination.
4600 Crisis Management (3) See DSM 4600.

4620 Human Behavior in Organizations (3) Prereq.: MGT 3200. Open only to College of Business students; open to others with permission of department. Behavioral sciences applied to understanding human dynamics in organizations; focus on individual, interpersonal, group, and teams, and the impact of human behavior on organizational effectiveness.

4701 Technological Entrepreneurship (3) See SDS 4701.

4702 Managing Technology Transfer (3) V Models of technological transfer; mechanisms and barriers to technological transfer; technological transfer and industrial innovation; domestic and international aspects of technology transfer.

7111 Entrepreneurship Management (3) F Investigation, analysis, and development of entrepreneurial feasibility studies and business plans.

7203 Development of Management Thought (3) F-O Origin and growth of managerial concepts; contributions of leaders associated with major schools of management thought, including scientific management, management process, empirical, human behavior, social system, decision theory, and quantitative methods.

7212 Seminar in Contemporary Management Topics (3) V Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary.

7301 Theories of Organizations (3) S Role of human resource managers; their relationships with employees, the external environment, and top management.

7302 Reward Systems in Organizations (3) V Theories of motivation, reward, performance and behavior; their application to major issues regarding human resources allocation, development, and utilization.

7401 International Business Management (3) F Theories and management of international operations; development of strategies, operational, strategic, and decision making perspectives.

7600 Organizational Behavior (3) F-E Behavior of people within organizations and the environment within which organizations function; components of the behavioral unit; processes, interactions, and outputs of organizational behavior.

7620 Strategic Management of Health Care Organizations (3) Cross-listed with PADM 7620.

7700 Organization Theory (3) S-O Macro aspects of organizations; processes by which organizations are formed, structures used in their elaboration; internal processes; environmental considerations; organizational viability and renewal.

7800 Current Issues in Strategic Management (3) S Contemporary issues in strategic management theory and practice; emphasis on field projects that provide top-management problem-solving experience.

7811 Research Issues in Strategic Management (3) F-E Prereq.: consent of instructor. Strategic planning issues including environmental scanning, goal formulation, strategic implementation, control, and evaluation in successful organizations.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.

9201 Research Methods in Management (3) S-O Theory building; measurement reliability and validity; significance testing; stationary samples; sampling strategies and missing data; multi-level and cross-level issues; research ethics.

9202 Pre-dissertation Research (1-9) May be repeated for credit. Pass-fail grading.

9204 Proseminar in Management (3) Required of all incoming PhD students. Pass-fail grading. May be taken for a max. of 3 sem. hrs. when topics vary. Contemporary research and critical issues in management.

9800 Seminar in Advanced Business Problems (3) May be taken for a max. of 6 hrs. of credit when topics vary. Directed work in advanced topics.

MARKETING • MKT

3401 Principles of Marketing (3) Prereq.: ACCY 2000 or 2001 (2002), and either ECON 2010 or ECON 2009 (2011). An honors course. MKT 3402, is also available. Credit will not be given for both this course and MKT 3402. Lecture-discussion, case analysis, marketing management game; the field of marketing; marketing environment, functions, and institutional strategies at a macro level; marketing strategy and policies at a micro level; the role of costs and productivity; view points of society, consumer, and managing marketer.

3402 HONORS: Principles of Marketing (3) Same as MKT 3401, with special honors emphasis for qualified students. Credit will not be given for this course and MKT 3401.

3410 Sports Marketing (3) Application of marketing concepts to sports and leisure activities; emphasis on planning and controlling the sport or leisure market; marketing executives; identification and measurement of market segments; analysis of their behavioral patterns as a basis for marketing strategy and planning.

3411 Consumer Analysis and Behavior (3) Prereq.: MKT 3401 and permission of department. Dynamics of consumer behavior; their relationship to marketing executives; analysis of their behavioral patterns as a basis for marketing strategy and planning.

3412 Marketing Research (3) Prereq.: MKT 3401 and ISDS 2000. Open only to College of Business students; open to others with permission of department. Formulation of marketing policies; theories, concepts, and methodology involved in applying research to marketing problems.

3421 Marketing Communication: Promotion (3) Prereq.: MKT 3401. Nature and contributions of personal selling and advertising to the firm’s marketing efforts.

3431 Retailing Management (3) Prereq.: MKT 3401. Store analysis, store planning, and development of retail method of inventory; problems connected with retail buying and selling.

3441 Business Marketing (3) Prereq.: MKT 3401. Strategies developed by manufacturers to compete for markets; differences between industrial and final consumer markets; formulation and execution of strategies connected with the marketing function; how the company’s marketing strategy is modified by other actors through the marketing channel.

3500 Marketing Tools Fundamentals (3) Prereq.: credit or registration in BADM 7100 or equivalent. Coverage of current and emerging computer-based and other tools used by marketing practitioners.

4411 Marketing Research Field Project (3) Prereq.: MKT 3401 and permission of the department. Advanced marketing research problems and theory.

4412 Sales Management (3) Prereq.: MKT 3401. Principles of sales planning and control; organizing sales departments, developing territories, motivating sales personnel, and controlling sales operations.

4413 Direct Marketing (3) Prerequisites: direct marketing process; planning and implementation of direct marketing campaigns; sales promotion in a catalog, mail order, direct response, catalog, mailings, commercial, computer, telemarketing, infomercial; and other direct marketing channels. A case study of a company example.

4421 Advanced Marketing Strategy (3) Prereq.: MKT 3401 or permission of instructor. Study of specific marketing strategy problems. Principles and practices pertaining to the use of the Internet by organizations.

4442 Strategic Marketing (3) Prereq.: MKT 3440 or consent of instructor. Study of the concepts, principles, and practices concerning the development and implementation of an integrated plan for use in electronic commerce on the Internet with emphasis on the Internet as an alternative marketing delivery system.

4443 International Marketing (3) Prereq.: MKT 3401. A case study of a company example. Global marketing environment and analytical processes; global marketing as all-encompassing (import-export, joint ventures, foreign subsidiaries, licensing, management contracts); marketing systems in various countries; strategies for international and multinational operations.

4446 Internship (3) Prereq.: senior standing or consent of instructor. Primarily for seniors in marketing. May be repeated for a max. of 6 sem. hrs. credit. Pass-fail grading. Internship job experience in approved marketing positions.

4451 Marketing Management (3) Prereq.: MKT 3401, and senior standing. Open only to College of Business students; open to others with permission of department. Analytical principles used in development of strategies for submarkets, market segments, products, price, channels, and promotion integrated in development of the firm’s total marketing effort.

4477 Indep Study in Advanced Marketing Problems (1-6) For undergraduate students in the E. J. Ourso College of Business with a GPA of 3.00 or above. May be repeated for a max. of 6 hrs. of credit. Pass-fail grading. Independent research under direction of a faculty member.

4488 Advanced Topics in Retailing Management (3) Prereq.: MKT 3431. Application of retailing theory and management techniques in areas of strategic planning and its interfaces with retailing environments, information systems, retail business analysis, locational strategies and site selection, merchandising policies and instore operations; store management, product distribution, and departmental layout.

4490 Services Marketing (3) Prereq.: MKT 3401. Developing, pricing, distributing and promoting the service; control of quality of customer encounters through service automation and/or employee selection and training; place of marketing in service organization structure; strategic implications of service industries.

4500 Entrepreneurial Marketing and Sales (3) Prereq.: MKT 3431 and MKT 3401 and Entrepreneurship Minor, or Entrepreneurship Concentration, or permission of instructor. This course will look at the role of marketing in entrepreneurial ventures, and the role of entrepreneurship in marketing efforts of all firms. Attention will be devoted to understanding the common mistakes entrepreneurs make when it comes to marketing and how to sell an idea/product in an entrepreneurial environment.

7110 Marketing Tools Foundations and Applications (3) Prereq.: credit or registration in BADM 7100 or equivalent. Coverage of current and emerging tools used by marketing practitioners, including retail systems, market segmentation tools, market share analysis, competitive intelligence, applications to real and/or simulated business ventures.

7120 Customer Decision Making and Brand Marketing Strategy (3) Prereq.: BADM 7100 or equivalent. Treatment of key elements of branding and advertising with emphasis on formulation of brand marketing strategy based on consumer behavior models, constructs, and information.

7130 Marketing Research and Brand Analysis (3) Applications of marketing research methods such as qualitative research techniques, market research experiments, and brand analysis techniques.

7140 Promotion Management and Strategy (3) Prereq.: BADM 7100 or equivalent. Examination of the techniques and methods used by marketing communicators with emphasis on theory and best practices; including development of a marketing promotions strategy for a present or emerging marketing organization.

7150 Global Marketing Issues and Strategies (1.5) Prereq.: BADM 7100 or equivalent. Examination of marketing strategies and tactics available to organizations seeking to compete with global markets.

7160 Services and Professional Services Marketing (3) Prereq.: BADM 7100 or permission of instructor. Marketing to services marketing with emphasis on issues involved in planning, implementing, and controlling professional services.

7300 Brand Marketing Strategy (3) Prereq.: MKT 7120 and 7130. Coverage of brand marketing strategy formulation, including marketing strategy analysis, plus resource allocation; emphasis on issues involved in marketing strategy formulation and implementation.

7443 Advanced Seminar in International Marketing (3) Prereq.: MKT 4451 or BADM 7100 or equivalent. Marketing management decision processes and marketing systems in the global environment; application to multinational business operations and strategy development; marketing techniques of foreign market entry; product, pricing, promotion, and distribution decisions.

7450 Topics in Advanced Marketing Management (3) Prereq.: BADM 7100 or permission of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Survey of marketing management areas such as distribution channel management, pricing, and product management.}

7471 Marketing Strategy (3) Design, implementation, and evaluation; corporate marketing models; demand forecasting; market modeling; product introduction, price promotion, and distribution policies; information systems; marketing audit; application of economic, quantitative, and behavioral tools as strategic aids to marketing management; model-building approach used to demonstrate tool applications in product, price, promotion, and distribution strategies.

7476 Marketing Theory and Thought (3) Evolution of marketing concepts, terminology, principles, and theory; development of a framework of thinking regarding the meaning and consequences of theory; prediction of future theoretical development.
2747 Seminar in Advanced Marketing Problems (3) May be taken for a max. of 9 hrs. of credit.

2748 Applications of Marketing Theory (3) Prereq.: MKT 7476, with special honors emphasis for qualified students. Analysis of the development and testing; theory operationalization and refinement. Major objectives: BADM 7100 or consent of instructor. Synthesis of theory, content area, and methodology in marketing through the study of modeling; modeling phenomena, functional forms, and analytical techniques of path analysis, simultaneous equation systems, and structural equation modeling.

7713 Marketing Construct Analysis (3) Prereq.: MKT 7471 or BADM 7100 or consent of instructor and DDS 7024 or equivalent. Open to doctoral students. Treatment of the theory, conceptualization, and measurement of constructs used in marketing research with emphasis on the development and refinement of marketing construct measurement.

7716 Advanced Marketing Research Techniques (3) Prereq.: BADM 7100. Advanced designs and techniques applied to marketing research; theory and assumptions of analytical methods; marketing applications; use of computer programs; marketing strategy; interpretations of empirical results.

7717 Advanced Seminar in Consumer Behavior (3) Prereq.: MKT 4451 or BADM 7100. Open only to doctoral students. Theoretical, conceptual, and methodological issues for selected topics in this area.

7720 Seminar in Marketing Theory and Experimental Methods (3) Prereq.: BADM 7100 or equivalent. Nature and importance of theory development, integration of theory and research methods; validity and implications in marketing and consumer research; experimental and quasi-experimental design; pluralism in marketing and consumer research.

8000 Thesis Research (1-12 per sem.) *S/U* grading. Credit. Open only to doctoral students.

9000 Pre-dissertation Research (1-9) May be repeated for a max. of 9 hrs. of credit.

9000 Dissertation Research (1-12 per sem.) *S/U* grading.

MASS COMMUNICATION • MC

3018 Foundations of Media Research (3) Prereq.: majors and minors only or permission of department; LIS 1901. Role of research in media institutions and the mass media; methodology and evaluation. 3000 Mass Media Law (3) Prereq.: majors and minors only or permission of department. Legal rights of and responsibilities on the mass media; emphasis on First Amendment considerations.

3018 Honors: Foundations of Media Research (3) Same as MC 3018, with special honors emphasis for qualified students.

3080 Mass Media Law (3) Prereq.: majors and minors only or permission of department. Legal rights of and responsibilities on the mass media; emphasis on First Amendment considerations.

3081 Honors: Mass Media Law (3) Same as MC 3080, with special honors emphasis for qualified students.

3333 Minorities and the Media (3) Historical and contemporary roles and portrayals of minorities in the media.

3650 Electronic Media and Society (3) Organizational and economic foundations of electronic mass media; history, regulation, social significance, and responsibility.

3700 Electronic Media: Law, Regulation, and Public Policy (3) Development of telecommunications media law and regulation through case studies relating to the Federal Communications Act; rules and policy decisions of the Federal Communications Commission and other regulatory bodies; emphasis on current legal issues affecting the telecommunication media; legal documents and literature.

3980 Internship (3) S, Su. Prereq.: 3.0 gpa in 12 or more hrs. of mass communication and consent of internship faculty supervisor and school dean. Pass-fail grading. May be taken only once for credit. May be counted toward a degree in Mass Communication. At least 15 hours of work per week (25 hrs. in a summer term) with a full-time faculty member and direct supervision of a professional in some field of mass communication.

4000 Media Ethics and the Military (3) Consent of instructor, 2 hrs. lecture; 2 hrs. lab; $50 field fee. In depth study of the modern relationship between the media and the military. The ethical, social, legal, and economic considerations related to media coverage of military events.

4090 Media Ethics and Social Responsibility (3) Prereq.: majors only. Concepts and principles of management, entrepreneurial leadership, organizational and strategic leadership, and responsibilities applicable to media organization; study of social, political, ethical, technological, and legal issues confronting media companies.

4090 Honors: Media Ethics and Social Responsibility (3) Same as MC 4090, with special honors emphasis for qualified students.

4095 American Media History (3) Themes and trends in the historical development of mass media, including journalism, advertising, and public relations.

4096 Honors: American Media History (3) Same as MC 4095, with special honors emphasis for qualified students.

4103 Comparative Media Systems (3) Prereq.: Majors only. World media, media news agencies, communication organizations, differing philosophies, international news flow, and political, economic, cultural, and geographical influences.

4104 Honors: Comparative Media Systems (3) Prereq.: Majors only. Same as MC 4103, with special honors emphasis for qualified students.

4111 Mass Media Practices (3) Prereq.: consent of Manuscript School of Mass Communication; 1 hr. lecture; 3 hrs. lab. Open to LSU undergraduates who qualify for entry into the University's Accelerated Master's Degree Program. Required of all students who enter the mass communication graduate program without a degree or professional experience in mass communication. May not be counted for undergraduate or graduate degree credit by Mass Communication majors. An honors course, MC 4112, is also available. An intensive course in laboratory practice in the professional skills required of all media professionals.

4112 Honors: Mass Media Practices (3) Same as MC 4111, with special honors emphasis for qualified students. Consent of instructor.

4151 Field Experience (3) Prereq.: Permission of instructor. 1 hr. lecture, 4 hrs. lab. Individually arranged assignments in electronic media, film, and producing media content in real-time situations with professional supervision, for regional newspapers, magazines, television stations, or other professional media organizations.

4211 Mass Media Principles (3) Prereq.: consent of the Manuscript School of Mass Communication; Open to LSU undergraduates who qualify for entry into the University's Accelerated Master's Degree Program. An honors course, required of all students who enter the mass communication graduate program without a degree or professional experience in mass communication. May not be counted for undergraduate or graduate degree credit by Mass Communication majors. An honors course, MC 4212, is also available. An intensive course provides an overview of the role of the mass media within society.

4212 Honors: Mass Media Principles (3) Same as MC 4211, with special honors emphasis for qualified students.

4270 Electronic Media Programming (3) Strategies in developing program schedules for television and radio; techniques of program development for target audiences.

4700 Electronic Media Management (3) Managing broadcast stations and cable systems, general management, sales, programming, and promotion.

4971 Special Topics in Mass Communication (3) Prereq.: consent of instructor. Also offered as CMST 4701. May be taken for a max. of 6 hrs. of credit when topics vary. Analysis and discussion of a selected topic that goes beyond present advanced course offerings.

4999 Independent Study (3) Prereq.: gpa of at least 3.0 and consent of school. Approval of written proposal required before enrollment. Pass-fail grading. Readings, projects, conferences, and reports under faculty direction.

7000 Proseminar in Mass Communication and Public Affairs (3) Open only to graduate students. Pass-fail grading. Introductory graduate study in mass communication; topics include faculty research, survey of the field, and professional and academic career preparation.

7001 Research Methods in Mass Communication (3) Qualitative and quantitative methods for investigating critical issues in mass communication; may include surveys, content analysis, experiments, focus groups, interviews, and other methods.

7002 Mass Communication Philosophy and Principles (3) Examination of the most influential principles, philosophies, and ideas underlying the development of the mass communication in the Western world.

7003 Case Studies in Mass Communication (3) Evaluation of the case study method of problems and challenges facing mass communication organizations, with particular emphasis on media management issues.

7005 Public Opinion and Public Affairs (3) Formation and development of public opinion; interaction of media organizations and public communication practitioners in building public support for ideas and policies.

7010 Seminar in Communication Literature (3) Basic issues and problems in mass communication as highlighted in relevant journals and books; journal articles and books of a classic nature.

7012 Survey Research Methods in Mass Communications (3) Design, development, execution, and analysis of public opinion surveys of mass communication problems; practical issues related to survey sampling, questionnaire construction and design, modes in interviewing, interviewer training, field control techniques, data processing, and analysis.

7014 Qualitative Research Methods in Mass Communication (3) Application of qualitative methods to mass communication research, creation of qualitative research design; exploration of the philosophy of science, theory construction and the core issues involved in conducting qualitative research.

7015 Mass Communication and Society (3) Roles of the mass media; responsibilities and rights of the communicator; interaction of mass media and society; media effects.

7016 International Mass Communication (3) How nations get their news; organization and operation of press associations, newspapers, magazines, radio, and television; impact of news and other media on social and political behavior.

7017 Media Industries and Behavior (3) How industry structures in various media influence decision making; effects of computerization and modern media behavior; economic performance in media and its effect on content.

7018 Legal Problems of the Mass Media (3) Specific legal problems affecting the mass media; basic principles of legal research methods.

7019 Media Systems: Policy and Technology (3) The impact of technology on the development of new types of entrepreneurship in media enterprises, especially new and emerging media systems.

7020 Basic Media Systems (3) Integration of traditional electronic media with new media systems: political, economic, and regulatory matters; cable television.
702 leaves Measurement techniques, concepts, and services. 702 leaves Development of layouts and storyboards; emphasis on organization's practice supervisor; consent of faculty intern coordinator; and permission from the school's associate dean for graduate studies. Written report containing a graduate research component is required. 7999 Special Topics in Communication (3) Prereq.: consent of instructor. May be taken for a max. of 9 hrs. Intensive advanced study, with reading and discussion, of topics in mass communication. 8000 The Research (1-12 per sem.) "S"/"U" grading. 8001 Professional Internship (3) Prereq.: skills and professional courses as specified in Manship Policy Statement. 10 hrs. simultaneous industrial publications; business news reporting for the daily newspapers. 3002 Feature Writing (3) Prereq.: MC 2010 and 3101 and permission of department. 1 hr. lab. Developing and writing feature stories, vignettes, and other human-interest material. 3003 HONORS: Feature Writing (Same as MC 3002, with special honors emphasis for qualified students). 3065 Photojournalism (3) Prereq.: "C" or better in MC 2010. Majors only. 2 hrs. lecture; 2 hrs. lab. Basic principles of photography and news writing and primary processing for economics, geography, and media's political communication; the role of the media in shaping public opinion and the influence of the audience on media content; impact on political attitudes and behaviors, especially voting. 4515 Case Studies in Media and Political Campaigns (3) Prereq.: Majors and minors only. Examination of political campaigns involving American media; the audience and message; developing media messages for political campaigns. 4520 Advanced Seminar in Political Communication (3) Prereq.: MC 3504 and MC 3505, or consent of instructor. Lectures, discussions and research on topics relevant to all aspects of political communication. Includes discussion of theoretical foundations of political communication; development of campaign strategies; and practical and ethical implications of political communication processes in democratic government. 4900 Research Projects in Mass Communication (3) Theory, development, and impact of propaganda as a controversial mass communication strategy for influencing public opinion. 7094 The News Media and Governance (3) News media influence on political actors, processes, and outcomes in American politics; public policy towards the news, strategic political communication, and influences of public officials and other political actors on the framing and structure of content. 7036 Seminar in Media and Public Affairs Theory (3) Advanced studies in the application of mass communication theory to public affairs and public policy cases, problems, and issues. 4270 News Production for the Internet (3) Prereq.: Majors only. Open to undergraduate and graduate students approved by the Manuscript School. 1 hr. lecture; 3 hrs. lab. Developing and producing electronic publications using converging media technology to create content for a new website. 4500 Advanced Journalism (3) Prereq.: MC 3101, 3102, and either 3103 or 3104 or permission of instructor. Majors only. 1 hr. lecture; 3 hrs. lab. Techniques of news presentation and production; application of advanced reporting techniques; production of laboratory newspaper; techniques of producing all aspects of a television news program, including videography, nonlinear video editing, producing a newscast and on-set news performance. 4720 Television Creative Projects (3) Prereq.: Majors only. "C" or better in MC 3105, and one of the following: MC 3031, 3031, 3101, 3102, 3503, 3506, and permission of the department. 1 hr. lecture; 3 hrs. lab. Master's students with projects requiring broadcast skills are encouraged to take this course. Techniques of television production for non-journalism projects; includes field production, nonlinear video editing, graphics and studio production. 7011 News Workers and Their Organizations (3) The impact of individuals and organizations on the selection and processing of news; examination of the influence of public affairs research on communicators and their organizations. POLITICAL COMMUNICATION 3504 Introduction to Political Communication (3) Prereq.: Majors and minors only. Introduction to theory and practice of political communication; role of media in political campaigns, pressure group communication, and policymaking; implications for media, politicians, and the public. 3505 Media and Policy Processes (3) Prereq.: Majors and minors only. Impact of the media on American politics through their interactions with political actors and involvement in the policy-making process; use of strategic political communication in government, and the media's role in spotlighting policy problems and suggesting policy solutions. 3506 Media, Politics, and the Public (3) Prereq.: Majors and minors only. Interaction among media, politics, and the public in American society; public opinion formation and the impact of the audience on media content; media impact on political attitudes and behaviors, especially voting. 4515 Case Studies in Media and Political Campaigns (3) Prereq.: Majors and minors only. Examination of political campaigns involving American media; the media's role in campaign strategy and the influence of the audience on media content; impact on political attitudes and behaviors, especially voting. 4520 Advanced Seminar in Political Communication (3) Prereq.: MC 3504 and MC 3505, or consent of instructor. Lectures, discussions and research on topics relevant to all aspects of political communication. Includes discussion of theoretical foundations of political communication; development of campaign strategies; and practical and ethical implications of political communication processes in democratic government. 4900 Research Projects in Mass Communication (3) Theory, development, and impact of propaganda as a controversial mass communication strategy for influencing public opinion. 7094 The News Media and Governance (3) News media influence on political actors, processes, and outcomes in American politics; public policy towards the news, strategic political communication, and influences of public officials and other political actors on the framing and structure of content. 7036 Seminar in Media and Public Affairs Theory (3) Advanced studies in the application of mass communication theory to public affairs and public policy cases, problems, and issues. 3000 Principles of Public Relations (3) Mass communication techniques, strategies and principles of the public relations function. 3010 Public Relations Practices (3) Prereq.: MC 2010 and MC 2015. Majors and minors only. History, theory, and current communication strategies in public relations. 4001 Public Relations Writing (3) Prereq.: MC 2235, 3015, or permission of instructor. 2 hrs. lecture; 2 hrs. lab. Developing and writing news releases, speeches, audio-visual scripts, feature stories, and other public relations communications. 4004 Digital Public Relations (3) Prereq.: MC 3015. Majors only. Theoretical concepts of public relations practice applied to solution of strategic business, institutional, and organizational problems.
4005 Public Relations Campaigns (3) V Prereq.: MC 3018, 4001, and 4004. Majors only. 2 hrs. lecture; 2 hrs. lab. Developing and implementing public relations communication campaigns; hands-on experience in designing and producing print and audio-visual materials for campaigns; emphasis on use of planning and evaluation techniques.

7006 Public Relations Strategies and Tactics (3) Formal and informal models, tasks, and techniques used to formulate and complete management activities of public relations and to function ethically in social systems.

7007 Public Relations Administration (3) Principles of public relations management and application of project research techniques; strategies of campaign setting; planning, organizing, staffing, leading, and controlling.

7008 Public Relations Programming and Production (3) Prereq.: MC 4111 or equivalent writing proficiency. 2 hrs. lecture; 2 hrs. lab. Writing public relations messages for print and broadcast; program proposals; practice in writing, graphic design; and layout of messages.

7013 Public Affairs Advertising Campaigns (3) The role mediated communication plays in defining/influencing/altering relationships among various stakeholders and interest groups, with emphasis on mass communication strategies used to formulate and execute public affairs programs.

7210 Public Communication Administration (3) Principles of public affairs, issues management, and political communication; application of research techniques in communication campaigns, strategies of campaign settings; planning, organizing, staffing, leading, and controlling communication campaigns in corporate and governmental settings.

---

**SEQUENCE OF MATHEMATICS COURSES NUMBERED BELOW 3000**

- **2065**
- **2057, 2058**
- **2090**
- **2085**
- **2025, 2030**

- **2203**
- **1154**
- **1552, 1553**
- **2020**

- **1202**
- **1441**
- **1550, 1551**

- **1201**
- **1023**
- **1022**
- **1431**

- **1021**
- **1100**
- **1029**

---

**MATHEMATICS • MATH**

General education courses are marked with stars (★).

No student may receive more than nine semester hours of credit in mathematics courses numbered below 1550, with the exception of students who are pursuing the elementary education degree and following the 12-hour sequence specified in that curriculum. No student who has already received credit for a mathematics course numbered 1550 or above may be registered in a mathematics course numbered below 1550, unless given special permission by the Department of Mathematics.

**0902 Preparation for College Mathematics II (3) Prereq.: MATH 0901 or placement by department. 3 hrs. lecture.** For students not prepared to take MATH 1009, 1015, or 1021. Not for degree credit. 3 sem. hrs. will be added to the degree program of any student taking this course. No student who has received credit for a mathematics course numbered 1000 or above may register for this course. Linear equations and inequalities, polynomials and factoring, algebraic fractions, operations on radical expressions, rational exponents, quadratic equations, graphing.

**1009 Mathematics for Prospective Elementary School Teachers I (3) V Prereq.: MATH 0902 or placement by department.** Offered by correspondence only. Logic; counting numbers, integers, rational numbers, real numbers; emphasis on field properties; set nomenclature and some number theory; units of measurement.

**1010 Mathematics for Prospective Elementary School Teachers II (3) V Prereq.: MATH 1009. Offered by correspondence only.** Continuation of MATH 1009. Measurement, informal geometry, systems of equations, introduction to probability and statistics.

**1015 Basic Mathematics and Applications (3) V Prereq.: MATH 0902 or placement by department. This course does not serve as a prerequisite for calculus. Credit will not be given for both this course and MATH 1021, 1022, or 1023. Offered by correspondence only. Basic mathematical skills of graphing, formulas for geometric measurement, systems of linear equations and inequalities, review of quadratic equations, logarithms and application to exponential growth and decay, triangle trigonometry and its application to geometry and measurements.**

★ **1021 College Algebra (3) F,S,Su Prereq.: MATH 0902 or placement by department. Credit will not be given for both this course and MATH 1015 or 1023. Quadratic equations, systems of linear equations, inequalities, functions, graphs, exponential and logarithmic functions, complex numbers, theory of equations.**

★ **1022 Plane Trigonometry (3) F,S,Su Prereq.: MATH 1021 or placement by department. Credit will not be given for both this course and MATH 1015 or 1023. 3 hrs. lecture; 1 hr. lab. Trigonometric functions and identities, inverse trigonometric functions, graphs, solving triangles and equations, complex numbers, polar coordinates.**

★ **1023 College Algebra and Trigonometry (5) F,S,Su Prereq.: placement by department or grade of “A” in MATH 0902. Credit will not be given for both this course and MATH 1015, 1021, or 1022. For qualified students, a replacement for MATH 1021 and 1022 as preparation for calculus.**
1025 Mathematics of Commerce (3) F,S PreReq.: MATH 1015 or 1021. Interest, discount, annuities, depreciation, and probability.

1029 Introduction to Contemporary Mathematics (3) F,S PreReq.: MATH 1001 or 1021. Primarily for students in liberal arts and social sciences. Mathematical approaches to contemporary problems, handling of data, and optimization using basic concepts from algebra, probability, and discrete mathematics.

1100 The Nature of Mathematics (3) F,S,Su PreReq.: MATH 1101. Not for science, engineering, or mathematics majors. For students who desire exposure to mathematics as a part of a liberal education. An honors course, MATH 1101, is also available. Logic; the algebra of logic; computers, and number systems; networks and combinations; probability and statistics.

1101 HONORS: The Nature of Mathematics (3) F PreReq.: a grade of "A" in MATH 1021 or consent of department. Same as MATH 1100, with special honors emphasis for qualified students. Logic; the algebra of logic; computers, and number systems; networks and combinations; probability and statistics; game theory; infinities; famous impossibilities and unsolved problems.

1201 Number Sense and Open-Ended Problem Solving (3) F,S,Su PreReq.: MATH 1021. Primarily for students in the elementary education curriculum. Cardinality and integers; decimal representation and the number line; exponents and logarithms; introduction to open-ended problem solving strategies; written communication of mathematics.

1202 Geometry, Reasoning, and Measurement (3) F,S,Su PreReq.: MATH 1201. Primarily for students in the elementary education Holmes curriculum. Synthetic and coordinate geometry; sequences and dimensional space; visualization and counting procedures; symmetries and tilings; history of geometry; written communication of mathematics.

1431 Calculus with Business and Economic Applications (3) F,S,Su PreReq.: MATH 1022. Credit will be given for only one of the following: MATH 1341, 1441, 1550. 3 hrs. lecture; 1 hr. lab. Differential and integral calculus of algebraic, logarithmic, and exponential functions; applications to business and economics, such as maximum-minimum problems, marginal analysis, and exponential growth models.

1435 Mathematics for Business Analysis (3) PreReq.: MATH 1431 or equivalent. Offered by correspondence only. Sets and counting; probability, including conditional probability, discrete and continuous random variables, variance, and normal distributions; matrices and echelon method for solving systems of equations; functions of several variables and partial derivatives.

1441 Calculus with Application to Technology (3) F,S PreReq.: MATH 1012 or 1022, or consent of department. Credit will be given for only one of the following: MATH 1341, 1441, 1550. Differentiation and integration of algebraic and trigonometric functions; application to business and economics, including maximum-minimum problems, marginal analysis, and exponential growth models.

1550 Analytic Geometry and Calculus I (5) F,S PreReq.: MATH 1022 or 1023 or consent of department. An honors course, MATH 1551, is also available. Credit will be given for only one of the following: MATH 1441, 1541, 1550. Analytic geometry, limits, derivatives, integrals, and applications.

1551 HONORS: Analytic Geometry and Calculus I (5) Same as MATH 1550, with special honors emphasis for qualified students. Credit will not be given for both this course and either MATH 1553 or MATH 1534. Techniques of integration, parameter equations, polar coordinates, infinite series, vectors in low dimensions; introduction to differential equations and partial derivatives.

1553 HONORS: Analytic Geometry and Calculus I (4) S PreReq.: MATH 1022 or 1023, or consent of department. An honors course, MATH 1551, is also available. Credit will be given for only one of the following: MATH 1441, 1550, 1551. Analytic geometry, limits, derivatives, integrals, and applications.

1554 Analytic Geometry and Calculus I (4) F PreReq.: MATH 1022. Credit will not be given for both this course and either MATH 1553 or MATH 1534. Techniques of integration, parameter equations, polar coordinates, infinite series, vectors in low dimensions; introduction to differential equations and partial derivatives.

1554 HONORS: Analytic Geometry and Calculus I (4) Same as MATH 1554, with special honors emphasis for qualified students. Credit will not be given for both this course and either MATH 1553 or MATH 1534. Techniques of integration, parameter equations, polar coordinates, infinite series, vectors in low dimensions; introduction to differential equations and partial derivatives.

1635 Further Calculus for Quantitative Analysis (5) PreReq.: MATH 1552. Credit will not be given for this course and either MATH 1553 or 2057. Selected topics in single-variable calculus, including related rates, Riemann sums, integral methods, elementary differential equations, infinite sequences and series; functions of several variables, including partial derivatives, least squares regression, Lagrange multipliers, double integrals; vectors in two and three dimensions; networks and combinations; probability and statistics.

2010 Inquiry Approaches to Math and Science Teaching (3) F PreReq.: MATH 1011 or 1021. Credit will not be given for both this course and MATH 1011. An inquiry-based course designed for in-service mathematics teacher in a local school, students will prepare and deliver middle school math lessons and/or develop lesson plans that incorporate appropriate use of technology.

2011 Inquiry-Based Math and Science Lesson Design (1) See BIOL 2111.

2020 Solving Discrete Problems (3) F,S PreReq.: MATH 1550. Logical reasoning, discrete probability, graph theory, and number theory.

2025 Integral Transforms and Their Applications (3) F PreReq.: MATH 1552 or equivalent. MATH 1550, or permission of instructor. Mathematical and structural techniques and structures selected from analysis; series of functions, Fourier series, Fourier integrals, and introduction to the theory of applications in differential equations and signal processing.

2030 Discrete Dynamical Systems (3) S PreReq.: MATH 1552 or permission of instructor. Dynamical systems with discrete time and in one spatial dimension; hyperbolicity; quadratic maps; chaos; structural stability; bifurcation theory; and higher dimensional systems.

2040 Fundamentals of Mathematics (3) PreReq.: MATH 1350. Introduction to techniques of mathematical proofs; sets, logic, relations and functions, induction, cardinality, and properties of real numbers.

2057 Multidimensional Calculus (3) F,S PreReq.: MATH 1552. Calculus of several variables will be given for only one of the following: MATH 2057, 2058, 2059.

2058 Elementary Differential Equations (3) F,S PreReq.: MATH 1552. Credit will be given for only one of the following: MATH 2057, 2058, 2059. Ordinary differential equations; emphasis on solving linear differential equations.

2070 Mathematical Methods in Engineering (4) F,S PreReq.: MATH 1552. Credit will be given for only one of the following: MATH 2057, 2058, 2059. Ordinary differential equations; Laplace transforms, linear algebra, and Fourier series; applications stressed.

2085 Linear Algebra (3) F,S PreReq.: MATH 1552, 1635 or 2040, or equivalent. An honors course, MATH 2090, is also available. Credit will not be given for both this course and MATH 2090. Systems of linear equations, vector spaces, linear transformations, matrices, determinants.

2086 HONORS: Linear Algebra (3) F,S PreReq.: MATH 2085, with special honors emphasis for qualified students.

2090 Elementary Differential Equations and Linear Algebra (4) F,S PreReq.: MATH 1552. Credit will be given for only one of the following: MATH 2057, 2058, 2059. Credit will not be given for both this course and MATH 2085, or equivalent.

2095 Discrete Dynamical Systems (3) F PreReq.: MATH 1552. Credit will be given for only one of the following: MATH 2057, 2058, 2059. Ordinarily differential equations; emphasis on solving linear differential equations.

2096 Advanced Calculus I (4) F,S PreReq.: MATH 2065, 2070, 2090. Credit will not be given for both this course and MATH 2085, or equivalent. Basic methods and techniques for solving optimization problems; n-dimensional geometry and convexity; classical and search optimization of functions of one and several variables; linear, nonlinear, and integer programming.

2097 Differential Equations (3) S PreReq.: MATH 2057 and 2085. Ordinary differential equations, with attention to theory.

2098 Advanced Calculus II (4) F PreReq.: MATH 2057 and 2085, or equivalent. Construction, development, and study of mathematical models for real situations; basic examples, model construction, Markov chain models for linear optimization, selected case studies.

2099 Optimization Theory and Applications (3) S PreReq.: MATH 2097 or MATH 2098, or equivalent. Optimization techniques for solving optimization problems; n-dimensional geometry and convexity; classical and search optimization of functions of one and several variables; linear, nonlinear, and integer programming.

2100 Vectors and Matrices (3) S PreReq.: MATH 2097 or MATH 2098, or equivalent. Vectors in n-dimensional space, differential calculus in n-dimensional space, vector spaces, linear transformations, matrices, determinants.

2130 Vectors and Matrices (3) F,S PreReq.: MATH 2097 or MATH 2098, or equivalent. Vectors in n-dimensional space, differential calculus in n-dimensional space, vector spaces, linear transformations, matrices, determinants.

2131 Vectors and Matrices (3) F,S PreReq.: MATH 2097 or MATH 2098, or equivalent. Vectors in n-dimensional space, differential calculus in n-dimensional space, vector spaces, linear transformations, matrices, determinants.
Mathematics

4039 Introduction to Topology (3) V Prereq: MATH 2057 and 2090, or equivalent. Examples and classification of two-dimensional manifolds, covering spaces, the Brouwer fixed-point theorem, and introduction to algebraic topology.

4050 Interest Theory (3) F Prereq: MATH 3355.
Measurement of interest (including accumulated and present value factors), annuities certain, yield rates, amortization schedules and sinking funds, and bonds and related securities.

Experimental design, sampling methods, nonparametric methods, hypothesis testing, and regression.

4058 Elementary Set Theory (3) S Prereq: MATH 2083 and 3355. Markov chains, Poisson process, and Brownian motion.

4065 Numerical Analysis I (3) F Prereq: MATH 2057.
Basic programming ability in Fortran, Pascal, or C.
Newton's method, Lagrange interpolation, least-squares approximation, orthogonal polynomials, numerical differentiation and integration, Gaussian elimination;

4066 Numerical Analysis II (3) S Prereq: MATH 4065 and one of the following: MATH 2065, 2070, 2090, 4027.
Numerical solutions of initial value problems and boundary value problems for ordinary and partial differential equations.

4135 Finite Dimensional Vector Spaces (3) S Prereq: MATH 2057 or 2083. Vector spaces, linear transformations, matrices, determinants, eigenvalues and eigenvectors, and various applications such as inner product space and canonical forms.

4158 Foundations of Mathematics (3) V Prereq: MATH 2057 or 2085 or equivalent. Sets, relations, function spaces, product spaces, order, and cardinality.

4171 Theory of Graphs (3) Prereq: MATH 2085 or consent of department. Topics selected from the theory of graphs and digraphs, trees, connectivity and traversability, planarity, colorability, network flows, matching theory, and applications.

4172 Combinatorics (3) F Prereq: MATH 2085 or equivalent. Topics selected from permutations and combinations, generating functions, inclusion-exclusion, Principle of Inclusion-Exclusion, Polya's theorem, graphs and digraphs, combinatorial designs, incidence matrices, partially ordered sets, matroids, finite geometries, Latin squares, difference sets, matching theory.

4190 Seminar in Combinatorics, Graph Theory, and Discrete Structures (1-3) Prereq: consent of department.
May be repeated for credit with consent of department.

4208 Abstract Algebra I (3) F Prereq: MATH 2085 or equivalent. Credit will not be given for both this course and MATH 4023.
Elementary properties of sets, relations, mappings, integers; groups; subgroups, normal subgroups, quotient groups, homomorphisms, automorphisms, and permutation groups; elementary properties of rings.

4208A Abstract Algebra II (3) S Prereq: MATH 4200 or equivalent. Ideals in rings, factorization in polynomial rings, unique factorization and Euclidean domains, field extensions, splitting fields, and Galois theory.

4325 Fourier Transforms (3) V Prereq: MATH 1552 and at least one from MATH 2075, 2085, 2070, 2083, 2090.
For students in physics, mathematics, and engineering. Fourier analysis on the real line, the integers, and finite cyclic groups; the fast Fourier transform; general introduction to modern applications and computational methods.

4349 Partial Differential Equations I (3) V Prereq: either MATH 2057, 2090, and knowledge of Laplace transforms; or MATH 2057, 2065, or 2070 and 2083. First-order partial differential equations and systems, canonical second-order linear equations, Green's functions, method of characteristics, properties of solutions, and applications.

4354 Special Functions (3) V Prereq: either MATH 2057 and 2090; or MATH 2057, 2085 or 2070 and 2085.
Sturm-Liouville problems, orthogonal functions (Bessel, Laguerre, Legendre, Hermite), orthogonal expansions including Fourier series, differential equations for Bessel, Legendre, and Hermite functions, gamma and beta functions, Chebyshev polynomials, and other topics.

4470 Error-Correcting Codes (3) V Prereq: MATH 2085 or 2090 or equivalent knowledge of linear algebra. Vector spaces over finite fields, basic properties of codes, examples of important codes (such as cyclic codes, Hamming codes, Bose-Chaudhuri-Hocquenghem codes), bounds on sizes and rates of codes, the weight enumerator polynomial, perfect codes, and other topics.

4780 History of Mathematics (3) V Prereq: MATH 2040, 2057, and 2085; students entering the course should have a firm sense of what constitutes a proof. This course will have substantial class discussion content; topics such as early Greek mathematics, from Euclid to Archimedes; algebra and number theory from Diophantus to the present; the calculus and the renewed emphasis on rigor and axiomatic foundations in the 19th and 20th centuries; interactions of mathematics with technology and the natural sciences; biographies of significant mathematicians.

4989 Senior Seminar for Mathematics Majors (3) S Prereq: junior or senior standing, approval of Department Chair, and completion of requirements for a mathematics major; for undergraduate credit only; under guidance of professor teaching the course, student will undertake several independent projects to write expository papers; oral presentations will follow preparation of written papers.

4999 Selected Readings in Mathematics (1-3) Prereq: consent of department. May be taken for a max. of 9 sem. hrs. credit.

314
and control volumes; thermodynamic properties of simple substances and 2nd law; pulse refrigeration cycles; ideal gas mixtures, water-vapor mixtures and psychrometric chart; combustion.

2533 Introduction to Engineering Computation (3) 2 hrs. lect.; 3 hrs. lab. See CSC 2531.

2733 Materials of Engineering for Mechanical Engineers (3) Prereq.: CHEM 1202 and credit or registration in PHYS 2102. Credit will not be given for both CHEM 2533 and 2733.

2735 Classification and study of engineering materials, their structure, properties, and behavior; typical metals and alloys, plastics and rubber, and ceramic materials; phase equilibria and manipulation of properties and behavior by adjustment of composition and processing variables; responses of engineering materials to stress and environmental variables; emphasis on Mechanical Engineering applications such as fracture and heat treatment processes.

2733 Materials of Engineering (3) Prereq.: CHEM 1201 and credit or registration in PHYS 2102. Not open to Mechanical Engineering majors. Credit will not be given for both ME 2723 and ME 2733.

3249, 3250 Engineering Practice (1-3,1-3) Sr. Prerequisites: Sr. standing in the College of Engineering. 2 hrs. lecture; 3 hrs. lab.

3271 Instrumentation and Measurement (3) Prereq.: EE 3950, ME 3143, and proficiency in English as required by the College of Engineering. 2 hrs. lecture; 3 hrs. lab.

3394 Fluid Mechanics (4) Prereq.: ME 2334, and credit or registration in CE 3400. Analysis of mechanical and other properties of engineering materials required for material selection; advanced engineering materials in mechanical engineering; applications and problems in processing and shaping; materials in selected mechanical systems.

3834 Fluid Mechanics (4) Prereq.: ME 2334, 3133; and a grade of "C" or better in PHYS 2102. Introduction to kinematics, and dynamics of continuum liquids and gases; conservation laws (mass, momentum, energy); integral analysis and dimensional analysis and similarity; internal and external viscous flows; compressible flows.

3900 Special Projects for Undergraduates (3) Prereq.: 2.5 cumulative GPA or equivalent; credit or registration in ME 3900.

4000 Mathematical Methods in Engineering (3) See MATH 3013.

4133 Machine Design I: Kinematics of Machinery (3) Prereq.: ME 2212, 2253, or equivalent. Kinematic and dynamic analysis and synthesis of mechanisms.

4143 Mechanical Vibrations (3) Prereq.: CE 3400, ME 3143, 3453, and a grade of "C" or better in MATH 2900; or equivalent. Basic principles of oscillating mechanical systems; single and multiple degrees of freedom; dynamic balancing; applications to mechanical systems; continuous systems vibration analysis.

4153 Kinematic Synthesis of Mechanisms (3) S Prereq.: ME 4143 or equivalent. Three-dimensional mechanisms; emphasis on computer solution methods.

4163 Intermediate Dynamics (3) F Prereq.: ME 4133 and a grade of "C" or better in MATH 2900. Rotating reference frames, rigid body kinematics in three dimensions, central force motion, variable mass problems, and Lagrange's equations.

4183 Electrical and Electronic Control Systems (3) F Prereq.: grade of "C" or better in MATH 2900. Basic principles, concepts, characteristics, and performance of linear feedback control systems; stability of linear systems; frequency response methods; compensator design in the frequency domain.

4201 Mechanical Engineering Design Laboratory I (1) Prereq.: credit registration or equivalent. 8 hrs. lab. Experiments involving basic concepts in machine design.

4202 Mechanical Engineering Capstone Design I (2) Prereq.: ME 3633, 3752, grade of "C" or better in MATH 3603. Principles from heat transfer, thermodynamics, design, fluids, and materials courses utilized to complete the project set forth in the preliminary design outline submitted in ME 4243.

4243 Mechanical Engineering Design Component I (3) Prereq.: ECON 2010, 2334, 3710 or equivalent. 2 hrs. lecture; 2 hrs. lab. Design project will be selected and approved (to be completed in ME 2042); project feasibility study and outline of the design project will be completed; design methodology, optimization, product reliability and liability, economics, use of ASME codes, and professional ethics.

4402 Machine Design II: Strength Considerations and Component Design (4) S Prereq.: CE 3400 and credit or registration in ME 4143. Design, three-dimensional stress analysis; deflection and stiffness; static and dynamic loading; failure theories and fatigue; fasteners; welded joints; mechanical connections; bearing; gears; shafts; clutches; brakes and couplings; belts and pulleys.

4423 Manufacturing Processes & Methods (3) Prereq.: CM 1020 or 1030, and ME 2723 or 2773. 2 hrs. lecture; 3 hrs. lab. Modern manufacturing processes integrated into total manufacturing systems; CAD/CAM flexible manufacturing operations; metal casting, forming, removal; welding processes and machinery; fine measurement, inspection, and quality control.

4723 Advanced Engineering Thermodynamics (3) S Prereq.: ME 2334 or equivalent. Postbaccalaureate treatment of laws of thermodynamics; equilibrium and maximum entropy postulates; development of formal relationships; principles and application to general systems.

4733 Deformation and Fracture of Engineering Materials (3) F Prereq.: CE 3400 and either ME 2723 or equivalent. Effect of temperature, strain rate, corrosion, and microstructure on stress-strain behavior and fracture of engineering materials, including metals, ceramics, and plastics.

4745 Kinetics in Materials Processes (3) Prereq.: ME 2723, ME 2734 or equivalent. Applications of the principles of diffusion, phase transformation, and thermodynamics to describe the kinetics of micro structural evolution in engineering materials.

4763 Fundamentals of Corrosion Science and Engineering (3) F Prereq.: ME 2734 or equivalent, and any first course in thermodynamics. Basic corrosion principles: polarization, passivation, inhibition, and other phenomena: principal methods used in corrosion prevention.

4983 Composite Materials: Manufacturing, Properties, and Design (3) Prereq.: ME 2734 or equivalent. Constituent materials, micro- and macromechanics, mechanical behavior, fracture, manufacturing and design of components made from these materials, including polymer, ceramic, and metal matrix materials.

4984 Interdisciplinary Fluid Dynamics: Physical Concepts (3) Prereq.: Diff. Equations and Introductory Physics. Also offered as CSC 4645. An introduction to fluid dynamics from a multi-disciplinary perspective, emphasizing theoretical, mathematical and physical concepts of fluid flows, and their application to a range of physical scales and disciplines.

Parallel computations.

Gas Dynamics (Prereq.: ME 2334; a grade of "C" or better in ME 2808; or equivalent. Derivation and review of basic equations of compressible fluid flow; reduction of the general problem to 1-D flow; 1-D flow in nozzles with and without friction; 1-D flow with heat addition; normal shock wave, Prandtl-Meyer turn, and oblique shock waves.

Turbomachinery (Prereq.: ME 2334, 3834, and 4343. Preliminary design of axial- and radial-flow pumps, compressors, and turbines; determination of optimum flow angles and dimensions, blade design, blade selection, and performance prediction.

Advanced Topics in Mechanical Engineering (3) May be taken for a max. of 6 hrs. of credit when topics vary. Two sections may be taken concurrently.

Special Problems in Aerospace Engineering (3) Prereq.: senior standing in mechanical engineering or related discipline. May be taken for a max. of 12 hrs. of credit when topics vary. Aeronautical problems of special interest in the analysis and design of water, land, air, and space transportation systems.

Advanced Vibrations (3) Prereq.: ME 4143 or equivalent. Advanced theory of continuous mechanical systems; inverse problems in vibration; active vibration control; dynamic absorption; wave propagation and reflection; numerical methods for continuous systems.

Advanced Machine Design (3) Prereq.: ME 4244 or equivalent.

Bearing Design and Lubrication (3) Prereq.: consent of instructor. Derivation of fluid flow in bearings; principles of hydrodynamics lubrication and application to journal and thrust bearings; effect of environment on type of lubrication systems and lubricants; heat generation in bearing and bearing transfer; compressible fluid and solid lubricants.

Computer-Aided Geometric Modeling (3) (S) Prereq.: ME 4573 or equivalent. Mathematical elements of modeling compound surface geometry in two and three dimensions for design, analysis, and display; wireframe, surface, and solid geometric modeling; computer graphics and algebra; computational, and projective geometry.

Advanced Heat Transfer I (3) F Prereq.: MATH 3038 or equivalent. Steady and transient heat conduction.

Advanced Heat Transfer II (3) F Prereq.: ME 7843 or equivalent. Prereq.: ME 7843 or equivalent. Co-turbulent flow.

Advanced Heat Transfer III (3) S Prereq.: consent of instructor. Radiation heat transfer and advanced topics.


Advanced Experimental Methods (3) S Prereq.: consent of instructor. 2 hrs. lecture; 3 hrs. lab. Applied course in contemporary analog and digital laboratory tools and techniques.

Advanced Engineering System Dynamics (3) Prereq.: ME 4183 or equivalent. Dynamic system modeling; bond graphs; state-determined systems; simulation; controllability/observability.

Advanced System Modeling (3) Prereq.: ME 7633 or equivalent. Mathematical models and dynamic behaviors of engineering systems in multi-energy domains; bond-graph modeling methods, simulations using contemporary software.

Advanced Mechanical Systems Control (3) Prereq.: ME 4183 or equivalent. Design and analysis of nonlinear control systems; adaptive and robust control techniques; state-space theory; control and stability of distributed parameter systems.

Materials Characterization Using Electron Beam Methods (3) Conal course. ME 2753, 2 hrs. lecture; 3 hrs. lab. Theory and principles of electron optics, electron microscopy, and spectroscopy; preparation, observation, and characterization of materials by electron beams.

Flow and Structure in Solids (3) Prereq.: CE 4440 or equivalent. Plastic deformation of single crystals and polycrystalline aggregates; theories of ductile and brittle fracture; internal friction and stress rupture; residual stresses; plastic forming of metals.


Thermodynamics of Solid Materials (3) Prereq.: ME 2733 and any first level course in Thermodynamics. Review of first and second laws of thermodynamics; material properties; vibrational equilibrium in reactions; solid solutions and phase diagram enumeration; reaction kinetics and non-equilibrium thermodynamics.

Advanced Corrosion Science and Engineering (3) S Prereq.: ME 4783 or equivalent. Corrosion topics in coal; corrosion; stress corrosion, high temperature corrosion, hydrogen embrittlement, etc.; thermodynamics of surfaces and corrosion.

Computation of Boundary Layer Flows and Heat Transfer (3) Prereq.: ME 3834 and 4433 or equivalent. Finite-difference methods for the solution of parabolic or boundary layer equations; use of a computer program for two-dimensional boundary layers; wall boundary layers, jets and wakes, flows in pipes, annuli, nozzles, and diffusers.

Computation of Fluid Flow and Heat Transfer (3) Prereq.: ME 3834, 4433 and ME 4533, or equivalent. Finite-difference methods for solving equations of fluid motions and energy; computer program used to solve complex problems involving fluid flow, heat transfer, and chemical reaction; material properties; turbulence, radiation, and combustion; their computing implications; application of prediction procedures for practical situations.

Inviscid Fluid Flow (3) S Prereq.: ME 7843 or equivalent. Potential gas; multi-dimensional compressible flow; computational gas dynamics.

Viscous Fluid Flow (3) S Prereq.: ME 7843 or equivalent. Navier-Stokes equations; Stokes and Oseen approximations for low Reynolds number flows; incompressible laminar boundary layer theory; transition; turbulent boundary layers, compressibility effects, and numerical methods.

Advanced Boundary Layer Theory (3) S Prereq.: ME 7781 or equivalent. NonNewtonian and turbulent fluid mechanics.

Fluid Dynamics (3) F Prereq.: credit or registration in MATH 4038 or equivalent. Fluid dynamics as continuum mechanics; potential flow using complex variables in two dimensions and superposition in three dimensions; viscous flow and Navier-Stokes equations; compressible flow, including shock waves, shocks, and linearized aerodynamics.

Seminar (1) (F,S,Prereq.: ME 7781 or equivalent. Steady and transient heat conduction.

Electrical Engineering System Dynamics (3) Prereq.: ME 7633 or equivalent. Mathematical models and dynamic behaviors of engineering systems in multi-energy domains; bond-graph modeling methods, simulations using contemporary software.

General education courses are marked with *.
introduction to the planning, delivery, and dosimetric aspects of advanced radiation therapy treatments such as brachytherapy, stereotactic radiosurgery, total skin electron therapy, intensity modulated radiotherapy, and image guidance. It also introduces the advanced physical techniques of accelerator quality assurance and radiation therapy shielding design.

7331 Radiation Therapy Physics (3) S Prereq.: MEDP 4311, 1.5 hrs. lab. Basic principles of radiation biology, physical effects of radiation, and quality assurance for external beam therapy (photons and electrons) and internal brachytherapy.

7530 Radiation Shielding (2) S Prereq.: MEDP 4351, 7337. Calculation of source term, geometric transformations, and attenuating factors associated with photon, neutron, and charged particle shielding; calculation of dose and dose equivalents; current governmental regulations and professional recommendations for shielding; shielding design for medical radiation facilities.

7537 Radiation Interactions and Transport (3) F Prereq.: PHYS 2203 or equivalent, CSC 2202 or equivalent experience in computer programming. Also offered as PHYS 7537. Photon, neutron, and electron interactions and energy deposition, the Boltzman equation, elementary analytical solutions; deterministic computer methods including spherical harmonics and discrete ordinates techniques; continue slowing down and Fokker-Planck approximations.

7538 Monte Carlo Simulation of Radiation Transport (3) S Prereq.: consent of instructor; CSC 2262 or equivalent experience in computer programming. Also offered as PHYS 7538. Radiation transport simulation by the Monte Carlo method; phase-space tracking; dose response estimators, biasing methods; integral form of the Boltzmann equation; condensed-history method for charged particles; neutron, photon, and electron transport calculations for shielding and medical physics applications.

7991 Advanced Projects in Medical Physics and Health Physics (1-3) Prereq.: MEDP 4111 or 7331 and consent of instructor. May be taken for a max. of 6 hrs. credit. Medical physics or health physics projects that study particular aspects of radiation therapy, medical imaging, or medical health physics.

7992 Advanced Topics in Medical Physics and Health Physics (1-3) Prereq.: consent of instructor. May be taken for a max. of 8 sem. hrs. of credit when topics vary. Advanced treatment of a specific area of medical physics or health physics technology of current interest.

7995 Seminar (1) F Prereq. Every semester for degree candidates in medical physics and health physics. Only 1 sem. hr. credit may be counted toward degree.

7999 Report Investigation (1-6) Prereq.: MEDP 4111 or 7331 and consent of instructor. May be taken for a max. of 12 sem. hrs. credit. Detailed investigation of a research problem or a technical design project.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

MILITARY SCIENCE • MILS

None or military science courses are designated by the course number. Students may be required to take military science courses as part of their majors.

1010 and 1011 Physical Training (1 hr. lab.) Restricted to freshmen and sophomores or permission of instructor. Rifle and pistol safety; training techniques; zeroing; physical and mental conditioning; sightig and aiming; standard firing positions; practical application on indoor firing range.

1011 Leadership and Personal Development (1) F, S, F/4 hrs. lecture; 1.5 hrs. lab. Introduction to the personal challenges and competencies critical for effective leadership. Focus on developing basic knowledge and comprehension of Army leadership dimensions while gaining an understanding of the Army Officer Candidate program, its purpose in the Army, and its advantages for students.

1012 Intro to Tactical Leadership (1) F, S Prereq.: MILS 1011 or permission of instructor. 1 hr. lecture; 1.5 hrs. lab. Overview of the history, strategies, and tactical developments. Open to all LSU students. May be taken for a max. of 8 sem. hrs. of credit. Development of leadership, stamina, agility, coordination, and flexibility through a combined program of group and individual exercise.

2161 Innovative Team Leadership (2) F, S Prereq.: MILS 1011 and permission of instructor; 2 hrs. lecture; 1.5 hrs. lab. Explores the dynamics of creative and innovative tactical leadership strategies and styles by studying history and current case studies and engaging in interactive student exercises.

2162 Foundations of Tactical Leadership (2) F, S Prereq.: MILS 2161 or permission of instructor; 2 hrs. lecture; 1.5 hrs. lab. Examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). Studies the benefit of the Army leadership framework and the dynamics of adaptive leadership in the context of military operations.

2001 Advanced Tactical Leadership (4) F Prereq.: MILS 2161 and 2162 or equivalent. 3 hrs. lecture; 3 hrs. lab. Study, practice, and evaluation of adaptive team leadership skills as presented with the demands of the ROTC Leader Development and Assessment Course (LDAC). Challenging scenarios related to small unit tactical operations are used to develop self-awareness and creative thinking skills.

3012 Leadership in Changing Environments (4) S Prereq.: MILS 3011. 3 hrs. lecture; 3 hrs. lab. Integrates the principles and practices of effective leadership, military operations and personal development, in order to adequately prepare for the summer Leadership Development Advanced Course (LDAC).

3013 ROTC Advanced Camp (3) S Prereq.: MILS 3011 and 3012. To receive academic credit, student must enroll in summer session prior to departure for Advanced Camp. Five week course conducted at an Army post with instructors and cadets representing ROTC programs from the United States, Puerto Rico, and Guam. Intense leadership development and training in military skills; written and oral orders, light infantry tactics and weapons systems, and confidence building events.

4011 Developing Adaptive Leaders (4) F, S Prereq.: MILS 4012 or equivalent. 3 hrs. lecture; 3 hrs. lab. Not for graduate credit. Senior standing required. Development of proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff and providing performance feedback to subordinates. Lessons on military justice and personnel processes prepare students to make the transition to becoming an Army officer.

4012 Leadership in a Complex World (4) S Prereq.: MILS 4011. 3 hrs. lecture; 3 hrs. lab. Not for graduate credit. Senior standing required. Explores the dynamics of leading in the complex situations of current military operations in the Contemporary Operating Environment (COE). Case studies, scenarios, and exercises are also used to prepare students to face the complex ethical and practical demand of leading as a commissioned officer in the U.S. Army.

4055 Civil War I (3) See HIST 4055.

4066 Military History of the United States (3) See HIST 4066.

4130 World War II (3) See HIST 4130.

4995 Special Topics in Military History (3) May be taken for a max. of 4 sem. hrs. of credit when topics vary.

MUSIC • MUS

Applied Music and Ensemble Courses

Admission to applied music courses is by audition only. Secondary and primary applied courses, MUS 2110-2154 and 3130-3134, are offered for 2 or 3 credits. Students who elect 2 credits will receive 30 minutes of individual instruction per week; students who elect 3 credits will receive 60 minutes of individual instruction per week. Graduate applied courses are offered for 2-6 credits.

All applied music and ensemble courses may be repeated for credit every semester.

APPLIED MUSIC COURSES

All students registering for 2130-54 and 3130-54 may be required to participate concurrently in one of the following major performing organizations: MUS 4232, 4233, 4234, 4235, 4236, 4250, 4251, 4252, 4253, 4254, or 4256.

Secondary Applied Music Courses

These courses are designed for students who are not qualified to either major or minor in the specific instrument designated by the course number.

2130 Secondary Voice (2-3)

2131 Secondary Piano (2-3)

2132 Secondary Violin (2-3)

2133 Secondary Organ (2-3)

2134 Secondary Harp (2-3)

2135 Secondary Violin (2-3)

2136 Secondary Viola (2-3)

2137 Secondary Cello (2-3)

2138 Secondary String Bass (2-3)

2139 Secondary Flute (2-3)

2140 Secondary Oboe (2-3)

2141 Secondary Clarinet (2-3)

2142 Secondary Saxophone (2-3)

2143 Secondary Bassoon (2-3)

2144 Secondary Trompet (2-3)

2145 Secondary French Horn (2-3)

2146 Secondary Euphonium (2-3)

2147 Secondary Trombone (2-3)

2148 Secondary Tuba (2-3)

2149 Secondary Percussion (2-3)

2151 Secondary Composition (2-3)

2152 Secondary Guitar (2-3)

2153 Secondary Electroacoustic Composition (2-3)

2154 Secondary Jazz Study (2-3)

Primary Applied Music Courses

These courses are for students whose declared major or minor is the specific instrument designated by the course number.

3130 Primary Voice (2-3)

3131 Primary Piano (2-3)

3132 Primary Harpsichord (2-3)

3133 Primary Organ (2-3)

3134 Primary Harp (2-3)

3135 Primary Violin (2-3)

3136 Primary Viola (2-3)

3137 Primary Cello (2-3)

3138 Primary String Bass (2-3)

3139 Primary Flute (2-3)

3140 Primary Oboe (2-3)

3141 Primary Clarinet (2-3)

3142 Primary Saxophone (2-3)

3143 Primary Bassoon (2-3)

3144 Primary Trumpet (2-3)

3145 Primary French Horn (2-3)

3146 Primary Euphonium (2-3)

3147 Primary Trombone (2-3)

3148 Primary Tuba (2-3)

3149 Primary Percussion (2-3)

3151 Primary Composition (2-3)

3152 Primary Guitar (2-3)

3153 Primary Electroacoustic Composition (2-3)

3154 Primary Jazz (2-3)

Graduate Applied Music Courses

7030 Graduate Voice (2-6)

7031 Graduate Piano (2-6)

7032 Graduate Harpsichord (2-6)

7033 Graduate Organ (2-6)

7034 Graduate Harp (2-6)

7035 Graduate Violin (2-6)

7036 Graduate Viola (2-6)

7037 Graduate Cello (2-6)

7038 Graduate String Bass (2-6)

7039 Graduate Flute (2-6)

7040 Graduate Oboe (2-6)

7041 Graduate Clarinet (2-6)

7042 Graduate Saxophone (2-6)

7043 Graduate Bassoon (2-6)

7044 Graduate Trumpet (2-6)

7045 Graduate French Horn (2-6)

7046 Graduate Euphonium (2-6)

7047 Graduate Trombone (2-6)
ENGLISH COURSES

 Admission to ensemble courses is by audition only, with the exception of 4232, 4233, and 4234. These courses are open to all students, including freshmen and sophomores. Courses marked with an asterisk (*) will satisfy the major ensemble requirement.

4220 Piano Ensemble (1) May be repeated for a max. of 2 sem. hrs. for degree credit.
4221 Vocal Chamber Music (1)
4222 Woodwind Chamber Music (1)
4223 Brass Chamber Music (1)
4224 String (or Piano and Strings) Chamber Music (1)
4225 Collegium Musicum (1)
4226 Percussion Ensemble (1)
4227 Marimba Ensemble (1)
4228 Contemporary Music Ensemble (1)
4229 Harp Ensemble (1)
4230 Gospel Choir (1)
4231 Swing Choir (1)*
4232 Men's Choir (1)*
4233 Women's Choir (1)*
4234 University Choir (8-1)
4235 Chamber Choir (1)*
4236 A Cappella Choir (1)*
4240 Opera Choir (1)*
42420 Tiger Marching Band (1)
42451 Wind Ensemble (0-1)
42452 Symphonic Band (0-1)
42453 Jazz Band (1)
42454 Symphonic Winds (0-1)
42455 Chamber Jazz (1)
4260 Philharmonia (1)*
4261 Symphony Orchestra (0-1)*

GENERAL COURSES

General education courses are marked with stars (*)

1001, 1002 Voice Class (2-2) Open to nonmusic majors with consent of instructor. Group instruction in voice production.
1010 In Concert (1) 2 hrs. lab. May be taken for a max. of 3 hrs. of credit. An elective course open to all University students; designed to develop proper audience etiquette and to expose students to a wide variety of music performances.
1018 Diction for Singers I (1) 2 hr. lab. Entry level course covering pronunciation of Latin and Italian for singing. Utilizing the International Phonetic Alphabet, pronunciation concepts will be supported by repetition and performance of representative song repertoire. Required of all vocal music education and voice performance majors.
1019 Diction for Singers II (1) 2 hr. lab. Entry level course covering pronunciation of German and French for singing. Utilizing the International Phonetic Alphabet, pronunciation concepts will be supported by repetition and performance of representative song repertoire. Required of all vocal music education and voice performance majors.
1026 Performance Craft for Singers (1) Preparatory for MUS 4240. May be taken for a max. of 2 hrs. of credit. Required of all voice performance majors. Workshop exploring performing artistry for the singer through individual coaching and class exercises such as movement, dance, and improvisation; stage turns, stage deportment, and stage etiquette; performance anxiety.
1108, 1109 Piano Class (2,2) MUS 1108 or consent of instructor is prerequisite for 1109. Open only to nonmusic majors. Instruction for the beginner and lower intermediate student.
1130, 1131, 1132, 1132 Group Piano I, II, III, IV (1 each) Open only to music majors. Required of all non-keyboard music majors who do not meet proficiency requirements. Fundamental skills in piano, including notation, reading, and fingerings.
1700 Recital Hour (0) May be repeated. Pass/fail grading. Weekly student recital and music seminar.
1731, 1732 Introduction to Music Study I, II (4, 4) 3 hrs. lecture; 2 hrs. lab. Forte: grade of "C" or better in 1731 required for registration in 1732. Fundamental elements of music from historical, cultural, and theoretical perspectives; development of skills in reading, notation, and listening to music; cultivation of studying and writing skills.
1733 HONORS: Introduction to Music Study II (4) Same as MUS 1732, with special honors emphasis for qualified students.
1751 Music Appreciation (3) Primarily for nonmusic majors. Credit will not be given for this course and MUS 1755. The art of music, with emphasis on listening skills; a nontechnical approach to understanding vocabulary and materials of music; correlation of musical literature with other disciplines in the humanities.
1755 HONORS: Music Appreciation (3) Primarily for qualified students not majoring in music. Credit will not be given for this course and MUS 1751 or 1752. Study of the musical art emphasizing the development of critical listening skills and a non-technical, but thoroughly musical vocabulary; additional emphasis placed on the historical correlation of both verbal and art music to corresponding developments in the other fine arts disciplines.
1799 Rudiments of Music (3) Not open to music majors. The grammar of music, including basic notation and elementary construction leading to a study of tonal harmony.
1800 Technology in Music Education (2) Music majors only. Introduction to the uses of technology in school music programs; includes discussion of the role and application of technology in K-12 school music settings.
1800 History of Jazz (3) Open to nonmusic majors. Survey of the evolution of jazz and jazz styles.
2012 Diction for Singers III (1) Required of all voice performance majors. Advanced study of phonetics and pronunciation for German and French songs; utilizing the International Phonetic Alphabet; pronunciation concepts supported by repetition and performance of representative song repertoire.
2019 Diction for Singers IV (1) 1 hr. lecture; 1 hr. lab. The phonetic alphabet and French diction.
2053 Survey of Music History I (3) Prereq.: grade of "C" or better in MUS 1732 or 1733. Music of Western Civilization to ca. 1750.
2054 Survey of Music History II (3) Prereq.: grade of "C" or better in MUS 1732 or 1733. Music of Western Civilization from ca. 1750 to the present.
2170 Music Education in the Elementary School I (3) Music fundamentals, materials, methods, and skills involved in teaching general music in the elementary school.
2175 Beginning Folk Music (3) Beginning level performance class; emphasis on literature and techniques used in the performance of folk music; basic music theory analysis.
2300 Instrumental and Vocal Techniques (1-2) May be repeated for credit. For prospective secondary school teachers of music. 2 hrs. lecture; 1 hr. lab. Woodwind and brass techniques for instrumental majors, and instrumental and choral techniques for vocal majors each may be taken for 2 hrs. of credit; percussion, strings, and voice for instrumental majors may be taken for 1 hr. of credit only. Development of fundamental skills in wind, string, and percussion instruments and voice.
2400 Jazz Fundamentals for Teachers (1) For music education majors only. Basic jazz techniques and concepts necessary for jazz ensemble and jazz combo instruction in secondary school settings.
2731, 2732 Music Theory I, II (4,4) Prereq.: grade of "C" or better in MUS 2731; grade of "C" or better in MUS 2732 is prerequisite for MUS 2733. 3 hrs. lecture; 2 hrs. lab. Basic tonal harmony and voice leading; fingerboard, structure, analysis of music form and genre; sight-singing and keyboard harmony skills, melodic and harmonic dictation.
2733, 2734 HONORS: Music Theory I, II (4,4) Same as MUS 2731, 2732, with special honors emphasis for qualified students.
2741 Composition Techniques I (2-3) Prereq.: permission of instructor. May be taken for a max. of 9 sem. hrs. of credit. Development of basic skills in composition; analysis and audition of selected scores.
2751 Jazz Improvisation II (2) Prereq.: MUS 2732 or equivalent. Introductory performance course in jazz improvisation; emphasis on its theoretical basis.
2752 Jazz Improvisation III (2) Prereq.: MUS 2731 or sight-reading. Continuation of MUS 2751.
3000 HONORS in Music (1-4) Prereq.: junior standing. May be taken for a max. of 6 sem. hrs. of credit. Preparation of an honors project.
3018 Vocal Pedagogy (3) Prereq.: 12 sem. hrs. of applied voice study. Principles and processes of voice production; psychology of teaching and studying singing; beginning comparative pedagogy; vocal repertoire for the beginning singer.
3020 American Musical Theatre (3) See THTR 3020.
3334, 3335 Group Piano V, VI (1,1) 2 hrs. lab. Functional keyboard skills for rehearsing and accompanying vocal ensembles and soloists; includes sight-reading, score reading, accompanying, playing vocal warm-up, and vocal coaching within vocal ensembles.
3703 Theory Survey (2) Admission by placement examination. 2 hrs. lecture; 1 hr. lab. Written aspects of theory.
3704 Theory Survey: Aural Skills (1) Admission by placement examination. 2 hrs. lab. Dictation and sight singing.
3710 Overview of Western Music History (3) Survey of Western classical music from the Middle Ages to the present day.
3731, 3732 Music Theory III, IV (3,3) Prereq.: grade of "C" or better in MUS 2732 is prerequisite for MUS 3731; grade of "C" or better in MUS 3731 is prerequisite for MUS 3732. Advanced tonal harmony; continued form and genre study; post-tonal compositional techniques; basic scoring and score reading; continued mastery of relevant musicianship skills.
3745 Introduction to Computer Music (3) Introduction to techniques and technologies in computer music; principles of digital audio, sound design, music synthesis, signal processing, and sound art composition.
3749 Choral Literature and Conducting I (1) 2 hr. lecture. 2 hrs. lab. Elements of conducting choral groups.
3750 Choral Literature and Conducting II (2) Prereq.: MUS 3749 or equivalent. 1 hr. lecture, 2 hrs. lab. Continuation of MUS 3749.
3757, 3758 Organ Literature, History, and Design (3,3) MUS 3757 is prerequisite for MUS 3758. Evolution and development of the organ and its literature through the development of keyboard (organ) forms, techniques, and idiomatic styles; organ mechanism and action; tonal structure; design problems.
3771 Instrumental Conducting I (2) Elements of conducting instrumental groups.
3772 Instrumental Conducting II (2) Prereq.: MUS 3771 or equivalent. 1 hr. lecture; 2 hrs. lab. Continuation of MUS 3771.
3997 Directed Studies in Music (1-3) Prereq.: content of departmental faculty concerned and dean of the School of Music. May be taken for a max. of 6 sem. hrs. of credit. MUS 3997 cannot be used in lieu of a required course in any School of Music curriculum.
4000 Music Workshops (1-3) Su only May be repeated for credit when topics vary. Topics announced at the beginning of the semester.
4005 Fundamentals of Musical Theatre Singing: Technique and Repertoire (1) Prereq.: permission of instructor. May be taken for a max. of 2 hrs. of credit. Fundamentals of musical theatre style singing and repertoire; emphasis on vocal and stage performance of literature appropriate to the singer.
4020 Introduction to the Alexander Technique (1) 2 hrs. lab. Employing the basic principles of the Alexander Technique; students will begin the process of psycho-physical re-education through exercise and controlled breathing exercises and hands-on work with the instructor.
4030 Meditation for Performers (1) 2 hrs. lab. Not for graduate credit. Pass/fail grading. Exploration of the various traditions, techniques, and objectives of meditation as they apply to the practice of music.
4101 Piano Accompanying (1) Open to pianists by permission of instructor. May be repeated for a maximum of 4 sem. hrs. of credit. Individual projects in principles and practical applications of accompanying.

4120 Reed Making for Double Reed Majors (1) 1 hr. lab. Recommended for all double reed and brass majors. May be taken for a maximum of 8 sem. hrs. but with a maximum of 2 hrs. credit toward any degree. Principles of double-reed making with emphasis on individual skill and application of reed making and finishing.

4124 String Literature (2) Prereq.: 12 sem. hrs. of applied string instrument study or consent of instructor. May be repeated once. Independent study in solo and ensemble literature for stringed instruments.

4126 Woodwind Literature (2) Prereq.: 12 sem. hrs. of applied wind instrument study or consent of instructor. May be repeated once. Independent study in solo and ensemble literature for woodwind instruments.

4128 Brass Literature and Pedagogy (2) Prereq.: 12 sem. hrs. of applied brass instrument study or consent of instructor. May be repeated once. Independent study in solo and ensemble literature and methods and materials for instruction in brass instruments.

4130 Percussion Literature and Pedagogy (2) Prereq.: 12 sem. hrs. of applied percussion instrument study or consent of instructor. May be repeated once. Independent study in solo and ensemble literature and methods and materials for instruction in percussion instruments.

4172 Stringed Instrument Pedagogy (2) Prereq.: 12 sem. hrs. of applied string instrument study or consent of instructor. Independent study in methods and materials for instruction in stringed instruments.

4173 Woodwind Instrument Pedagogy (2) Prereq.: 12 sem. hrs. of applied wind instrument study or consent of instructor. Independent study in methods and materials for instruction in woodwind instruments.

4215 Music Technology I (3) 3 hrs. lab. For majors only or by consent of instructor. Fundamentals of computer applications for educational uses in music; historical and social contexts of computer development; fundamentals in computer systems; configuring hardware; survey of commercial music software; and use of software applications.

4216 Music Technology II (3) Prereq.: MUS 4215 or equivalent. 3 hrs. lab. Application of hardware and software to music applications: notation, sequencing, technological applications of digital audio, video and acoustic sound specifically applied to the music education environment.

4241 Opera Theater (2) Admission by audition. 4 hrs. lab plus individual coaching. May be taken for a maximum of 8 hrs. of credit toward the master's degree. May not be taken with MUS 4242. Students must schedule this course both fall and spring semesters, unless permission to schedule only one semester is granted by the instructor and the musical theater; preparation and performance of operatic scenes and complete operas.

4242 Acting for Opera (1-2) Prereq.: permission of instructor. May be taken for a maximum of 4 sem. hrs. of credit. Techniques of acting for opera; training in audition skills; stage movement, stage makeup, vocal and dramatic techniques for operatic roles.

4351 Song Literature I (2) The art song repertoire from the classical songs of Haydn and Mozart to the Romantic period.

4352 Song Literature II (2) The art song repertoire from the French mélodie to contemporary English and American song.

4400 Orchestral Repertoire for Instrumentalists (1) Prereq.: Permission of instructor. May be taken for a maximum of 3 sem. hrs. of credit. Standard orchestral excerpt repertoire for instrumentalists including: preparation; score study and analysis; specialized practice techniques; and audition strategies. Emphasis on the performance of orchestral excerpts.

4500 Musical Theatre Production (1-3) Also offered as THTR 4500. Admission by audition. May be taken for a maximum of 4 sem. hrs. of credit toward any degree. Techniques of musical theatre production, including all production aspects; production design aspects; preparation and performance of musical scenes and complete shows.

4701, 4702 Organ Practicum (2, 2) Prereq.: consent of instructor. Open to majors or minors who meet the prerequisites for 4702. Techniques of service playing; techniques and materials of organ pedagogy.

4703 The Scientific Bases of Music (2) Musical acoustics; nature of sound; generation of sound; comparison of intervals and scales within various systems of tuning and temperament.

4710 Advanced Aural Skills (3) Prereq.: a grade of "C" or better in MUS 4745 or consent of instructor. May be taken in sight singing with a special emphasis upon skills needed for professional activity in performance, conducting and composition.

4712 Advanced Form and Analysis (3) Prereq.: a grade of "C" or better in MUS 4732 or consent of instructor. Analysis of selected works and creative writing in Ultra-Chromatic and Impressionistic styles.

4720 Post-Tonal Styles and Practices (3) Prereq.: a grade of "C" or better in MUS 4732 or consent of instructor. May be repeated once. Analysis of selected works and creative application of techniques, procedures, and formal schemes studied.

4721 Modal Counterpoint (3) Prereq.: grade of "C" or better in MUS 2732 or equivalent. Writing and analysis of contrapuntal music with modal bases.

4722 Tonal Counterpoint (3) Prereq.: grade of "C" or better in MUS 2732 or consent of instructor. May be repeated once. Counterpoint in two and three parts to a given cantus firmus; imitative contrapuntal forms such as the invention and the fugue.

4723 Elementary Orchestration (2) Prereq.: grade of "C" or better in MUS 2732. Traditional scoring practices.

4723 Intermediate Orchestration (2) Prereq.: MUS 3732 or consent of instructor. Intermediate scoring styles and techniques, from Dixieland to modern jazz.

4740 Business of Music (2) Surveys of contracts, legalities, economics, and production planning as they relate to performers, teachers, and composers of music in the fields of recording, concerts, publishing, broadcasting, motion pictures, and musical theater; copyright, performance rights societies, unions, and guilds.

4745 Computer Music (3) May be taken for a maximum of 6 hrs. of credit when topics vary. Digital sound design, synthesis, and signal processing; electroacoustic music composition using computers and computer music techniques.

4746 Seminar in Computer Music and Digital Media (3) Prereq.: MUS 4745 or consent of instructor. May be taken for a maximum of 6 hrs. of credit when topics vary. Focus on study of computer music and digital media such as computer music programming, sound diffusion techniques, interactive computer music and digital media systems, internet applications, analysis of computer music.

4747 Music, Technology, and Society (3) History and critical study of the impact of electronics and recording technologies on the creation and performance of music; and its subsequent impact on the role of music in society.

4749 Seminar in Music History (3) Prereq.: grade of "C" or better in MUS 2053 and 2054 or equivalent or permission of instructor. May be taken for a maximum of 6 sem. hrs. credit when topics vary.

4750 Music of the Middle Ages and the Renaissance (3) Prereq.: grade of "C" or better in MUS 2053 and 2054 or consent of instructor. The history of music from ca. 800 to 1600.

4760 Folk and Traditional Music: Music History and Literature (2) Background and history of folk and traditional music; emphasis on Anglo-American folk songs.

4770 Piano Literature I (3) A survey of the keyboard repertoire from the late renaissance through Haydn and Mozart.

4780 Piano Literature II (3) A survey of piano literature from Beethoven to the present.

4781, 4782 The Care and Repair of Band and Orchestral Instruments (1, 1) Prereq.: MUS 2300 or equivalent. 2 hrs. lab. for students with experience in instrumental music and a practical knowledge of the problems in instrumental upkeep.

4783, 4784 Piano Methods and Materials (3, 3) Materials and methods for the pianist.

4785 Marching Band Techniques (3) Marching techniques for marching band; emphasis on contemporary drill design; practical projects in charting drill.

4786 Piano Design, Construction and Theory of Tuning and Temperament (2) 1 hr. lecture; 2 hrs. lab. Open only to music majors. Piano and harpsichord design, construction, regulation, voicing, and tunings; knowledge important to pianists; laboratory experience in regulation, tuning, and voicing.

4789, 4790 Supervised Studio Instruction (2, 2) Program tailored to the needs of each student. Registration with a studio teacher who supervised the student's studio teaching program.

4792 Harp Technique and Maintenance (2) Required of all harp majors. May be taken for a maximum of 6 hrs. of credit. Independent study of major orchestral excerpts, including audition preparation.

4794 Harp Pedagogy (2) Required of all harp majors. Independent studies in materials and methods for the harp teacher.

4791 Introduction to Opera (3) Open to majors and nonmajors. History, production, and performance of opera from 1600 to the present.

4796 Senior Project in Music Theory (2) A written project on an approved topic in music theory. Required of all theory students in the composition curriculum.

4798 Senior Recital (1-3) May be taken for a maximum of 3 sem. hrs. of credit.

4799 Senior Composition Recital (1) Pass-fail grading. Concert of solo and chamber works.

4800 Computer Principles (3) Computer principles. May be repeated once.

4801 Advanced Computer Music (2) Open to music students with the recommendation of the appropriate applied music faculty. May be repeated for credit. Maximum amount of credit applicable toward a degree is 6 sem. hrs.

4801 Basic Techniques of Audio Recording (3) Basic properties of audio and various forms of sound energy; analysis of complete audio systems for recording and sound reinforcement and individual system components; aspects of stereo concert recording; emphasis on microphone placement techniques; professional music production techniques, including editing and tape duplication.

7001 Keyboard Skills for Pianists (1) Techniques of accompanying, including sight-reading, scoring, transposition, and harmonization.

7018 Advanced German Diction for Singers (1) 1 hr. lecture; 1 hr. lab. The rules of pronunciation utilizing the International Phonetic Alphabet; coaching in the Lied and operatic literature including spoken dialogue.

7019 Advanced French Diction for Singers (1) 1 hr. lecture; 1 hr. lab. The rules of pronunciation utilizing the International Phonetic Alphabet; coaching in the French art song and operatic literature.

7020 Italian Diction for Singers (1) 1 hr. lecture; 1 hr. lab. The rules of pronunciation utilizing the International Phonetic Alphabet; coaching in operatic and song literature; some outside research expected.

7124 Seminar in String Literature (2) Methods, solos, and chamber music for strings.

7126, 7127 Seminar in Woodwind Literature I, II (2, 2) Methods, solos, and ensemble literature for woodwinds.

7128 Seminar in Brass Literature (3) Methods, solos, and ensemble literature for brass instruments.

7130 Seminar in Percussion Literature (2) Methods, solos, and ensemble literature for percussion instruments.

7140 Survey of Jazz Styles (3) In-depth investigation of the American Jazz idiom from the perspective of historical jazz periods and specific artists.

7170 Advanced Vocal Pedagogy (2) Fundamentals of anatomy, physiology, and acoustics of voice production; emphasis on vocal registers, breath management, and articulation; pedagogical philosophies used to train the classically-trained voice in the Western tradition of art song and opera.

7172 Stringed Instrument Pedagogy (2) Methods and materials for instruction in string instruments.

7174 Woodwind Instrument Pedagogy (3) Fundamentals of anatomy, physiology, and acoustics of voice production; emphasis on vocal registers, breath management, and articulation; pedagogical philosophies used to train the classically-trained voice in the Western tradition of art song and opera.
7147 Musicology (3) Prereq.: MUS 3710 or 3714; or equivalent. Examination of the role of music in society, historical and cultural contexts.

7152 Advanced Vocal Accompanying (2) Prereq.: MUS 4745 and 4746, or equivalent. Preparation of vocal and piano literature for the intermediate and advanced levels.

7151 Instrumental Accompanying (2) May be repeated for a max. of 4 sem. hrs. of credit. Repertoire and techniques of accompanying for instrumental genres.

7522 Vocal Accompanying (2) Prereq.: MUS 4745. May be repeated for a max. of 4 sem. hrs. of credit. Repertoire and techniques of accompanying for vocal genres.

7150 College Teaching in Music (3) History of music in higher education institutions, curricular and pedagogical issues, and techniques of college teaching in music; development of effective college-level teaching skills.

7600 Sources of Music & Research (3) Also offered as LSS 7810. Focuses on finding, evaluating, using, and citing materials in print, online, and recorded sources for music research.

7708 Survey of Analytical Techniques (3) Prereq.: MUS 3703 and 3704 or passing of the Music Theory Diagnostic Examination. Survey of analytical tools and concepts for common practice period and post-tonal practice.

7701 Pedagogy of Music Theory (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. Techniques for teaching undergraduate music theory, including aural skills, reading, and comprehension of principal philosophies and textbooks.

7703 Contemporary Musical Practices (3) 6 sem. hrs. applicable to the major or concentration topics vary; 6 additional sem. hrs. applicable to the DMA degree when topics vary. Compositional trends in contemporary music; discussion of books on composition; analysis of major compositions.

7784 Studies in Schenkerian Analysis (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. May be taken for a max. of 6 sem. hrs. of credit; 3 sem. hrs. applicable to MM degree; 3 additional hrs. applicable to PhD or DMA degrees. Ideas and practices of music theorist Heinrich Schenker; their effect on musical thought and performance in this century.

7770 Theory and Analysis of Tonal Music (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. Readings and practice in various approaches to the analysis of music of the tonal era (ca. 1600–1900).

7771 Seminar in Post-Tonal Musical Analysis (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. May be taken for a max. of 6 hrs. of credit. Seminar on analytical study of specific composers, works, or styles.

7702 Advanced Modal Counterpoint (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. Writing exercises and composing works in two, three, and more voices in the style of Palestrina, Lassus, Victoria, and their contemporaries; analysis of representative compositions; survey of theoretical treatises of the time.

7704 Advanced Tonal Musical Analysis (3) Prereq.: MUS 3703 or successful passing of the Music Theory Diagnostic Examination. Writing exercises and composing works in three, four, and more voices in the style of J.S. Bach and his contemporaries; analysis of representative compositions; survey of contemporary theoretical treatises.

7721 Survey of Choral Literature I (3) A survey of choral literature beginning with Gregorian Chant and ending with the Romantic; emphasis on preparation for performance.

7722 Survey of Choral Literature II (3) A survey of choral literature beginning with the Baroque period of music and ending with the early Romantic; emphasis on preparation for performance.

7723 Survey of Wind Literature I (2) A survey of chamber wind literature (6 to 20 performers) from the late Renaissance to the present.

7724 Survey of Wind Literature II (2) A survey of orchestra, large wind ensemble, and large wind band literature (more than 20 performers) from the French Revolution to the present.

7725 Survey of Symphonic Literature I (2) A survey of orchestral works beginning with the Baroque period of music and ending with the early Romantic; emphasis on preparation for performance.

7726 Survey of Symphonic Literature II (2) A survey of orchestral works beginning with the Romantic period and ending with 20th-century music for orchestra, with emphasis on preparation for performance.

7741 History of Music Theory I (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory and Music History Diagnostic Examinations. History of theoretical writings on music, ca. 500-1600; acoustics, notes, and scales, intervals, tuning systems, modes, counterpoint, mensuration, musical poetics, speculative theory.

7742 History of Music Theory II (3) Prereq.: MUS 3703, 3704, and 3705 or successful passing of the Music Theory and Music History Diagnostic Examinations. Music theory from ca. 1600 to 1900; development of species counterpoint and figured bass theory; the rise of harmonic theory and rhythmic/phrase analysis; 19th-century expansions of harmonic theory and formal analysis.

7745 Advanced Computer Music (3) Prereq.: MUS 4745, or consent of instructor. Advanced techniques in digital sound synthesis and composition; analysis/synthesis techniques, granular synthesis, physical modeling, interactive computer music performance, and algorithmic composition using computers; survey of representative music of the genre.

7746 Graduate Seminar in Computer Music and Digital Media (1–3) Prereq.: MUS 4745 or consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Focused study of various topics in computer music such as music software development, computer music systems, interactive computer music, multimedia composition, alternative human-computer interfaces for music, sound installation art, and interactive and expanded computer music.

7747 History of Electroacoustic Music (3) The history of electroacoustic music; developments in technology, aesthetics, and style since ca. 1900 to present; survey and analysis of representative music from the general.

7749, 7750 Special Studies in Piano Literature (3.3) Each course may be taken for a max. of 6 hrs. of credit. May be repeated for credit. Max. amount of credit applicable toward a degree is 4 sem. hrs.

7751 Ancient and Medieval Music (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. History of music from ancient Greeks and Hebrews through the 14th century.

7752 Music of the Renaissance (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. Music of the 15th and 16th centuries.

7753 Music in the Baroque Era (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. Music of the 17th and 18th centuries; their role in the Baroque period.

7754 Music in the Classical Era (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. Music of the 18th and 19th centuries; their role in the Classical period.

7755 Music in the Romantic Era (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. Music of the 19th and 20th centuries; their role in the Romantic period.

7756 Music in the Modern Era (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. The most important phases in development of music in the U.S.

7760 Performance Practices (3) Prereq.: MUS 3710 or successful passing of the Music History Diagnostic Examination. Primary and secondary source materials dealing with the performance of music in the 17th and 18th centuries; their application to the interpretation of music.

7762 Measurement and Evaluation (3) Teacher-designed and standardized tests in music; learning theories.

7763, 7764 Comparative Methods in Music Education (3, 3) Prereq.: MUS 3710 or equivalent. Development and implementation of instructional techniques and approaches and tests evaluated with emphasis on curriculum construction; 7763 deals with elementary grades, 7764 with secondary.

7765 Philosophical Bases for Music Education (3) Various philosophical bases for music education including their origin, function, development, and implementation.

7766 Current Issues in Music Education (3) Develop broad perspectives from a multi-faceted review of issues affecting music education practice. Examine important contexts from which effective teachers make informed decisions.

7767 Experimental Research in Music (3) Prereq.: ELRC 4006 and MUS 7803. Primarily for doctoral students in music. Systematic investigation of musical behavior and music learning; collection, quantification, and treatment of data; current research.

7771, 7772 Advanced Choral Conducting (3, 3) Prereq.: previous successful passing of all music diagnostics and conducting of all music diagnostics for the MM and once for the DMA or PhD. Independent study of the techniques required to conduct all styles of choral music with emphasis on score analysis and performance functions.

7773, 7774 Advanced Band Conducting (3, 3) Prereq.: previous successful passing of all music diagnostics and conducting of all music diagnostics for the MM and once for the DMA or PhD. Independent study of the techniques required to conduct all styles of wind music with emphasis on score analysis and performance function.

7775, 7776 Advanced Orchestral Conducting (3, 3) Prereq.: previous successful passing of all music diagnostics and conducting of all music diagnostics for the MM and once for the DMA or PhD. Independent study of the techniques required to conduct all styles of symphonic music, with emphasis on score analysis and performance practices.

7777 Advanced Keyboard Literature I, II (3, 3) Prereq.: MUS 4757, 4758, or equivalent. Each course may be taken twice; once for the MM and once for the DMA. Genres and styles from earliest examples of keyboard literature through the most recent trends.

7797 Master’s Pedagogy Project (2) Pass-fail grading. Completion of a 45-minute oral presentation and short supporting paper on a pedagogical topic.

7798 Master’s Recital (3) Prereq.: MUS 4759 or equivalent. May be taken for a max. of 3 sem. hrs. of credit.

7799 Advanced Coaching in Applied Music (2) May be repeated for credit. Max. amount of credit applicable toward a degree is 4 sem. hrs.

8000 Introduction to Research in Music (3) Required of all doctoral students; recommended for master’s students who will write theses. Development of research skills including knowledge of research resources and materials; use of library facilities; practice in a clear and logical
7801 Psychology of Music (3) Physical and psychological bases of musical phenomena including physical properties of sound production, transmission, reception, and perception; anatomy and physiology of the auditory system; the role of the central nervous system and affective, physiological, and cognitive responses to musical stimuli; and learning theories as related to musical development, ability, and preference.

7901 Composition (1-3) Individual instruction for graduate candidates. Participation in the Composer’s Forum is considered a part of the course work and is, therefore, required. May be repeated for credit.

7903, 7904 From Music History (2-3,3) Prereq.: MUS 1710 or successful passing of the Music History Diagnostic Examination. Each course may be taken 3 times credit with 2 hours of credit applicable to the MM degree; maximum of 9 hrs. of credit; however, amount of credit applicable to the PhD: maximum for MM and PhD combined is 18 sem. hrs.

7905, 7906 Seminar in Music Education (2-6,2-6) Each course may be taken 3 times credit when topics vary. Only 6 sem. hrs. applicable to the MME degree; only 12 additional sem. hrs. applicable to the PhD; maximum for MME and PhD combined is 18 sem. hrs.

7921 Seminar in Music Theory (3) Prereq.: MUS 3703 and 3704 or successful passing of the Music Theory Diagnostic Examination. Each course may be taken for a max. of 6 hrs. of credit applicable to the MM degree when topics vary and only 12 additional sem. hrs. of credit applicable to the PhD when topics vary. Maximum for MM and PhD combined is 18 sem. hrs.

7979 Individual Projects in Music (1-3) Prereq.: consent of departmental faculty concerned and dean of the School of Music. May be repeated for credit as follows: for master’s degree, 3 sem. hrs.; for doctoral degree, 6 sem. hrs; beyond the master’s or a total of 9 sem. hrs. if both master’s and doctoral totals included.

7998 Special Topics in Music (2-3) May be taken for a max. of 9 hrs. of credit when topics vary. Advanced studies in individual or group projects.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

9001 Doctoral Solo Recital (1-3) May be repeated twice (max. of 6 sem. hrs. of credit). Students specializing in organ may repeat four times (max. of 12 sem. hrs. of credit).

9002 Second Doctoral Solo Recital (1-3)

9003 Doctoral Research (1-3) Does not fulfill final project requirement for DMA (MUS 9105).

9005 Concerto with Orchestra (1-2)

9006 Major Solo Part in an Oratorio or a Cantata (1)

9007 Doctor of Musical Arts Role in Opera (1-3) May not be taken twice credit with MUS 4241. May be repeated for credit. A max. of 4 hrs. of credit may be applied toward the DMA degree.

9008 Doctor of Musical Arts Chamber Music Recital (2) May be repeated for credit.

9009 Research and Monograph (1-12) “S”/“U” grading. For DMA candidates in performance only. May be repeated until monograph is completed.


9021 Seminar in Music Theory (3) For doctoral candidates only. May be taken for a max. of 6 hrs. of degree credit.

9758, 9759 Recitalography (3.3) Each course may be taken for a max. of 6 hrs. of credit; however, amount of credit applicable to a degree is determined by student’s advisory committee.

9901 Doctoral Seminar in Musical Composition (1-3) May be repeated for credit; max. amount of credit applicable to a degree is 12 sem. hrs. Participation in the Composer’s Forum is considered a part of the course work.

9925 to 9937 (Series) Seminar in Literature and Style in Performance (3 each) Historical developments of the various performance areas with concentration on their literature, important pedagogical principles, and stylistic problem solving, instruction, and research.

7115 N-S Stable Tracer Methodology for Biological Problems (2) Prereq.: consent of instructor’s 1 hr. lecture; 3 hrs. lab. Quantitative N-15 tracer applications and methodology in biological nitrogen systems, combining N-15 procedures with mass spectrometer techniques.

7528 Nuclear Reactor Materials (3) V Prerequisites: governing structure and properties of materials used in nuclear reactors; radiation effects, problems in selection, fabrication, and use of these materials.

7525 Nuclear Engineering Laboratory (2) S Prereq.: credit or registration in NS 7527. 6 hrs. lab. Operation of nuclear counting and spectroscopy systems; measurements of neutron behavior in multiplying and non-multiplying media; development of design parameters from empirical data.

7527, 7528 Reactor Engineering (3,3) F Prereq.: consent of department. NS 7527 is prerequisite for 7528. Basic concepts of reactor physics; slowing-down theory, homogenization, power-reactor theory; diffusion and transport theories for neutron flux calculations; criticality calculations: one-group, two-group, and multigroup methods; core burn up analysis.

7529 Nuclear Reactor Dynamics (3) S Prereq.: NS 7527 and credit for or registration in NS 7528. Transient reactor analysis; analytical and numerical point kinetics calculations; two-time delay systems; methods and solutions to multigroup neutron diffusion and transport equations; lattice physics methods, nodal techniques; applications to fuel management and light water reactor core physics analysis; calculation of temperature coefficients; advanced reactor systems.

7566, 7567 Advanced Nuclear Reactor Systems (3,3) F Prereq.: NS 4527 or equivalent. Engineering aspects of fusion reactor systems, including fuel behavior, energy removal, materials selection, and core interface with the balance of the plant.

7575 Two-Phase Flow and Heat Transfer (3) Prereq.: KR 4431 or equivalent. Modeling and analysis of liquid-vapor flow systems and applications in nuclear reactor design and safety; nucleation phenomena; boiling heat transfer, burnout, condensation, flow instabilities, critical flow, loss of coolant accidents.

3411 Fundamentals of Nuclear Radiation Science (3) F Prereq.: consent of instructor’s 1 hr. lecture; 3 hrs. lab. Nuclear structure, transmutations, decay, interactions of radiation with matter, and measurement.

4141 Radiobiology (3) F Prereq.: NS 4910 or equivalent. 2 hrs. lecture; 3 hrs. lab. Also offered as ENVS 4411. Radiation tracers, stable tracers, and radiation effects in both natural and man-made environments.

4352 Environmental Radiation Evaluation and Remediation (2) Prereq.: NS 4411 or permission of instructor. Methods of sampling and surveying to determine radiological concentrations; federal and state regulations governing remediation criteria; models and computer codes used to estimate dose; remediation planning and implementation.

4553 Environmental Radiation Evaluation and Remediation Laboratory (1) Prereq.: credit for or concurrent enrollment in NS 4352. Laboratory supplement to NS 4352. Sampling and surveying techniques used to measure radionuclides in the environment.

4572 Nuclear Reactor Theory and Design (3) F Prereq.: consent of instructor’s 1 hr. lecture; 3 hrs. lab. Does not satisfy major field course requirement for students in natural science curriculum. Also offered as BIOL 208 at Southern University in Baton Rouge. Life and environmental processes in marine and aquatic settings; their influence on coastal Louisiana.

4581 Introduction to Marine Sciences: Life Processes (4) S 3 hrs. lecture; 3 hrs. lab. Does not satisfy major field course requirement for students in natural science curriculum. Also offered as BIOL 208 at Southern University in Baton Rouge. Life and environmental processes in marine and aquatic environments; their influence on coastal Louisiana.

1006 Honors: Introduction to Oceanography (3) Similar to OCS 1005 with special honors emphasis for qualified students. Interaction of physical, geological, chemical, and biological processes of the ocean, effect of human activities.

Oceanography and Coastal Sciences • OCS

General education courses are marked with stars (★).

★ 1005 Introduction to Oceanography (3) An honors course. OCS 1005 is equivalent, but does not satisfy major field course requirement for students in natural science curriculum. Also offered as BIOL 208 at Southern University in Baton Rouge. Life and environmental processes in marine and aquatic settings; their influence on coastal Louisiana.

★ 1006 Honors: Introduction to Oceanography (3) Similar to OCS 1005 with special honors emphasis for qualified students. Interaction of physical, geological, chemical, and biological processes of the ocean, effect of human activities.
coastal environments (deltas, sandys, and coral reef coasts), and of physical processes and corresponding response features.

7129 Global Climate Change and Wetlands (2) Prereq.: consent of instructor. Impact of projected global climate change on coastal wetlands and adjacent coastal and interior wetland ecosystems; feedback of biogeochemical changes in wetlands caused by climate change.

7130 Marine Ichthyology (3) (F) Prereq.: graduate standing or consent of instructor. Concepts and laboratory principles for stable and radioactive isotopes, first- and second-order isotope data, marine applications in oceanography and biogeochemistry.

7131 Marine Geochemistry (3) S Geochemical processes in the marine environment, including water column geochemistry, pore water processes and interactions across the sediment-water interface, and early diagenesis; emphasis uranium-thorium decay series radionuclide ap- plications in ocean geochemistry.

7132 Coastal Physical/Chemical Systems: Analytical Methods (3) F-O Prereq.: consent of instructor. 2 hrs. lecture; 3 hrs. lab. Sampling techniques; proper handling and preservation of samples; sample processing for analysis; application of spectroscopy and chromatography analytical instrumentation for the determination of nutrients, trace and toxic metals, synthetic organics (pesticides and industrial organics), and petroleum hydrocarbons in water, soil, and sediment samples; techniques presented in terms of application of analytical chemistry to environmental and natural systems.

7150 Biogeochemistry of Wetland Soils and Sediments (3) S Prereq.: 37745. Mixed core redox chemi- try processes in fresh water, brackish water, and estuarine- flooded soils and sediments affecting the transformations of nutrients and toxic materials.

7170 Satellite Oceanography (3) F Prereq.: OCS 4470 or equivalent. Oceanographic measurements and observations using satellite-borne sensor systems; radiation-ocean-atmo- sphere interactions, satellite systems, sensor design, and data types; analysis of infrared, visible, and microwave data for deep ocean, coastal, and estuarine phenomena.

7311 Marine and Estuarine Plankton (3) S-E Prereq.: background in aquatic zoology, ichthyology, marine biology, or zoology; and consent of instructor. Structure and function of marine plankton populations; changes related to various environmental factors such as temperature, nutri- ents, radiation, transparency, currents, and water-masses; photoplankton, zooplankton and ichthyo- plankton food webs, trophic dynamics and case studies; life history, and biomeographic features; sampling theory, collecting techniques, distribution, abundances, production, analytical models, and economic significance.

7317 Marine Ecology (3) Prereq.: B IOL 7120.

7320 Fisheries Oceanography (3) S-E Prereq.: 37745. Mixed core redox chemi- try processes in fresh water, brackish water, and estuarine- flooded soils and sediments affecting the transformations of nutrients and toxic materials.

7513 Zoological Infectious and Parasitic Diseases (3) F-E Prereq.: BIOL 4094, 4122, or equivalent. Epidemiology, ecology, and control of major infectious and parasitic zoonoses.

7312 Epidemiological Study Design (4) S Introduction to the basic concepts of epidemiology with emphasis on the appropriate use and interpretation of epidemiological methods.

7404 Pathogenic Mechanisms of Bacteria (3) V Prereq.: BIOL 4094, 4122, or equivalent. Relation of bacterial structure and function to the induction of disease; virulence factors, mechanisms of host-parasite interaction; vaccine strategies.

7410 Biochemistry of Viruses (3) S-E Prereq.: BIOL 4094 or equivalent. See B IOL 7289.

7411 Molecular Mechanisms of Viral Pathogenesis (3) S-E Prereq.: B IOL 4150 or VM ED 5230 or equivalent. Virus-host interactions in disease induction emphasizing virus receptors and cell tropism, persistence and latency, oncogenesis, virus-induced immune suppression, and adverse response. 2 hrs. lab. 2 hrs. lecture.

7412 Techniques in Flow Cytometry (1) F-O Prereq.: consent of instructor. 1 hr. lecture. 3 hrs. lab. Applications in principles and applications of flow cytometry; topics include cell processing and staining with fluorescent probes as a measurement of immunophenotyping, DNA, and functional assays as well as computer generated data analysis.

7415 Current Experimental Methods in Parasitology (1-4) F-O Prereq.: a course in parasitology or equivalent. 2-8 hrs. lab. May be taken for a max. of 4 sem. hrs. when animal groups vary. Specialized laboratory methods used to produce experimental infections, diagnose parasitism and recover and identify protozoan and helminth parasites of ruminants, horses, pigs, and companion animals.

7416 Mechanisms of Cellular Immunology and Immunopathology (3) S Prereq.: BIOL 4122 or equivalent. Mechanisms involved in the development of protective and pathogenic immune responses; emphasis on the humoral and cellular components of inflammation and immune responses. 2 hrs. lecture. 2 hrs. lab.

7417 Pathogenesis of Infectious and Parasitic Agents (1- 4) Prereq.: introductory course in immunology. Introduction to the mechanisms of pathogenesis, pathology, and host immune interactions of viral, bacterial and parasitic disease agents.

7419 Population Dynamics and Ecology of Parascite and V ector-Borne Diseases (3) V Prereq.: course in ecol- ogy or equivalent. Population regulation and distribution of parasitic and vector-borne diseases of veterinary and medical significance; disease risk in populations and control strategies based on population models, transmission dynamics, climate, nutrition, immunity, geographic information systems, and herd health programs.

7423 Cellular and Molecular Immunology (3) F-O Prereq.: BIOL 4121 or equivalent. Cellular and molecular basis for the immune response; emphasis on molecular structure and function of antibodies and other receptors; role of lymphocyte subsets and cytokines in regulation of immune responses.

7425 Comparative Vulnerability (3) S-E Prereq.: consent of instructor. Basic microbiology and/or parasitology strongly recommended. 2 hrs. lecture; 2 hrs. lab. Same as R NR 7424.

7501 Veterinary Cellular Pathology (3) Prereq.: DVM degree or equivalent and consent of instructor. Basic mechanisms of pathogenesis and morphogenesis of disease at the cellular level in defined species derived from functional pathologic changes in cells and extracellular matrix.

7502 Advanced Veterinary Immunology (3) V Prereq.: DVM degree or equivalent and credit or concurrent enrollment in PB S 7516. Study of diseases by organ systems, using electron and light microscopy; patho- genic biology of specific disease mechanisms.

7508 Histopathology Slide Conference (1) F-S Prereq.: DVM degree or equivalent and consent of instructor. May be taken for a max. of 4 hrs. of credit when topics vary. Histological aspects of diseases in various animal species; direct student participation in morphological description and literature review.

7510 Mammalian Pathology (3) S Prereq.: DVM degree or equivalent and PB S 7516. May be taken for a max. of 6 sem. hrs. credit when topics vary. Gross and microscopic examination of surgically derived specimens of diseased tissues from various animals; clinical case interpretation, histopathological description, diagnosis, prognosis, and consultation techniques.

7513 Pathology of Neoplasia (2) V Prereq.: DVM degree or equivalent and PB S 7516. 1 hr. lecture; 1 hr. lab. Comparative gross, microscopic, immunochemical, and pathogenetic study of naturally occurring neoplastic disease in animals.

7514 Laboratory Animal Pathology (2) V Prereq.: DVM degree or equivalent and consent of instructor. Management, care and husbandry of experimental animals for the infective, nutritional, degenerate, and toxic diseases that affect the commonly used species of laboratory rodents, rabbits, and non-human primates.

7515 Veterinary Dermatopathology (2) V Prereq.: DVM degree or equivalent and PB S 7516. 1 hr. lecture; 2 hrs. lab. Histopathologic evaluation of integumentary system, tissue response, and diseases of various animal species of veterinary importance.

7516 Advanced Diagnostic Pathology of Animals (1-2) V Prereq.: DVM degree or equivalent. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Diagnosis and pathogenesis of hematological and clinical chemistry changes in blood from various animal species; understanding the applicable instrumentation, and methodologies of assays and quality assurance; interpretation of cytological specimens (tissue and fluids) and correlation with clinical and histopathological findings.

7525 Advanced Veterinary Clinical Pathology (1-2) V Prereq.: DVM degree or equivalent. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Necropsy of various animals submitted for postmortem examination: gross, light, and electron microscopy; and immunohistochemistry; correlation and synthesis of clinical information, anatomical finding, and other ancillary laboratory results, for an accurate determination of disease diagnosis and pathogenesis.

7526 Veterinary Laboratory Animal Science (I, II, III) V Prereq.: a course in parasitology or equivalent. 20 hrs. lab. 20 hrs. lecture. Study of infectious, nutritional, degenerate, and toxic diseases that affect the commonly used species of laboratory animals; courses not be taken in sequence.

PETROLEUM ENGINEERING • P E T E

1010 Introduction to Petroleum Engineering (2) Prereq.: MATH 1021. Scientific bases of petroleum geology and chemistry, exploration, drilling, production, reservoir engineering, and refining.

2031 Reservoir Rock Properties (3) Prereq.: MATH 1552, GEOL 1001 and PHYS 2101. Physical properties of reservoir rock related to the production of oil and gas.

2032 Reservoir Fluid Properties (3) Prereq.: credit or registration in PHYS 2102. Physical and chemical properties of petroleum reservoir fluids related to production of oil and gas.

2034 Rock and Fluid Properties Laboratory (1) S Prereq.: credit in PETE 2031 and/or 2032, and registration in the other course. 3 hrs. lab.

2060 Computational Methods in Petroleum Engineering (2) Prereq.: MATH 1552. 1 hr. lecture; 2 hrs. lab. Com- puting infrastructure, programming fundamentals, numerical methods, and petroleum engineering commercial software.

3002 Communicating Petroleum Engineering Technology (3) V Prereq.: EN Gl 2000. Senior standing in the Col- lege of Engineering, and permission of department. Com- munication skills including technical writing, public speak- ing, group management, and computer usage applied to petroleum engineering topics.
proc es s; syne rgy be twee n p roc es s p rod ucti vity and mental  impac t and  p ollution m ec hani sm s i n p etrol eum (3 ) V

ondary recovery o f o il. Pr ere q. : C E 2200.  3 hrs . lab
reg istration  in P ETE 4 04 5.  3 h rs. lab . Acc om pa nies  PETE
physical m odels; fluid flow in p oro us  m edia.

4058 Res erve E stim ati on and R eser voi r M anag ement
4050 R ese rvo ir D ynam ics ( 3)
of w ell p ro duc tion d ynam ics; rod p um ping, ga s lift.

CE 2460 or M E 3133,  and C E 3400
drilling f ree d omen t, a nd  o ptim um hydraulics o f d rilling flu ids; o il w ell

2018 Professional Ethics (3) Special problems of obliga-
tion and valuation related to law, medicine, politics, and
education, as well as business, engineering, and architec-
ture; altruism, trust, vocation, codes of honor, professional
privilege, and responsibilities for others arising from diffe-
rentia-l abilities.

2023 Philosophy of Art (3) Philosophical theories of beauty,
art, and art criticism.

2024 Philosophy in Literature (3) Philosophical
themes in world literature; fiction, poetry, drama, and
autobiography.

2025 Biospheres (3) Defining health and disease; deciding
on rights, duties, and obligations in the patient-physician
relationship; abortion and the concept of a person; defining
and determining death, euthanasia and the dignity of death;
allocation of medical resources, both large-scale and small-
scale; experimentation with fetuses, children, prisoners,
and animals; genetic testing, screening, and interference.

2028 Philosophy of Religion (3) Same as REL 2028. Essence
and meaning of religion as a pervasive phenomenon
in human society; faith and reason, nature of divinity,
arguments for and against its existence, religious know-
ledge and experience, morality and cult, the problem of evil.

2033 History of Ancient and Medieval Philosophy (3)
To be taken concurrently with PHIL 2033. 1 hr. of
instruction per week for honors students.

2035 History of Modern Philosophy (3) An honors
course. PHIL 2035 is also available. Introduction to
philosophy through a study of some of the main
writings of classical and medieval philosophy.

2036 HONORS: Tutorial in Modern Philosophy (1) To be
taken concurrently with PHIL 2035. 1 hr. of tutorial
instruction per week for honors students.

PHILOSOPHY • PHIL

General education courses are marked with stars (•).

★ 1000 Introduction to Philosophy (3) Major works on
such themes as appearance and reality, human nature,
nature of knowledge, relation of mind and body, right and
good, existence of God, and freedom and determinism.

★ 1001 HONORS: Introduction to Philosophy (3)
Prereq.: ENGL 1092 or equivalent. Same as PHIL 1000,
with a special honors emphasis for qualified students.
Credit will not be given for both this course and PHIL 1000.

★ 1021 Introduction Logic (3) No special background
presupposed. Formal and informal logic; introduction to
propositional logic; formal and informal fallacies;scientific reasoning.

2000 Contemporary Moral Problems (3) Philosophical
study of contemporary moral problems such as capital
punishment, preferential treatment, sexual equality, sexual
liberation, terrorism, war and nuclear arms, animal rights,
world hunger, environmental ethics, and the morality of suicide.

★ 2010 Symbolic Logic (3) Classical propositional and
first-order predicate logic; syntax, semantics, and formal
languages; translation between formal languages
and English; formal methods of proof.

★ 2020 Professional Ethics (3) Special problems of obliga-
tion and valuation related to law, medicine, politics, and
education, as well as business, engineering, and architec-
ture; altruism, trust, vocation, codes of honor, professional
privilege, and responsibilities for others arising from diffe-
rential abilities.

★ 2023 Philosophy of Art (3) Philosophical theories of beauty,
art, and art criticism.

★ 2024 Philosophy in Literature (3) Philosophical
themes in world literature; fiction, poetry, drama, and
autobiography.

★ 2025 Biospheres (3) Defining health and disease; deciding
on rights, duties, and obligations in the patient-physician
relationship; abortion and the concept of a person; defining
and determining death, euthanasia and the dignity of death;
allocation of medical resources, both large-scale and small-
scale; experimentation with fetuses, children, prisoners,
and animals; genetic testing, screening, and interference.

★ 2028 Philosophy of Religion (3) Same as REL 2028. Essence
and meaning of religion as a pervasive phenomenon
in human society; faith and reason, nature of divinity,
arguments for and against its existence, religious know-
ledge and experience, morality and cult, the problem of evil.

2033 History of Ancient and Medieval Philosophy (3)
To be taken concurrently with PHIL 2033. 1 hr. of
instruction per week for honors students.

2035 History of Modern Philosophy (3) An honors
course. PHIL 2035 is also available. Introduction to
philosophy through a study of some of the main
writings of classical and medieval philosophy.

2036 HONORS: Tutorial in Modern Philosophy (1) To be
taken concurrently with PHIL 2035. 1 hr. of tutorial
instruction per week for honors students.

7285 Statistical Reservoir Modeling (3) Prereq.:
participation in or registration in IE 3382. Theory and practice of modeling
uncertainty; spatially variable rock properties for subfracture reservoirs; distributions, transforms, Beyesian
updating, variograms/covariances, kriging, and other
co-estimation with various kriging methods, conditional
simulation.

7999 Seminar (1) All graduate students are expected to attend
every semester. Only 1 sem. hr. of credit will be allowed towards the degree. Pass/Fail
grading.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.
1100 Introduction to Physics (3) Prereq.: credit or registration in MATH 1550. Measurement, vectors, kinematics, Newton's law of motion, wave motion, temperature, the electric field, DC circuits, and geometrical optics.

1201, 1202 General Physics for Majors (4,4) F,S Prereq. for 1201: Grade of C or better in PHYS 1100 or registration in MATH 1550. Prereq. for 1202: PHYS 1201 and credit or registration in MATH 1552. 4 hrs. lecture/demonstration. Primarily for students intending to major in physics. Credit will not be given for both these courses and PHYS 2108, 2001, or 2102. Fundamentals of classical physics and some concepts of modern physics; calculus and vector analysis introduced and used in development of subject matter.

1208 Introductory Physics Laboratory (1) Prereq.: credit or registration in PHYS 2101. Mechanics, wave motion, radiation, and thermal energy. Introduction to the use of experimental apparatus and the reporting of experimental results.

2221 Introduction to Mechanics (3) Prereq.: PHYS 2102 or 2109. Mechanics of solids, fluid mechanics, and conformal mapping with emphasis on corresponding mathematical techniques.

2311 Electricity and Magnetism (3) S Prereq.: PHYS 2221 or CHEM 4581 and credit or registration in MATH 2045 or 2080. Electrostatics, flux of fields, magnetic fields, static and quasistatic electromagnetic fields in vacuo and in dielectric and magnetic media.

2401 Computational Concepts in Physics (3) V Prereq.: MATH 1202 or an ACT math score of at least 25. Primarily for students in liberal arts and education. Historical evolution and underlying philosophy of principles of physics. Understanding of association of physics; does not develop technical skill.

4141, 4142 Introduction to Quantum Mechanics (3,3) F,S Prereq.: PHYS 2221 and credit or registration in MATH 2045 or 2080. The Schrödinger equation, perturbation theory, matrix mechanics, and spin.

4198 Advanced Modern Physics Laboratory (3) S Prereq.: PHYS 4141. 1 hr. lecture; 6 hrs. lab. Computation and measurement of electric and magnetic effects, atomic and nuclear, and solid-state physics.


4251 Atomic Physics (3) Prereq.: PHYS 4142 and credit or registration in PHYS 2221. Perturbation theory of atomic structure, radiations, and processes.

4261 Introduction to Solid-State Physics (3) V Prereq.: PHYS 4141 or 4142. Properties of metals, semiconductors, and the free-electron; band theories of metals, insulators, and semiconductors.

4271 Subatomic Physics (3) Prereq.: PHYS 2203 or 4141. Nuclear and particle properties, abundance and stability of nuclei, strong, weak, and electromagnetic forces, nuclear instrumentation, particle accelerators and detectors, nuclear reactions, and particle and nuclear astrophysics.

4399 Research in Experimental Physics (3) F Prereq.: PHYS 4148 or consent of instructor and department chair. Individual research project conducted and supervised by a member of the faculty not under supervision of an individually selected faculty member.

4412 Computational Science II (3) Prereq.: PHYS 2411 or equivalent. Continuation of PHYS 2411. Advanced techniques for numerical computations in the physical sciences.

4750 Special Topics in Physics (3) F,S Prereq.: Consent of instructor. May be taken for a max. of 6 sem. hrs. credit if topics vary.

4991 Special Problems in Physics (1-3) Prereq.: thorough knowledge of the fundamentals of physics and mathematics, demonstrated ability in science, and consent of instructor and department chair. May be taken for a max. of 6 sem. hrs. credit. Individual reading and theoretical and/or experimental work on advanced problems in physics.


6004 Seminar in Teaching Secondary Science (3) See BIOL 4094.

6108 Introduction to Medical Physics (1) See BIOL 2090.

6191 Research Participation for Teachers (3) Prereq.: PHYS 2002 or 2102. May be taken for a max. of 9 hrs. credit.

6198 Laboratory Methods for Teachers (3) Prereq.: PHYS 2002 or 2102. 1 hr. lecture; 6 hrs. lab. For high school and junior college teachers; part of the MNS degree program. Origins of quantum theory; application to atomic and solid-state physics.

4399 Research in Experimental Physics (3) F Prereq.: PHYS 4148 or consent of instructor and department chair. Individual research project conducted and supervised by a member of the faculty not under supervision of an individually selected faculty member.

4412 Computational Science II (3) Prereq.: PHYS 2411 or equivalent. Continuation of PHYS 2411. Advanced techniques for numerical computations in the physical sciences.

4750 Special Topics in Physics (3) F,S Prereq.: Consent of instructor. May be taken for a max. of 6 sem. hrs. credit if topics vary.

4991 Special Problems in Physics (1-3) Prereq.: thorough knowledge of the fundamentals of physics and mathematics, demonstrated ability in science, and consent of instructor and department chair. May be taken for a max. of 6 sem. hrs. credit. Individual reading and theoretical and/or experimental work on advanced problems in physics.


6112 Classical Physics for Teachers (3) Prereq.: PHYS 2002 or 2102. For high school and junior college teachers; part of the MNS degree program. Origins of quantum theory; application to atomic and solid-state physics.

4991 Research Participation for Teachers (3) Prereq.: PHYS 2002 or 2102. May be taken for a max. of 9 hrs. credit.

6198 Laboratory Methods for Teachers (3) Prereq.: PHYS 2002 or 2102. 1 hr. lecture; 6 hrs. lab. For high school and junior college teachers; part of the MNS degree program. May be taken for a max. of 9 hrs. credit.

4991 Research Participation for Teachers (3) Prereq.: PHYS 2002 or 2102. May be taken for a max. of 9 hrs. credit.

7211, 7212 Mathematical Methods of Theoretical Physics (3,3) F,S Prereq.: PHYS 4142 or equivalent. PHYS 7211 is prerequisite for PHYS 7212. Continuation of mathematical methods of theoretical physics; mathematical foundations of quantum mechanics.

7221 Classical Mechanics (3) Prereq.: PHYS 4141. 3 hrs. lab. Techniques in modern physics, including interferometers, electrostatic and magneto-optic devices, fiber optics, spatial filtering, holography, and spectroscopy.

7231, 7232 Classical Electrodynamics (3,3) F,S Prereq.: PHYS 7231 is prerequisite for PHYS 7232. Problems in electrostatics and magnetostatics; Maxwell's equations, electromagnetic waves, wave guides, and antennas; relativistic electrodynamics and radiation from moving charges.

7241, 7242 Quantum Mechanics (3,3) F,S Prereq.: PHYS 7241 or equivalent. Continuation of PHYS 7242. Basic concepts of nonrelativistic quantum mechanics, operators and matrices, intrinsic and orbital angular momenta, perturbation theory, atomic structure, second quantization, and scattering theory.

7336 General Relativity (3) V General tensor analysis; postulates of general relativity, field equations, equations of motion, interior and exterior Schwarzschild solutions, cosmology.
RELIGIOUS STUDIES - REL

General education courses are marked with stars (*).

* 1000 Religions of the World (3) Primarily for non-majors. Survey of the religions of the world such as Hinduism, Buddhism, Judaism, Christianity, Islam, and indigenous religious traditions.
  1001 Beginning Hebrew (4) See HEBR 1001.
  1002 Beginning Hebrew (4) See HEBR 1002.
  1004 Old Testament (3) Scholarly study of the Hebrew Bible (Genesis to the Book of Revelation) and the methods by which scholars study them.
  1096 HONORS: New Testament (3) Same as REL 1095, with special honors emphasis for qualified students.
  1097 HONORS: Old Testament (3) Same as REL 1094, with special honors emphasis for qualified students.
  1015 HONORS: Introduction to Religion (3) Same as REL 1090, with special honors emphasis for qualified students.
  1020 Introduction to the Study of Religion (3) Thematic introduction to the academic study of religion; ways of being religious; forms of religious literature, beliefs and rituals; the place of religion in human life.
  2000 Intellectual Sources of Religion (3) Same as REL 2027, with special honors emphasis for qualified students.
  2029 Judaism, Christianity, and Islam (3) Survey of the history, beliefs, and practices of the major religions of Southern and Eastern Asia, focusing on Hinduism, Buddhism, and the religions of China and Japan.
  2033 Native American Religions (3) Survey of Native North American religious traditions from prehistory to the present; including issues of conversion and Christianization, freedom of religion, and gender.
  2034 Indigenous Religions (3) Introduction to the religions of the indigenous peoples or “First Nations” of the Americas, Africa, and Australia.
  2120 The Holocaust (3) Responses of Judaism and the Christian church to Nazi Germany's killing of the Jews; issues about God, human morality, Western civilization, and modernity.
  2920 Ethics and Public Service (3) Examination and analysis of role that ethical behavior and moral reasoning play in the practice of public administration; overview of dominant schools of classical ethical thought, including works of Socrates, Plato, Aristotle, Kant, Rawls, and Bentham, and leading ethical theories such as consequentialism, deontology, virtue ethics, and ethical relativism; readings, case studies, and experiential exercises will be used to explore the role of ethics in public service.
  2925 Seminar in Nonprofit Management (3) Overview of principal management functions as applied to nonprofit organizations.

one religious studies course. Also offered as HIST 4012; Major figures in the history of Christian thought from the Reformation through the 16th century.

4031 Comparative Religions (3) See ANTH 4031.

4032 Religion, Gender, and Society (3) Also offered as ANTH 4032. Emphasizes the link between religious ideas and gender formulations within simple and complex societies and certain religious communities.

4041 Women and Witchcraft (3) A cross-cultural examination of “witchcraft” and issues of gender in North America, Europe, and Africa.

4050 A History of God (3) Traces the development of the concept of God from antiquity to the present.

4060 Ideas of the Afterlife (3) Traces the development of ideas concerning life after death in various traditions from antiquity to the present.

4079 Geography of Religion (3) See GEOG 4079.

4095 The Middle East to 1800 (3) See HIST 4095.

4096 The Modern Middle East (3) See HIST 4096.

4097 Political Theology (3) See POLI 4097.

4098 Muslims of South Asia (3) See HIST 4098.

4124 Studies in African Diaspora Religions (3) Also offered as A&AS 4124. May be for a max. of 6 hrs. of credit when topics vary.

4125 History of Ancient Israel (3) Also offered as HIST 4125. Survey of Israel’s history from its beginnings to the Christian era; readings from biblical and other ancient Near Eastern texts.

4131 Religion in the United States (3) See HIST 4131.

4171 Religion in Southern Culture (3) Religion as a component of Southern history and culture; emphasis on the religious culture of Louisiana.

4191 Religions of China and Japan (3) See HIST 4191.

4227 Contemporary Christian Thought (3) Major theologians and theological movements of the 20th century.

4228 Major Religious Thinkers (3) May be for a max. of 6 sem. hrs. of credit when topics vary. Concentrat ed study of the work of a religious thinker.

4236 Studies in Literature and Religion (3) See ENGL 4236.

4301 Theories of Religion (3) Theories about the origins, nature, and function of religion from the social sciences and other disciplines.

4350 Religious Ethics (3) Ethical issues derived from religious traditions.

4500 Seminar in Biblical Studies (3) Prereq.: one course in biblical studies. May be for a max. of 6 hrs. of credit when topics vary.

4600 Hinduism (3) Prereq: REL 2027 or consent of instructor. A survey of Hinduism from its origins to the present.

4800 Buddhism (3) Prereq.: REL 2627 or consent of instructor. A survey of Buddhism from its origins to the present.

4850 Buddhist Psychology (3) Buddhist conceptions of mind, self, psyche, and personhood in comparison to Western views of the same.

4928 Medieval Philosophy (3) See PHIL 4928.

4939 Kierkegaard (3) See PHIL 4939.

4944 Philosophical Theology (3) See PHIL 4944.

4990 Independent Reading and Research (1-3) Open to advanced undergraduates with approval of faculty member who will direct the course. Student is responsible for selecting area of reading and research and gaining agreement of faculty member to direct the course. May be taken for a max. of 6 hrs. of credit when topics vary.

7250 Seminar: Theoretical Study of Religion (3) Method, theory, and approaches in the study of religion; emphasis on classical and recent works in the discipline.

7600 Seminar: Religious Studies (3) May be for a max. of 6 hrs. of credit when topics vary. Texts, ideas, and practices of major Asian religious traditions. Also offered as REL 7600.

7700 Seminar: Asian Religions (3) May be for a max. of 6 hrs. of credit when topics vary. Texts, ideas, and practices of major Asian religious traditions. Also offered as REL 7700.

7990 Independent Study (3) May be for a max. of 6 sem. hrs. of credit when topics vary.
RENEWABLE NATURAL RESOURCES • RNR

General education courses are marked with stars (★).★

1001 Natural Resource Conservation (3) F,S,Su Prereq.: for RNR majors only; credit or registration in RNR 1001. Discussions of the ecological, economic, social, political, and cultural factors that affect human relationships with the natural environment and the exploitation and management of water, forest, range, wildlife, and fisheries resources.

1002 Issues in Natural Resource Management (1) F,S Prereq.: for RNR majors only; credit or registration in RNR 1001. Discussion of the economic, social, political, and cultural factors that affect human relationships with the natural environment and the exploitation and management of water, forest, range, wildlife, and fisheries resources.

1003 Introduction to Wildlife Management (2) F,S,Fall Prereq.: permission of instructor. Introduction to the wildlife management profession; emphasis on the role of wildlife in contributing to the economy of the state.

1004 Conservation of Forest Resources (2) F,S,Su Prereq.: credit or registration in RNR 1001. Resources of forest and rural land, including wood, wildlife, recreation, forage, and water; techniques of multiple-use management of forest lands.

2001 Dendrology (3) F Prereq.: 6 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Principal trees of the U.S.; their identification, classification, nomenclature, and distribution. Emphasis on southern timber species, common shrubs, ornaments, and some herbaceous plants which will also be covered.

2002 Introduction to Fisheries and Aquaculture (3) F,Su F Prereq.: 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. History and scope of fisheries and aquaculture; production and harvest of economically important aquatic vertebrates and invertebrates; role of fisheries and aquaculture professions in society.

2031 Principles of Wildlife Management (3) F Wildlife conservation and management; ecology and management of wildlife in relation to the objectives of consumptive and nonconsumptive interest groups.

2039 Introduction to Renewable Natural Resource Policy (3) F Development and implementation of policies in renewable natural resources; current environmental issues.

2043 Wood Science and Forest Products (3) S Prereq.: 2 hrs. lecture; 3 hrs. lab. Structural components of wood and identifying characteristics; basic physical properties; manufacture and uses of forest products.

2061 Problems in Natural Resource Management (1-4) F,S,Su Prereq.: permission of instructor. May be taken for a maximum of 4 hrs. of credit. Topics vary with the needs of the student and availability of faculty.

2101 Ecology of Renewable Natural Resources (3) F Prereq.: BIOL 1201, 1208 and GIS (3) Prereq.: 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Introduction to sampling techniques in measuring renewable natural resources, such as trees, wood products, forest stands, wildlife and fisheries populations, and water quality. Introduction to use of global information systems (GIS) and global positioning systems (GPS) applications in natural resource management.

3002 Silviculture (3) F,S,Su Prereq.: RNR 2101. Basic knowledge of forest ecosystems and e-mail is assumed. 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. A generalized approach to forest stand establishment and culture based on the ecological principles of regeneration and the identification of stand conditions that will satisfy specific goals and objectives for the forest.

3004 Photography and GIS (3) F,S Prereq.: permission of department. 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Principles, interpretation, and use of aerial photos, Global Positioning Systems (GPS), and Geographic Information Systems (GIS) in land measurements and forest management applications.

3005 Field Studies in Wildlife Habitat (2) Interestion

only. Prereq.: RNR 2101. Class meets 5 hrs. per day for 2 weeks an off-campus location. Students are responsible for paying for travel expenses associated with this course. Identification of woody and herbaceous plants important to wildlife species and understanding of habitat requirements and management of wildlife; emphasis on selecting field data and plant identification in field setting to assess habitat quality for wildlife.

3018 Ecology of Louisiana Wildlife (4) F Prereq.: RNR 2031, 2 hrs. lecture; 6 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Habits, ecology, behavior, and reproduction of selected species of amphibians, reptiles, birds, mammals, and fishes; emphasis on the diversity of niche exploitation strategies among these groups.

3034 Field Studies in Zoology (1) Prereq.: RNR 2001. One week of field practice. Students are responsible for paying for travel expenses associated with this course. Experiences in designing and conducting bird and mammal surveys and multipurpose types of land surveying associated with forest resource management.

3037 Field Studies in Silviculture (1) F Prereq.: RNR 2001, 3002, and 3103. One week of field practice. Students are responsible for paying for travel expenses associated with this course. Field tours of a range of forestry practices and field experiences in various silviculture practices.

3038 Field Studies in Timber Harvesting (1) F Prereq.: RNR 3002 and 3103. One week of field practice. Students are responsible for paying for travel expenses associated with this course. Field tours of wood manufacturing facilities; exercises in product/raw material relationships.

3040 Silvicultural Prescriptions (1) F Prereq.: RNR 3002 and 3103. One week of field practice. Students are responsible for paying for travel expenses associated with this course. Principles of silvicultural prescriptions incorporating elementary economic analysis and silvicultural principles.

3041 Forest Practicum (1-4) F,S,Su 1-4 weeks. Students are responsible for paying for travel expenses associated with this course. May be taken for a max. of 4 sem. hrs. of credit. Field exposure to various aspects of forested ecosystems, off-campus field, lab, workshop, or other intensive training in the field of forestry.

3044 Renewable Natural Resources Field Studies (1) F Prereq.: RNR 3002, 3103. One-week field trip. Students are responsible for paying for travel expenses associated with this course. Insight into management objectives and issues in forested ecosystems not found in the West Gulf Coastal Plain; experience gained on site visits and discussions with various natural resource professionals.

3103 Forest Biometrics (2) F Prereq.: RNR 2102, EXST 2201, and MATH 1431. Principles in measuring trees, stands, wood products, and other forest resources; sampling and inventory techniques; statistical inference.

3105 Forest Biology (2) F Prereq.: RNR 2101. This is an 8-week course. The general University drop/add dates do not apply. The instructor will provide students with the drop/add dates established by the Office of the University Registrar. Topics include: tree anatomy, tree growth, tree physiology, forest genetics, and ecological principles specific to the United States forest ecosystems and sustainable management of forests.

3106 Timber Harvesting (2) F 1 hr. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. This is an 8-week course. The general University drop/add dates do not apply. The instructor will provide students with drop/add dates established by the Office of the University Registrar. Methods of harvesting timber crops; logging equipment, planning, road layout, legal and social issues, environmental concerns, financial analysis of logging operations, and contracts; field trips and practical exercises included.

3107 Wood Procurement (2) F Prereq.: RNR 3102. 1 hr. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. This is an 8-week course. The general University drop/add dates do not apply. The instructor will provide students with the drop/add dates established by the Office of the University Registrar. Methods of purchasing and marketing timber crops; practical of timber procurement systems; value assessments, wood specifications, human relations, negotiations, ethics, competitive bidding; legal and social issues; conservation, and sustainability of global aspects; field trips and practical exercises included.

3108 Case Studies in Habitat Restoration (2) F Prereq.: RNR 2101, 1 hr. lecture; 5 hrs. lab, 2 weekend field trips. Students are responsible for paying for travel expenses associated with this course. The general University drop/add dates do not apply because this is an 8-week course. The instructor will provide students with the drop/add dates established by the University Registrar. Principles related to the context, planning, design, and implementation of restoration; methods of evaluation of vegetation restoration efforts using the case study method.

4002 Fisheries Literature and Communication (3) F 2 hrs. lecture; 3 hrs. lab. Organization and communication of technical fisheries literature.

4011 Wildlife Management Techniques (4) F Prereq.: RNR 2101 and EXST 2201, 3 hrs. lecture, 1 hr. lab, 2 weekend field trips. Students are responsible for paying for travel expenses associated with this course. Wildlife science and the scientific method of testing hypotheses and predictions, statistical analysis of class generated data and scientific writing. Population inventories and analysis and management; methods to capture animals and determine age and sex. Immobilization methods, marking methods, radio telemetry, and assessment of nutrition and condition. Use of GPS and GIS in wildlife ecology.

4013 Ecology and Management of Wetland Wildlife (4) F Prereq.: 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. History and value of wetlands, waterfowl, fur animals, alligators, wetland habitat management.

4020 Taxonomy and Ecology of Wetland Plants (4) See BIOL 4020.

4021 Recreation in the Forest Environment (3) F Prereq.: senior standing. 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Resource-oriented recreation in the forest; demand and supply; recreational planning and development of forest lands and waters; basic recreation management policies and principles.

4022 Principles of Aquaculture (4) F Prereq.: 8 sem. hrs. of introductory chemistry and 8 sem. hrs. of introductory zoology. 3 hrs. lecture, 3 hrs. lab. 1 hr. of credit. Students are responsible for paying for travel expenses associated with this course. Aquaculture of fish, crustaceans, and mollusks.

4023 Marine Fisheries Resources (3) S Survey of the biology, harvest, and management of commercially important marine organisms throughout the world; emphasis on stock trends and the effects of biological and socioeconomic factors on development of management programs.

4025 Limnology (3) F Prereq.: BIOL 1201, 1208 and CHEM 1201, 1202, 1212 or equivalent. Geomorphology, physiochemistry, biology, and ecology of inland waters.

4030 Tropical Forestry (1) V Distribution and characteristics of tropical forests, conservation and sustainable management; managing the tropical forest resources of the world.

4032 Forest Fire Protection and Use (2) S 1 hr. lecture, 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. 8-week course. The general University drop/add dates do not apply. The instructor will provide students with drop/add dates established by the Office of the University Registrar. Forest fire control and use; emphasis on southern forests.

4033 Silviculture and Management of Hardwoods (4) F Prereq.: RNR 3002 or consent of instructor. 3 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Extended field trips, one weekend field trip. Ecology, silviculture, and management of hardwood forest ecosystems; improvement, conservation, and use for forest products, wildlife habitats, and other amenity values.
4035 Ecology and Management of Upland Wildlife (3) F 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Ecology and management of wildlife in upland habitat; recruitment of forest land; current issues related to upland wildlife.

4036 Forest Management (4) F Preq.: ECON 2303 or AGEC 2093 or equivalent; RNR 3036, 3037, and 3040. 3 hrs. lecture; 1 hrs. lab. Cost analysis and discounting; management of a single stand, even-aged and uneven-aged management, decision criteria, and decision variables, management of forest taxation and valuation; management of many stands; harvest scheduling.

4037 Biology of Fishes (3) S Preq.: RNR 4145 or consent of instructor. Principles and techniques in the manufacture of forest products including lumber, treated materials, furniture, adhesive, and composite materials such as plywood, particleboard, medium density fiberboard, oriented strandboard, and engineered lumber.

4105 Aquaculture Production Systems (3) S Preq.: BIOL 1201, 1208 or equivalent. General biology and culture techniques for global fish, crustacean, mollusk, amphibian, and reptilian species.

4106 Techniques in Limnology and Fisheries (2) S Preq.: junior, senior, or graduate standing and permission of instructor. 1 hr. lecture; 1 hr. lab. Students are responsible for paying for travel expenses associated with this course. Quantitative techniques in habitat, water quality, and fish population assessment in freshwater ecosystems.

4107 Human Dimensions in Natural Resources (3) F Preq.: RN 3320, 3324, or equivalent. Education electives. Human behavior as related to management and use of natural resources.

4145 Ichthyology (4) See BIOL 4145.

4151 Hydrology of Natural Landscapes (3) Preq.: AGRO 2031 and MAT 1061 or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Hydrologic processes and principles of natural landscapes; understanding of characteristics and role of watershed; concepts for water resources management and water quality protection.

4600 Topics in Marine Zoology (2-6) See BIOL 6600.

4900 Watershed Hydrology (3) F See ENVS 4900.

7001 Research Methodology (3) F Planning, conducting, and reporting of research in the renewable natural resources.

7003 Advanced Silviculture (3) S-O Silvics and silvicultural practices related to the commercially important Southern tree species, especially the pines; silvics and silviculture of several major commercial species outside of the southeast.

7004 Forest Ecology (3) S-O Preq.: AGRO 2031 or equivalent. 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course.

7006 Research Seminar in Forestry (1) F, S, Su May be taken for a max. of 6 sem. hrs. credit when topics vary.

7007 Graduate Seminar in Forestry (1) F,S,Su May be taken for a max. of 6 sem. hrs. credit when topics vary.

7011 Watershed Hydrology and Floodplain Analysis (3) Preq.: AGRO 2051 or RNR 4131 or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Also offered as ENVS 7250. Hydrologic processes and the creation of lakes and floodplains; intersections among water resources, water quality, land use, and management practices; hydrologic modeling of natural landscapes.

7012 Ecology and Management of Waterfowl (3) F-O 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Behavioral and physiological adaptations of waterfowl throughout the annual cycle; population dynamics and habitat management; political and economic aspects of harvest management in North America.

7013 Wildlife Population Dynamics (3) F-O Preq.: EXST 7003 or equivalent. 2 hrs. lecture; 2 hrs. lab. Theories of population growth and regulation, population interaction, life tables, mortality rate calculation; band data analysis; population change.

7015 Ecology and Management of Upland Birds (3) F 2 hrs. lecture; 3 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Ecology and management of selected upland birds found in North America; students will develop a comprehensive management plan for an upland bird species.

7016 Current Topics and Techniques in Conservation Science (3) F 2 hrs. lecture; 3 hrs. lab. Scientific basis for the preservation of biodiversity; conservation strategies of government and non-government organizations; current status of biodiversity around the world; new techniques applicable to conservation biology; quantitative exercise with data analysis; implications for the population and community levels, fragmentation and other landscape effects, and genetics of small populations.

7018 Habitat Management Principles (4) F-E 2 hrs. lecture; 6 hrs. lab. Students are responsible for paying for travel expenses associated with this course. Principles of management applied to habitat evaluation; endangered species; mitigations; global trends of habitat quality and change.

7020 Ecology of Fishes (3) S-O Preq.: BIOL 4253 or equivalent. Ecology of fish populations; interactions of fishes and their environment; behavioral adaptations of fishes.

7025 Advanced Aquaculture (3) Preq.: RN 4002 or equivalent. 4 hrs. lecture; 4 hrs. lab. Principles and practices for culturing commercially important crustaceans and mollusks including soft crabs, marina shrimp, freshwater prawns, crawfish, oysters, clams, and mussels; emphasis on environmental requirements, facility development, hatchery and production management, budgets, and processing and markets.

7026 Shellfisheries Aquaculture (4) F-O Preq.: RN 4022 and BIOL 4154; or equivalent. 3 hrs. lecture; 3 hrs. lab. Principles and practices for culturing commercially important crustaceans and mollusks including soft crabs, marina shrimp, freshwater prawns, crawfish, oysters, clams, and mussels; emphasis on environmental requirements, facility development, hatchery and production management, budgets, and processing and markets.

7027 Genetics and Culture of Finfish (4) S-O Preq.: RN 4002 and BIOL 2153; or equivalent. 3 hrs. lecture; 3 hrs. lab. Practical culture techniques and methods of breeding for genetic improvement of commercially important finfish.

7029 Advanced Topics in Renewable Natural Resources (1-4) V May be taken for a max. of 6 sem. hrs. credit when topics vary.

7036 Advanced Topics in Forest Biometrics and Forest Management (3) V Preq.: EXST 7014 and RNR 4036; or equivalent. Theory and practices involved in predicting growth and yield of forest stands; economic and goal programming, biometrics, and capital budgeting to timber and multiple-use management.

7041 Advanced Wood Science (4) V Preq.: RN 2903. 3 hrs. lecture; 3 hrs. lab. Topics in wood science, including review of selected literature; anatomical, physical, and chemical properties of wood, with emphasis on wood products.

7061 Water Quality Management and Policy (3) See ENVS 7081.

7070 Graduate Seminar in Fisheries (1) F,S,Su May be taken for a max. of 4 sem. hrs. of credit when topics vary.

7071 Graduate Seminar in Forestry (1) F,S,Su May be taken for a max. of 3 sem. hrs. credit. Pass-fail grading.

7072 Graduate Seminar in Wildlife (1) F,S,Su May be taken for a max. of 4 sem. hrs. of credit when topics vary. Topics of current interest in wildlife science and management.

7151 Watershed Hydrology and Floodplain Analysis (3) Preq.: AGRO 2051 or RNR 4131 or consent of instructor. 2 hrs. lecture; 3 hrs. lab. Also offered as ENVS 7250. Hydrologic processes and the creation of lakes and floodplains; intersections among water resources, water quality, land use, and management practices; hydrologic modeling of natural landscapes.

7320 Fisheries Oceanography (3) F See OCS 7320.

7424 Diseases of Aquatic Animals (3) Preq.: consent of instructor. Basic microbiology and/or parasitology.
Social Work

7455 Management in Human Services (3) Prereq.: completion of all foundation courses. Management used in the effective provision of social services; techniques of modern management; interdisciplinary and practical approaches; unique aspects of the human service management; development of critical attitudes and management skills. 5701 Program and Practice Evaluation (3) Prereq.: completion of all foundation courses; majors only and credit for or concurrent registration in SW 7501, 7502, 7503, 7504, and 7506. Types of research, designs, and instruments used in social work; research processes from specification to hypothesis and results of data.

7502 Advanced Field Internship I (3) Prereq.: majors only and credit for or concurrent registration in SW 7501, 7502, 7504, 7505, and 7506. Pass-fail grading. $100 internship fee. Supervised internship in an approved agency setting where advanced knowledge, skills, values, and ethics are applied in the practice setting. 240 clock hours.

7503 Advanced Field Internship II (3) Prereq.: majors only and credit for or concurrent registration in SW 7501, 7502, 7504, 7505, and 7506. Pass-fail grading. $100 internship fee. Continuation of SW 7502. Supervised internship in an approved agency setting where advanced knowledge, skills, values, and ethics are applied in the practice setting. 240 clock hours.

7504 Advanced Social Policy (3) Prereq.: majors only and credit for or concurrent registration in SW 7501, 7502, 7503, 7504, 7505, and 7506. Advanced methods of effective individual, family, and group treatment of systemic issues in a holistic perspective.

7506 Community and Agency Contexts for Direct Practice (3) Prereq.: majors only and credit for or concurrent registration in SW 7501, 7502, 7503, 7504, and 7505. Community, organizational, and social aspects of social work practice; indirect practice skills associated with effective social work practice in multiple service environments.

7710 Task-Oriented Group Interaction in Social Work (3) Interaction of small groups in social work practice; emphasis on understanding barriers to goal-directed interaction and on helping groups accomplish tasks. 7801 Family Violence (3) Topics in family violence; their relevance to social work practice; program development and intervention approaches and issues.

7803 Grant and Proposal Writing for Human Service Organizations (3) Prereq.: completion of all foundation courses; Methods of soliciting federal, state, and private funds; developing grant and contract proposals. 7804 Addictive Disorders in Contemporary Society (3) Topics related to addictive disorders in contemporary society; their relevance to social work practice.

7805 Special Topics in Social Work (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. of credit when topics vary. Selected topics on social work and social welfare theory, practice, and policy.

7905 Independent Reading and Research in Social Work Practice (3) Prereq.: consent of instructor. May be repeated once by PhD students if topics vary. 7906 Independent Reading and Research in Social Welfare Policy (3) Prereq.: consent of instructor. May be repeated once by PhD students if topics vary. 7907 Public Policies and the Aging (3) Public policies that affect quality of life for the elderly; Older Americans’ Act, Social Security Act, Medicare and Medicaid policies.

7908 Social Development: International Perspectives (3) Concepts of socialization and social development in the modern world; theories and normative perspectives; social and national planning.

7997 Research Project: Nonthesis (3) Prereq.: completion of all foundation courses; majors only and credit for or concurrent registration in SW 7501, 7502, 7503, 7504, and 7506. Types of research, designs, and instruments used in social work; research processes from specification to hypothesis and results of data.

8000 Thesis Research (1-12 per sem.) Prereq.: completion of all foundation courses and consent of instructor. "S"/"U" grading. 8000 Dissertation Research (1-12 per sem.) Prereq.: successful completion of the oral examination. "S"/"U" grading.
3601 Social Interaction (3) Prereq.: SOCL 2001 or PSYC 2001 or equivalent. Human behavior as social interaction.

3605 Collective Behavior (3) Prereq.: SOCL 2001 or equivalent. Sociological analysis of noninstitutionalized group behaviors; crowds, publics, panics, fads, hostile outbursts, and social movements.

3900 Sociology Internship (1-3) Prereq.: 75 hours of coursework completed, 2.50 overall GPA, written consent of department chair, and review of faculty member. May be taken for a max. of 3 hrs. of credit. Faculty supervised field study/research with an agency or organization whose mission or function is relevant to the student's curriculum.

3901 Directed Reading and Research in Sociology (1-3) Prereq.: SOCL 2001 or equivalent. May be taken for a max. of 9 hrs. of credit. Student registers with a faculty member before registration to select the area of reading or research. Topic must not substitute for regularly required courses unless reading goes beyond a standard course's offerings.

3905 HONORS: Senior Thesis Research (3) Prereq.: SOCL 3901; open to seniors who are candidates for a bachelor's degree with honors in sociology. Supervised research and preparation of a senior thesis.

3911 Research Practicum in Rural Sociology (1-3) Prereq.: SOCL 2211, 2351, and 3101. May be taken for a max. of 18 hrs. of credit. Student registers with a faculty member and, in consultation, selects a research problem. Supervised research experience in rural sociology, including data collection and analysis.

4011 Applied Social Research (3) Prereq.: SOCL 2001 or equivalent. Analysis of social processes in society, with emphasis on statistical methods of data analysis. Applied social research.

4091 Topics in Social Research (1) Prereq.: Permission of instructor. May be taken for a max. of 6 hrs. of credit if topics vary. Specialized areas in social research.

4301 Social Organization (3) Prereq.: SOCL 2001 or equivalent. Structure and function of social systems and institutions.

4302 Complex Organizations (3) Prereq.: SOCL 2001 or equivalent. Social process in organizational settings. Emphasis on applied research.

4401 Social Policy (3) Prereq.: SOCL 2001 or equivalent. The formulation and implementation of policies to affect social and economic conditions.

4421 Political Sociology (3) Prereq.: SOCL 2001 or equivalent. The impact of political factors on social behavior.


4441 Sociology of Technology (3) Prereq.: SOCL 2001 or equivalent. Nature of social and technological change; role of conflict in social change and in contemporary society.

4451 Sociology of Medicine (3) Prereq.: SOCL 2001 or equivalent. Sociological analysis of the work of physicians and the effects of the medical profession on society.

4461 Criminology (3) Prereq.: SOCL 2001 or equivalent. Crime, the criminal justice system, and the law.

4462 Sociology of Youth & Crime (3) Prereq.: SOCL 2001 or equivalent. The sociological study of adolescent deviance and crime; the socio-demographic correlates and social psychological causes of youthful offending and the juvenile justice system.

4471 Sociology of Law (3) Prereq.: SOCL 2001 or equivalent. Law and social change; evolution of legal institutions; crime; law and crime; influence of legal controls and sanctions on human behavior.

4481 Science, Technology, and Society (3) Prereq.: SOCL 2001 or equivalent. Scientific institutions and development; effects of technological decision making; technological change.

4511 Minority Peoples in the United States (3) Prereq.: SOCL 2001 or equivalent. Analysis of past and present contributions of ethnic and racial minority groups in the U.S.

4521 Sex Roles in Contemporary Society (3) Prereq.: SOCL 2001 or equivalent. Changes in sex roles and related behavior of males and females, including institutional and structural changes.

4531 The Aged in Contemporary Society (3) Prereq.: SOCL 2001 or equivalent. Social, demographic, psychological, cultural, and health factors related to the aging process in contemporary society.

4551 Sociology of Development (3) Prereq.: SOCL 2001 or equivalent. Central concepts, perspectives, and research areas in sociocultural developmental change.

4601 Personality and Social Structure (3) Prereq.: SOCL 3601 or PSYC 3140 or equivalent. Social structure, psychological, and cultural factors affecting personality and social behavior in society.

4611 Attitudes and Attitude Change (3) Prereq.: SOCL 3601 or PSYC 3140 or equivalent. Analysis of social attitudes and their formation and change.

4621 Small Groups (3) Prereq.: SOCL 3601 or PSYC 3140 or equivalent. The structure and functions of small groups.

4631 Social Networks and Society (3) Prereq.: SOCL 2001 or equivalent. Processes of network formation and their effects on social behavior, groups, and organizations.

4701 Population (3) Prereq.: SOCL 2001 or equivalent. Processes of population growth and changes in population size and composition.

4711 Human Ecology (3) Prereq.: SOCL 2001 or equivalent. Evolution and expansion of theory of social organization; emphasis on interdependence of population, technology, and organization in adaptation of a population to its environment.

7121 Seminar: Classical Sociological Theory (3) Prereq.: consent of instructor. Study of advanced methods in sociological research; emphasis on interpretation and current research.

7201 Research Methods in Sociology (3) Prereq.: SOCL 2351 or equivalent. Introduction to inferential methods for research in sociology; emphasis on procedure and critical evaluation. Course includes research design and evaluation.

7203 Advanced Research Methods in Social Science (3) Prereq.: SOCL 2201 or equivalent. Intermediate research methods in the social sciences; interplay of theory and methods of research; formulation of research problems and design; measurement and scaling; sampling; ethics in research; and critiques of social science research.

7213 Specialized Topics in Social Science Methods (2-3) Prereq.: SOCL 7203 or POLI 7963 or equivalent. May be taken for a max. of 12 sem. hrs. of credit if topics vary. Specialized areas in social research.

7391 Seminar: Topics in Social Organization (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. credit if topics vary. Specialized areas in social organization.

7491 Seminar: Topics in Social Institutions (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. credit if topics vary. Specialized areas in social institutions.

7591 Seminar: Topics in Social Issues (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. credit if topics vary. Specialized areas in social issues.

7691 Seminar: Topics in Social Interaction (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. credit if topics vary. Specialized areas in social interaction.

7791 Seminar: Topics in Population and Ecology (3) Prereq.: consent of instructor. May be taken for a max. of 12 sem. hrs. credit if topics vary. Specialized areas in population and ecology.

7891 Seminar: Independent Research and Research (3) Prereq.: successful completion of at least one year of graduate study.

7903 Proseminar in Sociology (1) Required twice of both master's and PhD candidates. Pass-fail grading. Contempory research and critical issues in sociology.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

8900 Research in Sociology (1-6) Open only to students engaged in a specific, organized research project under faculty supervision. Student must be engaged in design and implementation of research and analysis and interpretation of data.

9000 Dissertation Research (1-12 per sem.) “S”/“U” grading.

SPANISH - SPAN

Native speakers of Spanish will not receive credit for courses marked with an asterisk (*). General education courses are marked with stars (•).
everyday vocabulary, with exercises in comprehension and conversation.

★ 2101 Intermediate Spanish (3) F,S Su Prereq.: SPAN 1102 or equivalent. An honors course, SPAN 2103, is also available. Continuation of elementary Spanish.

★ 2102 Intermediate Spanish (3) F,S Su Prereq.: SPAN 2101 or equivalent. An honors course, SPAN 2104, is also available; Continuation of SPAN 2101.

★ 2103 Honors: Intermediate Spanish (3) F,S Su Preq.: Same as SPAN 2101, with special honors emphasis for qualified students.

★ 2104 Intermediate Oral Communication (3) V Prereq.: SPAN 2102 or equivalent. Development of listening and speaking competence.

★ 2155 Spanish Textual Commentary (3) F,S Prereq.: SPAN 2102 or equivalent. Oral and written commentary on a variety of genres and nonprint media in Spanish.

2156 Advanced Spanish Communication (3) Prereq.: Permission of department, and SPAN 2154 or credit in SPAN 2155.

3001 Tutoring Learners of Spanish as a Second Language (1) Preq.: EDCT 2002 or equivalent. 3 hrs. lab/field experiences in multicultural settings. A carefully monitored and evaluated Spanish tutoring experience in a local middle or high school, under the guidance of the course instructor and a mentor teacher.

3002 Developing Language Lessons for Spanish as a Second Language (1) Preq.: EDCT 3001, SPAN 3001, and concurrent enrollment in EDCT 3002. 3 hrs. lab/field experiences in multicultural settings. Under the supervision of a Spanish faculty member and a teacher mentor, teacher candidates in this course will prepare and deliver second language Spanish language lessons that incorporate audio-visual materials and technology-enhanced language learning activities.

3010 Advanced Spanish Grammar and Composition (3) F,S Preq.: Permission of department and credit or registration in SPAN 2155.

3026 Literary Analysis (3) F,S Preq.: SPAN 2155, 2156, and 3010. Literary genres and their characteristics; critical reading and commentary on Spanish texts.

★ 3043 Introduction to Latin American Literature I (3) Preq.: SPAN 2101, 2102 or equivalent. An introductory course in selected topics in Latin American literature from its beginnings to the end of the 14th century; emphasis on the mester de juglaria, mester de elocuencia, and masterpieces of prose and poetry of the 14th century.

4003 Instructional Strategies for the Second Language Classroom (3) Preq.: EDCT 4001, SPAN 4002, and concurrent enrollment in EDCT 4001. 3 hrs. lab/field experiences in multicultural settings. Teacher candidates will study and participate in activities that incorporate different classroom instructional structures, including teacher-to-whole-class, task-based group activities, and student-to-student (pair work). Participants will design and conduct Spanish language lessons using learner-centered activities.

4004 Critical Issues in Teaching Spanish as a Second Language: Capstone Course (3) Preq.: EDCT 4001, SPAN 4003, and concurrent enrollment in EDCT 4004. Teacher candidates should be in the last two semesters in completion of the requirement for a major in Spanish. Taught in Spanish. Focus on the consolidation of knowledge about the Spanish language, literature, and culture with respect to the teaching of subject content to middle or high school learners.

4005 Structure of the Spanish Language (3) Preq.: SPAN 3010 or equivalent. Spanish morphology and syntax; structural, sociolinguistic, and generative-transformational analyses and applications.

4007 Spanish Medieval Literature (3) Spanish literature from its beginnings to the end of the 14th century; emphasis on the mester de juglaria, mester de elocuencia, and masterpieces of prose and poetry of the 14th century.

4034 Special Topics in 18th and 19th Century Literature (3) V May be taken for a max. of 6 hrs. of credit when topics vary.

4053 Special Topics in Golden Age Prose (3) V May be taken for a max. of 6 hrs. of credit when topics vary.

4054 Special Topics in Spanish Literature (3) May be taken for a max. of 6 hrs. of credit when topics vary.

4057 Spanish Renaissance and Baroque Prose (3) V May be taken for a max. of 6 hrs. of credit when topics vary.

4063 Spanish Literature from 1899 to 1936 (3) Preq.: SPAN 3071 or 3072. Literature in all genres of the Early Modernists to the Avant Garde.

4064 Spanish Literature Since 1936 (3) Preq.: SPAN 3071 or 3072. Literature in all genres since the Spanish Civil War.

4081 Modern Spanish Prose Fiction in Translation (3) Taught in English; knowledge of Spanish not required. Selected outstanding novels and short stories of modern Spanish literature from the 16th and 17th century Golden Age to the present; includes The Life of Lazarillo de Tormes and works by Cervantes, Pérez Galdós, Unamuno, Valerio, Inclán, Pérez de Ayala, Cela, Lotus, and Gironella.

4082 Modern Spanish-American Prose Fiction in Translation (3) Taught in English; knowledge of Spanish not required. Selected outstanding Spanish-American prose works by García Márquez, Cortázar, Fuentes, Carpenter, and Borges.

4100 Women Writers in the Spanish World (3) May be taken for a max. of 6 hrs. of credit when topics vary. Examination of selected periods, themes, and genres.

4144 Latin American Literature I (3) Preq.: one literature course in Spanish at the 3000 level or consent of instructor. Topics in colonial Latin American literature from 1492-1810.

4145 Latin American Literature: 1810-1915 (3) Preq.: one literature course in Spanish at the 3000 level or consent of instructor. Topics in Latin American literature from independence through modernismo (1810-1915).

4146 Latin American Literature: 1915-1960 (3) Preq.: one literature course in Spanish at the 3000 level or consent of instructor. Topics in Latin American literature from the historical avant-garde to 1960.

4147 Latin American Literature: 1960-Prep. (3) Preq.: one literature course in Spanish at the 3000 level or consent of instructor. Topics in Latin American literature from 1960 to the present.

4200 Literature and Culture of Hispanics in the United States (3) Texts may be in English or Spanish. Selected periods, themes, and genres; related cultural topics.

4201 Cinema in Spanish (3) F,S Preq.: consent of instructor. Screening and analysis of representative films from Spain and Latin America and their interrelations with literature.

4400 Topics in Hispanic Cultural Studies (3) V May be taken for a max. of 6 hrs. of credit when topics vary. Hispanic literary texts in relation to such domains as the arts, politics, religion, and society.
2024 Introduction to Theatre Technology (3) Prereq.: THTR 1022, 1024. 2 hrs. lecture; 2 hrs. lab. Preparation and use of the equipment, techniques, and methods used in stage sound and audio; includes work in the areas of computer control and editing of sound, live sound, and recording techniques in both the analog and digital formats.

3511 Stage Lighting Technology (3) Prereq.: THTR 2022, 2024. 2 hrs. lecture; 2 hrs. lab. Introduction to the technical and mechanical lighting technology in both analog and digital formats.

3800 Theatre or Film Internship (3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. credit. Pass-fail grading. Study with an approved theatre or film company; emphasis may be in one or all of the following areas: performance, directing, design, technology, dramaturgy, stage management, administration, box office, or casting.

3802 Dance Composition (3) Fundamental elements and principles of choreography.

3803 Improvisation (3) Structural problems and exploration in dance improvisation.

3830 Technical Drafting for the Theatre (3) Prereq.: THTR 2022, 2024. 2 hrs. lecture, 2 hrs. lab. Drafting conventions and techniques used for depicting common scenic elements.

3900 Selected Topics in Theatre (3) Prereq.: consent of instructor. May be taken for a max. of 6 hrs. of credit when topics vary. Consult Schedule of Classes for current offering.

4008 Writing Drama (3) See ENGL 4008.

4020 Women and Theatre (3) Survey of western drama by and about women; female characters and playwrights in past and present dramas of Europe and America.

4023 Advanced Costume Construction Techniques for the Stage (3) Prereq.: THTR 3125. 6 hrs. lab. A continuation of THTR 3123. Skills and techniques unique to the construction of costumes for the stage; methods of planning and construction of costumes for the theatre with emphasis on the differences between theatrical costume construction and clothing construction for the consumer market; historical construction, patterning, cutting, fitting, design analysis, and adaptations for stage performance.

4024 Directing I (3) Prereq.: THTR 2022, 2025, and 2026; or equivalent. Director's problem solving in the areas of play selection, characterization, and scene visualization.

4025 Acting: Scene Study (3) Prereq.: THTR 3025. 2 hrs. lecture; 3 hrs. lab. Open only to Theatre performance majors. Technique of developing an actor's score for a role.

4027 Special Topics in Stage Movement (3) Prereq.: THTR 2029 and permission of instructor. Theatre majors in the performance area of concentration only. 2 hrs. lecture; 2 hrs. lab. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Advanced techniques in stage movement.

4120 Drama from Aeschylus to Ibsen (3) Prereq.: THTR 2025.

4121 Drama from Ibsen to the Present (3) Prereq.: THTR 2028.

4123 Costume Design (3) Principles of design related to stage costumes; design research, creative interpretation; adapting costumes to theatrical styles of production; inspiration from designs of the past.

4124 Scene Design (3) Basic principles of scenic design for the theatre; form, style, color, and lighting; sketches, renderings, and models.

4125 Directing II (3) Prereq.: THTR 4024 or equivalent. Principles of play selection, concept formulation, casting, rehearsal, and directing plays and scenes in workshop performance.

4126 Advanced Costume Design (3) Prereq.: THTR 3126 and 4123. Continuation of THTR 4123 concentrating on the development of a body of costume design research, conceptual choices, and advanced costume design techniques.

4127 Styles of Acting (3) Prereq.: THTR 4025 and permission of department. Fundamental techniques of acting; acting styles required by plays of the Greek, neoclassical, Elizabethan, and other periods.

4128 Mask Making (3) 2 hrs. lecture; 2 hrs. lab. Skills used in basic mask construction for the theatre; includes life casting and four common mask-making techniques with their distinctive properties.

4131 Seminar: Contemporary Theatre and Drama (3) Su May be taken for a max. of 6 hrs. of credit when topics...
4312 Theatrical Hair and Makeup (3) Prereq.: THTR 2502 or equivalent. Advanced principles of makeup for stage and film, including prosthetic makeup techniques and airbrush makeup; study and execution of period makeup; and hair styling, including basic wig and facial hair construction, and wig styling.

4314 Advanced Scenery Construction (3) Prereq.: THTR 1800 or consent of instructor. Introduction to theatre and television scenic construction techniques. Includes production of models, study of the medium and materials used, and construction of sets.

4320 Advanced Fundamentals of Nonprofit Arts Management (3) Prereq.: THTR 3320 or consent of instructor. Concepts and principles of nonprofit arts management with emphasis on the economics of the arts including the income gap, the economic impact of the arts, and the importance of arts education. Emphasis on non-profit organization management, fundraising, and grant writing.

4350 Advanced Development Strategies (3) Prereq.: THTR 3320 or consent of instructor. Principles of fund raising for the not-for-profit organization including grant writing, individual and corporate giving, planned giving, capital campaigns, and special events.

4345 Scene Painting II (3) Prereq.: THTR 3435 or equivalent. 4 hrs. lecture, 4 hrs. lab. (IA) Contemporary scene painting for the stage; emphasis on advanced projects.

4346 History of Theatrical Design (3) Prereq.: THTR 3320 or equivalent. Historical survey of theatre with emphasis on the development of lighting, costume and scenic design for the Greek theatre to the present; focus on individual designers important to each discipline.

4500 Musical Theatre Production (1-3) See MUS 4500.

4550 Sound Design (3) Prereq.: THTR 3550 or consent of instructor. 2 hrs. lecture; 2 hrs. lab. Sound design principles and techniques; their effect on production.

4551 Lighting Design I (3) Lighting design for the theatre; emphasis on script analysis, production concepts, and visual ideas.

4801 Dance History (3) Prereq.: THTR 1800 or consent of instructor. Development of dance from primitive cultures to the present.

4804 Dance Theatre (2) 6 hrs. lab. May be repeated for credit every semester. Admission by audition. Experienced modern dancers participate in modern dance theatre as lead dancers and as choreographers.

4820 Advanced Stage Management (3) Prereq.: THTR 2020 or equivalent. Advanced training in stage management techniques, including professional experience component with departmental approval.

4851 CAD Drafting for the Theatre (3) Prereq.: THTR 3580 or equivalent. 2 hrs. lecture; 2 hrs. lab. Introduction to the fundamentals of AutoCAD drafting and its use in the theatre industry.

4901 Special Projects in Theatrical Design (1-3) Prereq.: consent of instructor. 3-6 hrs. lab. Approval of projects required by instructor prior to registration. Execution of practical production projects in theatrical design.

4982 Special Projects in Theatrical Technology (1-3) Prereq.: consent of instructor. 2-6 hrs. lab. Approval of production projects required by instructor prior to registration. Execution of practical production projects in theatrical technology.

7001 Independent Projects in Performance Training (1-6) Prereq.: consent of instructor. May be repeated for a max. of 6 hrs. credit. Individual projects in performance training with close faculty supervision; emphasis may be in one or all of the following areas: acting, movement, and voice. 7008 Drama Writing (3-6) See ENGL 7008.

7130 Script Analysis and Dramaturgy (3) Methods of studying playscripts in preparation for their production on stage, through Aristotelian, modern, and postmodern approaches.

7220, 7221 Acting Studio IA, IB (5, 5) Prereq.: admission to MFA acting program. 4 hrs. lecture; 2 hrs. lab. (IA) Intensive work in actor's basic tools; text analysis; comprehensive Stanislavskian technique and characterization. (IB) Emphasis on scene work on the modern repertoire.

7222, 7223 Acting Studio IIA, IIB (4, 4) Prereq.: THTR 7221. (IIB) Acting demands of Greek and Shakespearean drama; scene work with selected texts. (IB) Acting demands of commedia dell'arte, comedy of manners, and farce; scene work with selected plays.

7224, 7225 Acting Studio IIA, IIB (2, 2) Prereq.: THTR 7223. (IIB) Special acting problems and stretch roles. (III) Problems in audition techniques and building a career as a professional actor.

7227 Voice for the Actor I (3) Prereq.: admission to the MFA program. 2 hrs. lecture; 2 hrs. lab. Development of vocal process through exercises in relaxation, alignment, and breathing; basics in speech articulation.

7228 Voice for the Actor II (3) Prereq.: admission to the MFA program. 2 hrs. lecture; 2 hrs. lab. Special emphasis for the actor's voice and use of the body in emotional expression. (IV) Vocal sound for stage and screen.

7231 Stage Movement I (3) Prereq.: admission to the MFA program or consent of instructor. 1 hrs. lecture; 2 hrs. lab. Preparation and integration of the actor's body in spatial awareness, flexibility, realignment, gesture, and body composition.

7234 Stage Movement IV (3) Prereq.: admission to the MFA program or consent of instructor. 1 hrs. lecture; 2 hrs. lab. Advanced stage movement techniques for scenic design projects; emphasis on movement and space. (VIII) Movement and space in scenic design projects; emphasis on movement and space.

7235, 7236 Stage Movement V, VI (3, 3) Prereq.: THTR 7234 or equivalent. 2 hrs. lecture; 2 hrs. lab. (V) Visual and spatial development of movement for the stage; emphasis on the use of space in movement and location; (VI) Movement and space in scenic design projects; emphasis on movement and space.

7277, 7278 Stage Movement VII, VIII (3, 3) Prereq.: THTR 7234 or equivalent. 2 hrs. lecture; 2 hrs. lab. (VII) Continuation of movement techniques with focus on Greek and Roman stage movement techniques; emphasis on period and style. (VIII) Movement and space in scenic design projects; emphasis on movement and space.

7320, 7321 Directing Seminar IA, IB (3, 3) Prereq.: admission to MFA directing program or consent of instructor. 2 hrs. lecture; 2 hrs. lab. (IA) Stage director's study of a script in preparation for creating an approach to production. (IB) Translating a play's text and director's approach into dramatic images on stage; one act of a realistic play mounted on workshop level.

7322, 7323 Directing Seminar IIA, IIB (3, 3) Prereq.: THTR 7321. (IIA) Director's approach to varying styles of production. (IIB) Advanced approach to Shakespearean and Jacobean drama; acts from plays presented on the workshop level.

7324, 7325 Directing Seminar IIIA, IIB (2, 2) Prereq.: THTR 7322. (IIA) Production of modern contemporary plays. (IIB) Continuation of directing techniques in American theatre.

7420 Director/Designer Communication (3) Prereq.: admission to MFA program or consent of instructor. Communication methods between director and designer; techniques in the design of plays; techniques for articulating ideas; techniques for stage design; emphasis on script analysis, developing the ground plan and elevations.

7422, 7423 Advanced Scene Design IIA, IIB (4, 4) Prereq.: THTR 7212. (IIA) Preparation and presentation of scene design projects; emphasis on period and style. (IIB) Preparation and presentation of scene design projects; emphasis on period and style.

7431, 7432 Rendering for the Theatre IA, IB (3, 3) Prereq.: admission to MFA design technology program or consent of instructor. 1 hr. lecture; 4 hrs. lab. (IA) Drawing and rendering techniques for scenic, costume, and lighting designers; emphasis on basic design elements and use of various media. (IB) Emphasis on methods of presentation.

7441 Computer Techniques for the Theatre (3) Prereq.: admission to MFA in Theatre program or consent of instructor. Examines the various ways the computer is used in theatre, specifically in the area of stage properties. Printing, plotting, and various computer programs are included in the curriculum.

7518 Studies in American and European Dress (3) Also offered as MUS 2971. May be taken for a max. of 6 sem. hrs. of credit when topics vary.

7519 Seminar in American Dress: 18th Century to 1880 (3) See HUEC 7519.

7520 Seminar in American Dress: 1880 to Present (3) See HUEC 7520.

7521, 7522, 7523 Advanced Costume Design I, II, III (4, 4, 4) Prereq.: admission to MFA design technology program or consent of instructor. 3 hrs. lecture; 2 hrs. lab. (I) Preparation of advanced costume design projects; emphasis on script analysis, characterization, and problem solving. (II) Emphasis on designing high fashion projects to achieve unity, coherence, and style. (III) Emphasis on design, selection, and preparation of fabrics for stage costumes. (IV) Emphasis on costume accessories including millinery, footwear, armor, and jewelry.

7601 Scene Shop Technologies and Theatre Safety I: Woodworking (3) Introduction to traditional and modern materials (primarily wood and plastic products); construction tools; techniques for executing theatrical constructs; shop organization and management; theatre safety; and occupational health.

7602 Scene Shop Technologies and Theatre Safety II: Metalworking (3) Introduction to traditional and modern materials (primarily metal products); construction tools; techniques for executing theatrical constructs; shop organization and management; theatre safety; and occupational health are covered.

7610 Structural Design for the Stage I (3) Develops student understanding and skills for analyzing loading conditions on scenic elements and engineering a structural design for executing these elements.

7611 Structural Design for the Stage II (3) Prereq.: THTR 7610. Continuation of the concepts presented in THTR 7610.

7615 Theatrical Production Planning (3) The management of the theatrical production process. Investigation of the labor and material cost budgeting for each of the production areas.

7618 Entertainment Rigging (3) Introduction to traditional rigging techniques for the stage, arena and outdoor venues.

7620 Stage Machinery Physics (3) Examination of Newtonian dynamics to aid in determining the behavior of moving scenery. Understanding how the components of a stage machine system are specified to withstand the forces encountered.

7621 Hydraulics and Pneumatics in Theatre (3) Prereq.: THTR 7620. 3 hrs. lecture, 2 hrs. lab. Examination of fluid and gas power systems for moving scenery. Topics include fluid power calculations laws and formulas related to pneumatics as well as delivery systems, actuators and valving.

7622 Scenery Automation (3) Prereq.: THTR 7620. 2 hrs. lecture; 2 hrs. lab. Examination of scenery control
systems, including PLC programming, positioning control, software and all-in-one control systems.

7623, 7624 Theatre Technology Seminar I, II (3, 3)
Prereq.: admission to MFA design technology program. (IA) Advanced techniques used on stage and in the scene shop. (IB) Techniques using electronics and optics for the stage.

7625, 7626 Theatre Technology Seminar III, II (3, 3)
Prereq.: admission to MFA design technology program. (IIA) Emphasis on theatre architecture and theatrical consulting. (IIIB) Emphasis on roles and responsibilities of the technical director and on preparation to enter the professional world.

7630 Directed Professional Internship (1-12)
Prereq.: third-year status in theatre MFA program. 2-24 hrs. lab. Pass-fail grading. A theatre-related internship with a professional organization or business (lighting manufacturer, professional theatre, computer company).

7721 Lighting Design II (3) Prereq.: admission to MFA design technology program or consent of instructor. Process of lighting design, lighting equipment, and assistant designer skills.

7722, 7723 Lighting Design III, (4, 4) Prereq.: THTR 7721 or equivalent. 1 hr. lecture; 2 hrs. lab. (IIA) Elements of lighting design explored through use of the light lab. (IVA) Complete presentations of lighting designs for various types of productions.

7801 Properties I (3) Prereq.: admission to MFA in Theatre program or consent of instructor. 1 hr. lecture; 4 hrs. lab. A detailed examination of basic materials, techniques, and procedures used by the designer and technician in the construction of stage properties.

7802 Properties II (3) Prereq.: THTR 7801; admission to MFA in Theatre program or consent of instructor. 1 hr. lecture; 4 hrs. lab. A continuation of the concepts presented in THTR 7801.

7821 Furniture and Woodworking I (3) Prereq.: admission to MFA in Theatre program or consent of instructor. 1 hr. lecture; 4 hrs. lab. Advanced studies in woodworking technologies including materials, construction techniques, and styles. Care and repair of furniture is included in the curriculum.

7822 Furniture and Woodworking II (3) Prereq.: THTR 7821; admission to MFA in Theatre program or consent of instructor. 1 hr. lecture; 4 hrs. lab. A continuation of the concepts presented in THTR 7821.

7831 Advanced Properties I (3) Prereq.: THTR 7801 and 7802. Engagement in projects that occur in productions under construction.

7832 Advanced Properties II (3) Prereq.: THTR 7831. Continuation of concepts covered in THTR 7831.

7900 Introduction to Graduate Study in Theatre (3) Prereq.: admission to the MA/PhD program in theatre, Research and bibliographic skills for students of theatre history, dramatic literature, theory, and criticism.

7901 Issues in Ancient Theatre and Performance (3) Survey of issues related to history, dramatic literature and theatre criticism of the Ancient World, including Greece, Rome, and Asia.

7902 Issues in Medieval and Renaissance Theatre and Performance (3) Survey of issues related to history, dramatic literature and theatre criticism in Medieval and Renaissance Europe, Asia, and Americas.

7903 Issues in 17th and 18th Century Theatre and Performance (3) Survey of issues related to history, dramatic literature, and theatre criticism founded in 17th and 18th century Europe, America, and Asia.


7910 Seminar in Drama: Classical to Renaissance (3) May be taken for a max. of 6 hrs. of credit when topics vary.

7911 Seminar in Drama: Renaissance to Realism (3) May be taken for a max. of 6 hrs. of credit when topics vary.

7912 20th Century First-Wave Avant-Garde Drama and Performance (3) Survey of dramatic and performance practices in the first half of the twentieth century with emphasis on European and American first-wave avant-gardes.

7913 Seminar in American Drama: 18th Century to the Present (3) May be taken for a max. of 6 hrs. of credit when topics vary.

7914 Drama and Performance: World War II to the Millennium (3) Survey of world performance and dramatic traditions from the end of World War II to the end of the twentieth century.

7920 Seminar in Drama of the African Diaspora (3) May be taken for a max. of 6 hrs. of credit when topics vary.

7923 Seminar in Gender, Sexuality, and Performance (3) Survey of practical and theoretical approaches, attitudes, and debates regarding issues of gender and sexuality as they relate to performance.

7924 Seminar: Evolution of Dramatic Theory (3) May be taken for a max. of 6 sem. hrs. of credit when topics vary. Major concepts of dramatic theory and practice in classical, medieval, and Renaissance periods.

7925 Seminar: Evolution of Dramatic Theory (3) May be taken for a max. of 6 sem. hrs. of credit when topics vary. Major concepts of dramatic theory and practice in the European and American modern period.

7926 Seminar in African Drama and Theatre (3) May be taken for a max. of 6 credit hours when topics vary. Comparative study of the form and expressions of drama among the various cultures of Africa.

7927, 7928 Problems in Theatre History (3,3) Each course may be taken for a max. of 6 hrs. of credit. Study of a selected figure, period, or trend in the history of the theatrical arts.

7929 Independent Research: Theatre (1-3) Prereq.: consent of instructor. May be taken for a max. of 6 sem. hrs. credit. For advanced graduate students who wish to pursue research on special problems exclusive of thesis or dissertation.

7930 Theatre Production (1-12) Prereq.: admission to MFA theatre program. 2-24 hrs. lab. Major acting, directing, design, or technical responsibility for one or more LSU productions.

8000 Thesis Research (1-12 per sem.) "S"/"U" grading.

9000 Dissertation Research (1-12 per sem.) "S"/"U" grading.

UNIVERSITY • UNIV

7901 Seminar: Veterinary Clinical Sciences (1) V Prereq.: DVM or equivalent degree or consent of instructor. May be taken for a max. of 8 hrs. of credit when topics vary. New developments in veterinary internal medicine, surgery, dermatology, ophthalmology, cardiology, neurology, theriogenology, and laboratory/exotic animal medicine.

7902 Research Techniques in Veterinary Clinical Sciences (1-4) Prereq.: appropriate 4000- or 5000-level course in selected topic or equivalent and consent of
VETERINARY MEDICINE • VMED

Courses in the professional curriculum are designated as Veterinary Medicine (VMED) courses, rather than departmental courses, because of the integration of the disciplines. These courses, all at the 5000 level, are described in the School of Veterinary Medicine Bulletin. Prerequisite for enrollment in these courses is formal admission to the professional curriculum in the School of Veterinary Medicine. All courses must be taken in the proper sequence, as each is a prerequisite for the succeeding course. The following courses are utilized by all concentrations in the Veterinary Medical Sciences graduate program.

7001 Seminar: Veterinary Medical Sciences (1) May be taken for a max. of 8 hrs. of credit. Reports and discussions on topics of current interest in various disciplines of veterinary medicine.

7003 Special Topics in Veterinary Clinical Sciences (1-4) Prereq.: appropriate 4000- and 5000-level course in selected topic or equivalent and consent of instructor. May be taken for a max. of 8 sem. hrs. of credit when topics vary. Aspects of the biochemical, physiological, pathophysiological, epidemiological and economic basis of clinical veterinary medicine.

7201 Veterinary Gastroenterology (2) V Prereq.: DVM or equivalent degree or consent of instructor. Gastrointestinal diseases and related conditions; emphasis on diagnostics, pathophysiology, and management options.

7202 Veterinary Surgical Techniques (1) V Prereq.: DVM or equivalent degree or consent of instructor. 3 hrs. lab. May be taken for a max. of 6 hrs. of credit when topics vary. Advanced surgical and experimental techniques related to an organ system.

7204 Advanced Veterinary Orthopedics (2) V Prereq.: DVM or equivalent degree or consent of instructor. Bone, muscle, tendon, and ligament diseases with emphasis on pathophysiology, diagnostics, and management options.

7205 Advanced Veterinary Clinical Neurology (2) V Prereq.: DVM or equivalent degree or consent of instructor. Diseases of the central and peripheral nervous system with emphasis on pathophysiology, diagnostics, neurosurgery, and other management options.

7206 Advanced Veterinary Urogenital Disease (2) S Prereq.: DVM or equivalent degree or consent of instructor. Urinary and reproductive tract diseases and related conditions with emphasis on pathophysiology, diagnostic, and management options.

7208 Advanced Veterinary Cardiovascular Disease (2) V Prereq.: DVM or equivalent degree or consent of instructor. Cardiovascular diseases and related conditions with emphasis on pathophysiology, diagnostic and management options.

7209 Advanced Veterinary Respiratory Disease (2) V Prereq.: DVM or equivalent degree or consent of instructor. Respiratory diseases and related conditions with emphasis on pathophysiology, diagnostic and management options.

7210 Veterinary Scientific Journal Review (1) Prereq.: DVM or equivalent degree or consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. In depth critique of current veterinary journals with emphasis on appraising experimental design and analysis; and interpretation and application of results.

7211 Advanced Veterinary Cardiopulmonary Disease (3) Prereq.: DVM or equivalent degree or consent of instructor. Cardiovascular and respiratory diseases and related conditions with emphasis on pathophysiology, diagnostic, and management options.

VETERINARY SCIENCE • VETS

2000 Anatomy and Physiology of Farm Animals (3) F Anatomy and physiology of farm animals; important species differences.

2020 Herd Health and Disease Management of Domestic Farm Animals (3) S Herd health program of preventive medicine for farm livestock; disease processes, epidemiology, and rational approaches to therapeutic principles and control of diseases.

3002 Practical Work with Livestock (1) S 3 hrs. lab. Dehorning, castration, branding, methods of restraint, and methods for control of parasites.

WOMEN’S & GENDER STUDIES • WGS

General education courses are marked with stars (★).

★ 1001 Evolution of Sex and Gender (3) Interdisciplinary course, team-taught by faculty in the physical and social sciences. Covers evolution as differential reproduction; reproduction-related earth history highlights; genetics of sex; animal reproduction strategies; anatomy and physiology of human reproductive systems; evolutionary trajectories in primates; sex and gender in human prehistory and in culture.

★ 2500 Introduction to Women’s & Gender Studies (3) Interdisciplinary study of women's lives: work, family, sexuality, economic development, political and social change; variance in sex roles among cultural groups and in different historical periods.

★ 2501 HONORS: Introduction to Women’s & Gender Studies (3) Same as WGS 2500, with special honors emphasis for qualified students.

★ 2908 Gender, Race, and Nation (3) The constructs of gender and sexuality across diverse racial, ethnic, cultural, and class boundaries.

3150 Survey of Feminist Theory (3) Interdisciplinary study of a range of feminist theories through which to consider the roles of women, gender, and sexuality.

3600 Women, Gender, and Leadership (3) Also offered as ELIR 3600. Interdisciplinary study of gender and leadership with emphasis on women as leaders in a range of settings in education and society.

4028 Gender and American Politics (3) See POLI 4028.

4087 Gender, Place and Culture (3) See GEOG 4087.

4500 Special Topics in Women’s & Gender Studies (3) Prereq.: WGS 2500. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Issues central to contemporary feminist inquiry.

4900 Independent Reading and Research in Women’s & Gender Studies (3) Prereq.: WGS 2500 and permission of instructor and department. May be taken for a max. of 6 sem. hrs. when topics vary. Reading and research on selected topics that emphasize feminist interdisciplinary approaches.

7150 Seminar in Feminist and Gender Theory (3) Topics in recent and contemporary theory in a range of disciplines including the humanities, social sciences, natural and physical sciences, design, and education; students are encouraged to develop research projects relevant to their primary disciplines and to their research interests.