Courses of Instruction

THIS SECTION lists and describes all undergraduate and graduate courses taught by the departments of the University. The courses are presented by subject area and arranged in departmental order, alphabetically. The subject name (the heading in large type) is followed by the subject area code in parentheses.

The subject name (subject area) together with the course number constitutes the official designation for the course for purposes of registration and official records. The specific course title appears following the course number. The figures in parentheses denote the number of hours of semester credit for the course. Following the credit hours are listed contact hours, the estimate of the actual hours per week a student should expect to be in class. If none are listed, the course will meet each week the number of hours that equals the number of course credit hours. Next appear the pre-requisites (required courses to be taken prior to) and co-requisites (required courses to be taken simultaneously with), if applicable.

Courses are numbered according to the following system:

1XXX- Undergraduate courses primarily for freshmen.
2XXX- Undergraduate courses primarily for sophomores.
3XXX- Undergraduate courses primarily for juniors.
4XXX- Undergraduate courses primarily for seniors.
5XXX- Professional school courses and courses for advanced undergraduates (junior or senior standing required).
6XXX - Graduate courses that are paired with parallel 5000 level course.
7XXX- Graduate courses. Not available to undergraduates.
8XXX- Graduate courses. Not available to undergraduates.
XXX3- Undergraduate and Professional Distance Education courses (Graded Option)
XXX6- Graduate outreach courses.

SUBJECT AREA INDEX

(Subject area codes in parentheses)

For schedule of courses, see the World Wide Web at www.auburn.edu/academic/au_academic.html and click "Course Schedule."
Accountancy (ACCT)

Dr. Norman H. Goodwin - 844-4340

ACCT 2110 PRINCIPLES OF FINANCIAL ACCOUNTING (3). LEC. 3 Pr., Sophomore standing and 2.2 GPA. Basic accounting principles with focus on preparation and use of financial statements. Credit will not be given for both ACCT 2110 and 2910.

ACCT 2117 HONORS PRINCIPLES OF FINANCIAL ACCOUNTING (3). LEC. 3 Pr., Membership in the honors college junior standing, cumulative GPA of 2.2 or higher. Basic accounting principles with focus on preparation and use of financial statements. Fall, Spring.

ACCT 2210 PRINCIPLES OF MANAGERIAL ACCOUNTING (3). LEC. 3 Pr., ACCT 2110 and 2.2 GPA. A continuation of ACCT 2110, with emphasis on cost accounting, budgeting, and decision-making using managerial accounting information.

ACCT 2217 HONORS PRINCIPLES OF MANAGERIAL ACCOUNTING (3). LEC. 3 Pr., ACCT 2117. Membership in the honors college junior standing, cumulative GPA of 2.2 or higher. A continuation of ACCT 2117, with emphasis on cost accounting, budgeting, and decision-making using managerial accounting information. Spring.

ACCT 2910 FUNDAMENTALS OF ACCOUNTING (3). LEC. 3 Pr., Sophomore standing and 2.2 GPA. Principles of financial and managerial accounting. Not open to undergraduates majoring in Business. Credit will not be given for both ACCT 2110 and 2910.

ACCT 2990 BUSINESS LAW (3). LEC. 3 Pr., 2.2 GPA. Introduction to contracts, sales, torts, ethics and the judicial system. Focus is on the business environment.

ACCT 2991 LEGAL ENVIRONMENT OF BUSINESS (3). LEC. 3 Pr., 2.2 GPA. Legal and social environment for business operations with emphasis on contemporary issues.

ACCT 3110/3113 INTERMEDIATE FINANCIAL ACCOUNTING I (3). LEC. 3 Pr., ACCT 2110 and 2.2 GPA. Accounting principles and theory including accounting for current assets, liabilities and investments.

ACCT 3120/3123 INTERMEDIATE FINANCIAL ACCOUNTING II (3). LEC. 3 Pr., ACCT 3110 with a grade of C or better and 2.2 GPA. Continuation of ACCT 3110, with emphasis on fixed assets, capital structure, and cash flows.

ACCT 3210/3213 MANAGERIAL DESIGN & USE OF COST ACCOUNTING INFORMATION (3). LEC. 3 Pr., ACCT 2210 and 2.2 GPA. A study of how cost data for products, projects, or services are recorded, analyzed, and used for decision making.

ACCT 3510/3513 ACCOUNTING INFORMATION SYSTEMS (3). LEC. 3 Pr., ACCT 3110 and 2.2 GPA. Introduction to accounting information systems with emphasis on understanding computer-based systems and developing technology skills.

ACCT 3710 SMALL BUSINESS ACCOUNTING AND TAX CONSULTING (3). LEC. 3 Pr., ACCT 2210 or 2910 and 2.2 GPA. Focus on financial statements for closely-held companies and designing strategies for wealth accumulation and asset management.

ACCT 3990 ADVANCED BUSINESS LAW (3). LEC. 3 Pr., ACCT 2990 and 2.2 GPA. Legal principles concerning secured transactions, bankruptcy, trusts and estates, partnership law, property, corporations, accountant’s legal liability, and negotiable instruments.

ACCT 4140 SPECIAL TOPICS IN ACCOUNTING (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Current issues in accounting theory and practice. Topics include regulations and economic and technological developments.

ACCT 4310/4313 CONTROL, ASSURANCE & AUDITING OF ACCOUNTING INFORMATION (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Design of internal controls and assurance services that identify and control business risks.

ACCT 4410/4413 INCOME TAX I (3). LEC. 3 Pr., ACCT 3110 and 2.2 GPA. Principles of federal taxation as it applies to individuals and property transactions.

ACCT 4920 ACCOUNTING INTERNSHIP (3). LEC. 3, SU. Pr., 2.2 GPA. Internship with an accounting firm, corporation, or governmental entity.

ACCT 4967 HONORS READINGS (1-3). LEC. Pr., Membership in the Honors College; department approval. Course may be repeated for a maximum of 3 credit hours.

ACCT 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College; department approval. Course may be repeated for a maximum of 3 credit hours.

ACCT 5130 ADVANCED ACCOUNTING TOPICS (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Emphasis on advanced accounting topics including business combinations, governmental accounting, foreign currency transactions, derivatives, and other advanced financial topics.

ACCT 5210 CONTROLLERSHIP (3). LEC. 3 Pr., ACCT 3210 or departmental approval and 2.2 GPA. The impact of ethical, international, environmental, and personnel issues on corporate accounting.

ACCT 5310 ADVANCED ASSURANCE AND AUDITING (3). LEC. 3 Pr., ACCT 4310 and 2.2 GPA and departmental approval. Principles of auditing standards, ethics, controls, evidence, sampling and audit reports.

ACCT 5420 INCOME TAX II (3). LEC. 3 Pr., ACCT 4410 and 2.2 GPA. Tax accounting for individuals, partnerships, corporations, estates and trusts. Extensive use of a tax-service program.

ACCT 5610 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Accounting for governmental and not-for-profit entities. Focus on effective use of resources.

ACCT 6130/6136 ADVANCED ACCOUNTING TOPICS (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Emphasis on advanced accounting topics including business combinations, governmental accounting, foreign currency transactions, derivatives, and other advanced financial topics.

ACCT 6210/6216 CONTROLLERSHIP (3). LEC. 3 Pr., ACCT 3210 or departmental approval and 2.2 GPA. The impact of ethical, international, environmental, and personnel issues on corporate accounting.

ACCT 6310/6316 ADVANCED ASSURANCE AND AUDITING (3). LEC. 3 Pr., ACCT 4310 and 2.2 GPA. Advanced topics in assurance and auditing services.

ACCT 6420/6426 INCOME TAX II (3). LEC. 3 Pr., ACCT 4410 and 2.2 GPA. Tax accounting for individuals, partnerships, corporations, estates and trusts. Extensive use of a tax-service program.

ACCT 6610/6616 GOVERNMENTAL AND NOT-FOR-PROFIT ACCOUNTING (3). LEC. 3 Pr., ACCT 3120 and 2.2 GPA. Accounting for governmental and not-for-profit entities. Focus on effective use of resources.

ACCT 7110/7116 RESEARCH IN ACCOUNTING (3). LEC. 3 Pr., ACCT 6130 or departmental approval. An evaluation, critique, and application of financial accounting theory to current reporting problems using current research tools and resources.

ACCT 7120/7126 INTERNATIONAL ACCOUNTING (3). LEC. 3 Pr., ACCT 6130 or departmental approval. Accounting issues unique to international business activity.

ACCT 7210/7216 ACCOUNTING FOR DECISION MAKING AND CONTROL (3). LEC. 3 Pr., ACCT 3210 or departmental approval. Relationship between management accounting and information systems and analysis of costs.

ACCT 7310/7316 RISK ANALYSIS AND CONTROL (3). LEC. 3 Pr., ACCT 4310 or departmental approval. Analysis of strategic and business process risks and design of effective financial controls.

ACCT 7320/7326 FINANCIAL ANALYSIS AND VALUATION (3). LEC. 3 Pr., ACCT 5130 or ACCT 6130 or departmental approval. Forecast of earnings and financial statements, valuation approaches and their application in accounting measurement and financial reporting as a tool in management communication with investors.

ACCT 7410/7416 FEDERAL TAX RESEARCH (3). LEC. 3 Pr., ACCT 6420 or departmental approval. Sources of authority used in federal tax research and survey of tax policy issues.

ACCT 7420/7426 CORPORATE AND PARTNERSHIP TAXATION (3). LEC. 3 Pr., ACCT 7410. Tax issues involving corporations and partnership.

ACCT 7430/7436 TAXES & DECISION MAKING (3). LEC. 3 Pr., ACCT 6420 or departmental approval. Emphasis on identifying, understanding, and evaluating tax planning opportunities.

ACCT 7510/7516 INTEGRATED ACCOUNTING APPLICATION (3). LEC. 3 Pr., ACCT 3510 or departmental approval. Design and analysis of accounting information systems and relational databases.

ACCT 7520 ENTERPRISE ACCOUNTING SYSTEMS (3). LEC. 3 Pr., ACCT 7510. Design, analysis and use of Enterprise accounting systems.

ACCT 7970 ADVANCED SPECIAL TOPICS IN ACCOUNTING (3). LEC. 3 Pr., ACCT 7110. Industry and technology issues in accounting.

ACCT 7990/7998 INTEGRATED ACCOUNTING CONCEPTS FOR DECISION MAKING (3). LEC. 3 Coreq., Final semester in Master of Accountancy Program or departmental approval. Capstone course for majors.
Aerospace Engineering (AERO)

AERO 2200 AEROSPACE FUNDAMENTALS (2). LEC. 1, LAB. 3. Pr., ENGR 1110. Introduction to the fundamental physical concepts required for the successful design of aircraft and spacecraft.

AERO 3040 ELEMENTARY METEOROLOGY (3). LEC. 3. Pr., sophomore standing. Basic principles, causes, effects and phenomena of weather with fundamental techniques of forecasting.

AERO 3110 AERODYNAMICS I (3). LEC. 3. Pr., MATH 2650. Properties of fluids, fluid statics, conservation of mass and momentum, atmospheric properties, two dimensional airfoils, three dimensional wings, drag, and flight performance.


AERO 3130 AERODYNAMICS LABORATORY (2). LEC. 1. LAB. 3. Pr., AERO 3110. Application of fundamental aerodynamic principles to subsonic and supersonic wind tunnel experiments.

AERO 3220 AEROSPACE SYSTEMS (3). LEC. 3. Pr., ENGR 2350, MATH 2650. Modeling of system elements, classical feedback control techniques used in the analysis of linear systems, analysis of systems undergoing various motions connected with flight.

AERO 3230 FLIGHT DYNAMICS (4). LEC. 3. LAB. 3. Pr., AERO 3110, ENGR 2350, MATH 2650. Airplane performance and stability and control including analytical prediction of performance characteristics, experimental determination of static stability parameters, and analytical prediction of dynamic stability characteristics.

AERO 3310 ORBITAL MECHANICS (3). LEC. 3. Pr., ENGR 2350, MATH 2650. Geometry of the solar system and orbital motion, mathematical integrals of motion, detailed analysis of two-body dynamics and introduction to artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories.

AERO 3610 AEROSPACE STRUCTURES I (2). LEC. 1. LAB. 3. Pr., ENGR 2070. Fundamental concepts employed in the mechanical testing of engineering materials and structures. Load, stress and strain measurement techniques are utilized to determine material properties and structural response.

AERO 40@0 PROGRAM ASSESSMENT (0). LAB., SU. Coreq., AERO 4710 or AERO 4730. Academic program assessment covering the areas of aerodynamics, aerospace structures, orbital mechanics, propulsion and vehicle design.

AERO 4140 AERODYNAMICS II (3). LEC. 3. Pr., AERO 3120. Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer.


AERO 4710 AIRCRAFT DESIGN I (3). LEC. 2. LAB. 3. Pr., AERO 3120, AERO 3230. Introduction to the principles of Class I and Class II fixed-wing aircraft design.

AERO 4720 AIRCRAFT DESIGN II (3). LEC. 2. LAB. 3. Pr., AERO 4710. Application of the principles of Class I and Class II fixed-wing aircraft design through construction of an actual small-scale glider.

AERO 4730 SPACE MISSION DESIGN I (3). LEC. 2. LAB. 3. Pr., AERO 3310. Introduction to the design of space systems including the identification of launch requirements, spacecraft system components, satellite tracking and orbital analysis to achieve a stated scientific objective.


AERO 4970 SPECIAL TOPICS IN AEROSPACE ENGINEERING (1-3). LEC. Pr., departmental approval. Investigation of current state-of-the-art technologies in aerospace engineering. Course may be repeated for a maximum of 9 credit hours.

AERO 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College and departmental approval. Directed research and writing of an honors thesis. Course may be repeated for a maximum of 3 credit hours.


AERO 5120 ROTARY WING AERODYNAMICS (3). LEC. 3. Pr., AERO 3110. Aerodynamics and flight characteristics of rotary-wing aircraft.


AERO 5330 APPLIED ORBITAL MECHANICS (3). LEC. 3. Pr., AERO 3310. Special perturbation techniques: N-body perturbations; general and restricted three-body problems; preliminary orbit determination; C-W equations, targeting and rendezvous; constellation design; mission planning.

AERO 5340 SATELLITE APPLICATION (3). LEC. 3. Pr., AERO 3310 or departmental approval. Principles related to the application of satellites to remote sensing, telecommunications, navigation and trajectory determination. Principles of space policy applied to both the unmanned and manned space flight programs.

AERO 5520 ROCKET PROPULSION (3). LEC. 3. Pr., AERO 4510. Analysis of the thermodynamics, gas dynamics and design of liquid and solid propellant rocket engines.

AERO 5530 SPACE PROPULSION (3). LEC. 3. Pr., AERO 4510. Analysis of space propulsion systems. Dynamics of electromagnetic systems, ion engines, photon drives, laser propulsion.


AERO 5750 LEGAL ASPECTS OF ENGINEERING PRACTICE (3). LEC. 3. Pr., PHIL 1020. The role of the law in the manufacture of a product. Ethical issues that may confront designers and engineers.


AERO 6120/6126 ROTARY WING AERODYNAMICS (3). LEC. 3. Pr., AERO 3110. Aerodynamics and flight characteristics of rotary-wing aircraft.


AERO 6330/6336 APPLIED ORBITAL MECHANICS (3). LEC. 3. Pr., AERO 3310. Special perturbation techniques: N-body perturbations; general and restricted three-body problems; preliminary orbit determination; C-W equations, targeting and rendezvous; constellation design; mission planning.
Africanas Studies (AFRI)
Dr. Constance Relihan - 844-4026

Agricultural Economics (AGEC)
Dr. John Adrian - 844-4800
AGEC 2100 MICROCOMPUTER APPLICATIONS IN AGRICULTURE (3). LEC. 3. LAB. Microcomputer technology: hardware and software including languages, electronic spreadsheet, word processing, data-based management, and programmed products; interface with data sources and processing systems.

AGEC 3010 AGRIBUSINESS MARKETING (3). LEC. 3. Pr., ECON 2020 and AGEC 2100 or equivalent. Principles and problems of marketing farm and agribusiness products including marketing methods, channels, structures, and institutions.

AGEC 3050 FARM APPRAISAL (2). LEC. 2. Theory of land values; terminology, processes and procedures for alternative appraisal purposes; factors affecting value; and evaluation of appraisal methods.

AGEC 4000 PRINCIPLES OF AGRIBUSINESS MANAGEMENT (3). LEC. 3. Pr., ECON 2020, AGEC 2100, or departmental approval. Economics and business principles applied to agriculture: business formation, composing and analyzing financial statements, financial analysis and decision-making functions of management, capital budgeting and investment decisions. (Credit will not be given to majors in AGEC, ECON, or business.)


AGEC 4070 AGRICULTURAL LAW (3). LEC. 3. Recognition of legal problems associated with property ownership, contracts, torts, financing, estate planning and environmental controls and restrictions.

AGEC 4100 AGRICULTURAL COOPERATIVES (2). LEC. 2. Principles and problems of organizing and operating farmers' cooperative buying and selling associations.

AGEC 4120 ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS (3). LEC. 3. Economic principles related to common property, public goods, property rights, externalities and resource scarcity and allocation applied to current issues.


AGEC 4930 DIRECTED STUDIES IN AGRICULTURAL ECONOMICS (1-2). IND. Pr., departmental approval, junior standing. Individualized work and study in consultation with a faculty member on a subject of mutual concern. May include directed readings, research, data analysis or a combination of these. Course may be repeated for a maximum of 6 credit hours.

AGEC 4950 UNDERGRADUATE SEMINAR (0). SEM., SU. Pr., junior standing. Current developments in agricultural economics; role of agricultural economists in agribusiness firms and the general economy. Interaction with agricultural and agribusiness leaders.

AGEC 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College and junior standing. Topics in agricultural economics. Course may be repeated for a maximum of 3 credit hours.

AGEC 4997 HONORS THESIS (1-3). LEC. 3. Pr., membership in the Honors College and junior standing. Directed research and writing of honors thesis. Course may be repeated for a maximum of 3 credit hours.

AGEC 5010 FARM MANAGEMENT (3). LEC. 3. Pr., AGEC 2100 and ECON 3020, or equivalents. Principles of economics applied to agriculture; uses of farm records to improve management of the farm; developing enterprise budgets and use in preparing a profit-maximizing farm plan.

AGEC 5030 AGRICULTURAL PRICES (3). LEC. 3. Pr., ECON 3020 or equivalent; Math 1690 or equivalent; STAT 2610 or 2510 or equivalent. Functions of prices and principles of supply and demand in price determination for agricultural products and markets. Statistical estimation of price and demand relationships. Spring.

AGEC 5090 RESOURCE ECONOMICS I (3). LEC. 3. Pr., AGEC 2100 or equivalent and ECON 3020. Supply, demand, future requirements and availability of natural resources plus institutional framework affecting and conditioning such use through property rights, zoning, taxation, etc.

AGEC 5100 AGRICULTURAL BUSINESS MANAGEMENT (3). LEC. 3. Pr., ECON 2020, AGEC 2100 and AGEC 4040, and ACCT 2210, or departmental approval. Principles and problems in acquiring or starting, organizing, and operating successful agribusiness; financial and operational efficiency; human resource and public relations; decision-making tools.

AGEC 5210 ADVANCED AGRIBUSINESS MANAGEMENT (3). LEC. 3. Pr., AGEC 6100, ECON 3020, MATH 1690, STAT 2510 or 2610, senior standing. Case studies, managerial economics.

AGEC 6010 FARM MANAGEMENT (3). LEC. 3. Pr., AGEC 2100 and ECON 3020, or equivalents. Principles of economics applied to agriculture; uses of farm records to improve management of the farm; developing enterprise budgets and use in preparing a profit-maximizing farm plan.

AGEC 6030 AGRICULTURAL PRICES (3). LEC. 3. Pr., ECON 3020 or equivalent; Math 1690 or equivalent; STAT 2610 or 2510 or equivalent. Functions of prices and principles of supply and demand in price determination for agricultural products and markets. Statistical estimation of price and demand relationships. Spring.

AGEC 6090 RESOURCE ECONOMICS I (3). LEC. 3. Pr., AGEC 2100 or equivalent and ECON 3020. Supply, demand, future requirements and availability of natural resources plus institutional framework affecting and conditioning such use through property rights, zoning, taxation, etc.

AGEC 6100 AGRICULTURAL BUSINESS MANAGEMENT (3). LEC. 3. Pr., ECON 2020, AGEC 2100 and AGEC 4040, and ACCT 2210, or departmental approval. Principles and problems in acquiring or starting, organizing, and operating successful agribusiness; financial and operational efficiency; human resource and public relations; decision-making tools.

AGEC 6210 ADVANCED AGRIBUSINESS MANAGEMENT (3). LEC. 3. Pr., AGEC 6100, ECON 3020, MATH 1690, STAT 2510 or 2610, senior standing. Case studies, managerial economics.

AGEC 7000 ADVANCED AGRICULTURAL AND ENVIRONMENTAL POLICY (3). LEC. 3. Pr., AGEC 6090 and AGEC 4300, or AGEC 6030 Food and farm problems and related governmental actions from historical, political and analytical viewpoints. Welfare economics and other procedures used to evaluate costs and benefits of existing and proposed governmental programs and actions affecting agriculture, environment and the consumer.

AGEC 7010 ADVANCED FARM MANAGEMENT (3). LEC. 3. Pr., AGEC 6010. Advanced theory and application of farm management principles and economic concepts to agriculture. Planning, implementation, and control of various types of farms for optimum utilization of available resources.

AGEC 7030 ADVANCED AGRICULTURAL PRICES (3). LEC. 3. Pr., AGEC 6030 and ECON 6020. Theory and measurement of farm supply, retail demand and marketing-marginal relationships. Introduction to equilibrium-displacement modeling.

AGEC 7080 PRODUCTION ECONOMICS I (3). LEC. 3. Pr., ECON 6020. Resource allocation and efficiency of production in the firm, between firms, and between agriculture and other industries.

AGEC 7090 RESOURCE ECONOMICS II (3). LEC. 3. Pr., AGEC 6090. Analysis of institutional and economic factors affecting use of natural resources including economic feasibility/conservation, benefit-cost analysis, environmental controls and other interventions.

AGEC 7100 OPERATIONS RESEARCH METHODS IN AGRICULTURAL ECONOMICS (3). LEC. 3. Optimization techniques with emphasis on linear programming and its extensions applied to agriculture. General theoretical background and associated computational procedures are used for presentation of models and modeling techniques.

AGEC 7110 AGRICULTURAL ECONOMIC DEVELOPMENT (3). LEC. 3. Pr., ECON 2020. Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis
of financial and technical aid to other countries and case studies of development problems.

**AGEC 7200 AQUACULTURAL ECONOMICS I (3). LEC. 3. Pr., ECON 2020.** Application of economic theories and principles to production, marketing, and consumption of aquacultural enterprises and products. Role of aquaculture in economic development.

**AGEC 7250 AQUACULTURAL ECONOMICS II (3). LEC. 3. Pr., AGEC 7200 or departmental approval.** Application of advanced economic theory and principles of production, marketing, and consumption of aquacultural products. Analysis of comparative role and competitive position of aquaculture in economic development and resource allocation.

**AGEC 7590 INTRODUCTION TO AGRICULTURAL ECONEOMETRICS (3). LEC. 3. Pr., MATH 1610, STAT 2610 or equivalent.** Regression analysis in economic research. Model specification and estimation plus introduction to detection and correction of violations of assumptions of OLS. Hypothesis testing, dummy variables, heteroscedasticity, autocorrelation and measurement errors.

**AGEC 7700 RESEARCH METHODS IN AGRICULTURAL ECONOMICS (3). LEC. 3. Overview of the philosophy of science, detailed discussion of how various research tools are used to perform applied research in agricultural economics.**

**AGEC 7950 GRADUATE SEMINAR (1). SEM. 1, SU.** A forum for sharing research information and interaction on topics and issues of current interest.

**AGEC 7970 SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS (1-3). LEC. Pr., departmental approval.** Individualized direction/instruction by faculty on research, teaching and/or outreach issues. Course may be repeated for a maximum of 6 credit hours.

**AGEC 7990 RESEARCH AND THESIS (1-10). MST., TD.** Course may be repeated with change in topic.

**AGEC 8060 THEORY OF AGRICULTURAL MARKETS (3). LEC. 3. Pr., AGEC 7590 and ECON 6020 or departmental approval.** Theory and methods for estimating complete demand systems (e.g., LES, Translog, ALIDS, and Rotterdam) for food products. Introduction to imperfect competition models.

**AGEC 8080 PRODUCTION ECONOMICS II (3). LEC. 3. Pr., AGEC 7080.** Firm-level economics problems are extended. Consideration of the influence of risk on firm behavior; empirical analysis of theoretical problems; welfare analysis; technical change; impacts of research investments.

**AGEC 8090 RESOURCE ECONOMICS III (3). LEC. 3. Pr., AGEC 7090.** Quantitative analysis of economic relationships related to natural resource and environmental problems. Economic framework includes dynamic efficiency of resource allocation and welfare analysis techniques, property rights and resource policy, with consideration of legal ramifications and non-market values.

**AGEC 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD.** Course may be repeated with change in topic.

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**RURAL SOCIOLOGY (RSOC)**

**RSOC 3190 AGRICULTURE AND SOCIETY (3). LEC. 3.** Values and conflicts associated with technological and other changes in farming, rural communities and the food system. Perspectives on agrarian structures, food security, and government policy.

**RSOC 3620 COMMUNITY ORGANIZATION (3). LEC. 3.** Analysis of social organization at the community level. Conceptual framework developed to examine both internal and external forces affecting urban as well as rural communities in the U.S., and to identify strategies to strengthen local capacity to adapt to changing social and economic environments.

**RSOC 4410 EXTENSION PROGRAMS AND METHODS (3). LEC. 3.** Principles and models of applied social change in U.S. and developing nations. The Cooperative Extension System is analyzed as an educational institution. Fundamental steps in program development and evaluation.

**RSOC 4930 DIRECTED STUDIES IN RURAL SOCIOLOGY AND COMMUNITY DEVELOPMENT (1-3). IND. Pr., departmental approval, junior standing.** Individualized study of topics in rural sociology and community development, natural resources and environmental issues conducted in consultation with a faculty member. Course may be repeated for a maximum of 3 credit hours.

**RSOC 4980 DIRECTED FIELD EXPERIENCE (3). LEC. 3. Pr., departmental approval, junior standing.** Structured intensive involvement within an agency or organization serving people in communities or rural areas. Supervision is shared between agency personnel and department faculty who plan, consult, discuss and evaluate student activities and reports.

**RSOC 5610 RURAL SOCIOLOGY (3). LEC. 3. Pr., SOCY 1000.** Theories and conceptual approaches to rurality in international and domestic contexts. Rural-urban differences in demographic composition, occupational structure, attitudes and values of rural people and regional cultures. Rural services and institutions as determinants of the quality of life.

**RSOC 5640 SOCIOLOGY OF COMMUNITY DEVELOPMENT (3). LEC. 3. Pr., SOCY 1000 or departmental approval.** Principles of applied social change at the community level in both industrialized and non-industrialized settings; impacts of economic and technological changes on urban and rural communities; citizen participation in community affairs.

**RSOC 5650 SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (3). LEC. 3.** The social origins of contemporary environmental problems, emergence of environmentalism as a social movement within industrialized nations, and other topical issues.

**RSOC 6610 THEORIES AND CONCEPTUAL APPROACH (3). LEC. 3.** Theories and conceptual approaches to rurality in international and domestic contexts. Rural-urban differences in demographic composition, occupational structure, attitudes and values of rural people and regional cultures. Rural services and institutions as determinants of the quality of life.

**RSOC 6640 SOCIOLOGY OF COMMUNITY DEVELOPMENT (3). LEC. 3. Pr., SOCY 1000 or departmental approval.** Principles of applied social change at the community level in both industrialized and non-industrialized settings; impacts of economic and technological changes on urban and rural communities; and citizen participation in community affairs.

**RSOC 6650 SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (3). LEC. 3.** The social origins of contemporary environmental problems, emergence of environmentalism as a social movement within industrialized nations, and other topical issues.

**RSOC 7410 EXTENSION PROGRAMS AND METHODS (3). LEC. 3.** Principles and models of applied social change in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.

**RSOC 7620 SOCIOLOGY OF COMMUNITY (3). LEC. 3.** Emphasis on theories, conceptual approaches and methods for studying communities and assessing developmental needs with attention to organizational structure, power structure, decision-making and linkage networks to societal units.

**RSOC 7630 POLITICAL ECONOMY OF DEVELOPMENT (3). LEC. 3.** Theories of societal development applied to contemporary issues associated with change in non-industrialized nations. Exploration of institutional, class, and state interests that guide development processes, as well as alternative participatory development strategies.

**RSOC 7650 SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (3). LEC. 3.** The social origins of contemporary environmental problems, emergence of environmentalism as a social movement within industrialized nations, and other topical issues.

**RSOC 7700 METHODS OF SOCIAL RESEARCH (3). LEC. 3. Pr., SOCY 3700 or departmental approval.** Problem identification, hypothesis development and empirical analysis. Quantitative and qualitative procedures for obtaining social data using surveys, direct observation and secondary sources.

**RSOC 7970 SPECIAL PROBLEMS IN RURAL SOCIOLOGY AND COMMUNITY DEVELOPMENT (1-3). LEC. Pr., departmental approval.** Individual study in a particular area or topic of interest involving an in-depth review of the literature, a research project, or an outreach education activity. Course may be repeated for a maximum of 6 credit hours.

**RSOC 7990 RESEARCH AND THESIS (1-10). MST., TD.** Course may be repeated with change in topic.

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**AGRICULTURE (AGRI)**

**AGRI 3800 AGRICULTURAL LEADERSHIP DEVELOPMENT (2). LEC. 1, LAB. 2. Pr., sophomore standing, COMM 1000.** Programmed sessions and activities designed to enhance self-awareness of leadership skills and enable students to become effective leaders.

**AGRI 5840 ADVANCED AGRICULTURAL LEADERSHIP DEVELOPMENT (3). LEC. 2, LAB. 2. Pr., Junior standing, AGRI 3800, ANSC 4800, or college approval.** Critical analysis of theory and practice of contemporary leadership processes and principles of learning to lead through service. Fall, Spring.
AGRI 6840 ADVANCED AGRICULTURAL LEADERSHIP DEVELOPMENT (3). LEC. 2, LAB. 2, Pr., Junior standing. AGRI 3800, ANSC 4800, or college approval. Critical analysis of theory and practice of contemporary leadership processes and principles of learning to lead through service. Fall, Spring.

Agronomy and Soils (AGRN)
Dr. Joseph T. Touchton - 844-4100

AGRN 1000 BASIC CROP SCIENCE (4). LEC. 3, LAB. 2. Basic agronomic principles involved in classification, growth, structure and soil-plant relationships of field crops. Emphasis is on the influence of man and environment on crop growth, and the local and global importance of crop production in world food production. Fall, Spring.

AGRN 2040 BASIC SOIL SCIENCE (4). LEC. 3, LAB. 2, Pr., CHEM 1010/1011 or CHEM 1030/1031. Formation, classification, properties, management, fertility and conservation of soils in relation to the growth of plants. Fall, Spring.

AGRN 3100 SOILS IN AGRICULTURAL AND EARTH SYSTEMS (4). LEC. 3, LAB. 2, Pr., GEOL 1100, CHEM 1010. The role of the soils as key components in changing earth and agricultural systems. Intended for those who will teach earth science at the middle school level. Credit will not be given for AGRN 3100 and either AGRN 2040 or AGRN 3040. Spring, Summer, Fall.

AGRN 3120 PRINCIPLES OF WHEED SCIENCE (4). LEC. 3, LAB. 2, Pr., BIOL 1020, BIOL 3100, and AGRN 2040. Weed identification and biology, methods of weed management and classification of herbicides and how they are used in weed control. Laboratory subjects are weed identification and sprayer calibration. Fall.

AGRN 3150 TURFGRASS MANAGEMENT (4). LEC. 3, LAB. 2, Pr., AGRN 2040, BIOL 1020. The management of recreational and home area turfgrass will be studied including establishment and maintenance of turf and the effect of light, traffic, soil fertility and water on its growth. Fall, Spring.

AGRN 3920 AGRONOMY AND SOILS INTERNSHIP (3). INT. 3, Pr., departmental approval. Practical experience under the supervision of an approved employer and the department. Internship may be in the areas of production, business, turf or science.

AGRN 3970 PROBLEMS IN WEEED SCIENCE (2). IND. 2, Pr., departmental approval. Conferences, problems and assigned reading in weed science. Spring.

AGRN 4000 ADVANCED CROP SCIENCE (3). LEC. 3, Pr., AGRN 1000 or BIOL 1030 and AGRN 2040. Application, expansion and integration of principles from undergraduate agricultural, biological and physical sciences courses in the management of crop production systems with emphasis on discussion and problem-solving. Spring.

AGRN 4010 FORAGE PRODUCTION AND UTILIZATION (3). LEC. 3, Pr., junior standing. Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil-improving crops. Spring.

AGRN 4200 SOIL JUDGING (2). LEC. 1, LAB. 4, Pr., AGRN 2040. Description, evaluation and interpretation of soil-profile characteristics. Fall.

AGRN 4210 ADVANCED SOIL JUDGING (2). LEC. 1, LAB. 2, Pr., AGRN 4200. Advanced description, evaluation, and interpretations of soil-profile characteristics. Spring.

AGRN 4950 SENIOR SEMINAR (1). SEM. Pr., junior standing. Professional communication related to selected topics in agronomy and soils. Fall, Spring.

AGRN 4967 HONORS READINGS (1-3). LEC. Pr., Membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

AGRN 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

AGRN 5000 SOILS & ENVIRONMENTAL QUALITY (3). LEC. 3, Pr., AGRN 2040. Role of soils in bio-geochemical cycling of major elements and compounds of environmental concern; interactions of pollutants with soils and aquatic and atmospheric environments; methods to minimize or correct pollution; risk assessment. Fall.

AGRN 5020 NUTRIENT MANAGEMENT (3). LEC. 3, Pr., AGRN 2040. Lectures and problems illustrate principles of nutrient management as related to soil or growth media, plant, fertilizer practices, management systems and environment. Required for all students majoring in Agronomy and Soils. Spring.

AGRN 5060 SOIL MICROBIOLOGY (4). LEC. 3, LAB. 2, Pr., BIOL 3200. Ecology, physiology, and biochemistry of soil microorganisms with emphasis on soil microbial processes that are important to environmental quality and soil productivity. Spring.

AGRN 5080 SOILS RESOURCES AND CONSERVATION (4). LEC. 3, LAB. 2, Pr., AGRN 2040. Soils as a natural resource for land-use planning; their use and management for sustainable crop production, urban and industrial development and ecosystem protection. Fall.

AGRN 5100 PLANT GENETICS AND CROP IMPROVEMENT (3). LEC. 3, Pr., BIOL 1030. Principles related to mendelian, population, and molecular genetics of plants including inheritance of qualitative and quantitative traits, and plant transformation. Improvement of crop plants including heritability, role of environment, pedigree selection, recurrent selection, the backcross method, and marker-assisted selection. Fall, Spring.

AGRN 5150 SOIL MORPHOLOGY (4). LEC. 3, LAB. 2, Pr., AGRN 2040. Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses. Spring.

AGRN 5160 ADVANCED TURFGRASS MANAGEMENT (3). LEC. 3, Pr., AGRN 3150 and either BIOL 3100 or BIOL 6130. Factors affecting the turfgrass plant as a component of a dynamic community. Influence of soil chemical and physical conditions, management practices and climate are discussed. Theoretical and practical aspects of turfgrass management practices are discussed along with design and construction of golf courses and other athletic purpose turf areas. Spring.

AGRN 5300 SOIL CHEMISTRY (4). LEC. 2, LAB. 4, Pr., AGRN 2040. An introduction to the basic soil chemical properties of mineral composition, weathering, absorption, cation exchange, acidity, alkalinity, salinity and soil reactions with fertilizers, pesticides and heavy metals. Spring.

AGRN 5970 SPECIAL PROBLEMS (1-3). IND. 1, Pr., departmental approval, junior standing. Work under the direction of a staff member on special problems in crop, soil or weed science. Course may be repeated for a maximum of 6 credit hours.

AGRN 6000 SOILS AND ENVIRONMENTAL QUALITY (3). LEC. 3, Pr., AGRN 2040. Role of soils in bio-geochemical cycling of major elements and compounds of environmental concern; interactions of pollutants with soils and aquatic and atmospheric environments; methods to minimize or correct pollution; risk assessment. Fall.

AGRN 6020 NUTRIENT MANAGEMENT (3). LEC. 3, Pr., AGRN 2040. Lectures and problems illustrate principles of nutrient management as related to soil or growth media, plant, fertilizer practices, management systems and environment. Required for all students majoring in Agronomy and Soils. Spring.

AGRN 6060 SOIL MICROBIOLOGY (4). LEC. 3, LAB. 2, Pr., BIOL 3200. Ecology, physiology, and biochemistry of soil microorganisms with emphasis on soil microbial processes that are important to environmental quality and soil productivity. Spring.

AGRN 6080 SOIL RESOURCES AND CONSERVATION (4). LEC. 3, LAB. 2, Pr., AGRN 2040. Soils as a natural resource for land-use planning; their use and management for sustainable crop production, urban and industrial development and ecosystem protection. Fall.

AGRN 6100 PLANT GENETICS AND CROP IMPROVEMENT (3). LEC. 3, Pr., BIOL 1030. Principles related to mendelian, population, and molecular genetics of plants including inheritance of qualitative and quantitative traits, and plant transformation. Improvement of crop plants including heritability, role of environment, pedigree selection, recurrent selection, the backcross method, and marker-assisted selection. Fall, Spring.

AGRN 6150 SOIL MORPHOLOGY (4). LEC. 3, LAB. 2, Pr., AGRN 2040. Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses. Spring.

AGRN 6160 ADVANCED TURFGRASS MANAGEMENT (3). LEC. 3, Pr., AGRN 3150 and either BIOL 3100 or BIOL 6130. Factors affecting the turfgrass plant as a component of a dynamic community. Influence of soil chemical and physical conditions, management practices and climate are discussed. Theoretical and practical aspects of turfgrass management practices are discussed along with design and construction of golf courses and other athletic purpose turf areas. Spring.

AGRN 6300 SOIL CHEMISTRY (4). LEC. 2, LAB. 4, Pr., AGRN 2040. An introduction to the basic soil chemical properties of mineral composition, weathering, absorption, cation exchange, acidity, alkalinity, salinity and soil reactions with fertilizers, pesticides and heavy metals. Spring.
Aviation Management and Logistics (AMLG)

AMLG 1010 INTRODUCTION TO AVIATION (3). LEC. 3. Pr., 2.2 GPA. Orientation to aviation management career opportunities. The history of significant events and accomplishments in the attempt to move through air and space.

AMLG 2141 FLIGHT ORIENTATION (1). LAB. 2. Pr., 2.25 GPA. Basic flight experience for non-pilots to familiarize aviation majors, engineers, teachers, and other students desiring a limited exposure to flight. Includes ground discussion and aircraft flight time. Special fee.


AMLG 2171 PRIVATE PILOT FLIGHT TRAINING I (1). LAB. 3. Pr., AMLG 2150 or departmental approval and 2.25 GPA. Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special fee.

AMLG 2181 PRIVATE PILOT FLIGHT TRAINING II (1). LAB. 3. Pr., AMLG 2171 or departmental approval and 2.25 GPA. Continuation of dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special fee.

AMLG 2230 PRINCIPLES OF INSTRUMENT FLIGHT (3). LEC. 3. Pr., Departmental approval and 2.2 GPA. Instruments, FAA regulations, air traffic control procedures, radio navigation and aircraft operation and performances as applied to instrument flying. Preparation for the FAA Instrument Pilot written examination. Special fee.

AMLG 2241 INSTRUMENT FLIGHT TRAINING I (1). LAB. 3. Pr., Private Pilot Certificate and 2.25 GPA. Instruments, FAA regulations, air traffic control procedures, radio navigation and aircraft operation and performances as applied to instrument flying. Preparation for the FAA Instrument Pilot written examination. Special fee.

AMLG 2250 COMM FLIGHT OPERATIONS (3). LEC. 3. Pr., Private Pilot Certificate, AMLG 2171, or departmental approval and 2.2 GPA. FAA regulations, high altitude operations aerodynamics, commercial flight maneuvers, environmental, ice control, retractable landing gear and aircraft performances as applied to commercial flying. Preparation for the FAA Commercial Pilot knowledge examination. Special fee.

AMLG 2251 INSTRUMENT FLIGHT TRAINING II (1). LAB. 3. Pr., AMLG 2241 or departmental approval and 2.25 GPA. Continuation of Instruments, FAA regulations, air traffic control procedures, radio navigation and aircraft operation and performances as applied to instrument flying. Preparation for the FAA Instrument Pilot written examination. Special fee.

AMLG 2261 COMM FLIGHT TRAINING II (1). LAB. 3. Pr., AMLG 2241 and departmental approval and 2.25 GPA. Flight training toward the Commercial Pilot Certificate. Special fee.

AMLG 2271 COMM FLIGHT TRAIN III (1). LAB. 3. Pr., AGML 2261 and 2.25 GPA. Continuation of flight training towards the Commercial Pilot Certificate. Emphasis on advanced commercial maneuvers, complex airplane systems and cross country flying. Special fee.

AMLG 3050 AVIATION METEOROLOGY (3). LEC. 3. Pr., departmental approval. Meteorology as it applies to the operation of aircraft with emphasis on observation of weather elements and interpretation of flight planning weather information.

AMLG 3100 PROPULSION AND SYSTEMS (3). LEC. 3. Pr., PHYS 1500 and 2.2 GPA. Coverage of turbine and reciprocating engine components and principles of operation. Description and operation of systems typically found on light and heavy transport aircraft and selected aerospace vehicles.

AMLG 3140 AEROSPACE MANAGEMENT AND OPERATIONAL PROBLEMS (3). LEC. 3. Pr., computer competency, ECON 2030 and 2.2 GPA. Introduction to the use of operations research techniques. Includes the role of math modeling procedures, manual and computer generated solutions, applied to the decision-making process.

AMLG 3200 ECONOMIC ANALYSIS IN THE AVIATION INDUSTRY (3). LEC. 3. Pr., Computer competency, ECON 2030 and 2.2 GPA. Development of principles required in economic analysis.

AMLG 3330 ADVANCED AERODYNAMICS (3). LEC. 3. Pr., PHYS 1500 and 2.2 GPA. The principles of aerodynamics and aircraft design and how aerodynamic factors affect all aircraft in terms of lift, thrust, drag, in-air performance, stability and flight control. All the steps in the aircraft design process, from concept to test flight and the reasoning behind them.

AMLG 3710 INTRODUCTION TO LOGISTICS (3). LEC. 3. Pr., 2.2 GPA, junior standing. Logistics activities and their interrelationships in the management of the materials supply and distribution process.

AMLG 3720 PRINCIPLES OF TRANSPORTATION (3). LEC. 3. Pr., 2.2 GPA, junior standing. The study of transportation systems and their role in domestic and international trade.

AMLG 4030 GENERAL AVIATION MANAGEMENT (3). LEC. 3. Pr., MNGT 3100, junior standing, and 2.2 GPA. An overview of general aviation and its impact and interaction with the total aviation industry including a study of the various users, the suppliers and service organizations, the aircraft and facilities and regulatory framework.

AMLG 4040 GENERAL AVIATION OPERATIONS (2). LEC. 2. Pr., Junior standing and 2.2 GPA. Current principles and practices in commercial and business/corporate flight operations including organization sources of revenue, functions, operation and typical problems.

AMLG 4050 AVIATION SAFETY (3). LEC. 3. Pr., Junior standing and 2.2 GPA. Problems and issues of aviation safety including aircraft accidents, their cause, effect and the development of safety programs and procedures.

AMLG 4060 AVIATION ACCIDENT CAUSES AND INVESTIGATION (3). LEC. 3. Pr., Junior standing and 2.2 GPA. Analysis and insight into the sequence of circumstances that can occur and cause an aircraft accident to happen as well as the techniques, processes and limitations in determining aircraft accident causation.

AMLG 4080 AIR TRANSPORT PLANNING (3). LEC. 3. Pr., AMLG 5090 and 2.2 GPA. Management decision making involved in selection of equipment, routes and the establishment of rates by certified and non-certified air carriers.

AMLG 4130 AIRPORT MANAGEMENT (3). LEC. 3. Pr., MKTG 3310 and 2.2 GPA. Practices in management of a civil public airport, including organization, functions, operations, sources of revenue, funding and maintenance administration.

AMLG 4140 AIRPORT PLANNING AND DESIGN (3). LEC. 3. Pr., AMLG 4130 and 2.2 GPA. Principles and procedures pertaining to planning airport facilities required to meet the immediate and future air transportation of a community or region.

AMLG 4160 AIRLINE OPERATIONS (3). LEC. 3. Pr., Junior standing or departmental approval and 2.2 GPA. Significance of air transportation in modern society. Development of the present system. Economic and social costs and benefits of the present air transport system.

AMLG 4190 AIR TRAFFIC CONTROL FUNDAMENTALS (3). LEC. 3. Pr., Departmental approval and 2.2 GPA. Air traffic control procedures, facilities, center, and operations. Theory of radar operation and air traffic separation units, computer-based ATC radar simulators. Special fee.

AMLG 4200 AIR CARGO OPERATIONS (3). LEC. 3. Pr., Junior standing and 2.2 GPA. Domestic and international air cargo operations with emphasis on cargo economics, equipment, domestic and international regulatory activities, agents, operational techniques, systems and problems.

AMLG 4210 COMMUTER AIRLINE OPERATIONS AND MANAGEMENT (3). LEC. 3. Pr., Departmental approval and 2.2 GPA. Management practices and operational characteristics of the commuter airline and its place in the air transportation system.

AMLG 4220 COMPARATIVE AIRLINE MANAGEMENT AND OPERATIONS (3). LEC. 3. Pr., Junior standing or departmental approval and 2.2 GPA. Interdisciplinary study of industry globalization and global scale competition. The differences in economic characteristics, management structures, types of organizational behavior and more, political economy frameworks, and human factors, between airlines in the United States and abroad.

AMLG 4271 MULTI ENGINE TRAINING I (1). LAB. 2. Pr., 2.25 GPA, AMLG 2271 or Commercial Pilot Certificate with Instrument rating and departmental approval. Specialized instruction in methods and techniques of multi engine aircraft operations. Sufficient classroom and flight instruction is given under FAA Part 141 to qualify for the FAA Multi-Engine Land Certificate. Special Fees.
AMLG 4290 PRINCIPLES OF FLIGHT INSTRUCTOR II (2). LEC. 2. Pr., AMLG 4280. Continuation of principles of teaching as applied to instructing, analyzing and evaluating flight students. Emphasis is on preparation for the FAA Fundamentals of Instruction and the Flight Instructor-Airplane Knowledge Examinations.

AMLG 4291 FLIGHT INSTRUCTION TRAINING II (1). LAB. 3. Pr., AMLG 4281 and 2.25 GPA. Continuation of Discussion, instruction and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate. Special fee.

AMLG 4320 PRINCIPLES OF PROFESSIONAL FLIGHT (3). LEC. 3. Pr., AMLG 2230 or departmental approval and 2.2 GPA. Advanced aircraft performance, IFR operations, high altitude meteorology and FAR Part 135. Industry opportunities and required qualifications. Special fee.

AMLG 4331 TRANSPORT AIRCRAFT FLIGHT TRAINING (1). LAB. 2. Pr., AMLG 2271, departmental approval, and 2.25 GPA. Includes instrument and night instruction, emergency procedures and actual air transportation operations. Preparation for the Airline Transport Pilot Certification, if otherwise qualified. Special fees.

AMLG 4340 PURCHASING (3). LEC. 3. Pr., 2.2 GPA, junior standing and 2.2 GPA. Objectives, control and direction of industrial purchasing.

AMLG 4351 INSTRUMENT FLIGHT INSTRUCTOR TRAINING (1). LAB. 2. Pr., AMLG 4280, AMLG 4291, or CFI and departmental approval, and 2.25 GPA. Discussion, instruction and arranged practice in instrument flight instruction in preparation for the FAA Instrument Instructor Certificate. Special fees.


AMLG 4380 HUMAN FACTORS CREW/RESOURCE MANAGEMENT (3). LEC. 3. Pr., Junior standing and 2.2 GPA. Maximizing all of the accessible resources to accomplish the safe and competent execution of any aviation task while using a multi-person work crew.

AMLG 4780 TRANSPORTATION MANAGEMENT IN THE SUPPLY CHAIN (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in AMLG 3720. Strategies for managers involved in the transportation industry covering the perspectives of both shippers and carriers.

AMLG 4790 LOGISTICS IN THE SERVICE INDUSTRIES (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in AMLG 3710. The management of logistics processes in the retail, banking and communications industries.

AMLG 4800 INTERNATIONAL SUPPLY CHAIN MANAGEMENT (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in AMLG 3710. International aspects of managing the flow of product and its accompanying information around the world.

AMLG 4880 LOGISTICS DECISION MAKING (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in AMLG 3710, College of Business Information Technology requirement. College of Business Information Technology requirement. Managerially-applied course utilizing data analysis packages and logistics software applications for logistics decision-making.

AMLG 4890 INTERMODAL DISTRIBUTION (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in AMLG 3710. The management of intermodal distribution and intermodal marketing operations.

AMLG 4900 SPECIAL PROBLEMS IN LOGISTICS (1-3). LEC. 3. SU. Pr., 2.2 GPA, senior standing, departmental approval. Advanced research, reading and study of special topics in logistics. Course may be repeated for a maximum of 3 credit hours.

AMLG 4910 INTERNSHIP IN LOGISTICS (1-6). INT. SU. Pr., 2.2 GPA, grade of C or better in AMLG 3710, AMLG 3720, departmental approval. Work experience in a Logistics or logistics-related business, industry or organization. Course may be repeated for a maximum of 6 credit hours.

AMLG 4920 INTERNSHIP IN AVIATION MANAGEMENT (1-6). INT., SU. Pr., Departmental approval and 2.2 GPA. Practical on-the-job training under supervision with aviation agencies. Written reports are required by designated faculty supervisors. Course may be repeated for a maximum of 6 credit hours.

AMLG 4950 AVIATION STRATEGIC MANAGEMENT SEMINAR (1). SEM. 1. Pr., 2.2 GPA, senior standing, departmental approval. Coreq., MNGT 4800. Aviation Management Capstone course in which managerial issues in the aviation and aerospace industries are analyzed through a problem solving exercise.

AMLG 4967 HONORS READING (1-3). LEC. Pr., Membership in the Honors College, departmental approval and 2.2 GPA.

AMLG 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College, departmental approval and 2.2 GPA.

AMLG 5090 AVIATION LAW AND INSURANCE (3). LEC. 3. Pr., 2.2 GPA, departmental approval. The legal structure of aviation including federal, local and state statutes, contracts, insurance and liability, regulatory statutes and case law.

AMLG 5170 AIRLINE MANAGEMENT (3). LEC. 3. Pr., Junior standing or departmental approval and 2.2 GPA. Airline manufacturing, economic, and operational/managerial issues, research and development and competition issues and a survey of the world's major airlines in terms of their management strategies and style.

AMLG 5180 INTERNATIONAL AIRLINE OPERATIONS (3). LEC. 3. Pr., Departmental approval or junior standing and 2.2 GPA. International foreign air carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.

AMLG 5970 SPECIAL TOPICS AVIATION MANAGEMENT (1-4). LEC. Pr., Departmental approval and 2.2 GPA. Investigation of current issues in the aviation industry. Course may be repeated for a maximum of 4 credit hours.

AMLG 6090/6096 AVIATION LAW AND INSURANCE (3). LEC. 3. Pr., departmental approval. The legal structure of aviation including federal, local, and state statutes, contracts, insurance and liability, regulatory statutes and case law.

AMLG 6170/6176 AIRLINE MANAGEMENT (3). LEC. 3. Pr., departmental approval. Airline manufacturing, economic, and operational/managerial issues, research and development and competition issues and a survey of the world's major airlines in terms of their management strategies and style.

AMLG 6180/6186 INTERNATIONAL AIRLINE OPERATIONS (3). LEC. 3. Pr., departmental approval or junior standing. International foreign air carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.

AMLG 6770/6776 SUPPLY CHAIN MANAGEMENT (3). LEC. 3. Pr., MKTG 3310 and AMLG 3710, or departmental approval. Problems and analysis in the design and management of the retail, industrial and service supply chain. Credit will not be given for both AMLG 5770 and AMLG 6770. Fall, Spring.

AMLG 6970/6976 SPECIAL TOPICS IN AVIATION MANAGEMENT (1-3). LEC. Pr., departmental approval. Investigation of current issues in the aviation industry. Credit will not be given for both AMLG 5970 and AMLG 6970. Course may be repeated for a maximum of 9 credit hours.

AMLG 7930/7936 SPECIAL PROBLEMS IN AVIATION MANAGEMENT (1-3). LEC. Pr., Departmental approval. Special problems and current status of aviation and aerospace industries are analyzed through a problem solving exercise. Course may be repeated for a maximum of 6 credit hours.

Animal Sciences (ANSC)
Dr. Wayne Greene - 844-1521

ANSC 1000 INTRODUCTION TO ANIMAL AND DAIRY SCIENCES (4). LEC. 3. LAB. 2. The importance of livestock to agriculture and to the health and nutrition of a modern society. Livestock terminology, selection, reproduction, nutrition, management, marketing and species characteristics of beef and dairy cattle, swine, sheep and horses.

ANSC 1100 ORIENTATION TO ANIMAL AND DAIRY SCIENCES (1). LEC. 1. SU. An introduction to the departmental programs and personnel and how to make the most of the college experience. Breadth of career opportunities for animal science graduates.

ANSC 2000 COMPANION ANIMAL MANAGEMENT (3). LEC. 3. Practical aspects of behavior, nutrition, breeding, reproduction, health and management of dogs, cats and other animals generally considered to be human companions.

ANSC 2050 INTRODUCTION TO HORSE MANAGEMENT AND TRAINING (3). LEC. 1. LAB. 4. An introduction to the management, training and enjoyment of horses.
ANSC 2150 SKILLS AND CONCEPTS OF EQUESTRIAN SPORTS (1). LAB. 4. Pr., departmental approval. Basic management and care of animals used in intercollegiate equestrian and rodeo sports. Course may be repeated for a maximum of 2 credit hours.

ANSC 2700 VALUE-BASED ANALYSIS OF MEAT ANIMALS (2). LAB. 4. Pr., ANSC 1000. Comparative evaluation of body composition and application of federal grading standards to determine relative value and price of live animals, carcasses and wholesale cuts.

ANSC 2710 COMMERCIAL MEAT MANAGEMENT (4). LEC. 3. LAB. 2. The importance of meat in the food service industry, including food safety, purchasing, cooking and meat in the diet. For non-majors only.

ANSC 3000 HERD HEALTH MANAGEMENT (3). LEC. 3. Pr., ANSC 1000 and BIOL 3200. The prevention and control of the major diseases of farm animals and the development of herd health programs.

ANSC 3300 INTRODUCTORY LIVESTOCK EVALUATION AND MARKETING (2). LAB. 6. Pr., ANSC 1000. Comprehensive study of live animal and carcass evaluation techniques used in the selection and marketing of beef cattle, swine and sheep. The development of decision-making and oral communication skills is emphasized.


ANSC 3330 INTRODUCTION TO DAIRY CATTLE JUDGING (2). LEC. 6. Pr., ANSC 1000. Theory and practice in the selection of dairy cattle based on visual appraisal, pedigree and performance records. The development and presentation of oral reasons also is emphasized.

ANSC 3400 ANIMAL NUTRITION (4). LEC. 3, LAB. 2. Pr., ANSC 1000 and BCHE 3200 and BIOL 1030, or departmental approval. Principles and practice of animal nutrition, nutrient contents of feedstuffs and diet formulation.

ANSC 3500 ANIMAL BREEDING (3). LEC. 3. Pr., ANSC 1000, BIOL 3000. Genetic and environmental effects of animal differences. Selection and mating systems used in the improvement of domestic animals with an emphasis on livestock.

ANSC 3600 REPRODUCTIVE PHYSIOLOGY (4). LEC. 3, LAB. 2. Pr., ANSC 1000 and BIOL 2510 or equivalent. Comparative anatomy, physiology and endocrinology of animal reproduction; principles of reproductive biotechnologies used to enhance reproductive efficiency in mammalian systems.


ANSC 3800 CAREERS IN ANIMAL SCIENCE (1). LEC. 1, SU. Pr., Junior standing. Career opportunities for animal science graduates. Identifying and investigating careers and presenting oneself professionally for employment or post-baccalaureate education.

ANSC 4000 MODERN LIVESTOCK SYSTEMS (4). LEC. 3, LAB. 2. Pr., ANSC 1000 and Jr. standing or departmental approval for non-majors. Overview of basic principles of swine and small ruminant production systems. Modern concepts, ideas and methodology associated with the application of technology to reproduction, breeding, health, nutrition, waste nutrient utilization, and management.

ANSC 4030 DAIRY CATTLE PRODUCTION (4). LEC. 3, LAB. 3. Pr., ANSC 3400, 3500, 3600 or departmental approval for non-majors. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics and management for efficient dairy production.

ANSC 4050 HORSE PRODUCTION (4). LEC. 3, LAB. 2. Pr., ANSC 3400, ANSC 3500, ANSC 3600 or departmental approval for non-majors. Practical application and integration of nutrition, breeding, reproduction, selection, herd health, economics and management for efficient horse production.

ANSC 4070 SWINE PRODUCTION (4). LEC. 3, LAB. 2. Pr., ANSC 3400, ANSC 3500, ANSC 3600 or departmental approval for non-majors. Practical application and integration of nutrition, breeding and genetics, herd health, reproduction, economics, housing and management techniques for efficient swine production.

ANSC 4090 SHEEP PRODUCTION (4). LEC. 3, LAB. 2. Pr., ANSC 1000, or departmental approval for non-majors. Application and integration of breeding and selection, nutrition, reproduction, health and marketing to achieve optimum lamb and wool production in the southeastern U.S.

ANSC 4100 FARM ANIMAL BEHAVIOR (2). LEC. 2. Pr., ANSC 3600 or departmental approval. Basic information on behavior, its purpose and measurement. Examination of eating, locomotive, sexual, aggressive, territorial, maternal and resting behaviors in cattle, horses, swine and sheep.

ANSC 4150 ADVANCED SKILLS AND CONCEPTS OF EQUESTRIAN SPORTS (1). LEC. 4. Pr., ANSC 2150 and departmental approval. Principles and skills utilized in intercollegiate equestrian and rodeo team competition and management. Issues affecting management, training, marketing and promotion of animals used in equestrian and rodeo sports. Course may be repeated for a maximum of 2 credit hours.

ANSC 4300 ADVANCED LIVESTOCK JUDGING (1). LAB. 4. Pr., ANSC 3300. Advanced course in principles and techniques of livestock selection based on visual criteria, performance records and other advanced technologies. Course may be repeated for a maximum of 2 credit hours.

ANSC 4310 ADVANCED MEAT JUDGING (1). LAB. 4. Pr., ANSC 3310. Practice in evaluation and grading of beef, pork, and lamb carcasses and cuts. Development of communication skills and exposure to animal agriculture through training and intercollegiate competition. Course may be repeated for a maximum of 2 credit hours.

ANSC 4320 ADVANCED ANIMAL EVALUATION AND MARKETING (1). LAB. 4. Pr., ANSC 4300 or 4310 or departmental approval. Live animal and carcass evaluation techniques used in marketing cattle, swine, and sheep.

ANSC 4330 ADVANCED DAIRY CATTLE JUDGING (1). LAB. 4. Pr., ANSC 3330. Advanced course in the selection of dairy cattle and presentation of oral reasons. Course may be repeated for a maximum of 2 credit hours.


ANSC 4800 ISSUES IN ANIMAL AGRICULTURE (2). LAB. 2. Pr., Junior standing, ANSC 1000, COMM 1000, or departmental approval. Issues affecting animal agriculture, dealing with concerns of consumers and activists, involvement in public debate and the political process.

ANSC 4810 PROFESSIONAL DISCOURSE IN AGRICULTURE (1). LEC. 2. Pr., Junior standing, COMM 1000 or departmental approval, ANSC 4800. Methods for enhancing effective discourse concerning issues facing the livestock industry.

ANSC 4920 INTERNSHIP IN ANIMAL AND DAIRY SCIENCES (1-15). INT. SU. Pr., department approval. Course may be repeated for a maximum of 15 credit hours.

ANSC 4967 HONORS READINGS (3-6). IND. Pr., membership in the Honors College, junior standing, departmental approval. Consult Honors Program Adviser for more details. Course may be repeated for a maximum of 6 credit hours.

ANSC 4970 SPECIAL PROBLEMS (1-5). IND. Pr., departmental approval. Students will work under the direction of staff members on specific problems. Course may be repeated for a maximum of 6 credit hours.

ANSC 4997 HONORS THESIS (3-6). IND. Pr., membership in the Honors College, junior standing, departmental approval. See Honors Program Adviser for more details. Course may be repeated for a maximum of 6 credit hours.

ANSC 5010 BEEF PRODUCTION (4). LEC. 3, LAB. 2. Pr., ANSC 3400, 3500, 3600 or departmental approval for non-majors. Overview of the beef cattle industry. Modern concepts, ideas and methodology associated with the application of technology to reproduction, breeding, nutrition, management and the use of facilities in a modern beef cattle enterprise.

ANSC 6010 STOCKER CATTLE PRODUCTION (4). LEC. 3, LAB. 4. Pr., departmental approval. Application of the principles of animal science to the successful production of stocker cattle. Emphasis placed on marketing and management strategies. Lab will involve a considerable amount of traveling.

ANSC 7400 RUMINANT NUTRITION (3). LEC. 3. Pr., BCHE 7210 or departmental approval. Digestive physiology, mechanisms of rumen fermentation, postruminal nutritional biochemistry.
ANSC 7410 NON-RUMINANT NUTRITION (3). LEC. 3 Pr., BCHE 7210 or departmental approval. Digestion, absorption and utilization of macro and micro nutrients, nutrient interrelationship in swine and other non-ruminant species.

ANSC 7420 NUTRITIONAL TOXICOLOGY (3). LEC. 3. Pr., graduate standing. General principles of nutrition and toxicology applied toward understanding and managing livestock responses to toxicants in feeds and plants.

ANSC 7500 EXPERIMENTAL METHODS (3). LEC. 3. Pr., STAT 7010. Research methods used in the animal sciences for the analysis and interpretation of data. Included are experimental designs and computing techniques.

ANSC 7510 QUANTITATIVE GENETICS (3). LEC. 3. Pr., BIOL 3000 or departmental approval, STAT 7010. Principles of population genetics; gene frequency, biometric relationships between relatives, additive, dominance and epistatic effects, estimation and use of repeatability, heritability, genetic correlations, and breeding values.

ANSC 7600 PHYSIOLOGY OF REPRODUCTION (3). LEC. 3. Pr., ANSC 3600, BIOL 6240 or departmental approval. Physiological, endocrinological, cellular and molecular mechanisms regulating reproduction, with emphasis on mammalian systems.

ANSC 7610 PHYSIOLOGY OF GROWTH (3). LEC. 3. Pr., BCHE 7210 or departmental approval. Molecular and cellular basis of tissue differentiation, growth and development with emphasis on muscle, adipose and connective tissues and factors influencing gene expression controlling such events.

ANSC 7700 MUSCLE FOODS AND APPLIED MUSCLE BIOLOGY (4). LEC. 3. LAB. 2. Pr. ANSC 3700, BCHE 7210 or departmental approval. Investigations of muscle microanatomy, biochemistry of muscle proteins and lipids, biochemistry of skeletal muscle contraction, lipid/protein interactions, antemortem and postmortem factors affecting fresh and processed meat quality; discussion of classic and current scientific literature.

ANSC 7950 SEMINAR (1). LEC. 1, SU. An intensive study of selected topics in some facet of animal sciences.

ANSC 7970 SPECIAL PROBLEMS (1-5). LEC. Conference problems, assigned reading, literature searches in one or more of the following major fields: (a) biochemistry, (b) nutrition, (c) animal breeding, (d) reproductive physiology, (e) growth physiology, (f) muscle foods, (g) microbiology, and (h) behavior. Course may be repeated for a maximum of 15 credit hours.

ANSC 7990 RESEARCH AND THESIS (1-15). MIST, TD. Research and thesis may be on technical laboratory problems or on problems directly related to beef and dairy cattle, sheep, swine or laboratory animals. Course may be repeated with change in topic.


ANSC 8410 VITAMIN AND MINERAL METABOLISM (3). LEC. 3. Pr., BCHE 7210 or departmental approval. Vitamin and mineral nutrition with emphasis on chemical structures and characteristics, metabolic functions, deficiencies and toxicity syndromes, interrelationships and requirements of vitamins and minerals.

ANSC 8500 LINEAR MODEL APPLICATIONS IN ANIMAL BREEDING (4). LEC. 4. Pr., ANSC 7510 and STAT 7010. Selection index and mixed linear model genetic theory for estimation and prediction. Equivalent animal models, properties of solutions, and extension of methods to consider genetic relationships, multiple records, culling bias and multiple trait evaluation. Current literature will also be discussed.

ANSC 8610 MUSCLE PHYSIOLOGY AND BIOCHEMISTRY (3). LEC. 3. Pr., BCHE 7210, BIOL 6600 or departmental approval. Heterogeneity and plasticity of muscle as a tissue, ontogeny, differentiation, growth and regulation of metabolic and molecular properties of muscle fibers by innervation, usage, hormones and artificial modulation. Evaluation of current literature.

ANSC 8990 DOCTORAL RESEARCH AND DISSERTATION (1-15). DSR., TD. Course may be repeated with change in topic.

Architectural (ARCH)

ARCH 1000 CAREERS IN DESIGN AND CONSTRUCTION (1). LEC. 2, SU. Introduction to the environmental design and construction professions and the curricula in the chosen field.

ARCH 1010 INTRODUCTION TO ARCHITECTURE DESIGN I (5). LEC. 1, STU. 12. Principles of visual organization, research and design process skills, and the graphic communication of form and ideas.

ARCH 1020 INTRODUCTION TO ARCHITECTURE DESIGN II (5). LEC. 1, STU. 12. Principles of visual organization, research and design process skills, and the graphic communication of form and ideas.

ARCH 1060 VISUAL COMMUNICATION (2). LEC. 1, STU. 2. Coreq., ARCH 1010. Introduction to graphic communication. Focus on developing graphic skills for the purpose of explaining form and communicating ideas via exercises in drafting, sketching, and diagramming.

ARCH 1420 INTRODUCTION TO DIGITAL MEDIA (2). LEC. 1, STU. 2. Pr., ARCH 1060. Coreq., ARCH 1020. Introduction to the principles of 2-D and 3-D digital media and how these principles are utilized in architectural design.

ARCH 2010 STUDIO 1 (6). LEC. 2, STU. 10. Pr., ARCH 1010. Basic issues of architectural design centered around the thoughtful creation of exterior and interior space. Studies of light, material, texture, proportion, scale and site are integrated into each project.


ARCH 2110 ARCHITECTURAL HISTORY I: HISTORY OF THE BUILT ENVIRONMENT (3). LEC. 3. Pr., ARCH 1010. Examination of the social determinants that shape the public beliefs and practices that produce buildings.

ARCH 2600 THE ART OF ARCHITECTURE, PLACE, AND CULTURE (3). LEC. 3. The interrelationship of art, architecture, place and culture with emphasis on the art of architecture from a global multicultural perspective. Illustrated lecture, readings, and essays.


ARCH 3110 ARCHITECTURAL HISTORY II: HISTORY OF EUROPEAN ARCHITECTURE TO 1800 (3). LEC. 3. Pr., ARCH 2110. Introduction to key European buildings and towns from the Bronze Age to the Enlightenment. Examines how societal beliefs and practices influence the making of architecture.

ARCH 3120 ARCHITECTURAL HISTORY III: 19TH CENTURY TO PRESENT (3). LEC. 3. Pr., ARCH 3110. The history of architecture, 1850-present, with an emphasis on the rise of the modern movement in Europe and the UnitedStates.

ARCH 3320 MATERIALS AND METHODS OF CONSTRUCTION I (3). LEC. 3. Pr., ARCH 1010. The properties and potential design function of materials used in contemporary construction, with an emphasis on foundation systems, wood, and masonry.

ARCH 3410 DESSEIN ELECTIVES (3). LEC. 3. Explorations in the art of representation. Complete descriptions of specific courses and their prerequisites are available from the School of Architecture. Course may be repeated for a maximum of 6 credit hours.

ARCH 3500 SEMINAR IN METHODS AND PROCESS (3). LEC. 3. Pr., ARCH 2020. The tools and techniques available to the design professional including specific design specializations, and design methodologies. Descriptions of specific seminars are available from the School of Architecture. Course may be repeated with change in topic.

ARCH 3600 SEMINAR IN CONTEMPORARY ISSUES (3). LEC. 3. Pr., ARCH 2020. Investigation of significant topics that present opportunities and constraints to architectural thought and practice. Course may be repeated with change in topic.

ARCH 3700 SEMINAR IN HISTORY AND THEORY (3). LEC. 3. Pr., ARCH 3120. Investigation of theories, schools or periods to examine the potential
and limitations of architecture. Descriptions of specific seminars available from School of Architecture. Course may be repeated with change in topic.

**ARCH 3710 SEMINAR IN HISTORICAL PERSPECTIVES (3). LEC. 3.**

**ARCH 3800 SEMINAR IN ASPECTS OF DESIGN (3). LEC. 3. Pr., ARCH 2020.** Study of aspects of architectural design, such as form, space, style, meaning, perception, culture. Descriptions of specific seminars available from the School of Architecture. Course may be repeated with change in topic.


**ARCH 4020 STUDIO 6 (6). LEC. 2. STU. 10. Pr., ARCH 3020, ARCH 3320, ARCH 2110, BSCI 3400.** Coreq., ARCH 4900. Architectural design in the community. Includes the development of team-based design proposals. Based in the School's Birmingham Center. Lectures will focus on issues of urban planning and design.

**ARCH 4120 ELECTIVE STUDIO: THE RURAL STUDIO (6). LEC. 6. Pr., ARCH 3020, ARCH 3320, ARCH 2110, BSCI 3400.** This context-based elective studio is designed to give students first-hand exposure to a comprehensive design/build project involving all phases of the process. Students will design a building as a team, research all aspects of its construction, and construct the building they have designed. This studio is based in the School's remote facilities in Newburn, AL.

**ARCH 4220 STUDIO 6: EUROPE TRAVEL STUDIO (6). LEC. 6. Pr., ARCH 4010. Coreq., ARCH 4900.** First hand exposure to the canonical works of European architecture and urban design. The specific subjects of study and trip itinerary will vary slightly based on the objectives of the faculty leading the studio.

**ARCH 4320 MATERIALS AND METHODS OF CONSTRUCTION 2 (3). LEC. 3. Pr., ARCH 3320.** Properties and potential design applications of materials used in contemporary construction, with an emphasis on steel and concrete, roofing, glass and glazing, cladding, and interior finishes.

**ARCH 4500 PROFESSIONAL PRACTICE (3). LEC. 3. Pr., ARCH 3020.** Architects' legal responsibilities, frameworks of professional practice, office organization, business planning, marketing, project delivery, internship and professional ethics and leadership.

**ARCH 4900 SPECIAL PROBLEMS (1-6). IND. Pr., ARCH 1010 and departmental approval.** Development of an area of special interest through independent study. May be a group or individual effort under direction of the faculty and with prior approval of the School Head. Evaluation of the work may be by faculty jury. Course may be repeated for a maximum of 6 credit hours.

**ARCH 4920 RURAL STUDIO COMPLETION (0). LEC. Pr., ARCH 4120.** Completion of construction project for ARCH 4120 Elective Studio. This studio is based in the School's remote facilities in Newbern, AL.

**ARCH 4997 HONORS THESIS (1-6). LEC. Pr., membership in the Honors College; departmental approval.** Course may be repeated for a maximum of 6 credit hours.

**ARCH 5010 STUDIO 7 (6). LEC. 2. STU. 10. Pr., ARCH 4020, ARCH 4300, and ARCH 3120, BSCI 3450 and BSCI 3110. Coreq., ARCH 5990 and ARCH 5030.** Advanced problem-solving in the synthesis of previous design experiences. Development of a comprehensive design project from program to construction documents.


**ARCH 5030 APPLIED TECTONICS (2). LEC. 2. Coreq., ARCH 5010.** Connections between broad architectural ideas and the way the idea is realized; relationship between form and technique; and the role of material and construction method in the explicit expression of built form.

**ARCH 5990 INTRODUCTION TO THESIS RESEARCH (2). LEC. 2. Coreq., ARCH 5010.** The tools, techniques and strategies required to select, develop, refine, write and present a thesis argument.

**ARCH 5991 THESIS RESEARCH (1). LEC. 1. Pr., ARCH 5990. Coreq., ARCH 5020.** Expansion on the individual thesis argument and research begun in ARCH 5990 in parallel with the development of their thesis design project in ARCH 5020.

**INTERIOR ARCHITECTURE (ARIA)**


**ARIA 3020 STUDIO 4-A INTERIOR ARCHITECTURE (6). LEC. 2. STU. 10. Pr., ARCH 3010.** Parallels Architecture Studio 4, but with an emphasis on interior architecture with exploration of detail and accomodation.

**ARIA 4020 STUDIO 6-A INTERIOR ARCHITECTURE (6). LEC. 2. STU. 10. Pr., ARCH 4010, ARCH 3020, ARCH 3320, ARCH 2110, BSCI 3400.** Parallels Architecture Studio 6, with emphasis on the development of interior architecture and spaces within an urban context. Consideration will be given to adaptive reuse.

**ARIA 4030 INTERIOR ARCHITECTURE THESIS (6). LEC. 3. STU. 10. Pr., ARCH 4020.** Coreq., ARIA 4080. Interior design project of the student's choice, under the direction of a faculty member.

**ARIA 4080 INTERIOR ARCHITECTURE RESEARCH (2). LEC. 2. Pr., ARCH 4020. Coreq., ARIA 4030.** Research and writing of thesis documents, to include programming, site, and case studies.

**ARIA 4450 INTERIOR ARCHITECTURE PROFESSIONAL PRACTICE (2). LEC. 2. Pr., ARCH 4020.** Prepares student to enter professional office with an understanding of the skills, concepts and technical knowledge expected.

**ARIA 4680 HISTORY AND THEORY OF INTERIOR ARCHITECTURE (3). LEC. 3. Pr., ARCH 4020. Coreq., ARIA 4030.** The theory and history of interior spaces, their social, material, and aesthetic development and their artifacts.

**COMMUNITY PLANNING (CPLN)**

**CPLN 5000 HISTORY AND THEORY OF URBAN FORM (3). LEC. 3.** The vocabulary and historical of urban design, focusing on the environmental and cultural forces that design, shape, build and redevelop the urban fabric.

**CPLN 5020 DEATH AND LIFE OF GREAT AMERICAN CITIES (3). LEC. 3.** Global, economic, technical, and social change influences on the evolution or cities and planners responses. Use of computer simulation to create ideal cities.

**CPLN 5100 URBAN DESIGN METHODS (3). LEC. 3. Pr., senior level or departmental approval.** Techniques and methodologies in urban design problem-solving and strategies for implementation.

**CPLN 5200 HISTORY & THEORY OF URBAN FORM (3). LEC. 3. Pr., senior level or departmental approval.** The vocabulary and historical development of urban design, focusing on the environmental and cultural forces that design, shape, build and redevelop the urban fabric.

**CPLN 5300 REAL PROPERTY DEVELOPMENT (3). LEC. 3. Pr., fourth-year standing or departmental approval.** Survey and analysis of the financial, legal, administrative, planning and design factors influencing the process of land development from the perspectives of developers, planners and consumers.

**CPLN 5400 PRESERVATION PLANNING (3). LEC. 3. Pr., senior-level or departmental approval.** Planning for the preservation, restoration, conservation and adaptive reuse of historic buildings, sites and districts within the comprehensive planning process.


**CPLN 5970 SPECIAL TOPICS IN PLANNING (1-3). LEC. Pr., departmental approval.** Study of a substantive area related to community planning in a seminar setting. Course may be repeated for a maximum of 9 credit hours with a change in topic. Course may be repeated for a maximum of 9 credit hours.

**CPLN 6000 HISTORY AND THEORY OF URBAN FORM (3). LEC. 3.** The vocabulary and historical of urban design, focusing on the environmental...
and cultural forces that design, shape, build and redevelop the urban fabric.

CPLN 6020 DEATH AND LIFE OF GREAT AMERICAN CITIES (3). LEC. 3. Global, economic, technical, and social change influences on the evolution of cities and planners responses. Use of computer simulation to create ideal cities.

CPLN 6100 URBAN DESIGN METHODS (3). LEC. 3. Pr., senior level or departmental approval. Techniques and methodologies in urban design problem-solving and strategies for implementation.

CPLN 6200 HISTORY AND THEORY OF URBAN FORM (3). LEC. 3. Pr., senior level or departmental approval. The vocabulary and historical development of urban design, focusing on the environmental and cultural forces that design, shape, build and redevelop the urban fabric.

CPLN 6300 REAL PROPERTY DEVELOPMENT (3). LEC. 3. Pr., fourth-year standing or departmental approval. Survey and analysis of the financial, legal, administrative, planning and design factors influencing the process of land development from the perspectives of developers, planners and consumers.

CPLN 6400 PRESERVATIONplanning (3). LEC. 3. Pr., senior-level or departmental approval. Planning for the preservation, restoration, conservation and adaptive reuse of historic buildings, sites and districts within the comprehensive planning process.


CPLN 6970 SPECIAL TOPICS IN PLANNING (1-3). LEC. Pr., Departmental approval. Study of a substantive area related to community planning in a seminar setting. Course may be repeated for a maximum of 9 credit hours.

CPLN 7200 URBAN DESIGN STUDIO (6). STU. 12. Pr., departmental approval. Coreq., CPLN 7220 and CPLN 7240. Conceptual issues in urban design are explored, with an emphasis on the interpretation and representation of urban form; projects provide experience in both the making and the critical understanding of design actions within the community.

CPLN 7220 PLANNING IMPLEMENTATION (3). LEC. 3. Pr., departmental approval. Coreq., CPLN 7200. The programming of public and private action to affect community growth and development, including policy formulation, information systems; taxation policies and capital improvement programming.

CPLN 7240 QUANTITATIVE METHODS FOR PLANNING (3). LEC. 3. Pr., departmental approval. Coreq., CPLN 7200. Development of working knowledge of planning techniques such as data collection, basic statistics, demographic analysis, economic analysis, social research, transportation and evaluation.

CPLN 7400 COMMUNITY PLANNING STUDIO (6). STU. 12. Pr., CPLN 7200 or departmental approval. Coreq., CPLN 7420, CPLN 7440. Application of the comprehensive planning process to assist a client in the solution of a community planning problem, under faculty direction in cooperation with other professionals.

CPLN 7420 PLANNING LAW (3). LEC. 3.

CPLN 7440 HISTORY AND THEORY OF PLANNING (3). LEC. 3. Pr., CPLN 7200 or departmental approval. Coreq., CPLN 7400. Historical development of communities with emphasis on the interaction of their dynamic and structural elements; impact of the planning process and planners on public and private decision-making; ethics and professional responsibility of planners.

CPLN 7460 DIGITAL APPLICATIONS FOR PLANNING, DEVELOPMENT AND DESIGN (3). LEC. 3. Pr., GEOG 5830, 6830, or departmental approval. Basic concepts and range of applications of geographic information systems in land use planning, development, and local government. Emphasis on the use of information for spatial decision-making in the areas of service delivery, management and policy-planning.

CPLN 7600 SYNTHESIS STUDIO I (6). STU. 12. Pr., CPLN 7400 or departmental approval. Coreq., CPLN 7630. Demonstration of competence in community planning and design through the production of an original, comprehensive project that integrates knowledge and experience in addressing a complex problem.

CPLN 7620 RESEARCH METHODS (3). LEC. 3. Pr., CPLN 7400 or departmental approval. Coreq., CPLN 7600. The tools for conducting research that are essential for the development of a comprehensive community planning and design synthesis project.

CPLN 7800 SYNTHESIS PROJECT (6). STU. 12. Pr., CPLN 7620. Demonstration of competence in community planning and design through production of an original, comprehensive project that integrates knowledge and experience in addressing a complex planning and design problem.

CPLN 7920 PLANNING INTERNSHIP (1-6). INT. Pr., Departmental approval. Professional experience in public, private or non-profit planning or planning-related agency.

CPLN 7950 SYNTHESIS SEMINAR (1). SEM. 1, Su, Pr., CPLN 7600 and CPLN 7620. Coreq., CPLN 7800. Seminar to familiarize students in depth with current and compelling issues in the relevant fields of community planning and design through readings, discussions and presentations.

LANDSCAPE ARCHITECTURE (LAND)

Prof. Bruce Lindsey - 844-5418

LAND 4170 DESIGN COMMUNICATION (3). LEC. 3. Coreq., LAND 4010. Graphic and communication theories and skills in a variety of media.


LAND 5100 MATERIALS AND STRUCTURE STUDIO (5). STU. 10. Coreq., LAND 5101. Landscape architecture design studio emphasizing material research, planning and design problems at the neighborhood to community scales.


LAND 5110 BASIC LANDSCAPE ARCHITECTURAL DESIGN (6). STU. 12. Landscape architectural design studio emphasizing research, planning and design problems at neighborhood to community scales.

LAND 5120 HISTORY OF LANDSCAPE DESIGN (3). STU. 12. Survey of the traditions and heritage of landscape architecture from antiquity to the present.

LAND 5130 HISTORY OF LANDSCAPE ARCHITECTURE I (3). LEC. 3. The heritage and traditions of landscape architecture from antiquity to the 17th century.

LAND 5140 LANDSCAPE ARCHITECTURE CONSTRUCTION I (3). LEC. 3. Coreq., LAND 5100. Fundamental skills needed to analyze, understand, and manipulate landform with respect to form, grading, and drainage.

LAND 5150 LANDSCAPE ARCHITECTURE: Construction I; Landform, Grading, Drainage (3). LEC. 3. Fundamental skills necessary to analyze, understand, and manipulate landforms to maximize use and minimize environmental impact.

LAND 5160 PROFESSIONAL PRACTICE OF LANDSCAPE ARCHITECTURE (3). LEC. 3. Procedure in architectural practice, construction methods, office organization, legal requirements, professional organizations and relations, civic responsibility, and professional ethics.

LAND 5170 DESIGN COMMUNICATION (3). LEC. 3. Coreq., LAND 5010. Graphic and communication theories and skills in a variety of media.


LAND 5210 URBAN HOUSING STUDIO (6). STU. 12. Spatial/formal qualities of multi-unit housing utilizing the wealth of housing typologies erected in North America.


LAND 5240 LANDSCAPE CONSTRUCTION II (3). LEC. 3. Pr., LAND 5140. Advanced skills necessary to direct construction in the built environment including road design, grading design, cut and fill calculations and drainage planning.
LAND 5250 SEMINAR IN HISTORY OF LANDSCAPE ARCHITECTURE (3). LEC. 3. Examination of different topics in Landscape Architecture; A) The formal garden in America, B) 20th-century Landscape Architecture, C) The life and works of Frederick Law Olmstead. Course may be repeated with change in topic.

LAND 5260 LANDSCAPE ARCHITECTURE: CONSTRUCTION II; SITE ENGINEERING. DESIGN AND DETAILING (3). LEC. 3. Pr., LAND 5150. Advanced skills necessary to direct construction in the built environment.

LAND 5270 STUDY ABROAD (3-15). FLD. Pr., Level-II standing. Study abroad, China, Europe or Canada. Course may be repeated for a maximum of 15 credit hours.

LAND 5280 LANDSCAPE ELEMENTS: EARTH, FIRE AND WATER (3). LEC. 3. Introduces students to the basic elements used in the design of the built landscape.

LAND 5310 INDEPENDENT STUDY (THEESIS) (6). STU. 12. Pr., Level-III standing, departmental approval. Coreq., LAND 5330. Extensive exploitation and development of a landscape architecture issue of the students choice beyond the level associated with entry to the profession.


LAND 5420 HISTORY SEMINAR: PLACE OR TIME (3). LEC. 3. Pr., LAND 5120. Historical investigations and research on the cultural and historical implications of a specific site. Previous topics have included: The formal garden in America, 20th-century American landscape architecture. The life and works of Frederick Law Olmstead. Course may be repeated with change of topic. Fall, Spring. Course may be repeated with change in topic.

LAND 5430 URBAN THEORY (3). LEC. 3. An introduction to contemporary theories of urban design, geography, and cultural theory using case study methods.

LAND 5500 LAND ETHICS AND ENVIRONMENTAL RESPONSIBILITY (3). LEC. 3. Explores the ethical relationship of man and nature.

LAND 5510 ENVIRONMENTAL PLANNING STUDIO (6). STU. 12. Pr., level-II standing. Natural systems analysis as a basis for site planning and large scale facilities design.

LAND 5520 LANDSCAPE ARCHITECTURAL DESIGN STUDIO (6). STU. 12. Pr., LAND 5110. A continuation of the basic design studio emphasizing research, planning, and design problems at community to regional scales.

LAND 5540 HISTORY OF LANDSCAPE ARCHITECTURE II (3). LEC. 3. Explores the built landscape from the 17th century to the present including designs in America, Europe and Asia.

LAND 5590 INDEPENDENT STUDY (THEESIS) (6). STU. 12. Pr., LAND 5310. Coreq., LAND 5340. A major integrative investigation of a focused problem area, defined and pursed by the student under the direction of a faculty member.


LAND 6100 MATERIALS AND STRUCTURE STUDIO (5). STU. 10. Coreq., LAND 6101. Landscaping architecture design studio emphasizing material research, planning and design problems at the neighborhood to community scales.

LAND 6101 FIELD STUDIES, MATERIAL AND STRUCTURES STUDIO (1). FLD. 2. Coreq., LAND 6100. Field studies related to LAND 6100. Fall, Spring.

LAND 6120 HISTORY OF LANDSCAPE DESIGN (3). LEC. 3. Survey of the traditions and heritage of landscape architecture from antiquity to the present.

LAND 6140 LANDSCAPE ARCHITECTURE CONSTRUCTION I (3). LEC. 3. Coreq., LAND 6100. Fundamental skills needed to analyze understand, and manipulate landform with respect to form, grading, and drainage.

LAND 6170 DESIGN COMMUNICATION (3). LEC. 3. Coreq., LAND 6010. Graphic and communication theories and skills in a variety of media.


LAND 6201 FIELD STUDIES, COMMUNITY FABRIC STUDIO (1). FLD. 2. Coreq., LAND 6200. Field studies related to LAND 7200. Approximately four days devoted to a Field Study(s). Spring.


LAND 6240 LANDSCAPE CONSTRUCTION II (3). LEC. 3. Pr., LAND 6140. Advanced skills necessary to direct construction in the built environment including road design, grading design, cut and fill calculations and drainage planning.


LAND 6420 HISTORY SEMINAR: PLACE OR TIME (3). LEC. 3. Pr., LAND 6120. Historical investigations and research on the cultural and historical implications of a specific site. Previous topics have included: The formal garden in America, 20th-century American landscape architecture. The life and works of Frederick Law Olmstead. Course may be repeated with change of topic. Fall, Spring. Course may be repeated with change in topic.

LAND 6430 URBAN THEORY (3). LEC. 3. An introduction to contemporary theories of urban design, geography, and cultural theory using case study methods.


LAND 7330 LANDSCAPE ECOLOGY: MATERIALS AND PROCESSES (3). LEC. 3. Facilitates a working knowledge of natural ecological systems in site analysis; how they can be preserved or restored to enhance human and ecological health.

LAND 7360 PROFESSIONAL PRACTICE (3). LEC. 3. Studies in landscape and architecture practice, construction methods, office organization, legal requirements, professional organizations and relations, civic responsibility and professional ethics. Fall, Spring.


LAND 7900 INDEPENDENT STUDY (1-3). LEC. Pr., Departmental approval and MLA II standing. An individual student can pursue an area of research beyond the required curriculum. Course may be repeated for a maximum of 9 credit hours.

LAND 7930 INDIVIDUAL DESIGN THESIS I (6). LEC. 6. Pr., MLA Level III status. Coreq., LAND 7510. Extensive expansion and development of a landscape architecture issue of the student’s choice. The thesis is expected to impact the body of knowledge and discipline of Landscape Architecture. Fall, Spring.

LAND 7970 SPECIAL TOPICS (1-6). LEC. Pr., Departmental approval and MLA I standing. Groups of student work with a specific faculty on a special topic in an area of interest. Course may be repeated for a maximum of 9 credit hours.

LAND 7980 INDIV SUMMARIZE RESEARCH STUDIO II (8). LEC. 8. Pr., MLA Level III status; LAND 7930 or LAND 7500. Coreq., LAND 7981. Integrative studio work for a landscape architecture research issue.

ARTS 1010 BASIC DRAWING (3). STU. 9. Pr., Not open to ARTS majors. Credit not applicable to BFA degree. Instruction in freehand drawing concepts, materials and techniques. A variety of approaches and subject matter will be used.

ARTS 1030 BASIC CERAMICS (3). STU. 9. Pr., Credit not applicable to BFA. Instruction in principles of three-dimensional design and sculpture. Clay is used to explore techniques of casting, constructing, modeling and wheel throwing. Work with glazes and surface decoration.

ARTS 1040 BASIC PAINTING (3). STU. 9. Pr., Not open to ARTS Majors. Credit not applicable to BFA. Instruction in painting concepts, materials, and techniques. Waterbased paints and other media are used to explore a variety of approaches and subject matter.

ARTS 1110 DRAWING I (3). STU. 9. Pr., Arts majors only; or Departmental permission. Basic drawing with emphasis on accurate observation, pictorial organization, and the depiction of space; development of drawing skills using various black and white media.

ARTS 1120 DRAWING II (3). STU. 9. Pr., ARTS 1110. Continuation of concepts and processes from ARTS 1110. Introduction to interpretive approaches with emphasis on concept, content, and creativity. Exploration of various black and white and color media.

ARTS 1210 2-D DESIGN FOR FINE ART AND GRAPHIC DESIGN (3). STU. 9. Pr., Arts majors only; or Departmental permission. Elements and principles of basic two-dimensional design. Emphasis on composition, color theory, and craftsmanship.

ARTS 1220 3-D DESIGN FOR FINE ART AND GRAPHIC DESIGN (3). STU. 9. Pr., Arts majors only; or Departmental permission. Elements and principles of basic three-dimensional design. Emphasis on spatial organization, color, and media exploration and craftsmanship.

ARTS 1710 INTRODUCTION TO ART HISTORY I (3). LEC. 3. Fine Arts Core. Introduction to major art traditions of the world, from Paleolithic times to AD/CE 1000.

ARTS 1720 INTRODUCTION TO ART HISTORY II (3). LEC. 3. Fine Arts Core. An introduction to world art, c.1000 to c.1700. Medieval, Renaissance and Baroque Europe with Islamic and non-Western art of the same time period.

ARTS 1730 INTRODUCTION TO ART HISTORY III (3). LEC. 3. Fine Arts Core. Major works of painting, sculpture and architecture from the Rococo period through the 20th century. Emphasis on styles and social, political and cultural relationships.

ARTS 2110 FIGURE DRAWING (3). STU. 9. Pr., ARTS major; ARTS 1120, 1210, 1220, two 1000-level art history courses. The human figure as form as a compositional element. Measuring and sighting for proportion. Drawing from casts, skeletons and live nude models.

ARTS 2140 ADVANCED DRAWING I (3). STU. 9. Pr., ARTS major only. ARTS 2110. Concepts, materials and techniques with emphasis on the development of a personal vision and individual approach. Live nude models may be used.


ARTS 2220 TYPOGRAPHICS I (3). STU. 9. Pr., ARTS 1120, ARTS 1210, ARTS 1220, two 1000-level Art History courses, 6 hrs. of University Core Curriculum. Minimum 2.5 GPA in pre-requisite courses and department approval. Practical applications of typography for design and layout, advertising and other contemporary formats. Historical and anatomical development of type and letter forms. Emphasis on presentation and visualization of concepts.


ARTS 2410 PRINTMAKING I (3). STU. 9. Pr., ARTS 1120, ARTS 1210, ARTS 1220, two 1000-level art history courses. Instruction in painting concepts, materials and techniques of printmaking. Mono printing, relief and multiple originals are covered.


ARTS 2710 HISTORY OF GRAPHIC DESIGN (3). LEC. 3. Pr., 6 hours from ARTS 1710, ARTS 1720 or ARTS 1730; sophomore standing. A chronological survey of graphic design from its Paleolithic origins to the present. Emphasis on social and cultural contexts, symbolic application, formal characteristics, and significant art and design movements.


ARTS 3150 ADVANCED DRAWING II (3). STU. 9. Pr., ARTS 2140. ARTS majors only. Medium and subject determined by student with approval of instructor. Emphasis on strengthening the student's aesthetic awareness and technical skills.

ARTS 3200 INTRODUCTION TO GRAPHIC DESIGN (4). STU. 12. Pr., ARTS 1710, ARTS 1720, ARTS 1730, GPA 2.5 in ARTS 2210 and ARTS 2220. Design and layout, and image making procedures for creative problem solving in graphic design, emphasis on presentation, creativity and visualization.


ARTS 3220 PHOTO COMMUNICATIONS (4). STU. 12. Pr., ARTG major. ARTS 1710, 1720, 1730, 2210, 2220, 3200, 3210. Photography as applied communication such as advertising, editorial photography, and annual report photography. Emphasis on advanced technological and studio techniques.

ARTS 3240 ELECTRONIC MEDIA (4). STU. 12. Pr., ARTG major. ARTS 3200, 6 hours of art history, junior standing. Emphasis on new technology in relation to advertising design, graphic design and imaging.


ARTS 3320 PAINTING II (3). STU. 9. Pr., 2.5 GPA in ARTS 2140, ARTS 2310. Instruction in painting concepts, materials and techniques with emphasis on the development of technical skills and a personal vision and individual approach.

ARTS 3330 PAINTING III (3). STU. 9. Pr., ARTS 2140, ARTS 2310. Medium and subject determined by student and instructor. Emphasis on strengthening aesthetic awareness and technical skills. Live nude models may be used.


ARTS 3430 PRINTMAKING III (3). STU. 9. Pr., 2.5 GPA in ARTS 2410, ARTS 2140. Techniques of lithography. May not be taken concurrently with ARTS 3420.

ARTS 3520 SCULPTURE II (3). STU. 9. Pr., 2.5 GPA in ARTS 2510, ARTS 2140. Instruction in sculptural concepts, materials and techniques with emphasis on the development of technical skills, personal vision and individual approach.

ARTS 3530 SCULPTURE III (3). STU. 9. Pr., ARTS 3520, ARTS 2140. Advanced sculpture with medium and subject determined by student and instructor. Emphasis on student's aesthetic awareness and technical skills.

ARTS 3700 ART OF THE UNITED STATES (3). LEC. 3. Pr., sophomore standing. 6 hours of 1000-level Art History or departmental approval. A study of architecture, painting and sculpture from colonial to recent times. Selected movements and works are considered in relationship both to European and to indigenous conditions and attitudes.
ARTS 3710 ANCIENT ART OF THE WEST (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. An examination of major art traditions of the ancient world: Egypt, Near East, Aegean, Greece, Rome. Junior standing. Development of the student’s awareness and technical skills as a maturing painter. Live nude models may be used. Course may be repeated for a maximum of 6 credit hours.

ARTS 3720 MEDIEVAL ART OF THE WEST (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of major art traditions of the West from the fall of Rome to CE 1400, with a selective focus on the major art traditions: Migration period, Carolingian, Ottonian, Romanesque, Gothic and Italo-Byzantine.

ARTS 3730 RENAISSANCE ART IN ITALY (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of the architecture, painting, and sculpture of the 15th and 16th centuries in Italy.

ARTS 3740 BAROQUE AND ROCOCO ART (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of Baroque architecture, painting and sculpture in 17th-century Europe and of the Rococo style of the 18th century.

ARTS 3750 19TH CENTURY ART (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. An introduction to major art movements from Neo-Classicism to Post-Impressionism and Art Nouveau.

ARTS 3760 20TH CENTURY ART (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of major developments in painting, sculpture and architecture in Europe and the United States from 1900 to recent times.

ARTS 3770 ANCIENT AMERICAN ART (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of major art traditions of Nuclear America, from Mexico to the Andes, from the beginnings to CE 1550.

ARTS 3780 RENAISSANCE ART OF NORTHERN EUROPE (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. A study of the art of Northern Europe, CE 1300-1600. Major themes include cultural interchange, court and bourgeois patronage, rise of graphic arts, and the development of the art market.

ARTS 3790 ARTS OF ASIA (3). LEC. 3. Pr., sophomore standing, 6 hours of 1000-level Art History or departmental approval. Introduction to major art traditions of Asia, from the beginnings to the present.

ARTS 3800 ISSUES AND CRITICISM CONTEMPORARY ART (3). LEC. 3. Pr., ARTS 1710, 1720, 1730, one 3000-level art history course, levels I and II in a fine arts studio sequence. Readings and discussions about art since 1970.

ARTS 3820 CERAMICS II (3). STU. 9. Pr., ARTS 1120, 1210, 1220, and 6 hours of Art History. Introduction to wheel-thrown pottery. Presentation of historical and contemporary contexts for fine arts ceramics. Work with glazes and firing.

ARTS 3830 CERAMICS III (3). STU. 9. Pr., ARTS 2810, ARTS 2140. Continuation of ARTS 2810 with increased emphasis on individual stylistic and conceptual concerns.

ARTS 3920 GRAPHIC DESIGN INTERNSHIP (4). INT. 4. Pr., ARTS 3200. A fifteen-week period working full time as a staff member with an approved internship sponsor under the direction of a supervising art director.

ARTS 4010 ART IN EDUCATION (4). STU. 10. Pr., junior standing. Not open to ARTS majors. Principles and objectives of art issues pertinent to teaching on the public school level. Art appreciation and production emphasizing multicultural and interdisciplinary aspects of art in the classroom. Course may be repeated for a maximum of 8 credit hours.

ARTS 4240 GRAPHIC DESIGN I (4). STU. 12. Pr., ARTG major. ARTS 2710, ARTS 3200 junior standing. Application of communicative procedures and skills necessary to convey messages by means of graphic presentation: problem solving in corporate identity, advertising design, self-promotion, etc. Development of student’s individual style. Courses in this sequence may not be taken concurrently.

ARTS 4250 GRAPHIC DESIGN II (4). STU. 12. Pr., ARTG major. ARTS 2710, 3200, junior standing. Application of communicative procedures and skills necessary to convey messages by means of graphic presentation: problem solving in publication design, packaging, large format design and layout, etc. Development of student’s individual style and main potential. Courses in this sequence may not be taken concurrently.

ARTS 4320 PRINTMAKING II (3). LEC. 3. Pr., 2.5 GPA in ARTS 2140, ARTS 2410. Techniques of intaglio printmaking. May not be taken concurrently with ARTS 3430.

ARTS 4340 PAINTING IV (4). STU. 12. Pr., ARTS 3330, ARTS 1710, ARTS 1720, ARTS 1730, one 3000-level art history. Advanced painting with medium and subject idea determined by student with approval of the instructor. Emphasis on strengthening the student’s aesthetic awareness and technical skills as a maturing painter. Live nude models may be used. Course may be repeated for a maximum of 8 credit hours.

ARTS 4440 PRINTMAKING IV (4). LEC. 4. STU. 12. Pr., ARTS 3420, ARTS 3430, ARTS 1710, ARTS 1720, ARTS 1730, one 3000-level art history. Stylistic development, technical proficiency, and individual interest are pursued. Emphasis on aesthetic and conceptual growth through production and research. Course may be repeated for a maximum of 8 credit hours.

ARTS 4540 SCULPTURE IV (4). STU. 12. Pr., ARTS 3530, ARTS 1710, ARTS 1720, ARTS 1730, one 3000-level art history. Advanced sculpture with medium and subject idea determined by student with approval of the instructor. Emphasis on strengthening the student’s aesthetic awareness and technical skills as a maturing sculptor. Course may be repeated for a maximum of 8 credit hours.

ARTS 4640 IMAGE I (4). STU. 12. Pr., ARTS 3200 and 6 hours of Art History. Application of illustration techniques and concepts to various graphic formats. Development of personal skills and an individual style. Courses in this sequence may not be taken concurrently.

ARTS 4650 IMAGE II (4). STU. 12. Pr., ARTS 3200 and 6 hours of Art History. Exploration of 2 dimensional and 3 dimensional imaging techniques and concepts. Development of personal skills and an individual style. Courses in this sequence may not be taken concurrently.

ARTS 4840 CERAMICS IV (4). STU. 12. Pr., ARTS 1710, 1720, 1730, 3820, 3830, and one 3000-level art history. Continuation of ARTS 3830 with increased emphasis on individual stylistic and conceptual concerns.

ARTS 4900 INDEPENDENT STUDY (2-3). IND. Pr., 3.0 minimum average in 3000-level ARTS courses in area of emphasis and departmental approval. Senior standing. Open to ARTS students only, who have Pr., shown ability, initiative and industry on individual projects. Independent studies are offered in Graphic Design, Painting, Printmaking, Sculpture, Imaging, Art History, Ceramics and Photography (see department for listing). Course may be repeated for a maximum of 6 credit hours.

ARTS 4910 PROFESSIONAL STUDIO PRACTICES (2). STU. 6. Pr., Senior standing. Instruction in portfolio preparation, resume writing, gallery and museum exhibition, and information on a wide range of art careers and graduate study. Fall, Spring.

ARTS 4967 HONORS READINGS (1-3). LEC. 3. Pr., membership in the Honors College, ARTS major only. Course may be repeated for a maximum of 3 credit hours.

ARTS 4970 SPECIAL TOPICS (2-3). STU. Pr., Completion of all 1000-level Art History and all 1000-level Foundation courses, one 3000-level studio and junior standing. ARTS majors only. Offered in Design, Fine Arts, Imaging and Art History (see department for listing). Course may be repeated for a maximum of 6 credit hours.

ARTS 4980 SENIOR PROJECT FOR FINE ARTS (4). LEC. 4. Pr., ARTS 2310, ARTS 2410, ARTS 2510, ARTS 2810 and Fine Arts studio sequence in one group through level IV. Must be taken student’s final semester. Coreq., ARTS 4910. A directed terminal studio project with choice of subject and medium. This project will be exhibited and a faculty committee will award a letter grade. Professional quality color slides of the project work must be presented to the department before the student is cleared for graduation.

ARTS 4990 SENIOR PROJECT FOR GRAPHIC DESIGN (4). STU. 12. Pr., ARTS 4240 and ARTS 4250 or ARTS 4640 and ARTS 4650. Must be taken in student’s final semester. A directed terminal studio project with choice of subject and medium. Project will be exhibited and a faculty committee will award a letter grade. Professional quality color slides of the project work must be presented to the department before student is cleared for graduation.

ARTS 4997 HONORS RESEARCH AND THESIS (1-3). IND. Pr., membership in the Honors College, ARTS major only. Course may be repeated for a maximum of 4 credit hours.

Biochemistry (BCHE)
Dr. William Hill - 844-4043
Dr. Jacek Wower - 844-1508
BCHE 3180 NUTRITIONAL BIOCHEMISTRY (3). LEC. 3. Pr., CHEM 2030 or CHEM 2080 or departmental approval. Fundamental pathways of carbohydrate, lipid and amino acid metabolism in human beings. Credit will not be given for both BCHE 3180 and BCHE 3200.
BCHE 3200 PRINCIPLES OF BIOCHEMISTRY (3). LEC. 3. Pr., CHEM 2030 and BIOL 1010 or departmental approval. Structure and function of biomolecules, enzyme catalysis, processing of genetic information, bioenergetics and metabolism, and regulatory mechanisms in cellular processes.


BCHE/CHM 5180 BIOCHEMISTRY I (3). LEC. 3. Pr., CHEM 2080 or departmental approval. Fundamentals of metabolism, focusing on the design and regulation of the major catabolic and biosynthetic metabolic pathways, bioenergetics.

BCHE/CHM 5181 BIOCHEMISTRY I LABORATORY (1). L. 3. Coreq., BCHE 5180 or CHEM 5180. Laboratory techniques required for identification and quantification of compounds of important biochemical classes.

BCHE/CHM 5190 BIOCHEMISTRY II (3). LEC. 3. Pr., BCHE 5180. Fundamentals of metabolism, focusing on the design and regulation of the major catabolic and biosynthetic metabolic pathways.

BCHE/CHM 5191 BIOCHEMISTRY II LABORATORY (1). L. 3. Coreq., BCHE 5190. Laboratory techniques required for partial purification, kinetic studies and characterization of enzymes and nucleotides from various plants, animals and bacteria.


BCHE/CHM 6180 BIOCHEMISTRY I (3). LEC. 3. Pr., CHEM 2080 or departmental approval. Fundamentals of the classification, structure and reactions of the major constituents of living matter and evaluation of binding phenomena and bioenergetics.

BCHE 6181 BIOCHEMISTRY I LABORATORY (1). L. 3. Coreq., BCHE 6180 or CHEM 6180. Laboratory techniques required for identification and quantification of compounds of important biochemical classes.

BCHE/CHM 6190 BIOCHEMISTRY II (3). LEC. 3. Pr., BCHE 6180. Fundamentals of metabolism, focusing on the design and regulation of the major catabolic and biosynthetic metabolic pathways.

BCHE 6191 BIOCHEMISTRY II LABORATORY (1). L. 3. Coreq., BCHE 6190. Laboratory techniques required for partial purification, kinetic studies and characterization of enzymes and nucleotides from various plants, animals and bacteria.


BCHE 7200 ADVANCED BIOCHEMISTRY I (3). LEC. 3. Graduate credit will not be given for both BCHE 6190 and BCHE 7200.

BCHE 7210 ADVANCED BIOCHEMISTRY II (3). LEC. 3. Pr., CHEM 2080 or equivalent. Structure and function of macromolecules participating in the flow of molecular information. Graduate credit will not be given for both BCHE 6180 and BCHE 7210.

BCHE 7220 PRINCIPLES OF CELLULAR AND MOLECULAR ENZYMOLOGY (3). LEC. 3. Pr., BCHE 6190, or CHEM 6190 or departmental approval. The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes.


BCHE 7250 BIOCHEMISTRY OF LIPIDS AND LIPOPROTEINS (3). LEC. 3. Pr., BCHE 7200 or departmental approval. The regulation of lipid and lipoprotein metabolism, role of lipid mediators in signaling pathways and protein modification, assembly and dynamics of lipoproteins and biomembranes.

BCHE 7260 BIOINFORMATICS (3). LEC. 3. Pr., BCHE 7260 or departmental approval. Advanced study of main concepts and tools of genomics and proteomics.

BCHE 7270 BIOCHEMICAL RESEARCH TECHNIQUES (3-6). LEC. Pr., BCHE 6190, or CHEM 6190 or departmental approval. Modern Biochemical Laboratory Techniques. Course may be repeated for a maximum of 6 credit hours.

BCHE 7280 TOPICS IN BIOCHEMISTRY (1-3). LEC. Pr., BCHE 7210 or equivalent, departmental approval. Directed studies in biochemistry. Course may be repeated for a maximum of 3 credit hours.

Biological Sciences (BIOC)

Biological Sciences (BIOC)
Dr. James Barbaree - 844-1647

BIOL 1000 INTRODUCTION TO BIOLOGY (4). LEC. 3. LAB. 2. Pr., Credit will not be given for both BIOL 1000 and BIOL 1020 or BIOL 1027. Science Core. Introduction to biological principles relevant to human society. Designed for non-science majors. Credit will not be given for both BIOL 1000 and BIOL 1020 or BIOL 1027.

BIOL 1001 INTRODUCTION TO BIOLOGY LABORATORY (0). LAB., NG. Coreq., BIOL 1000. Laboratory course for BIOL 1000.

BIOL 1010 A SURVEY OF LIFE (4). LEC. 3. LAB. 2. Pr., Credit will not be given for both BIOL 1010 and BIOL 1030 or BIOL 1037. Science Core. Emphasis on contrasting strategies employed by organisms to meet similar biological needs. Credit will not be given for both BIOL 1010 and BIOL 1030 or BIOL 1037.

BIOL 1011 A SURVEY OF LIFE LABORATORY (0). LAB., NG. Coreq., BIOL 1010. Laboratory course for BIOL 1010.

BIOL 1020 PRINCIPLES OF BIOLOGY (4). LEC. 3. LAB. 2. Pr., Credit will not be given for both BIOL 1020 and BIOL 1000 or BIOL 1027. Science Core. Introduction to the physical, chemical, and biological principles common to all organisms. Credit will not be given for both BIOL 1020 and BIOL 1000 or BIOL 1027.

BIOL 1021 PRINCIPLES OF BIOLOGY LABORATORY (0). LAB., NG. Coreq., BIOL 1020. Laboratory Course for BIOL 1020.

BIOL 1027 HONORS BIOLOGY (4). LEC. 3. LAB. 2. Pr., Membership in the Honors College. Science Core. Introduction to the physical, chemical, and biological principles common to all organisms. Credit will not be given for both BIOL 1027 and BIOL 1000 or BIOL 1020.

BIOL 1030 ORGANISMAL BIOLOGY (4). LEC. 3. LAB. 2. Pr., BIOL 1020. Science Core. Principles and fundamentals of biology at the organismal level. Credit will not be given for both BIOL 1030 and BIOL 1010 or BIOL 1037.

BIOL 1031 ORGANISMAL BIOLOGY LABORATORY (0). LAB., NG. Coreq., BIOL 1030. Laboratory Course by BIOL 1030.

BIOL 1037 HONORS ORGANISMAL BIOLOGY (4). LEC. 3. LAB. 2. Pr., Membership in the Honors College and BIOL 1020 or BIOL 1027. Science Core. Principles and fundamentals of biology at the organismal level. Credit will not be given for both BIOL 1037 and BIOL 1010 or BIOL 1030.

BIOL 2000 MICROBIOLOGY AND PUBLIC HEALTH (4). LEC. 3. LAB. 1. Pr., BIOL 1000 or BIOL 1020. Introduction to the science of microbiology with an emphasis on the public health aspects. (Cannot be used to satisfy minor or major requirements in the biological sciences).

BIOL 2015 MARINE SCIENCE I: OCEANOGRAPHY (5). LEC. 3. LAB. 4. Pr., MATH 1130, departmental approval. An introduction to oceanography that integrates physical, geological, chemical and biological oceanography to provide a multidisciplinary foundation in the fundamentals of marine science. Taught at Gulf Coast Research Laboratory.

BIOL 2415 MARINE SCIENCE II: MARINE BIOLOGY (5). LEC. 3. LAB. 4. Pr., BIOL 1020, BIOL 1030, departmental approval. An overview of biological oceanography with emphasis on organisms, habitats, and fisheries of Mississippi Sound and the Gulf of Mexico. Taught at Gulf Coast Research Laboratory.

BIOL 2425 MARINE BIOLOGY (4). LEC. 3. Pr., BIOL 1030, departmental approval. The invertebrates, vertebrates and marine plants as communities with emphasis on local examples. Taught only at Dauphin Island Sea Lab.

BIOL 2445 COASTAL ECOLOGY FOR TEACHERS (4). LEC. 3. LAB. 2. Pr., Basic science courses required for education degree, departmental approval. Provides teachers with a background in basic coastal ecology. Interdisciplinary concepts involving the environment and its conservation. Taught at the Gulf Coast Research Laboratory.

BIOL 2500 HUMAN ANATOMY AND PHYSIOLOGY I (4). LEC. 3. LAB. 3. Pr., BIOL 1000, BIOL 1020, or BIOL 1027. Study of the structure and function of the human body. First half of two-part sequence with BIOL 2510, concentrating on tissues, muscle and nervous system.


BIOL 3000 GENETICS (4). LEC. 3. LAB. 1. Pr., BIOL 1020, BIOL 1027 and MATH 1150. A contemporary overview of theoretical principles of transmis-
sion, population and molecular genetics. Principles emphasizing use of animal, plant and microbial models.

**BIOL 3010 COMPARATIVE ANATOMY** (4). LEC. 3, LAB. 3, Pr., BIOL 1030, or BIOL 1037. Comparisons of the organ systems of vertebrates.

**BIOL 3020 GENOMIC BIOLOGY** (4). LEC. 3, LAB. 2, Pr., BIOL 1020. An overview of genes, genomes, and genomic and proteomic approaches and methodology. Application of principles of biology at the genomic level. Includes an introduction to bioinformatic approaches to genomic problems in a computer laboratory setting.

**BIOL 3030 EVOLUTION AND SYSTEMATICS** (3). LEC. 3, Pr., BIOL 1030 or BIOL 1037. An introduction to evolutionary processes, classification or organisms and scientific nomenclature.

**BIOL 3060 ECOLOGY** (4). LEC. 3, LAB. 3, Pr., 8 hours Biology or departmental approval. Interactions of organisms with their environments and characteristics of populations, communities, and ecosystems.

**BIOL 3075 INTRODUCTION TO OCEANOGRAPHY** (4). LEC. 4, Pr., MATH 1150, CHEM 1030, PHYS 1500, departmental approval. The physics, chemistry, biology and geology of the oceans. Taught only at Dauphin Island Sea Lab.

**BIOL 3100 PLANT BIOLOGY** (3). LEC. 3, Pr., BIOL 1030, or BIOL 1037, CHEM 1040. Coreq., BIOL 3101. Introduction to the morphology, anatomy, physiology and classification of plants with emphasis on the angiosperms.

**BIOL 3101 PLANT BIOLOGY LABORATORY** (1). LEC. 3, Pr., BIOL 1030, or BIOL 1037, CHEM 1041. Coreq., BIOL 3100. Introductory plant biology laboratory on morphology, anatomy, physiology and classification of plants with emphasis on the angiosperms.

**BIOL 3200 GENERAL MICROBIOLOGY** (4). LEC. 3, LAB. 2, Pr., BIOL 1030, or BIOL 1037, CHEM 1030. Introduction to the science of microbiology, emphasizing cell structure, systematics, growth, genetics, and the role in human affairs.

**BIOL 3500 PERSPECTIVES IN IMMUNOLOGY** (3). LEC. 3, Pr., BIOL 3000 or BIOL 3020 and BIOL 3200. Introduction to the cells and components of the immune response with an emphasis on host response to infection and medical immunology.

**BIOL 4000 HISTOLOGY** (4). LEC. 3, LAB. 3, Pr., BIOL 1030, or BIOL 1037. Morphology and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.

**BIOL 4010 INvertebrate Biodiversity** (4). LEC. 3, LAB. 3, Pr., BIOL 1030, or BIOL 1037. Survey of the phyla of invertebrates with emphasis on morphology, anatomy, ecology, evolution and systematics.

**BIOL 4020 VERTEBRATE Biodiversity** (4). LEC. 3, LAB. 3, Pr., BIOL 1030, or BIOL 1037. Ecology and evolution of living vertebrates of the world.

**BIOL 4055 Marine Science for Teachers** (3). LEC. 3, Pr., departmental approval. Provides teachers an introduction to the study of marine science and incorporation of marine biology at all grade levels. Taught at Gulf Coast Research Laboratory.


**BIOL 4101 CELL BIOLOGY LABORATORY** (2). LEC. 4, Pr., or corequisite BIOL 4100. Light/electron microscopy, cell structure, origins of life, centrifugation, protein/nucleic acid electrophoresis and blotting, motility, DNA purification, chromatography, pH, fluorescence microscopy.

**BIOL/CMBL 4150 HUMAN GENETICS** (3). LEC. 3, Pr., BIOL 3000, BIOL 4100, CHEM 2080. Study of the biological interaction of genes, effects of mutation and changes in gene frequency in human populations. Emphasis on molecular approach to study evolutionary changes in human gene pools.

**BIOL 4200 CLINICAL MICROBIOLOGY** (4). LEC. 3, LAB. 4, Pr., BIOL 3200, junior standing. Isolation, cultivation, identification, classification and pathogenesis of infectious agents with emphasis on bacteria; includes clinical materials, Eubacteria, Mycoplasma, Rickettsiae, and Spirochaetes.

**BIOL 4385 Marine Faunistic Ecology** (5). LEC. 2, LAB. 6, Pr., departmental approval. A field survey of animals associated with three habitat types and factors controlling their distribution in the northern Gulf of Mexico. Taught at Gulf Coast Research Laboratory.

**BIOL 4400 CLINICAL PHYSIOLOGY** (3). LEC. 3, Pr., BIOL 2500. Exploration of membrane, muscle and nerve physiology, peripheral and central nervous systems; special consideration of physiological processes involved in cardiology, respiration, the urinary system, digestion and reproduction.

**BIOL 4410 VERTEBRATE DEVELOPMENT** (5). LEC. 3, LAB. 4, Pr., BIOL 3000, Seniors only or departmental approval. Morphogenesis and organogenesis of frog, chick, pig and human from a descriptive and analytical approach. Fall.

**BIOL 4425 Marine Fisheries Management** (4). LEC. 4, Pr., departmental approval. Fisheries management philosophy, objectives, problems, and principles involved in management decisions. Offered at the Gulf Coast Research Laboratory.

**BIOL 4435 Special Topics in Marine Science** (1-6). LEC. Pr., departmental approval. An opportunity for students to study in an area in which GCRL offers no formal course; not research oriented. Taught at Gulf Coast Research Laboratory. Course may be repeated for a maximum of 6 credit hours.

**BIOL 4445 Special Problems in Marine Science** (1-6). LEC. Pr., departmental approval. Individualized research-oriented experience. Taught at Gulf Coast Research Laboratory. Course may be repeated for a maximum of 6 credit hours.

**BIOL 4455 Marine Invertebrate Zoology** (5). LEC. 5.

**BIOL 4465 Parasites of Marine Animals** (6). LEC. 3, LAB. 6, Pr., BIOL 6110 or departmental approval. A study of the parasites of marine estuarine animals with emphasis on morphology, taxonomy, life histories, and host-parasite relationships. Taught at Gulf Coast Research Laboratory.

**BIOL 4475 Marine Ichthyology** (6). LEC. 6, Pr., 16 Hours including BIOL 3010 or departmental approval. Biology of the major piscine taxa in Mississippi Sound. Principles involved in classification and evolutionary relationships of these organisms. Taught at Gulf Coast Research Laboratory.

**BIOL 4485 Marine Ecology** (5). LEC. 5, Pr., 16 hrs of Biological Science including BIOL 1030, or BIOL 1037, BIOL 4010, departmental approval. The relationship of marine organisms to their environment and the effects of environment on abundance and distribution on marine organisms. Offered at Gulf Coast Research Laboratory, Ocean Springs, MS.

**BIOL 4485 Comparative Histology of Marine Organisms** (6). LEC. 6, Pr., departmental approval. Detailed study of the histological organization and its relationships to physiological changes during the life cycle of representative marine organisms. Light and electron microscopy. Taught at Gulf Coast Research Laboratory.

**BIOL 4515 Marine Invertebrate Zoology** (4). LEC. 4, Pr., BIOL 1030 or BIOL 1037, and 10 hours of BIOL 2000-level or above, departmental approval. The natural history, systematics and morphology of marine invertebrates from the Gulf of Mexico; oriented toward a field and laboratory approach. Participation in extended field trips is part of the course. Taught only at Dauphin Island Sea Lab.

**BIOL 4525 Dolphins and Whales** (2). LEC. 2, Pr., BIOL 1030, or BIOL 1037, departmental approval. Classification, anatomy and ecology of the cetaceans. Taught only at Dauphin Island Sea Lab.

**BIOL 4535 Coastal Zone Management** (2). LEC. 2, Pr., BIOL 1030, or BIOL 1037, departmental approval. Management of shorelines and flood plains, and current legislation. Water quality and ecosystem quality management. Taught only at Dauphin Island Sea Lab.

**BIOL 4545 Coastal Ornithology** (4). LEC. 4, Pr., BIOL 4020, departmental approval. Coastal and pelagic birds with emphasis on ecology, taxonomy, and distribution. Taught at Dauphin Island Sea Lab.

**BIOL 4565 Marine Vertebrate Zoology** (4). LEC. 4, Pr., BIOL 1030 or BIOL 1037, departmental approval. Systematics, zoogeography and ecology of marine fishes, reptiles, and mammals. Taught at Dauphin Island Sea Lab. May not be substituted for BIOL 4020.


**BIOL 4950 Undergraduate Seminar** (1). LEC. 1, Pr., departmental approval. Oral presentation and discussion of recent scientific publications from a selected area of biological sciences. One hour is required of all majors. Course may be repeated for a maximum of 3 credit hours.

**BIOL 4967 Honors Reading** (1-3). LEC. Pr., membership in the Honors College; department approval. Course may be repeated for a maximum of 3 credit hours.

**BIOL 4970 Special Topics** (1-4). LEC. Pr., departmental approval. Instruction and discussion in a selected current topic in Biological Sciences. Course may be repeated for a maximum of 8 credit hours.
BIOL 4980 UNDERGRADUATE RESEARCH (2-4). IND. Pr., departmental approval, junior or senior standing. Directed research in an area of specialty within the department. Course may be repeated for a maximum of 4 credit hours.

BIOL 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College. Undergraduate research and thesis. Course may be repeated for a maximum of 3 credit hours.

BIOL 5020 DEVELOPMENTAL BIOLOGY (3). LEC. 3. Pr., BIOL 4100, BIOL 4410. Consideration of induction, constancy of the genome, pathfinding by migrating cells, morphogenetic movements, and other developmental processes.

BIOL 5090 CONSERVATION BIOLOGY (3). LEC. 3. Pr., BIOL 3060 or departmental approval. Conservation of biodiversity, including endangered species, population viability analyses, species recovery plans, sustainable landscapes and environmental policy.

BIOL 5110 PARASITOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 1030 or BIOL 1037 or BIOL 2500. Development, identification, host-parasite relationships and medical significance of parasitic protozoa, helminthes, and arthropods that infect humans, domestic animals and wildlife.


BIOL 5140 PLANT ECOLOGY (4). LEC. 3. LAB. 4. Pr., BIOL 1030, or BIOL 1037, BIOL 3100 and BIOL 3060 or departmental approval. Exploration of ecological interactions between plants and their environment. Field trips emphasize Southeastern habitats/plant examples. Includes 3-day weekend field trip.

BIOL 5150 ANIMAL COMMUNITY ECOLOGY (3). LEC. 3. Pr., BIOL 3060 or departmental approval. Dynamics of natural animal communities, including niches, species interactions, succession, island biogeography, special diversity and food webs.

BIOL 5160 FIELD BIOLOGY AND ECOLOGY (3-15). LEC. 3. Pr., 15 hours of biology and departmental approval. Intensive classroom and field studies of an area outside Alabama. Course may be repeated for a maximum of 15 credit hours.


BIOL 5210 MICROBIAL PHYSIOLOGY (3). LEC. 3. Pr., BIOL 3200, CHEM 2080. General physiology of microbial cells emphasizing fermentation, respiration, photosynthesis, nitrogen fixation, cell wall synthesis, membranes and macromolecular synthesis.

BIOL 5220 INTRODUCTORY MOLECULAR GENETICS (3). LEC. 3. Pr., BIOL 3000, BIOL 3200. Principles of gene expression including replication, transcription and translation; structure and regulation of genes; concepts and techniques in recombinant DNA.


BIOL 5240 ANIMAL PHYSIOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 4100 or CHEM 2070. General overview of the function of the major systems in animals, including evolution and adaptation to specific environments.

BIOL 5300 PLANT ANATOMY AND DEVELOPMENT (4). LEC. 3. LAB. 4. Pr., BIOL 3100 or departmental approval. Investigation of the various levels of plant organization from subcellular to organ through use of light and scanning electron microscopes.

BIOL 5320 PLANT GENE EXPRESSION (4). LEC. 4. Pr., BIOL 3100 or departmental approval. Genetic expression of genetic elements in plants from the recent literature.


BIOL 5360 POPULATION ECOLOGY (3). LEC. 3. Pr., BIOL 3060, MATH 1610 or departmental approval. Quantitative study of populations, including life tables, Leslie matrices, exponential and logistic models, metapopulations and life-history theory.

BIOL 5375 MARINE SCIENCE FOR ELEMENTARY SCHOOL TEACHERS (3). LEC. 3. Pr., 6 hours in basic biological science and departmental approval. Principle-centered training in a broad spectrum of subjects relating marine science to health, reading, social studies, language, arithmetic, science and art. Taught at Gulf Coast Research Laboratory.


BIOL 5435 COASTAL VEGETATION (4). LEC. 2. LAB. 2. Pr., BIOL 1030 or BIOL 1037, BIOL 3100. Study of different coastal ecosystems with an emphasis on plant vegetation.

BIOL 5455 MARSH ECOLOGY (4). LEC. 4.

BIOL 5465 MARINE MICROBIOLOGY (5). LEC. 3. LAB. 2. Pr., BIOL 3200, BIOL 4600 or departmental approval. The role of microorganisms in marine environments.

BIOL 5475 OCEANOLOGY OF THE GULF OF MEXICO (3). LEC. 2. LAB. 2. Pr., departmental approval. A descriptive study of the oceanology of the Gulf of Mexico and adjacent waters including coastal zone, continental shelf, and deep ocean. Summer.

BIOL 5495 MARINE PROTOZOOLOGY (3). LEC. 2. LAB. 3. Pr., introductory Biology. Treatment of the major groups of protists from marine habitats including their taxonomy, structure, ecology, and methods of studying.

BIOL/CMBL 5500 IMMUNOLOGY (3). LEC. 3. Pr., BIOL 3200 and BIOL 3000. The cellular and molecular basis of the immune response, including antigen presentation, immunogenetics, effector mechanisms and medical immunology.


BIOL 5510 BIOGEOGRAPHY (3). LEC. 3. Patterns and processes associated with the distribution of living and fossil organisms.

BIOL/CMBL 5521 GENE EXPRESSION AND RECOMBINANT DNA LAB (2). LEC. 2. LAB. 4. Coreq., BIOL 5220. Laboratory experiences demonstrating concepts and techniques in recombinant DNA.

BIOL 5525 MARINE BEHAVIORAL ECOLOGY (4). LEC. 3. LAB. 3. Pr., Vertebrate and Invertebrate Zoology. Study of animal behavior and the influence by and interaction with the environment and the ecological and evolutionary significance of these behaviors. Summer.


BIOL 5600 MAMMALIAN PHYSIOLOGY (6). LEC. 5. LAB. 3. Pr., BIOL 1030, BIOL 1051 or BIOL 2500 and CHEM 2080. An in-depth investigation of the physiology of the major mammalian organ systems.

BIOL 5650 ETHOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 1030 or BIOL 1037 and BIOL 3060. Animal behaviors, analysis of their adaptive value, development and evolution.

BIOL 5660 FOOD MICROBIOLOGY (5). LEC. 3. LAB. 6. Pr., BIOL 3200. The role of microorganisms food production and food spoilage with basic training in the microbiological analysis of food.


BIOL 6020 DEVELOPMENTAL BIOLOGY (3). LEC. 3. Pr., BIOL 4100, BIOL 4410. Consideration of induction, constancy of the genome, pathfinding by migrating cells, morphogenetic movements, and other developmental processes.

BIOL 6090 CONSERVATION BIOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 3060 and departmental approval. Examination of practical and theoretical issues in the conservation and maintenance of biological diversity and the recovery and management of endangered species.

BIOL 6110 PARASITOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 1030 or BIOL 1037 or BIOL 2500. Development, identification, host-parasite relationships and medical significance of parasitic protozoa, helminthes, and arthropods that infect humans, domestic animals and wildlife.


BIOL 6140 PLANT ECOLOGY (4). LEC. 3. LAB. 4. Pr., BIOL 1030, or BIOL 1037, BIOL 3100 and BIOL 3060 or departmental approval. Exploration of ecological interactions between plants and their environment. Field trips emphasize Southeastern habitats/plant examples. Includes 3-day weekend field trip.

BIOL 6150 ANIMAL COMMUNITY ECOLOGY (4). LEC. 3. LAB. 2. Pr., BIOL 3060 or departmental approval. Dynamics of natural animal communities, including niches, species interactions, succession, island biogeography, species diversity and food webs.

BIOL 6160 FIELD BIOLOGY AND ECOLOGY (3-15). LEC. 3. Pr., 15 hours of biology and departmental approval. Intensive classroom and field studies of an area outside Alabama. Course may be repeated for a maximum of 15 credit hours.


BIOL 6210 MICROBIAL PHYSIOLOGY (3). LEC. 3. Pr., BIOL 3200, CHEM 2070. General physiology of microbial cells emphasizing fermentation, respiration, photosynthesis, nitrogen fixation, cell wall synthesis, membranes and macromolecular synthesis.

BIOL/CMBL 6220 INTRODUCTORY MOLECULAR GENETICS (4). LEC. 4. Pr., BIOL 3000, BIOL 4510. Advanced principles of gene expression including replication, transcription and translation; structure and regulation of genes; detailed concepts and techniques in recombinant DNA. Credit will not be given for both BIOL 6220 and CMBL 6220.

BIOL/CMBL 6230 VIROLOGY (4). LEC. 4. Pr., BIOL 3000, BIOL 3200, BIOL 3220. Molecular mechanisms of virus biology including virus-cell interactions, replication, assembly and release and pathogenesis. Credit will not be given for both BIOL 6230 and CMBL 6230.

BIOL 6240 ANIMAL PHYSIOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 4100 or CHEM 2070. General overview of the function of the major systems in animals, including evolution and adaptation to specific environments.

BIOL 6300 PLANT ANATOMY AND DEVELOPMENT (4). LEC. 2. LAB. 4. Pr., BIOL 6130 or departmental approval. The study of the structure and ontogeny of plant cells, tissues, and organs. Fall.

BIOL/CMBL 6320 PLANT GENE EXPRESSION (4). LEC. 4. Pr., BIOL 5320 or departmental approval. Genetic expression of genetic elements in plants from the recent literature. Credit will not be given for both BIOL 6320 and CMBL 6320.


BIOL 6360 POPULATION ECOLOGY (4). LEC. 4. Pr., BIOL 3060 or departmental approval. Quantitative study of populations, including life tables, Leslie matrices, exponential and logistic models, metapopulations and life-history theory.

BIOL 6375 MARINE SCIENCE FOR ELEMENTARY SCHOOL TEACHERS (3). LEC. 3. Pr., 6 hours in basic biological science and departmental approval. Principle-centered training in a broad spectrum of subjects relating marine science to health, reading, social studies, language, arithmetic, science and art. Taught at Gulf Coast Research Laboratory.


BIOL 6425 MARINE BOTANY (4). LEC. 4.

BIOL 6435 COASTAL VEGETATION (4). LEC. 2. LAB. 2. Pr., BIOL 1030 or BIOL 1037, BIOL 3100. Study of different coastal ecosystems with an emphasis on plant vegetation.

BIOL 6455 MARSH ECOSYSTEM (4). LEC. 4.

BIOL 6465 MARINE MICROBIOLOGY (5). LEC. 3. LAB. 2. Pr., BIOL 3200, BIOL 4600 or departmental approval. The role of microorganisms in marine environments.

BIOL 6475 OCEANOLOGY OF THE GULF OF MEXICO (3). LEC. 2. LAB. 2. Pr., Departmental approval. A descriptive study of the oceanology of the Gulf of Mexico and adjacent waters including coastal zone, continental shelf, and deep ocean. Summer.

BIOL 6495 MARINE PROTOZOOLOGY (3). LEC. 3. LAB. 3. Pr., Introductory Biology. Treatment of the major groups of protists from marine habitats including their taxonomy, structure, ecology, and methods of studying.

BIOL/CMBL 6500 IMMUNOLOGY (3). LEC. 3. Pr., BIOL 3200 and BIOL 3000. The cellular and molecular basis of the immune response, including antigen presentation, immunogenetics, effector mechanisms and medical immunology.

BIOL/CMBL 6501 IMMUNOLOGY LABORATORY (2). LAB. 4. Pr., or corequisite BIOL 6500. Techniques illustrating principles of antigen-antibody interactions and their application in immunoassays, identification of leukocytes, cellular interactions and antibody production.

BIOL 6510 BIOGEOGRAPHY (3). LEC. 3. Pr., departmental approval. Patterns and processes associated with the distribution of living and fossil organisms.

BIOL/CMBL 6521 GENE EXPRESSION AND RECOMBINANT DNA LAB (2). LEC. 2. LAB. 4. Coreq. BIOL 6220. Laboratory experiences demonstrating concepts and techniques in recombinant DNA.

BIOL 6525 MARINE BEHAVIORAL ECOLOGY (4). LEC. 3. LAB. 3. Pr., Vertebrate and Invertebrate Zoology. Study of animal behavior and the influence by and interaction with the environment and the ecological and evolutionary significance of these behaviors. Summer.


BIOL 6550 WETLAND BIOLOGY (4). LEC. 4. LAB. 3. Pr., BIOL 3060 or equivalent. Biology of world wetland habitats. Field trips, research project, presentation, and paper discussion required.

BIOL 6600 MAMMALIAN PHYSIOLOGY (6). LEC. 5. LAB. 3. Pr., BIOL 1030, BIOL 1037 or BIOL 2500 and CHEM 2080. An in-depth investigation of the physiology of the major mammalian organ systems.

BIOL 6650 ETHOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 1030 or BIOL 1037 and BIOL 3060. Animal behaviors, analysis of their adaptive value, development and evolution.

BIOL 6660 FOOD MICROBIOLOGY (5). LEC. 3. LAB. 2. Pr., BIOL 3200. The role of microorganisms food production and food spoilage with basic training in the microbiological analysis of food.


BIOL 6750 ORNITHOLOGY (4). LEC. 3, LAB. 3. Pr., departmental approval. An intensive investigation of the current literature and relevant research dealing with birds.


BIOL 7000 ADVANCED PARASITOLOGY (3). LEC. 3. Pr., BIOL 6110. Cell biology, immunology, vaccine strategy, and other topics in parasitology including review of current literature on newly emerging/re-emerging parasitic diseases.

BIOL 7010 FUNDAMENTALS OF TEACHING BIOLOGY (1). LEC. 1. SU. Spring, Summer, Fall. Course may be repeated for a maximum of 6 credit hours.


BIOL 7125 COASTAL ECOSYSTEMS DYNAMICS (2). LEC. 2. Pr., None: Biological Oceanography, Advanced Marine Ecology, Fisheries Oceanography recommended. Investigation of the basic principles of ecosystem structure and function.

BIOL 7160 SYSTEMATIC Ichthyology (3). LEC. 3. Pr., BIOL 6380. The principles of systematics and their application to the study of the evolution of fishes. Emphasizes individual and group work with faunistic literature and museum material.

BIOL 7170 POPULATION GENETICS (3). LEC. 3. Pr., BIOL 3000. Examination of the theories relating to maintenance of variation in natural populations of plants and animals.

BIOL 7190 COMPARATIVE PHYSIOLOGY (4). LEC. 3, LAB. 3. Pr., BIOL 6240 or departmental approval. Evolution of physiological and biochemical systems in invertebrates and lower vertebrates and adaptations to specific environments.


BIOL 7225 FIELD MARINE SCIENCE - MAINE (2). LEC. 1, LAB. 4. Pr., Marine Biology. Field study in Maine emphasizing rocky intertidal, kelp bed and eel grass habitats.

BIOL/CMBL 7220 INFRASTRUCTURE PLANT CELLS AND MICROBES (5). LEC. 3, LAB. 4. Pr., departmental approval. Theory and practice of transmission and scanning electron microscopy and their applications to the biological sciences. Credit will not be given for both BIOL 7270 and CMBL 7270. Spring.

BIOL 7280 PLANT HORMONES (2). LEC. 2. Pr., BIOL 6130. Synthesis, physiology, and mode of action of the major plant hormones including abscisic acid, auxins, cytokinins, ethylene and gibberellins.

BIOL/CMBL 7290 EVOLUTIONARY GENETICS (3). LEC. 3. Pr., BIOL 3000, BIOL 6170 or departmental approval. The role of population processes as mechanisms for evolution; and evolution at the molecular level. Credit will not be given for both BIOL 7290 and CMBL 7290.

BIOL/CMBL 7330 MOLECULAR BIOLOGY OF PLANT DEVELOPMENT (2). LEC. 2. Pr., BIOL 6130, BIOL 7280, or departmental approval. Physiological, biochemical and molecular aspects of plant growth and development. Credit will not be given for both BIOL 7330 and CMBL 7330.

BIOL 7340 WATER RELATIONS AND ENVIRONMENTAL STRESS (2). LEC. 2.

BIOL 7370 STREAM ECOLOGY (4). LEC. 3, LAB. 3. Pr., BIOL 3030 and BIOL 3060. Physical, chemical, and biological aspects of stream ecosystems emphasizing effects of natural environmental factors and human influences on stream biota, and quantitative methods used to study stream ecology.


BIOL/CMBL 7440 ADVANCED CELL BIOLOGY (3). LEC. 3. Pr., BIOL 4100. Examination of current areas of research in cell and developmental biology by directed reading and discussion. Credit will not be given for both BIOL 7440 and CMBL 7440.

BIOL 7490 PHYSIOLOGICAL ECOLOGY (3). LEC. 3. Pr., 20 hours of biology beyond 1000-level to include a course in ecology. A study of the physiological adaptations that allow animals to survive in unusual environments.

BIOL 7515 OCEANOLOGY OF THE GULF OF MEXICO (3). LEC. 3.


BIOL 7540 PROFESSIONAL ASPECTS OF BIOLOGY (3). LEC. 3. Pr., departmental approval. Instruction on practical aspects of a career in biological sciences.

BIOL 7560 PLANT/ANIMAL INTERACTIONS (3). LEC. 3. Pr., BIOL 3060, BIOL 3100 or departmental approval. Overview of ecological and evolutionary interrelationships between animals and plants, including pollination biology, dispersal ecology, carnivory and plant-herbivore interactions.

BIOL 7620 MICROBIOLOGY OF EPIDEMICS (3). LEC. 3. Pr., BIOL 4200 or departmental approval. Epidemics of communicable disease outbreaks are analyzed according to the hosts, modes of transmission, environment, and pathogenesis of the agents.

BIOL 7705 TROPICAL BIOLOGY: ECOLOGICAL APPROACH (8). LEC. 4, LAB. 12. Pr., 75 hours of graduate level biological science. An in-depth introduction to the principles of ecology in the tropics. Orientation and introductory lecture in San Jose, Costa Rica followed by field work during an 8 week period.

BIOL 7715 TROPICAL AGRO ECOLOGY (8). LEC. 4, LAB. 12. Pr., 20 hours of graduate level biological science. Application of ecological principles to tropical agricultural systems with emphasis on research training. Orientation in San Jose, Costa Rica followed by visits to 3 main habitats.


BIOL 7950 MASTER'S THESIS SEMINAR (1). LEC. 1. SU. Pr., departmental approval. Oral presentation and discussion of research in the field of specialization. Course may be repeated for a maximum of 2 credit hours.

BIOL/CMBL 7960 READINGS IN MOLECULAR BIOLOGY (1). LEC. 1. Pr., or corequisite BIOL 7220. Oral presentation and discussion of recent scientific publications from a selected area molecular biology. Credit will not be given for both BIOL 7960 and CMBL 7960. Course may be repeated for a maximum of 4 credit hours.

BIOL 7970 SPECIAL TOPICS (1-4). LEC. Pr., departmental approval. Instruction and discussion in a selected current topic in botany, microbiology, molecular biology, or zoology. A different topic for advanced study will be selected each semester this course is offered. Course may be repeated for a maximum of 8 credit hours.

BIOL 7980 SPECIAL PROBLEMS (1-4). LEC. Pr., departmental approval. (A) Zoology, (B) Botany, (C) Microbiology, (D) Molecular Biology. Numerous study areas are available in each category. Consult individual faculty member before registering. Course may be repeated for a maximum of 4 credit hours.

BIOL 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.

BIOL 8950 DOCTORAL SEMINAR (1). SEM. 1. SU. Oral presentation and discussion of research in the field of specialization. Course may be repeated for a maximum of 3 credit hours.

BIOL 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

Building Science (BSCI)
Prof. John Murphy - 844-4518

BSCI 1100 HISTORY AND INTRODUCTION TO CONSTRUCTION (3). LEC. 2, LAB. 6. Overview of the construction industry, practices, and careers and the development and use of construction materials and methods in Western civilization from Greece to the present time.
BSCI 1200 WORKING DRAWINGS AND SPECIFICATIONS (3). LEC. 2, LAB. 2. Pr., PBSC major. Graphic communication in construction; reading and interpreting working drawings, specifications, and shop drawings for use in construction estimating and administration.

BSCI 2200 CAD IN CONSTRUCTION (3). LEC. 2, LAB. 8. Pr., BSCI 1200. Applications of CAD in modern construction practice, which should enable students to produce/modify CAD drawings typically found in the construction environment.

BSCI 2300 MATERIALS, METHODS AND EQUIPMENT I (3). LEC. 3. LAB. 4. Pr., PBSC major. An overview of the materials, methods and construction equipment used in the construction of components found in CSI divisions 2-6.

BSCI 2350 MATERIALS, METHODS AND EQUIPMENT II (3). LEC. 3. Pr., BSCI 2300. An overview of the material, methods and construction equipment used in the construction of components found in CSI divisions 7-16.

BSCI 2400 STRUCTURES I (3). LEC. 3. Pr., PBSC, PHYS 1500, and MATH 1610. Principles of mechanics and material behavior related to building structures. Includes: force systems, frame analysis, section properties, stress, basic design and structural elements.

BSCI 3100 ENVIRONMENTAL CONTROL I (3). LEC. 3. Pr., ARCH 1010. Survey of the effects of climate, design, materials and systems on the energy consumption and human environment of buildings. Alternative energy sources are also included.

BSCI 3110 ENVIRONMENTAL CONTROL II (2). LEC. 2. Pr., BSCI 3100. Survey of the effects of climate, design, materials and systems on the energy consumption and human environment of buildings. Alternative energy sources are also included.

BSCI 3300 FIELD SURVEYING (2). LEC. 1. LAB. 6. Pr., BSCI Major. Surveying techniques, construction layout, use of equipment and dimensional controls for buildings. Surveying camp, a concentrated, 10 working day course held during Summer/Fall break. Students will be required to register for the Summer semester preceding the camp. Summer.

BSCI 3400 STRUCTURES II (3). LEC. 3. Pr., BSCI 2400, BSCI major. Primary and secondary member design, connection design, temporary bracing/shoring, and steel shop drawing review.

BSCI 3450 STRUCTURES III (3). LEC. 3. Pr., BSCI 3400. Introduction to the design of reinforced concrete and related formwork including beams, columns, slabs, footings, retaining walls, and pre-stressed members.

BSCI 3500 CONSTRUCTION INFORMATION TECHNOLOGY (3). LEC. 1. LAB. 4. Pr., BSCI major. Exploration of information technology and information management in construction. Problem solving using beginning and advanced techniques in spreadsheets, databases, presentation software, and many forms of digital communication.

BSCI 3550 CONSTRUCTION INFORMATION TECHNOLOGY II (3). LEC. 3. Pr., BSCI 3500.


BSCI 3650 PROJECT CONTROLS II (4). LEC. 3. LAB. 2. Pr., BSCI 3600. Professional estimating and scheduling concepts focusing on the roll-over of project estimates into detailed CPM schedules for construction including cost budget data.

BSCI 3700 CONSTRUCTION SAFETY HOISTING (3). LEC. 3. Pr., BSCI major. Introduction to safety management in construction including risk reduction, lift planning, operations and rigging. Students earn 10 hour OSHA certification through the detailed coverage of code requirements.

BSCI 3800 PROJECT CONTROLS LEVELING I (3). LEC. 3. Pr., departmental approval. Combined course in blueprint reading, quantity surveying and calculating for students accepted into the Master’s program, but working on required remedial coursework. This course can not be used to replace required undergraduate courses. Fall.


BSCI 3850 PROJECT CONTROLS LEVELING II (3). LEC. 2. LAB. 2. Pr., BSCI 3800. Combined course in construction scheduling and project administration for students accepted into the Master’s program, but working on required remedial coursework. This course can not be used to replace required undergraduate courses. Spring.

BSCI 3920 EXPERIMENTAL LEARNING (3). LEC. 3. SU. Pr., Junior standing and departmental approval. Requires daily log and employer certification.

BSCI 4200 RESIDENTIAL CONSTRUCTION (3). LEC. 3. Pr. Provides an overview of residential construction and development practices and professional issues including: local ordinances and codes, land use law, financing practices, architect-builder relationship, spec homes vs. custom homes, etc.

BSCI 4300 COMBINED ESTIMATING AND SCHEDULING FOR DESIGNERS (3). LEC. 3. Provides an overview of estimating and project planning practices and techniques which relate to interactions between the architect and constructor. Includes: sources of project costs, conceptual estimating, value engineering, CPM scheduling, cost of acceleration and delays, change orders, etc.

BSCI 4400 CONSTRUCTION STRUCTURES (2). LEC. 2. Pr., BSCI 2400. Temporary construction methods and design principles to insure stability of structures during all phases of the construction process. Includes: concrete formwork, trench shoring, temporary bracing, rigging, and materials handling.

BSCI 4600 PROJECT CONTROLS III (4). LEC. 3. LAB. 2. Pr., BSCI 3650. Detailed development of project management and project administration skills including resource scheduling, change management, project documentation, billing, cost control, QA/QC techniques, and site utilization planning.

BSCI 4700 BUILDING EQUIPMENT (3). LEC. 3. Pr., BSCI major. Overview of plumbing, mechanical and electrical systems in buildings. Basic design concepts are covered with emphasis on the management and quality control of system installation during the construction process.

BSCI 4750 SOILS, EARTHMOVING, AND SURVEYING (2). LEC. 2. LAB. 3. Pr., BSCI major. Introduction to properties and testing of soils encountered on a jobsite.

BSCI 4800 CONTRACTING BUSINESS (3). LEC. 3. Pr., BSCI 4600. Introduction to the organization and management of construction companies. Includes issues such as business planning, operations management, insurance, bonding, construction finance, employment law, etc.

BSCI 4850 BUSINESS AND CONSTRUCTION LAW (3). LEC. 3. Pr., BSCI major. Introduction to the legal environment of business in the United States with emphasis on contract law and liability issues for construction companies. Course includes legal research, claims avoidance, claims documentation, and alternative dispute resolution.

BSCI 4920 BUSINESS INTERNSHIP (1-3). INT. SU. Pr., 2.2 GPA; approval of instructor prior to internship; and completion of, or current enrollment in two or more of the following: ACCT 2110, ECON 2020/2030, FINC 3610, MNGT 3100, or MKTG 3310. Internship option for students to gain work experience who seek general or free elective credit.

BSCI 4980 BUILDING SCIENCE THESIS (4). LAB. 12. Pr., BSCI 4600. Individual project demonstrating mastery of curriculum content through the application of skills/knowledge to a theoretical construction company and project. Requires a written thesis and oral defense of work.

BSCI 5970 SPECIAL PROBLEMS (1-5). IND. Pr., departmental approval. Special problems in construction topics. Offered only at the discretion of the department head. This course may not be used to replace any required Building Science course.

BSCI 6970 SPECIAL PROBLEMS IN CONSTRUCTION (1-3). LAB. Pr., departmental approval. Individually proposed problems or projects related to the construction industry. Students must prepare a written proposal with defined deliverables. Course may be repeated for a maximum of 3 credit hours.

BSCI 7010 CONSTRUCTION LABOR AND PRODUCTIVITY (3). LEC. 3. Pr., departmental approval. Construction labor issues, productivity measurement and productivity improvement in the construction industry. Includes reading, research, and an out of class project.

BSCI 7020 ADVANCED CONSTRUCTION SCHEDULING (3). LEC. 3. Pr., departmental approval. Construction planning and scheduling techniques, the analysis of schedule data, and the decision making process of construction planning. Individual scheduling and analysis projects, presentations, and research.

BSCI 7030 CONSTRUCTION INFORMATION MANAGEMENT (3). LEC. 3. Pr., departmental approval. Advanced computer and information management systems applied in the construction industry. Topics include: network systems, EDI, voice recognition, bar coding/other ID systems, imaging, etc. Independent projects, research and homework assignments.
BSENI 7040 PROJECT DELIVERY SYSTEMS (3). LEC. 3. Pr., departmental approval. Survey of alternative project delivery systems in construction with analysis of their impact on project management and company organization. Guest lecturers, readings, exams and projects.

BSENI 7100 ELECTIVES IN PROJECT MANAGEMENT (3). LEC. 3. Pr., departmental approval. Special course offerings related to advanced project management topics. Course may be repeated with change in topic.

BSENI 7200 ELECTIVES IN CONSTRUCTION LAbOR (3). LEC. 3. Pr., departmental approval. Special course offerings related to construction labor topics. Course may be repeated with change in topic.

BSENI 7300 ELECTIVES IN INFORMATION TECHNOLOGY AND INNOVATION (3). LEC. 3. Pr., departmental approval. Special course offerings related to information technology, innovation, and robotics in construction. Course may be repeated with change in topic.

BSENI 7950 GRADUATE SEMINAR (1). SEM. 1. SU. Pr., departmental approval. Two hour bi-weekly meetings. Topics include research techniques, professional development, job placement, student projects, etc. Course may be repeated for a maximum of 3 credit hours.

BSENI 7960 DIRECTED READINGS IN CONSTRUCTION (1-3). IND. Pr., departmental approval. Individually proposed exploration of a construction industry related topic not covered in existing course offerings. Students must prepare a written proposal of the topic. Course may be repeated for a maximum of 3 credit hours.

BSENI 7980 CAPSTONE PROJECT (3). LAB. 6. Pr., departmental approval. Independent exploration of an approved topic with final written report of findings and an oral defense of the work. Specific capstone project requirements are established by the supervising committee and vary based on the chosen topic.

Biosystems Engineering (BSEN)

Steven E. Taylor - 844-3534

BSEN 3210 MECHANICAL POWER FOR BIOSYSTEMS (3). LEC. 2, LAB. 3. Pr., ENGR 2010, MECH 2110. Coreq., MATH 2650. Basic engineering analysis, synthesis, and design concepts applied to power sources, mobile equipment and machinery applications for agricultural, forestry, and natural resource systems.


BSEN 3260 ENGINEERING FOR PRECISION AGRICULTURE AND FORESTRY (3). LEC. 2, LAB. 3. Pr., ELEC 3810, MATH 2650, or departmental approval. Engineering aspects of spatial technologies applied to agricultural and forest production. Data collection in the field using GPS and use of field data in site specific applications. Fall.

BSEN 3500 NATURAL RESOURCE SYSTEMS CONSERVATION (3). LEC. 2, LAB. 3. Pr., MATH 1130. Natural resource conservation technologies including rainfall-runoff relationships, sediment transport capacity, runoff control structures, water supply development, surveying techniques including GPS methods. Spring.

BSEN 3510 AGRICULTURAL POWER AND MACHINERY FUNDAMENTALS (3). LEC. 2, LAB. 3. Pr., MATH 1130. Power unit fundamentals with emphasis on diesel and small gasoline engines; mechanics of operation, safety, use, and adjustment of machines used for horticultural and agronomic crop production; and precision agriculture principles and technology. Fall.

BSEN 3530 AGRICULTURAL PRODUCTION AND PROCESSING FACILITY TECHNOLOGY (3). LEC. 3. Pr., MATH 1130. Fundamental requirements for the design and operation of agricultural production and processing facilities. Spring.

BSEN 3560 TURF SYSTEMS IRRIGATION DESIGN (3). LEC. 3. Pr., MATH 1130. Irrigation system design for turf-based systems including residential lawns, commercial properties, athletic fields and golf courses. Irrigation scheduling and water demand are presented to provide management capabilities. Fall.

BSEN 4210 IRRIGATION SYSTEM DESIGN (3). LEC. 2, LAB. 3. Pr., CIVL 3110. Theory and design of irrigation systems for the application of water and wastewater including surveying techniques for system design. Systems include solid-set, traveler, center-pivot and trickle. Fall.


BSEN 4240 MECHANICAL AND ELECTRICAL PROCESS OPERATIONS IN BIOSYSTEMS (3). LEC. 3. Pr., ENGR 2070, CIVL 3110, ELEC 3810. Fluid flow applications, pump and fan selection, materials handling, size reduction, sorting and separating. Application of electrical power, equipment, and control devices to biological, food, forest and agricultural systems. Fall.


BSEN 4310 ENGINEERING DESIGN FOR BIOSYSTEMS (4). LEC. 2, LAB. 6. Pr., Departmental approval. Capstone design course in biosystems engineering emphasizing teamwork, communication, safety engineering, and economic analysis to complete an engineering design project. Spring.

BSEN 4900 SPECIAL PROBLEMS IN BIOSYSTEMS ENGINEERING (1-4). IND. Pr., departmental approval. Faculty supervision of individual student investigations of specialized problems in biosystems engineering. May be repeated with change in problem. Course may be repeated with change in topic.

BSEN 4967 HONORS READING (1-3). IND. Pr., membership in the Honors College. Course may be repeated for a maximum of 3 credit hours.

BSEN 4970 SPECIAL TOPICS IN BIOSYSTEMS ENGINEERING (1-4). LEC. Pr., departmental approval. Individual or small group study of a specialized area in biosystems engineering. May be repeated with change in topic. Course may be repeated for a maximum of 12 credit hours.

BSEN 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College. Course may be repeated for a maximum of 3 credit hours.

BSEN 5220 INTRODUCTION TO SPATIAL TECHNOLOGIES FOR BIOSYSTEMS (3). LEC. 2, LAB. 3. Pr., STAT 2510, STAT 2610, or STAT 3010, or AGRN 2040, or departmental approval. Spatial technologies including GPS, GIS and remote sensing systems applied to biosystems. Collecting, managing, and analyzing spatial data for agricultural and forest systems. Spring.

BSEN 5250 DETERMINISTIC MODELING FOR BIOSYSTEMS (3). LEC. 3. Pr., LAB. 2. Pr., MATH 2650. ELEC 3810, ENGR 2350, or MECH 2110 or departmental approval. Modeling of biosystems, methods to deal with complexity and validation tools. Spring.

BSEN 5550 PRINCIPLES OF FOOD ENGINEERING TECHNOLOGY (4). LEC. 3. LAB. 3. Pr., MATH 1130, PHYS 1000. Engineering concepts and unit operations used in processing food products. Fall.

BSEN 6220 INTRODUCTION TO SPATIAL TECHNOLOGIES FOR BIOSYSTEMS (3). LEC. 2, LAB. 3. Pr., STAT 2510, STAT 2610, or STAT 3010, or AGRN 2040, or departmental approval. Spatial technologies including GPS, GIS and remote sensing systems applied to biosystems. Fall.

BSEN 6250 DETERMINISTIC MODELING FOR BIOSYSTEMS (3). LEC. 3. Pr., LAB. 2. Pr., MATH 2650. ELEC 3810, ENGR 2350, or MECH 2110 or departmental approval. Modeling of biosystems, methods to deal with complexity and validation tools. Spring.

BSEN 6650 PRINCIPLES OF FOOD ENGINEERING TECHNOLOGY (4). LEC. 3. LAB. 3. Pr., MATH 1130, PHYS 1000. Engineering concepts and unit operations used in processing food products. Fall.

BSEN 7050 SOIL DYNAMICS OF TILLAGE AND TRACTION (3). LEC. 3. Pr., CIVL 4300, AGRN 7590, and departmental approval. Analyses and measurements of soil reactions as affected by physical properties of soil when subjected to forces imposed by tillage implements and traction devices.

BSEN 7120 STOCHASTIC MODELING FOR BIOSYSTEMS (3). LEC. 3. Pr., CIVL 3020 or departmental approval. Solving problems in biosystems engineering and related fields by modeling data with probability distribu-
tions, spatial statistics, autoregressive models, Monte-Carlo simulation, and reliability methods.

**BSEN 7900 SPECIAL PROBLEMS IN BIOSYSTEMS ENGINEERING** (1-4). IND. Pr., departmental approval. Faculty supervision of individual student investigations of advanced specialized problems in biosystems engineering at the graduate level. Course may be repeated with change in topic.

**BSEN 7950 SEMINAR** (1). SEM., SU. Reviews and discussions of research techniques, current scientific literature and recent developments in biosystems engineering. Course may be repeated for a maximum of 12 credit hours.

**BSEN 7970 SPECIAL TOPICS IN BIOSYSTEMS ENGINEERING** (1-4). IND. Pr., departmental approval. Individual or small group study of an advanced specialized area in biosystems engineering at the graduate level. Course may be repeated with change in topic.

**BSEN 7990 RESEARCH AND THESIS** (1-10). RES., TD. Course may be repeated with change in topic.

**Business Administration (BUSI)**

**BUSI 1010 CONTEMPORARY ISSUES IN BUSINESS ADMINISTRATION I** (1). LEC. 1. SU. Exposure to various topics relative to business administration. For Business majors, should be taken during student’s first academic year.

**BUSI 2010 CONTEMPORARY ISSUES IN BUSINESS ADMINISTRATION II** (1). LEC. 1. SU., BUSI 1010. Orientation to business administration. Business majors should take during student’s second academic year.

**BUSI 3510 INTRODUCTION TO BUSINESS AND ENGINEERING** (3). LEC. 3. Pr., MATH 2630, junior standing, and admission to Business-Engineering-Technology Program, and 2.2 GPA. Principles of business and engineering management processes.

**BUSI 3520 INTEGRATING BUSINESS AND ENGINEERING THEORIES WITH PRACTICE** (3). LEC. 2, LAB. 3. Pr., 2.2 GPA. Coreq., BUSI 3530. Case study problems from business and engineering practice.

**BUSI 3550 CROSS-FUNCTIONAL TEAMWORK** (1). LEC. 1. Pr., Admission to the B-E-T program. Development of skills needed to perform well in cross-functional teams.

**BUSI 3560 LEADERSHIP** (1). LEC. 1. Pr., Admission of the B-E-T program. Overview of leadership concepts and skills.

**BUSI 4540 ENTREPRENEURSHIP AND STRATEGIC MANAGEMENT OF TECHNOLOGY AND INNOVATION** (4). LEC. 4. Pr., Admission to the B-E-T program, BUSI/ENGR 3510; BUSI/ENGR 3520, and 2.2 GPA. Develop student skills for starting a new business and making strategic decisions concerning technology.

**BUSI 4920 BUSINESS INTERNSHIP** (1-3). INT., SU., Pr., 2.2 GPA; approval of instructor prior to internship; and completion of, current Pr., enrollment in two or more of the following: ACCT 2110, ECON 2020/2030, FINC 2620, MNGT 3100, or MKTG 3310, and 2.2 GPA. Internship option for students to gain work experience who seek general or free elective credit.

**BUSI 4970 CAPSTONE PROJECT I: DESIGN PROPOSAL** (1). LEC., LAB. 3. Pr., 2.2 GPA. Coreq., BUSI 4540. Processes to develop and present design proposal for cooperating industry.

**BUSI 4980 CAPSTONE PROJECT II: DESIGN PROJECT** (3). LEC. 1, LAB. 6. Pr., BUSI 4970 or ENGR 4970, and 2.2 GPA. Cross-functional team design projects for sponsoring industry.

**BUSI 7110/7716 FINANCIAL ANALYSIS** (3). LEC. 3. Pr., departmental approval. Integrated course combining financial accounting and corporate finance for MBA students.

**BUSI 7120/7726 QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS** (3). LEC. 3. Pr., departmental approval. Integrated course in statistical methods and management science for MBA students.

**BUSI 7130/7736 STRATEGIC ANALYSIS AND THE COMPETITIVE ENVIRONMENT** (3). LEC. 3. Pr., departmental approval. Integrated course covering business strategy and the external environment in a global context.

**BUSI 7140/7746 ORGANIZATIONAL LEADERSHIP AND CHANGE** (3). LEC. 3. Pr., departmental approval. Integrated course covering aspects of individual and group behavior and assessment in organizations, effective team building, and leading organizations through change.

**BUSI 7210/7726 MARKETING AND CONSUMER THEORY** (3). LEC. 3. Pr., departmental approval. Combines elements of the economics of demand theory and marketing management. Includes advanced pricing topics and the competitive environment.

**BUSI 7220/7726 OPERATIONS AND INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE** (3). LEC. 3. Pr., departmental approval. The structure of business operations and the role that information technology plays in formulating and implementing strategies for competitive advantage.

**BUSI 7230/7726 COST ANALYSIS AND SYSTEMS** (3). LEC. 3. Pr., departmental approval. Integrates production and cost theory from economics with managerial and cost accounting theory and systems for MBA students.

**BUSI 7920/7926 MBA INTERNSHIP** (3-6). INT., SU., Pr., departmental approval. Internship for MBA students in business organizations. Course may be repeated for a maximum of 6 credit hours.

**BUSI 7970/7976 SPECIAL TOPICS IN BUSINESS ADMINISTRATION** (1-3). IND. Pr., departmental approval. Specialized topics in business administration not otherwise covered in existing courses. Course may be repeated for a maximum of 6 credit hours.

**BUSI 7980/7988 INTEGRATED BUSINESS PROJECT AND CASE ANALYSIS** (3). LEC. 3. Pr., departmental approval. Integrates knowledge gained from MBA classes and applies that knowledge to address actual business problems.

**Consumer Affairs (CAHS)**

**CAHS 1010 INTRODUCTION TO CONSUMER AFFAIRS** (3). LEC. 3. Pr., CAHS 1000, core fine arts. Historical, sociocultural, and economic aspects of consumer behavior. Spring.

**CAHS 1020 CONSUMER LAW** (3). LEC. 3. Pr., CAHS 1010, core fine arts. Legal aspects of consumer behavior. Spring.

**CAHS 1030 CONSUMER SERVICES** (4). LEC. 3, STU. 3. Introduction to the retail business environment. Fall.

**CAHS 2010 CONSUMER PROTECTION** (3). LEC. 3. Pr., CAHS 1020, core fine arts. Legal systems and consumer protection. Fall.


**CAHS 2030 CONSUMER BUDGETING** (3). LEC. 3. Pr., CAHS 1010, core fine arts. Planning and living within financial constraints. Fall.

**CAHS 2040 CONSUMER ECONOMICS** (3). LEC. 3. Pr., CAHS 1010, core fine arts. Consumer decision making. Fall.


**CAHS 2060 CONSUMER INFORMATION** (4). LEC. 3, STU. 3. Consumer investigations of advanced specialized problems in biosystems engineering at the graduate level. Course may be repeated with change in topic.


**CAHS 2300 HISTORY OF THE DECORATIVE ARTS** (3). LEC. 3. Pr., CAHS 1000, core fine arts. Historical survey of the interior design and decorative arts from antiquity through present. Fall.

**CAHS 2400 INTERIOR MATERIALS AND COMPONENTS** (3). LEC. 3. Pr., CAHS 1000. Survey of finishes, textiles, materials and components. Introduction to health, safety and environmental issues that impact consumers. Fall.


**CAHS 2740 AESTHETICS FOR APPAREL DESIGN** (4). LEC. 2, STU. 6. Pr., CAHS 1600, 2.2 ungraded cumulative gpa. Principles of aesthetics applied to apparel product development including computer-aided design and other presentation techniques.


**CAHS 2760 VISUAL MERCHANDISING** (4). LEC. 2, STU. 6. Pr., CAHS 1600 or departmental approval. 2.2 ungraded cumulative gpa. History, equipment, application and theory of display techniques in store and non-store settings. Fall.

**CAHS 2800 APPAREL PRODUCTION MANAGEMENT** (4). LEC. 3. LAB. 3. Pr., CAHS 1750, 2.2 ungraded cumulative gpa. Introduction to apparel...
industry terminology, technology, production methods, and engineering quality into apparel products.


**CAHS 3380 STUDY ABROAD OPPORTUNITY IN HUMAN SCIENCES** (1). LEC. 1. Exploration of study abroad opportunities for students interested in the International Minor in Human Sciences. Spring.


**CAHS 3600 TEXTILES** (4). LEC. 3. LAB. 3. Pr., CAHS 1600, CHEM 1020, CHEM 1021. 2.2 ungapped cumulative gpa. Organic compounds, polymers, fibers, yarns, fabrics and chemical finishes for apparel and household textiles with laboratory evaluation. Fall.

**CAHS 3750 PRODUCT DEVELOPMENT: APPAREL DESIGN** (4). LEC. 2. STU. 6. Pr., CAHS 2750, CAHS 2800, 2.2 ungapped cumulative gpa. Advanced design techniques, including couture production; portfolio and internship planning. Spring.

**CAHS 3850 MERCHANDISE PLANNING AND CONTROL** (3). LEC. 2. LAB. 2. Pr., CAHS 1600, ACCT 2910. Application of principles of merchandising and retail buying to the retailing of consumer goods and services. Spring.

**CAHS 3900 INDEPENDENT STUDY** (1-3). IND. Pr., departmental approval. Directed readings and/or individualized research project. Course may be repeated for a maximum of 6 credit hours.

**CAHS 3940 STUDY AND TRAVEL IN CONSUMER AFFAIRS** (1-3). FLD. Pr., departmental approval. Concentrated study in the U.S. or abroad. Course may be repeated for a maximum of 6 credit hours.


**CAHS 4300 STUDIO X: DIRECTED RESEARCH IN INTERIOR DESIGN** (2). LEC. 1. STU. 3. Pr., CAHS 3400, CAHS 3500, senior standing, departmental approval. Selection and development of design thesis project with faculty supervision. Fall.

**CAHS 4400 STUDIO XI: DESIGN THESIS PROJECT** (4). LEC. 2. STU. 6. Pr., CAHS 4300, senior standing, departmental approval. Design development, project management process, and construction drawing of design thesis project; Spring.

**CAHS 4763 FASHION ANALYSIS AND FORECASTING** (3). LEC. 3. Pr., CAHS 1600 or dept. approval. Theories explaining fashion dynamics and techniques for forecasting change, with case applications in textiles, apparel and retailing. Spring.

**CAHS 4800 APPAREL ENGINEERING** (4). LEC. 3. LAB. 3. Pr., CAHS 2800, 2.2 ungapped cumulative gpa. Planning and problem solving throughout the apparel production process, including methods engineering, time study, costing, CAD. Fall.

**CAHS 4920 INTERNSHIP IN INTERIOR DESIGN** (8). INT. Pr., senior standing and departmental approval. Supervised 10 week professional internship experience in the field of Interior Design. Summer.


**CAHS 4950 PORTFOLIO DEVELOPMENT FOR APPAREL DESIGNERS** (3). LEC. 2. LAB. 2. Pr., CAHS 3750, junior standing, departmental approval. Coreq., CAHS 3750. Survey of advanced techniques in design presentation including computer-aided design and graphics software. Portfolio development in print, computer slide show, and web formats. Spring.
CAHS 6760 FASHION ANALYSIS AND FORECASTING (3). LEC. 3. Pr., CAHS 1600 or department approval, graduate standing. Theories explaining fashion dynamics and techniques for forecasting change with case applications in textiles, apparel, and retailing. Credit will not be given for both CAHS 6760 and CAHS 5760.

CAHS 6766 DIST-ED FASHION ANALYSIS AND FORECASTING (3). LEC. 3. Pr., CAHS 1600 or dept. approval, graduate standing. Theories explaining fashion dynamics and techniques for forecasting change with case applications in textiles, apparel and retailing.

CAHS 6850 APPAREL MERCHANDISING AND RETAIL MANAGEMENT (4). LEC. 3. LAB. 2. Pr., CAHS 3850 or departmental approval. Problem-solving and decision making strategies for retailing apparel, textiles and other consumer products. Credit will not be given for both CAHS 6850 and CAHS 5850.


CAHS 7100 ENVIRONMENTAL DESIGN THEORIES AND APPLICATIONS (3). LEC. 3. Pr., CAHS 4400 or departmental approval. Theories, methodologies, and current issues relevant to interior design; sociological, psychological, ecological, and post-modern perspectives. Fall - odd numbered years. Fall.

CAHS 7530 ECONOMICS OF APPAREL AND TEXTILES (3). LEC. 3. Pr., departmental approval. Economic issues involving the manufacture, distribution and consumption of textiles and apparel. Fall - even numbered years. Fall.


CAHS 7670 CLOTHING AND BEHAVIOR (3). LEC. 3. Pr., departmental approval. Clothing as a factor in the physical, social, and psychological environment; response to and use of clothing in social behavior. Fall.

CAHS 7690 CONSUMER PREFERENCES FOR FASHION PRODUCTS (3). LEC. 3. Pr., departmental approval. Effects of consumer preference formation on the product development, marketing and merchandising of fashion products. Fall.

CAHS 7900 INDEPENDENT STUDY (1-3). IND., SU. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

CAHS 7910 SUPERVISED TEACHING IN CONSUMER AFFAIRS (1). IND., SU. Pr., departmental approval. Practical experience teaching in the classroom. Course may be repeated for a maximum of 3 credit hours.

CAHS 7920 GRADUATE INTERNSHIP (3). INT. Pr., departmental approval. Supervised professional experience in the United States or internationally.

CAHS 7930 ADVANCED DESIGN PROJECTS (1-6). IND., SU. Pr., departmental approval. Independent execution of advanced design work. (A) Apparel; (B) Interiors; (C) Visual Merchandising; (D) Textile Design. Course may be repeated for a maximum of 6 credit hours.

CAHS 7940 STUDY/TRAVEL IN CONSUMER AFFAIRS (1-3). FLD., SU. Pr., departmental approval. Concentrated study/travel in the U.S. or internationally. Course may be repeated for a maximum of 6 credit hours.

CAHS 7950 SEMINAR (1). SEM., SU. Pr., Departmental approval. Research presentations and discussion. Course may be repeated for a maximum of 3 credit hours.

CAHS 7960 DIRECTED READINGS (1-3). IND., SU. Pr., departmental approval. Directed readings in textiles, apparel, interiors and retailing. Course may be repeated for a maximum of 6 credit hours.

CAHS 7970 DIRECTED RESEARCH IN DESIGN (1-6). RES. Pr., departmental approval. (A) Apparel; (B) Interiors; (C) Visual Merchandising; (D) Textile Design. Independent execution of advanced design work. Course may be repeated for a maximum of 6 credit hours.

CAHS 7980 GRADUATE PROJECT (1-3). LEC. Pr., Departmental approval. In-depth, integrative research in a particular project related to apparel, textiles, interiors or consumer behavior. Course may be repeated for a maximum of 6 credit hours.

CAHS 7990 RESEARCH AND THESIS (1-10). MST., TD. Pr., departmental approval. Course may be repeated with change in topic.
Core. Laboratory experiments emphasizing course material in CHEM 1127. Credit will not be given for both CHEM 1128 and CHEM 1041 or CHEM 1121.

CHEM 2030 SURVEY OF ORGANIC CHEMISTRY (3). LEC. 3. Pr., CHEM 1040, CHEM 1120, or CHEM 1127. Structure, nomenclature and reactions of the functional group classes of organic compounds, polymers, and molecules of biological interest. Credit will not be given for both CHEM 2030 and CHEM 2070.

CHEM 2070 ORGANIC CHEMISTRY I (3). LEC. 3. Pr., CHEM 1040, CHEM 1120 or CHEM 1127. In-depth study of organic chemistry including structure, nomenclature, reactions, reaction mechanisms, stereochemistry, synthesis and spectroscopic structure determination organized by the functional group approach. Considers alkanes, alkenes, alkyanes, alky halides, alcohols, ethers, and aromatic compounds. Credit will not be given for both CHEM 2070 and CHEM 2030.

CHEM 2071 ORGANIC CHEMISTRY I LABORATORY (1). LAB. 3. Pr., or corequisite CHEM 2070. Laboratory for CHEM 2070.


CHEM 2200 CHEMICAL APPLICATIONS OF COMPUTERS II (1). LEC. 1. Pr., CHEM 1200. Coreq., CHEM 2080. Utilization of chemically-oriented programs to include chemical drawing, graphic analysis and spreadsheet chemistry. Introduction to generating technical documents.

CHEM 3000 CHEMICAL LITERATURE (1). LEC. 1. Pr., CHEM 2080. Chemical literature with emphasis on primary and secondary sources and the various computer data bases available.

CHEM 3050 ANALYTICAL CHEMISTRY (3). LEC. 3. Pr., CHEM 1040, CHEM 1120, or CHEM 1127. Theory and application of volumetric, potentiometric and photometric chemical analysis.

CHEM 3051 ANALYTICAL CHEMISTRY LABORATORY (1). LAB. 3. Pr., or corequisite CHEM 3050. Analytical techniques applied to chemical analysis.

CHEM 3160 SURVEY OF PHYSICAL CHEMISTRY (3). LEC. 3. Pr., CHEM 1040, CHEM 1120, or CHEM 1127. The principles of physical chemistry.

CHEM 4070 PHYSICAL CHEMISTRY I (3). LEC. 3. Pr., CHEM 1040, CHEM 1120, or CHEM 1127; MATH 2630; PHYS 1610. The connection between molecular structure and the physical properties of matter using thermodynamics, quantum mechanics and statistical mechanics.

CHEM 4071 PHYSICAL CHEMISTRY I LABORATORY (1). LAB. 3. Pr., or corequisite CHEM 4070.

CHEM 4080 PHYSICAL CHEMISTRY II (3). LEC. 3. Pr., CHEM 4070. Continuation of CHEM 4070 with emphasis on kinetics and spectroscopy.

CHEM 4081 PHYSICAL CHEMISTRY II LABORATORY (1). LAB. 3. Pr., CHEM 4070 or corequisite CHEM 4080. Laboratory for CHEM 4080.

CHEM 4100 INORGANIC CHEMISTRY (3). LEC. 3. Pr., CHEM 4080 or equivalent. Principles of inorganic chemistry emphasizing periodic properties, bonding, structure and symmetry, the solid state, acid-base theory and coordination chemistry.

CHEM 4101 INORGANIC CHEMISTRY LABORATORY (1). LAB. 3. Pr., or corequisite CHEM 4100. Synthesis and characterization of a variety of inorganic compounds.

CHEM 4110 INORGANIC CHEMISTRY II (3). LEC. 3. Pr., CHEM 4100 or departmental approval. Survey of main group, transition metal and organometallic chemistry.

CHEM 4111 INORGANIC CHEMISTRY LABORATORY II (1). LAB. 3. Pr., CHEM 4101 or departmental approval. Coreq., CHEM 4110. Laboratory for CHEM 4110.

CHEM 4130 INSTRUMENTAL ANALYSIS (3). LEC. 3. Pr., CHEM 4080. Fundamental concepts used in instrumental analytical chemistry emphasizing spectrophotometric, electroanalytical and chromatographic analysis.

CHEM 4131 INSTRUMENTAL ANALYSIS LAB (1). LAB. 3. Coreq., CHEM 4130. Laboratory for CHEM 4130.

CHEM 4901 SPECIAL PROBLEMS IN CHEMISTRY (3). LAB. 9. Pr., junior standing and departmental approval. This is an individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest. Course may be repeated for a maximum of 9 credit hours.

CHEM 4950 UNDERGRADUATE SEMINAR (1). LEC. 1. SU. Pr., junior standing. Oral presentation and discussion of research in the area of specialization.

CHEM 4997 HONORS THESIS (1-3). LEC. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 6 credit hours.

CHEM 5180 BIOCHEMISTRY I (3). LEC. 3. Pr., CHEM 2080. Molecular Structure: classification, structure and reactions of the major constituents of living matter. Also includes binding phenomena and bioenergetics. Credit will not be given for both CHEM 5180 and BCHE 5180.

CHEM 5181 BIOCHEMISTRY I LABORATORY (1). LEC. 3. Pr., or corequisites CHEM 5180. Identification and quantification of compounds from the important biochemical classes. Examples include amino acid chromatography, dipeptide sequencing, glucose concentration, etc. Credit will not be given for both CHEM 5181 and BCHE 5181.

CHEM 5190 BIOCHEMISTRY II (3). LEC. 3. Pr., CHEM 5180. Metabolism: survey of design and regulation of the major catabolic and biosynthetic (including photosynthesis) metabolic pathways. An overview of the flow of genetic information. Credit will not be given for both CHEM 5190 and BCHE 5190.

CHEM 5191 BIOCHEMISTRY II LABORATORY (1). LEC. 3. Pr., or corequisite CHEM 5190. Partial purification, Kinetic studies and characterization of enzymes and nucleotides from various plants, animals and bacteria. Credit will not be given for both CHEM 5191 and BCHE 5191.

CHEM 5280 COMPUTATIONAL CHEMISTRY (4). LEC. 3. LAB. 3. Pr., CHEM 2080 and CHEM 4080 or equivalent. Modern computational chemistry including molecular mechanics and quantum mechanical calculations.

CHEM 6180 BIOCHEMISTRY I (3). LEC. 3. Pr., CHEM 2080. Molecular Structure: classification, structure and reactions of the major constituents of living matter. Also includes binding phenomena and bioenergetics. Credit will not be given for both CHEM 6180 and BCHE 6180.

CHEM 6190 BIOCHEMISTRY II (3). LEC. 3. Pr., CHEM 6180. Metabolism: survey of design and regulation of the major catabolic and biosynthetic (including photosynthesis) metabolic pathways. An overview of the flow of genetic information. Credit will not be given for both CHEM 6190 and BCHE 6190.

CHEM 6280 COMPUTATIONAL CHEMISTRY (4). LEC. 3. LAB. 3. Pr., CHEM 2080 and CHEM 6080 or equivalent. Modern computational chemistry including molecular mechanics and quantum mechanical calculations.

CHEM 7100 ADVANCED INORGANIC CHEMISTRY (3). LEC. 3. Pr., CHEM 6100 or departmental approval. Current concepts of inorganic chemistry with an emphasis on theory, structure, bonding and reactivity.

CHEM 7110 PHYSICAL METHODS IN INORGANIC CHEMISTRY (3). LEC. 3. Pr., CHEM 7100 or equivalent. Theory and application of techniques for obtaining information on inorganic compounds including magnetism, multinuclear nmr, mass spectrometry, x-ray diffraction, vibrational and electronic spectroscopies.

CHEM 7120 ORGANOMETALLIC CHEMISTRY (3). LEC. 3. Pr., CHEM 7100 or departmental approval. Main group and transition metal organometallic chemistry.

CHEM 7160 ADVANCED TOPICS IN INORGANIC CHEMISTRY (3). LEC. 3. Pr., CHEM 7100 or departmental approval. Currently active research areas in inorganic chemistry. Course may be repeated for a maximum of 12 credit hours.

CHEM 7200 ADVANCED ORGANIC CHEMISTRY I (3). LEC. 3. Pr., CHEM 2080 or departmental approval. Structure and mechanism in organic chemistry.

CHEM 7210 ADVANCED ORGANIC CHEMISTRY II (3). LEC. 3. Pr., CHEM 7200. Physical organic chemistry including spectroscopic methods.


CHEM 7260 SPECIAL TOPICS IN ORGANIC CHEMISTRY (1-3). LEC. Pr., CHEM 7200. Advanced course in a research area in organic chemistry which is of mutual interest to graduate students and the instructor. Course may be repeated for a maximum of 6 credit hours.

CHEM 7280 THEORY AND PRACTICE OF COMPUTATIONAL CHEMISTRY (3). LEC. 3. Pr., departmental approval. The use of modern computational chemistry in solving chemical problems.

CHEM 7300 ADVANCED PHYSICAL CHEMISTRY (3). LEC. 3. Pr., CHEM 6080. Topics of general and current interest; may vary from year to year.


CHEM 7370 SPECIAL TOPICS IN PHYSICAL CHEMISTRY (1-3). LEC. 3. Pr., CHEM 7300. Modern topics in advanced physical chemistry. Course may be repeated for a maximum of 3 credit hours.


CHEM 7520 SURFACE CHEMISTRY (3). LEC. 3. Pr., CHEM 7500. Basic concepts in surface chemistry and surface analytical methods.


CHEM 7750 FORMAL PRESENTATIONS IN MODERN CHEMISTRY (1). LEC. 1. Pr., graduate student standing. Oral presentations skills will be developed with a focus on the dissemination of new discoveries in the field of Chemistry. Course may be repeated for a maximum of 6 credit hours.

CHEM 7930 DIRECTED INDIVIDUAL STUDY IN CONTEMPORARY CHEMISTRY (1-15). IND. credit to be arranged. Course may be repeated for a maximum of 15 credit hours.

CHEM 7950 SEMINAR (1). SEM. 1. SU. Course may be repeated for a maximum of 6 credit hours.

CHEM 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.

CHEM 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

LABORATORY TECHNOLOGY (LABT)

LABT 1010 ORIENTATION (1). LEC. 1. Aims, objectives and requirements for careers in medical and laboratory technology.


LABT 4050 CLINICAL IMMUNOHematology/Parasitology (5). LEC. 3. LAB. 6. Pr., CHEM 2070 or departmental approval. Immunogenetics, clinical significance of blood group antigens and antibodies, theory and techniques of serological study of human blood group.

LABT 4250 CLINICAL BIOCHEMISTRY/INSTRUMENTATION (4). LEC. 3. LAB. 3. Pr., CHEM 6180 and junior standing or departmental approval. Theoretical and practical application of continuous flow analysis, atomic absorption, spectrophotometry, radioimmunoassay and chromatographic techniques used in the analysis of body fluids.

LABT 4910 CLINICAL PRACTICUM (0). PRA.

LABT 4920 CLINICAL INTERNSHIP (0). PRA. Pr., LABT 4910 Final term of clinical internship.

Chemical Engineering (CHEN)

Dr. Christopher Roberts - 844-2036

CHEM 2 @@@ CHEMICAL ENGINEERING PROGRESS ASSESSMENT I (0). LAB., SU. Progress assessment examination in basic science, general chemistry, physics, basic math principles (geometry, algebra), multivariable calculus, chemical engineering process principles (mass and energy balances).

CHEM 2100 PRINCIPLES OF CHEMICAL ENGINEERING (4). LEC. 3. LAB. 3. Pr., CHEM 1110, CHEM 1030, MATH 1610 or MATH 1710. Coreq., CHEM 1120 or CHEM 1040, MATH 1620 or MATH 1720, PHYS 1600. Application of multicomponent material and energy balances to chemical processes involving phase changes and chemical reactions.

CHEM 2610 TRANSPORT I (3). LEC. 3. Pr., PHYS 1600. Completion of CHEN 2100 with a grade of C or higher. Coreq., ENGR 2010, MATH 2630.

Introduction to fluid statics and dynamics; dimensional analysis; compressible and incompressible flows; design of flow systems, introduction to fluid solids transport including fluidization, flow through process media and multiphase flows.

CHEM 3 @@@ CHEMICAL ENGINEERING PROGRESS ASSESSMENT II (0). LAB., SU. Pr., CHEM 2 @@@. Progress assessment examination in thermodynamics, linear differential equations, organic chemistry, transport phenomena (fluid mechanics, heat, mass transfer), phase and reaction equilibria, reaction engineering, design and conduction of experiments, analysis and interpretation of data, professional, ethical, societal and contemporary issues.

CHEM 3090 PULP AND PAPER TECHNOLOGY (3). LEC. 3. Pr., CHEM 1030 or CHEM 1110, ENGR 2010 and junior standing or departmental approval. An introductory course on the technology of pulp and paper manufacture with emphasis on raw materials, pulping, bleaching, paper making, coating and environmental control. For students with no formal pulp and paper background.

CHEM 3370 PHASE AND REACTION EQUILIBRIA (3). LEC. 3. Pr., Completion of ENGR 2010 and CHEM 2100 with grades of C or better. Molecular thermodynamics of phase and chemical reaction equilibria including non-ideal thermodynamics and multiphase components.


CHEM 3600 COMPUTER-AIDED CHEMICAL ENGINEERING (3). LEC. 2. LAB. 3. Pr., COMP 1200, MATH 2650. Completion of CHEM 2610 with a grade of C or higher. Coreq., CHEM 3620. General and structured programing concepts, numerical methods and introductory probability and statistics concepts. Application to chemical engineering problems involving material and energy balances and transport processes, data validation and analysis.

CHEM 3620 TRANSPORT II (3). LEC. 3. Pr., MATH 2630. Completion of CHEN 2610 with a grade of C or higher. Fundamentals and applications of heat and mass transfer in chemical processes including conduction, convection, and radiation, heat exchange, evaporation, chemical reaction gas absorption, drying and humidification.

CHEM 3650 CHEMICAL ENGINEERING ANALYSIS (3). LEC. 2. LAB. 3. Pr., Completion of CHEM 3600 and CHEM 3620 with grades of C or higher. Mathematical modeling, analytical, numerical and statistical analysis of chemical processes.

CHEM 3660 CHEMICAL ENGINEERING SEPARATIONS (3). LEC. 3. Pr., Completion of CHEM 3370 and CHEM 3620 with grades of C or higher. Separations processes including distillation, extraction, membrane separation, and other separation operations.

CHEM 3700 CHEMICAL REACTION ENGINEERING (3). LEC. 3. Pr., MATH 2650. Completion of CHEM 2610 and ENGR 2010 with grades of C or higher. Design of chemical reactors with homogeneous reaction systems.

CHEM 3820 CHEMICAL ENGINEERING LABORATORY I (2). LEC. 1. LAB. 3. Pr., Completion of CHEM 3600 and CHEM 3620. Experimental study of chemical thermodynamics, heat and momentum transfer with analytical, numerical, and statistical analysis.

CHEM 4100 PULP AND PAPER PROCESSING LABORATORY (2). LAB. 6. Pr., CHEM 2610, CHEM 3090, CHEM 3820 or departmental approval. Experimental study of pulping and papermaking operations.

CHEM 4160 PROCESS DYNAMICS AND CONTROL (3). LEC. 2. LAB. 3. Pr., Completion of CHEM 3600 and CHEM 3620 with grades of C or higher. Dynamic modeling of chemical processes, feedback systems and analog controller tuning and design, sequential control systems.

CHEM 4170 DIGITAL PROCESS CONTROL (3). LEC. 2. LAB. 3. Pr., Completion of CHEM 3650 with a grade of C or higher. Analysis of open loop and closed loop process control systems. Introduction to digital control systems including operator/machine interface design and operation. Application of process dynamics and digital control systems in experimental control laboratory.

CHEM 4180 ADVANCED DIGITAL PROCESS CONTROL (3). LEC. 2. LAB. 3. Pr., Completion of CHEM 4170 with a grade of C or higher. Application of sequential, closed loop and open loop process control principles to actual industrial and experimental control laboratory process.
Introduction to molecular structure and long range microstructure, with an emphasis on the role of molecular science in the design of chemical engineering products for specific applications.

**Chemical Engineering (CHEN)**

**CHEN 4450 PROCESS ECONOMICS AND SAFETY** (3). LEC. 2, LAB. 3. Pr., CHEM 2080. Completion of CHEN 3370, CHEN 3650, CHEN 3660, and CHEN 3700 with grades of C or higher. Fundamentals of applications of process economics and design, computer-aided cost estimation, profitability analysis and process improvement. Application of chemical process safety, risk assessment and management, chemical engineering principles for risk reduction.

**CHEN 4460 PROCESS SIMULATION SYNTHESIS AND OPTIMIZATION** (2). LEC. 1, LAB. 3. Pr., CHEM 2080. Completion of CHEN 3370, CHEN 3650, CHEN 3660, and CHEN 3700 with grades of C or higher. Coreq., CHEN 4450. Fundamentals of computer-aided simulation and synthesis. Process integration and optimization principles including their applications in design, retrofitting and operation of chemical processes.

**CHEN 4470 PROCESS DESIGN PRACTICE** (3). LEC. 2, LAB. 3. Pr., CHEM 4070. Completion of CHEN 4450 and CHEN 4460 with grades of C or higher. Flow sheet simulation and techno-economic analysis applied to complex, open-ended chemical processes. Screening of alternatives and economic optimizations. Capstone design course.

**CHEN 4560 PULP AND PAPER PROCESS SIMULATION** (2). LEC. 1, LAB. 3. Pr., CHEM 2080. Completion of CHEN 3090, CHEN 3370, CHEN 3650, CHEN 3660, and CHEN 3700 with grades of C or higher. Coreq., CHEN 4100, CHEN 4450 and CHEN 5110. Fundamentals of microcomputer process simulation with applications to the pulp and paper industry. Design of pulp and paper plant operations and scale-up processes using commercial simulation software.

**CHEN 4570 PULP AND PAPER PROCESS DESIGN** (2). LEC. 2. Pr., CHEM 4560. Application of process simulation and process economics to complex, open-ended design, retrofitting and operation problems in pulp and paper. Design of pulp and paper plant operations and processes. Screening of alternatives and economic optimization.

**CHEN 4630 INTRODUCTORY TO TRANSPORT PHENOMENA** (3). LEC. 3. Pr., Completion of CHEN 3620 and CHEN 3650 with grades of C or higher. Application of chemical engineering analysis to momentum, heat and mass transport problems for advanced undergraduate students preparing for graduate school.

**CHEN 4860 CHEMICAL ENGINEERING LABORATORY II** (2). LEC. 1, LAB. 3. Pr., CHEN 3660 and CHEN 3820. Coreq., CHEN 3700. Experimental study of mass transfer, separations and reaction engineering. Emphasis is on open-ended laboratory projects with electronic instrumentation; experimental design with numerical and statistical analysis of data.

**CHEN 4880 PULP AND PAPER ENGINEERING LABORATORY** (3). LAB. 9. Pr., Completion of CHEN 4100 and CHEN 5110 with grades of C or higher. Comprehensive open-ended projects on pulp and paper topics.

**CHEN 4900 INDEPENDENT STUDY** (1-6). IND. Pr., Junior standing and departmental approval. Supervised study in specialized areas of chemical engineering. Topic must be arranged with instructor during preregistration. Project report.

**CHEN 4970 SPECIAL TOPICS IN CHEMICAL ENGINEERING** (1-10). LEC. Pr., departmental approval. Topical courses in special areas. Topic must be arranged with instructor during pre-registration. Course may be repeated for a maximum of 10 credit hours.

**CHEN 4980 UNDERGRADUATE RESEARCH** (1-3). IND. Pr., junior standing and departmental approval, GPA above 3.0. Individual and small group projects. Topic must be arranged with instructor during preregistration. Research Report. Course may be repeated for a maximum of 3 credit hours.

**CHEN 4997 HONORS THESIS** (1-6). IND. Pr., Membership in the Honors College, junior standing, departmental approval. Course may be repeated for a maximum of 6 credit hours.


**CHEN 5120 SURFACE AND COLLOID SCIENCE** (3). LEC. 3. Pr., CHEM 4070. Fundamentals of surface and colloid science with applications in pulping and papermaking, including sizing, retention and drainage, charge measurements, dry/wet strength additives, fillers, colorants, foams, pitch and deposits.

**CHEN 5400 MOLECULAR ENGINEERING** (3). LEC. 3. Pr., CHEM 2080, CHEM 4070, CHEN 3370 with a grade of C or higher. Coreq., CHEN 3700. Introduction to how molecular structure and long range microstructure affect the properties of chemical engineering products and how this knowledge can be used to design chemical engineering products for specific applications.

**CHEN 5410 MACROMOLECULAR SCIENCE AND ENGINEERING** (3). LEC. 3. Pr., CHEM 2080, CHEM 4070, completion of CHEN 3370 with a grade of C or higher. Statistical mechanics of chain molecules; thermodynamics of polymer solutions; dilute, semi-dilute, and concentrated solutions and gels; polymer physics; scaling concepts in polymer physics; reptation theory (deGennes, Doi, Edwards) and molecular dynamics; phase separations; crystallization of polymers; rubber elasticity theory; mechanical analysis; viscoelasticity; diffusion theory of polymers; surface properties of polymers.

**CHEN 5420 POLYMER CHEMICAL ENGINEERING** (3). LEC. 3. Pr., CHEM 2070. Completion of CHEN 3620 and CHEN 5410 with grades of C or higher. Polymer rheology, transport phenomena, thermodynamics, membranes, coating polymers, surfaces, interfaces and processing.

**CHEN 5430 BUSINESS ASPECTS OF CHEMICAL ENGINEERING** (3). LEC. 3. Pr., senior standing in Chemical Engineering or departmental approval. The procession of activities required to successfully commercialize and market new chemical-engineering-based technologies to the consumer and process industries.

**CHEN 5440 ELECTROCHEMICAL ENGINEERING** (3). LEC. 3. Pr., Completion of CHEN 3370, CHEN 3620, and CHEN 3700 with a grade of C or higher. Thermodynamics, electrode kinetics and transport phenomena of electrochemical systems, current and potential distributions, double layer theory, electrochemical processes, power sources, synthesis, corrosion.

**CHEN 5650 HAZARDOUS MATERIALS MANAGEMENT AND ENGINEERING** (3). LEC. 3. Pr., CHEM 2030 or CHEM 2080, CHEN 3620 or CIVL 5210, or departmental approval. Fundamental principles and regulatory information related to hazardous material and process safety management and engineering, dispersion of chemicals, hazard and operability analysis, chemical engineering principles for risk education.

**CHEN 5670 POLLUTION PREVENTION ENGINEERING** (3). LEC. 3. Pr., CHEM 2080, Completion of CHEN 3370, CHEN 3620, CHEN 3660, CHEN 3700 with a grade of C or higher. Chemical and engineering principles applied to pollution prevention. Theory and practice of basic separation methods, reaction engineering, process controls, and other fundamental principles of chemical engineering disciplines as well regulatory requirements to prevent unnecessary waste generation. Case studies.

**CHEN 5700 ADVANCED SEPARATION PROCESSES** (3). LEC. 3. Pr., Completion of CHEN 3370 and CHEN 3660 with a grade of C or higher. Advanced treatment of modern chemical engineering separation processes. Theory and practice of staged multi-component mass transfer operations, non-ideal multi-phase separations and continuous rate processes.

**CHEN 5800 BIOCHEMICAL ENGINEERING** (3). LEC. 3. Pr., Completion of CHEN 3700 with a grade of C or higher. Bioreactor design. Analysis of enzyme and microbial processes.

**CHEN 5810 BIOMEDICAL ENGINEERING** (3). LEC. 3. Pr., CHEM 2080, CHEM 4070. Completion of CHEN 3620, and CHEN 3700 with a grade of C or higher. Application of chemical engineering principles to the study of medical physiology. Human biochemistry, analytics and physiology, rheological properties of blood and synovial fluid, rheology of cell membranes. Biomedical fluid mechanics and heat and mass transfer.

**CHEN 5820 ADVANCED TOPICS IN ENVIRONMENTAL BIOTECHNOLOGY** (3). LEC. 3. Pr., departmental approval. Application of biotechnology to environmental process treatment, bioremediation and bioreactor development.

**CHEN 5970 ADVANCED SPECIAL TOPICS IN CHEMICAL ENGINEERING** (1-6). LEC. SU. Pr., departmental approval. Topical courses in areas for advanced undergraduate and graduate students. Topics must be arranged with instructor during preregistration. Course may be repeated for a maximum of 24 credit hours.


**CHEN 6120/6126 SURFACE AND COLLOID SCIENCE** (3). LEC. 3. Pr., Departmental approval. Fundamentals of surface and colloid science with applications in pulping and papermaking, including sizing, retention and drainage, charge measurements, dry/wet strength additives, fillers, colorants, foams, pitch and deposits.

**CHEN 6400/6406 MOLECULAR ENGINEERING** (3). LEC. 3. Pr., CHEM 2080, CHEM 4070, CHEN 3370 with a grade of C or higher. Coreq., CHEN 3700. Introduction to how molecular structure and long range microstructure affect the properties of chemical engineering products and how this knowledge can be used to design chemical engineering products for specific applications.
ture affect the properties of chemical engineering products and how this knowledge can be used to design chemical engineering products for specific applications.

CHEN 6410/6416 MACROMOLECULAR SCIENCE AND ENGINEERING (3). LEC. 3. Pr., CHEM 2080, CHEM 4070. Completion of CHEN 3370 with a grade of C or higher. Coreq., CHEN 3700. Statistical mechanics of chain molecules; thermodynamics of polymer solutions; dilute, semi-dilute, and concentrated solutions and gels; polymer physics; scaling concepts in polymer physics; reptation theory (deGennes, Doi and Edwards) and molecular dynamics; phase separations; crystallization of polymers; rubber elasticity theory; mechanical analysis; viscoelasticity; diffusion theory of polymers; surface properties of polymers.

CHEN 6420/6426 POLYMER CHEMICAL ENGINEERING (3). LEC. 3. Pr., CHEM 2070. Completion of CHEN 3620 and CHEN 6410 with grades of C or higher. Polymer rheology, transport phenomena, thermodynamics, membranes, conducting polymers, surfaces, interfaces and processing.

CHEN 6430/6436 BUSINESS ASPECTS OF CHEMICAL ENGINEERING (3). LEC. 3. Pr., senior standing in Chemical Engineering or departmental approval. The procession of activities required to successfully commercialize and market new chemical-engineering-based technologies to the consumer and process industries.

CHEN 6440/6446 ELECTROCHEMICAL ENGINEERING (3). LEC. 3. Pr., Completion of CHEN 3370, CHEN 3620, and CHEN 3700 with a grade of C or higher. Thermodynamics, electrode kinetics and transport phenomena of electrochemical systems, current and potential distributions, double layer theory, electrochemical processes, power sources, synthesis, corrosion.

CHEN 6650/6656 HAZARDOUS MATERIALS MANAGEMENT AND ENGINEERING (3). LEC. 3. Pr., CHEM 2030 or CHEM 2080, CHEM 3820 or CIVIL 5210. Fundamental principles and regulatory information related to hazardous material and process safety management and engineering, dispersion of chemicals, hazard and operability analysis, chemical engineering principles for risk education.


CHEN 6680/6686 ENERGY CONVERSION AND CONSERVATION IN CHEMICAL PROCESSES (2). LEC. 2. Pr., CHEN 6460. Sources of energy. Energy Utilization. Integration of fuel, electric power and heating/cooling in chemical processes, integration.


CHEN 6800/6806 BIOCHEMICAL ENGINEERING (3). LEC. 3. Pr., CHEN 3700 with a grade of C or higher. Bioreactor design. Analysis of enzyme and microbial processes.

CHEN 6810/6816 BIOMEDICAL ENGINEERING (3). LEC. 3. Pr., CHEM 2080, CHEM 4070. Completion of CHEN 3620 and CHEN 3700 with a grade of C or higher. Application of chemical engineering principles to the study of medical physiology. Human biochemistry, anatomy, and physiology, rheological properties of blood and synovial fluid, rheology of cell membranes. Biomedical fluid mechanics and heat and mass transfer.

CHEN 6820/6826 ADVANCED TOPICS IN ENVIRONMENTAL BIOTECHNOLOGY (3). LEC. 3. Pr., departmental approval. Application of biotechnology to environmental process treatment, bioremediation and bioreactor development.

CHEN 6970/6976 ADVANCED SPECIAL TOPICS IN CHEMICAL ENGINEERING (1-6). LEC. SU. Pr., Departmental approval. Topics may be arranged with instructor during preregistration. Course may be repeated for a maximum of 24 credit hours.


CHEN 7130/7136 ADVANCED PULP AND PAPER ENGINEERING (3). LEC. 3. Topics in pulping, chemical recovery and papermaking.


CHEN 7710 INTRODUCTION TO RESEARCH SEMINAR (1). LEC. 1. SU. Coreq., CHEN 7100. Introductory graduate research seminars for entering graduate students.


CHEN 7790/7906 INDEPENDENT STUDY (1-10). IND. Pr., departmental approval. Supervised study in specialized areas of chemical engineering. Topic must be arranged with instructor during pre-registration. Course may be repeated for a maximum of 20 credit hours.

CHEN 7950 GRADUATE SEMINAR (1). SEM. 1. SU. Seminar Course may be repeated for a maximum of 12 credit hours.

CHEN 7970/7976 ADVANCED SPECIAL TOPICS IN CHEMICAL ENGINEERING (1-6). IND. Pr., departmental approval. Topical courses for graduate students. Topics must be arranged with instructor during preregistration. Course may be repeated for a maximum of 12 credit hours.

CHEN 7990 RESEARCH AND THESIS (1-20). MST., TD. Credit hours to be arranged.

CHEN 8000/8006 GRADUATE CHEMICAL ENGINEERING ANALYSIS (2). LEC. 2. Pr., CHEN 7100. Applications of advanced numerical methods to the analysis of complex chemical engineering problems.


CHEN 8100 ADVANCED TOPICS IN CHEMICAL ENGINEERING PROCESSES (3). LEC. 3. Pr., CHEN 7110. Advanced concepts in fluid dynamics with special emphasis on applications to chemical engineering, creeping flow, multiphase instabilities, computational fluid mechanics and turbulence.


CIVL 3510 TRANSPORTATION ENGINEERING (4). LEC. 4. Pr., CIVL 2010, CIVL 3010, junior standing. Introduction to transportation engineering practice with emphasis on highway facility design, traffic operations, and life-cycle costing.


CIVL 4120 HYDROLOGY (3). LEC. 3. Pr., STAT 3010, CIVL 3110. Hydrologic cycle, probability concepts and frequency analysis, precipitation, infiltration, runoff, hydrographs, flood routing, evaporation, subsurface hydrology.

CIVL 4180 HYDROLOGIC DESIGN (3). LEC. 3. Pr., STAT 3010, CIVL 3110. Stormwater hydrology, hydraulic and hydrologic analysis and design of stormwater drainage systems, inlets, storm sewers, open channels, culverts and detention basins.

CIVL 4210 ENVIRONMENTAL ENGINEERING II (4). LEC. 3. LAB. 3. Pr., CIVL 3210 or departmental approval. The fundamentals and applications of wastewater collection and treatment systems. Wastewater characteristics, sanitary and storm sewer design, and the theory and operation of wastewater treatment processes are emphasized.

CIVL 4220 ENVIRONMENTAL ENGINEERING DESIGN (3). LEC. 3. Pr., CIVL 3210 or CIVL 4210. Process design of environmental engineering systems.

CIVL 4310 GEOTECHNICAL ENGINEERING II (3). LEC. 3. Pr., CIVL 3810. Analysis and design in geotechnical engineering based on principles of soil mechanics and soil behavior. Problems of slope stability, earth pressure and design of earth retaining structures, foundation bearing capacity and settlement.

CIVL 4500 TRAFFIC ENGINEERING FUNDAMENTALS (3). LEC. 3. Pr., CIVL 3510. The fundamental elements of traffic engineering including traffic operations and traffic control devices.

CIVL 4520 AIRPORT DESIGN (3). LEC. 3. Pr., CIVL 3510 or departmental approval. An analysis of the elements affecting the design of airports including forecasting, runway configuration, capacity analyses, geometric design of runways and taxiways, pavement design and airfield drainage.

CIVL 4590 TRANSPORTATION DESIGN PROJECT (3). LEC. 3. Pr., ENGR 1110, CIVL 3510, CIVL 3810. Individual senior design project requiring the development of plans for a roadway over a large land segment; horizontal and vertical alignment and design; topographic terrain features; historical preservation area; minimum elevation; intersection design; earthwork balance.

CIVL 4600 REINFORCED CONCRETE DESIGN (2). LEC. 2. Pr., CIVL 3610. Concrete and reinforcing steel properties, analysis and design of reinforced concrete beams, slabs and columns; torsion, bond and development length, reinforcement details.


CIVL 4690 CONCRETE DESIGN PROJECT (3). LEC. 3. Pr., CIVL 4600. Execution of a major comprehensive design experience in designing a reinforced concrete facility. Emphasis on the design process, creative thinking, analysis, synthesis, teamwork and communications.
CIVL 6420/6426 CONSTRUCTION MANAGEMENT (3). LEC. 3. Pr., CIVL 3410. Planning and management of construction/engineering projects and organizations, project management techniques, skills, and applications.

CIVL 6440/6446 CONSTRUCTION EQUIPMENT AND METHODS (3). LEC. 3. Pr., CIVL 3410, CIVL 3510, CIVL 3510. Selection of equipment for heavy construction operations, production rates, owning and operating costs, fleet management.

CIVL 6460 PROJECT ESTIMATING (3). LEC. 3. Pr., CIVL 3410. Conceptual and definitive estimates, overhead and profit determination; claim change order pricing.


CIVL 6510/6516 TRAFFIC CONTROL SYSTEMS DESIGN (3). LEC. 3. Pr., CIVL 3510, STAT 3010. Fundamental design concepts for highway traffic control systems. Control requirements and warrants: hardware operation and equipment selection; development and implementation of timing plans for isolated intersections and intersection networks.

CIVL 6530/6536 GEOMETRIC DESIGN (3). LEC. 3. Pr., CIVL 3510. An analysis of the elements affecting the location and design of rural highways, urban highways and arterial streets including design controls and criteria, cross-section elements, intersection design, interchange design and social and environmental considerations.

CIVL 6560/6566 TRANSPORTATION PLANNING (3). LEC. 3. Pr., CIVL 3510 and STAT 3010, or departmental approval. The planning process for urban and regional transportation development. Topics include planning objectives and data requirements; planning inventories; modeling of trip-making behavior, development and evaluation of alternate plans; multimodal applications, including railway operations.

CIVL 6600/6606 ADVANCED REINFORCED CONCRETE DESIGN (3). LEC. 3. Pr., CIVL 4600. Analysis and design of continuous beams and one-way slabs, bond and development length, torsion, slenderness effects in columns, two-way slabs, footings, and retaining walls.

CIVL 6620/6626 PRE-STRESSED CONCRETE DESIGN (3). LEC. 3. Pr., CIVL 4600. Properties and behavior of pre-stressed concrete, pre-stressing systems and end anchorors, analysis and design of beams for flexure and shear, camber and deflection, cable layout, pre-stressed concrete slabs.

CIVL 6650/6656 ADVANCED STEEL DESIGN (3). LEC. 3. Pr., CIVL 4650. Composite construction, open web joists, torsion, plate girders, plastic analysis and design, highway bridges, computer applications.


CIVL 6690/6696 TIMBER DESIGN (3). LEC. 3. Pr., CIVL 3610. Properties and behavior of timber and plywood; design of timber beams, columns, floor and wall assemblies and wood formwork; timber trusses and laminated arches.

CIVL 6700/6706 DESIGN FOR LATERAL LOADS (3). LEC. 3. Pr., CIVL 3610, CIVL 4600 or CIVL 4650. Wind meteorology and loadings, effects of wind loadings, building code wind pressures and load provisions, fundamentals of structural vibrations, earthquake characteristics and loadings, building code earthquake provisions, building lateral load resisting systems.

CIVL 6810/6816 PAVEMENT DESIGN AND CONSTRUCTION (3). LEC. 3. Pr., CIVL 3810, CIVL 3310 and CIVL 3510. General concepts, traffic factors, material characterization, layer thickness selection, earthwork, base and sub-base construction, surface course construction, quality control/assurance.


CIVL 7170/7176 NUMERICAL METHODS IN HYDRAULICS AND HYDROLOGY (3). LEC. 3. Pr., CIVL 4210. Numerical approximations of ordinary and partial differential equations representing problems common to civil engineering including groundwater flow, soil consolidation, and mass transport. The formulation and computational solution of diffusion and equilibrium problems are emphasized. Computer programming is required.

CIVL 7210/7216 METHODS OF POLLUTANT ANALYSIS IN ENVIRONMENTAL ENGINEERING (3). LEC. 2, LAB. 3. Pr., CIVL 6210. Fundamentals of identifying and quantifying environmental pollutants: review of pollutant chemistry, quality and quantity of pollutants, statistical basis of sampling, environmental sampling techniques, analytical techniques, and data analysis.

CIVL 7220/7226 WATER AND WASTEWATER OPERATIONS AND PROCESSES I (3). LEC. 3. Pr., CIVL 4210 or departmental approval. Coreq., CIVL 6210 or departmental approval. Physical and chemical principles applied to water and wastewater treatment. Advanced mathematical and modeling concepts.

CIVL 7230/7236 WATER AND WASTEWATER OPERATIONS AND PROCESSES II (3). LEC. 3. Pr., CIVL 7220 or departmental approval. Design and analysis of unit operations and processes used in modern water and wastewater treatment systems. Mixing, coagulation, sedimentation, filtration, and chemical precipitation.

CIVL 7240/7246 WATER AND WASTEWATER OPERATIONS AND PROCESSES III (3). LEC. 3. Pr., CIVL 7220 or departmental approval. Design and analysis of unit operations and processes used in modern water and wastewater treatment systems are rigorously examined: adsorption, ion exchange, membrane filtration, reverse osmosis, gas transfer, corrosion, and treatment residuals processing.


CIVL 7280/7286 SURFACE WATER QUALITY MODELING (3). LEC. 3. Pr., CIVL 4210 or departmental approval. Physical, chemical, biological and hydrological considerations relating to the degradation and self-purification of streams, lakes, and estuaries. Water uses and water quality goals, objectives and criteria. Principles of water quality modeling and waste load allocation.

CIVL 7310/7316 FOUNDATION ENGINEERING (3). LEC. 3. Pr., CIVL 4600. Analysis, design and construction of shallow and deep foundation systems.

CIVL 7330/7336 SOIL PROPERTIES (3). LEC. 3. Pr., CIVL 3310. Soil behavior, shear strength, compressibility, hydraulic conductivity, and measurement of soil properties.


CIVL 7390 IN SITU TESTING OF SOILS (3). LEC. 3. Pr., CIVL 4310. In situ tests used in geotechnical engineering: test procedures, interpretation of results, and designing from in situ geotechnical data.

CIVL 7410/7416 TEMPORARY STRUCTURES AND FACILITIES (3). LEC. 3. Pr., STAT 3010, CIVL 3610, CIVL 3610. Construction loads, applicable codes and standards, and design principles for temporary structures; planning and implementation of construction facilities; economic analysis of temporary structures.

CIVL 7500/7506 TRAFFIC FLOW THEORY (3). LEC. 3. Pr., CIVL 6500 or departmental approval. Basic phenomena underlying traffic stream movement and individual vehicle behavior. Topics include flow parameters and relationships; microscopic and macroscopic flow models; equations of motion and state; single and multi-regime flow models.

CIVL 7520/7526 PUBLIC TRANSPORTATION (3). LEC. 3. Pr., CIVL 3510 or departmental approval. Technology and characteristics of public transportation; transportation demand analysis; transit users; innovative technologies.

CIVL 7540/7546 TRANSPORTATION SAFETY (3). LEC. 3. Pr., CIVL 6500 or departmental approval. Transportation safety problems and the engineer’s role in developing and administering safety programs. Topics include hazardous location identification; analysis of accident data; development and evaluation of accident countermeasures and safety programs.

CIVL 7550/7556 ROADSIDE DESIGN (3). LEC. 3. Pr., CIVL 6500 or departmental approval. Concepts of roadside design that can prevent or reduce crash severity. Topics include design, selection, placement and construction of longitudinal barriers, crash cushions, bridge rails, transitions, end terminals, sign posts, and other roadside features.


CIVL 7630/7636 ADVANCED STRESS ANALYSIS (3). LEC. 3. Pr., CIVL 3610. Hooke’s 1-D, 2-D, 3-D stress-strain relations and applications, stress and strain transformations and Mohr’s circle, material properties and failure theories, biaxial bending, unsymmetrical bending, composite material members, shear center, torsional stress, stress concentrations, beams on elastic foundations.


CIVL 7650/7656 ADVANCED ANALYSIS OF FRAMED STRUCTURES (3). LEC. 3. Pr., CIVL 6670. Matrix analysis of framed structures, elastic supports, specified displacements, member and releases, principle of minimum potential energy, geometric non-linearity, frame stability, substructures.

CIVL 7670/7676 FINITE ELEMENT METHODS IN STRUCTURAL MECHANICS (3). LEC. 3. Pr., CIVL 6670 or departmental approval. Introduction to finite element analysis; variational principles. 1D, 2D and 3D element formulation; nonlinear (geometric and constitutive) formulations and solutions; eigen value problems.


CIVL 7680/7686 FATIGUE AND FRACTURE MECHANICS (3). LEC. 3. Pr., CIVL 4650 or departmental approval. Linear-elastic and elastic-plastic fracture mechanics, fatigue, yield criteria, applications to highway structures.

CIVL 7690/7696 ANALYSIS OF PLATE AND SHELL SYSTEMS (3). LEC. 3. Pr., CIVL 6670 or departmental approval. Analysis of isotropic and anisotropic plates with various shapes and boundary conditions due to lateral and in-plane loads; large deflection considerations; numerical techniques; bending and membrane behavior of isotropic shells.

CIVL 7710/7716 APPLIED ELASTICITY (3). LEC. 3. Pr., CIVL 6670 or departmental approval. Linear-elastic and plastic fracture mechanics, fatigue, yield criteria, applications to highway structures.

CIVL 7770/7776 VARIATIONAL METHODS IN STRUCTURAL MECHANICS (3). LEC. 3. Pr., CIVL 6670 or departmental approval. Calculus of variations; derivation of Euler’s equations and boundary conditions; applications of energy principles to structures; variational approaches to finite element methods.

CIVL 7810/7816 CIVIL ENGINEERING MATERIALS (4). LEC. 3. LAB. 3. Pr., CIVL 6810 or departmental approval. Laboratory and field test methods for determining the engineering properties of pavement materials, including hot-mix asphalt, Portland cement concrete, granular materials and subgrade soils; interpretation of test data for selecting property values; and use of engineering properties in the design and analysis of pavement response to environmental and vehicular loads.

CIVL 7820/7826 ADVANCED PAVEMENT DESIGN AND REHABILITATION (3). LEC. 3. Pr., CIVL 7810. Pavement management concepts, life cycle costs analysis, design and rehabilitation alternatives, serviceability concepts, empirical thickness selection models, reliability.

CIVL 7970/7976 SPECIAL TOPICS IN CIVIL ENGINEERING (1-3). LEC. Pr., departmental approval. Individual student or group endeavor under direct faculty supervision involving special topics of an advanced nature in civil engineering. Course may be repeated for a maximum of 9 credit hours.

CIVL 7980/7986 ENGINEERING PROJECT (1-10). LEC. Pr., departmental approval. Credit to be arranged. Course may be repeated with change in topic.

CIVL 7990 RESEARCH AND THESIS (1-10). MSTR., TD. Pr., departmental approval. Credit to be arranged.

CIVL 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Credit to be arranged.
CMBL/BIOL 7440 ADVANCED CELL BIOLOGY (3). LEC. 3. Pr., BIOL 4100. Examination of current areas of research in cell and developmental biology by directed reading and discussion. Credit will not be given for both CMBL 7440 and BIOL 7440.

CMBL/VBMS 7460 MOLECULAR PATHOGENESIS (3). LEC. 3. Pr., VBMS 7510 or BIOL 4520, and departmental approval. Molecular and cellular basis of virulence of bacterial pathogens of animals.

CMBL/VBMS 7480 METHODS IN IMMUNOLOGY (5). LEC. 1, LAB. 8. Pr., departmental approval. Theoretical concepts underlying immunological methods combined with practical hands-on immunological experimentation focused on application to research in the biological sciences.


CMBL/VBMS 7510 MOLECULAR GENETICS I (5). LEC. 5. Pr., CHEM 7200. Bacterial, bacteriophage, and eukaryotic genetics, with a focus on gene structure, and molecular mechanisms regulation expression. Critical review of current literature will be emphasized.

CMBL/VBMS 7520 MOLECULAR GENETICS II (5). LEC. 5. Pr., VBMS 7510. Genetic mechanisms by which eukaryotic cells replicate, communicate and differentiate. Current literature will be used extensively.


CMBL/VBMS 7540 CURRENT TOPICS IN MOLECULAR VIROLOGY (3). LEC. 3. Pr., VBMS 7510, VBMS 7520, departmental approval. Viral gene expression and evasion of host defense mechanisms.

CMBL/VBMS 7660 MOLECULAR GENETICS AND BIOTECHNOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 3000 or departmental approval. Principles and application of DNA fingerprinting technologies, gene mapping; genetic information and analysis using internet tools, transgenic technologies. Credit will not be given for both CMBL 7660 and FISH 7660.

CMBL/BIOL 7960 READINGS IN MOLECULAR BIOLOGY (1). RCT. 1. Pr., BIOL 7220. Coreq., BIOL 7220. Oral presentation and discussion of recent scientific publications from a selected area of molecular biology. Credit will not be given for both CMBL 7960 and BIOL 7960. Course may be repeated for a maximum of 4 credit hours.

CMBL/POUL 8160 LABORATORY TECHNIQUES IN MOLECULAR VIROLOGY (4). LEC. 1, LAB. 9. Pr., BIOL 4520, BIOL 4530, or equivalent. Isolation, purification, and identification of viral nucleic acids and proteins. Credit will not be given for both CMBL 8160 and POUL 8160.

CMBL/PLPA 8880 PHYSIOLOGICAL AND MOLECULAR PLANT PATHOLOGY (3). LEC. 2, LAB. 2. Pr., PLPA 6000, CHEM 6180, BIOL 4230, or departmental approval. Comprehensive coverage of physiology and molecular biology of plant-pathogen interactions.

Communication Disorders (CMDS)

Dr. Lawrence Molt - 844-9613

CMDS 2500 COMMUNICATION DISORDERS IN SOCIETY (2). LEC. 2. Information on stuttering, speech, language, voice disorders and hearing impairment and how to interact with individuals with communication disorders.

CMDS 2503 COMMUNICATION DISORDERS IN SOCIETY (2). LEC. 2. Information on stuttering, speech, language, voice disorders and hearing impairment and how to interact with individuals with communication disorders.

CMDS 2504 COMMUNICATION DISORDERS IN SOCIETY (2). LEC. 2. Information on stuttering, speech, language, voice disorders and hearing impairment and how to interact with individuals with communication disorders.

CMDS 3000 INTRODUCTION TO SPEECH PATHOLOGY-AUDIOLOGY (3). LEC. 3. Survey of the field of speech pathology-audiology. Includes history of the profession, the inter-relatedness of the various pathologies, general principles of evaluation and therapy and the profession itself.


CMDS 3550 SPEECH AND HEARING SCIENCE (3). LEC. 3. The acoustic properties of speech, their relationship to perceptual and physiological phonetics, and instrumentation used in speech science.

CMDS 4510 ARTICULATION DISORDERS (3). LEC. 3. Pr., CMDS 3400, CMDS 3410 or departmental approval; 2.2 GPA. Principles of normal and deviant articulation acquisition.

CMDS 4520 LANGUAGE ACQUISITION (3). LEC. 3. Pr., CMDS 3400, CMDS 3410 or departmental approval; 2.2 GPA. First language acquisition in childhood and its change throughout the life span.

CMDS 4530 FLUENCY DISORDERS (3). LEC. 3. Pr., CMDS 3400, CMDS 3410 or departmental approval; 2.2 GPA. Principles of fluent and disfluent verbal behavior.

CMDS 4540 VOCAL DISORDERS (3). LEC. 3. Pr., CMDS 3400, CMDS 3410 or departmental approval; 2.2 GPA. Principles of normal and deviant vocal behavior.

CMDS 4560 CHILD AND ADOLESCENT LANGUAGE DISORDER (3). LEC. 3. Pr., CMDS 4520 or departmental approval; 2.2 GPA. Overview of research dealing with the nature, assessment and treatment of language disorders in child and adolescent populations.

CMDS 4580 INTRODUCTION TO CLINICAL PROCEDURES IN SPEECH-LANGUAGE PATHOLOGY (3). LEC. 3. CLN. 30. Pr., CMDS 4510 or CMDS 4520 and one of the following: CMDS 4510, CMDS 4520, CMDS 4530, CMDS 4540. Orientation to clinical activities, management methods and preparation of professional reports.


CMDS 4620 HEARING REHABILITATION (3). LEC. 3. Pr., CMDS 4600 or departmental approval; 2.2 GPA. Rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation; includes clinical practice.

CMDS 4650 INTRODUCTION TO CLINICAL PROCEDURES IN AUDIOLOGY (3). LEC. 3. Pr., CMDS 4600 or departmental approval; requires 2.5 GPA to enter. Audiological instrumentation and test procedures.

CMDS 4910 CLINICAL PRACTICUM IN SPEECH-LANGUAGE PATHOLOGY (1). FRA. 1. Pr., CMDS 4580 or departmental approval; 2.5 GPA. Course may be repeated for a maximum of 2 credit hours.

CMDS 4930 DIRECTED STUDY IN COMMUNICATION DISORDERS (1-3). IND. Pr., Department approval. Directed learning experience in communication disorders involving bibliographic research, writing, gaining expertise with laboratory/practical procedures or conducting directed research. Course may be repeated for a maximum of 3 credit hours.

CMDS 4997 HONORS RESEARCH (1-3). IND. Pr., Membership in the Honors College; departmental approval. Junior or senior standing. Course may be repeated for a maximum of 3 credit hours.

CMDS 4997 HONORS THESIS (1-3). IND. Pr., Membership in the Honors College; accepted as CMDS major. Course may be repeated for a maximum of 6 credit hours.

CMDS 5100 HEARING SCIENCE (3). LEC. 3. Pr., CMDS 4600, CMDS 4620 or departmental approval. Introduction to instrumentation and calibration of audiometric equipment. Auditory perception in normal-hearing and hearing-impaired listeners.

CMDS 5110 AUDITORY PHYSIOLOGY (3). LEC. 3. Pr., CMDS 4400 or departmental approval. Detailed study of the anatomy and physiology of the human auditory system. Fall.

CMDS 5200 DIAGNOSTIC AUDIOLOGY (3). LEC. 3. Pr., CMDS 4600, CMDS 4650. Basic and advanced audiometric techniques to assess the site of lesion in the auditory system. Spring.


CMDS 5220 AMPLIFICATION I (3). LEC. 3. Pr., CMDS 4600, CMDS 4620 or departmental approval. Background and development of hearing aids and other amplification systems; performance standards and measurement techniques; selection, fitting and dispensing procedures.

CMDS 5230 CLINICAL LEVEL I (2). LEC. 2. Pr., CMDS 4650 or departmental approval. Didactic and practical training for performing audiological testing and patient management at clinical level I. Spring.

CMDS 5300 CENTRAL AUDITORY PROCESSING (3). LEC. 3. Pr., CMDS 4600, CMDS 4620 or departmental approval. Selected clinical procedures
in audiology, including acoustic reflex measures and behavioral test of central auditory function.

**CMDS 5310 AURAL REHABILITATION** (3). LEC. 3. Pr., CMDS 4600, CMDS 4620 or departmental approval. Psychosocial aspects on hearing loss; clinical and therapeutic management of older persons with hearing disorders including counseling of the hearing-impaired and their families.

**CMDS 5320 CLINICAL LEVEL II** (2). LEC. 2. Pr., CMDS 5230 with a grade of C or higher. Didactic and practical training for performing audiological testing and patient management at Clinical Level II. Summer.


**CMDS 5410 AURAL HABILITATION** (3). LEC. 3. Pr., CMDS 4600, CMDS 4620, or departmental approval. The parameters involved in the management of hearing-impaired school-aged children.


**CMDS 5430 CLINICAL LEVEL III** (2). LEC. 2. Pr., CMDS 5230, CMDS 5320 with a grade of C or higher. Didactic and practical training for performing audiological testing and patient management at Clinical Level III. Spring.

**CMDS 5500 ELECTROPHYSIOLOGICAL PROCEDURES IN AUDIOLOGY** (3). LEC. 3. Pr., CMDS 4600, CMDS 4620, or departmental approval. Selected neurophysiological clinical procedures in audiology, including electrocochleography and auditory evoked potentials.

**CMDS 5510 CLINICAL LEVEL IV** (2). LEC. 2. Pr., CMDS 5230, CMDS 5320, CMDS 5430 with a grade of C or higher. Didactic and practical training for performing audiological testing and patient management at Clinical Level IV. Spring.

**CMDS 5520 HEARING CONSERVATION** (3). LEC. 3. Pr., CMDS 5310. A study of the effects of noise on the auditory system and implementation of hearing conservation programs in industry, schools and the military. Spring.

**CMDS 5570 EVALUATION OF RESEARCH IN SPEECH PATHOLOGY & AUDIOLOGY** (3). LEC. 3. Pr., Departmental approval. Survey of experimental designs and statistical procedures used in speech-language pathology/audiology literature for consumers of research.

**CMDS 5600 BALANCE DISORDERS** (3). LEC. 3. Detailed coverage of the assessment and treatment of patients with balance disorders using nystagmography and other techniques. Summer.

**CMDS 5610 IMPLANT TECHNOLOGY** (2). LEC. 2. Detailed study of the assessment and treatment of patients with cochlear implants. Summer.

**CMDS 5620 OUTCOME MEASURES IN AUDIOLOGY** (3). LEC. 3. Pr., CMDS 5120. Application of research methodology to demonstrate efficacy in clinical service delivery in all areas of audiological practice. Summer.

**CMDS 5700 PROFESSIONAL ISSUES** (3). LEC. 3. Legal and ethical issues in clinical audiology. Fall.

**CMDS 5800 THE NEUROLOGICAL BASES OF COMMUNICATION DISORDERS** (3). LEC. 3. Pr., Departmental approval. Anatomy and physiology of the central nervous system as it relates to speech, language and hearing function and disorders.


**CMDS 5910 CLINICAL PROBLEMS IN HEARING** (2). LEC. 2. Pr., CMDS 4600, CMDS 4620 and CMDS 4620 or departmental approval.

**CMDS 5920 CLINICAL INTERNSHIP** (5). INT. 5. SU. Pr., Third year standing and completion of CMDS 5510 with a grade of "C" or better. Intensive clinical experience at off-campus setting up to 20 hours per week of supervised practice.

**CMDS 5940 CLINICAL RESIDENCY** (10). LEC. 10. SU. Pr., CMDS 5920. A full time, supervised, nine month residency at an off-campus facility that provides audiological services. Fall, Spring. Course may be repeated for a maximum of 20 credit hours.


**CMDS 5980 CAPSTONE PROJECT** (1). LEC. 1. A third year project involving applied clinical research or development of an innovative clinical procedure. Course may be repeated for a maximum of 3 credit hours.

**CMDS 7500 CLINICAL PROBLEMS IN SPEECH** (2). LEC. 2. Pr., CMDS 4580-4910 series or departmental approval. Methods, techniques and clinical management of the disorders of speech. Clinical practice required. Course may be repeated for a maximum of 12 credit hours.

**CMDS 7510 ADVANCED ARTICULATION DISORDERS** (3). LEC. 3. Pr., CMDS 4510 or departmental approval. Empirical and theoretical bases for articulatory pathologies.

**CMDS 7520 CLINICAL STRATEGIES IN CHILD AND ADOLESCENT LANGUAGE DISORDERS** (3). LEC. 3. Pr., CMDS 4520 or departmental approval. Empirical and theoretical bases for evaluation and treatment of child/ adolescent language disorders.

**CMDS 7530 ADVANCED FLUENCY DISORDERS** (3). LEC. 3. Pr., CMDS 4530 or departmental approval. Empirical and theoretical bases for dysfluency disorders, diagnoses and therapies.

**CMDS 7540 ADVANCED VOICE DISORDERS** (3). LEC. 3. Pr., CMDS 4540 or departmental approval. Empirical and theoretical bases for voice pathologies, diagnoses and therapies.

**CMDS 7550 LANGUAGE AND SPEECH DISORDERS** (3). LEC. 3. Pr., CMDS 4520 or departmental approval. Empirical and theoretical bases for speech-language disorders associated with CNS pathologies, diagnoses and therapies.

**CMDS 7560 CLEFT PALATE** (3). LEC. 3. Pr., CMDS 4510 or departmental approval. Empirical and theoretical bases for speech/language disorders associated with cleft palate, diagnoses and therapies.

**CMDS 7570 EVALUATION OF RESEARCH IN SPEECH PATHOLOGY AND AUDIOLOGY** (3). LEC. 3. Pr., Departmental approval. Survey of experimental designs and statistical procedures used in speech-language pathology/audiology literature for consumers of research.

**CMDS 7600 CLINICAL PROBLEMS IN HEARING** (2). LEC. 2. Pr., CMDS 4650, CMDS 4660 and CMDS 4620 or departmental approval. Course may be repeated for a maximum of 12 credit hours.

**CMDS 7800 THE NEUROLOGICAL BASES OF COMMUNICATION DISORDERS** (3). LEC. 3. Pr., Departmental approval. Anatomy and physiology of the central nervous system as it relates to speech, language and hearing function and disorders.

**CMDS 7810 MOTOR SPEECH DISORDERS** (3). LEC. 3. Pr., CMDS 7800 or departmental approval. Empirical and theoretical bases for motor speech disorders, diagnoses and therapies.

**CMDS 7820 SWALLOWING DISORDERS AND MEDICAL ASPECTS OF SPEECH-LANGUAGE PATHOLOGY** (3). LEC. 3. Pr., CMDS 7800 or departmental approval. Overview of the role of speech language pathology in medical settings with specific emphasis on terminology and procedures used to assess and treat dysphagia, dementia, traumatic brain injury and right hemisphere damage in adult population. Fall.

**CMDS 7840 AUGMENTATIVE AND ALTERNATIVE COMMUNICATION** (3). LEC. 3. Process and specific equipment involved in assessment, prescription and intervention with adults and children who are unable to use traditional communication modes.

**CMDS 7860 EXPERIMENTAL PHONETICS** (3). LEC. 3. Pr., CMDS 3550 or departmental approval. Orientation to acoustic and physiologic instrumentation used in the study of normal and disordered speech.

**CMDS 7900 INDEPENDENT STUDY** (1-3). IND. Conferences, readings, research or reports in a specialized area of communication disorders. Course may be repeated for a maximum of 3 credit hours.

**CMDS 7940 FIELD EXPERIENCE** (5). LEC. 5. Full-time assignment in a facility, such as University Speech and Hearing Clinic, hospital, public school and various community agencies. Course may be repeated for a maximum of 10 credit hours.

**CMDS 7970 SEMINAR** (1-3). SEM. Pr., departmental approval. Advanced treatment of contemporary topics and trends, as well as current research aspects of audiology and speech-language pathology. Course may be repeated for a maximum of 3 credit hours.

**CMDS 7990 RESEARCH AND THESIS** (1-5). MST., TD. Course may be repeated with change in topic.

**Communication (COMM)**

Dr. Dale W. Harrison - 844-5166

**COMM 1000 PUBLIC SPEAKING** (3). LEC. 3. Oral communication theory and practice in a public speaking setting with emphasis on content, organization, delivery, and adaptation to the audience.

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COMM 2010 MESSAGE PREPARATION AND ANALYSIS (3). LEC. 3. Pr., COMM 1000 or COMM 1010. Theory underlying the construction of rhetorical messages as well as critical perspectives for the analysis of public discourse.

COMM 2400 COMMUNICATION IN ORGANIZATIONS (3). LEC. 3. Pr., sophomore standing. Communication in modern organizations emphasizing practice in areas such as interviewing, meeting management, and professional presentations.

COMM 2410 SMALL GROUP COMMUNICATION (3). LEC. 3. Pr., sophomore standing. Theory and practice of competent communication in task-oriented small group settings. Topics include roles, leadership, decision making, problem solving, and conflict management.

COMM 3100 SPEAKING BEFORE AUDIENCES (3). LEC. 3. Pr., Departmental approval, sophomore standing, COMM 1000, and 2.0 GPA. Refining the knowledge and skills necessary for communicating clearly and effectively in oral presentations. Recommended for COMM majors only.

COMM 3110/3113 PERSUASIVE DISCOURSE (3). LEC. 3. Pr., Sophomore standing and 2.0 GPA. Understanding and analyzing persuasive messages. Survey of theoretical approaches to attitude formation and change. Developing skills as a critical evaluation of persuasive messages.


COMM 3450 INTERCULTURAL COMMUNICATION (3). LEC. 3. Pr., Sophomore standing and 2.0 GPA. Different types of problems encountered when communicating with different cultures.

COMM 3500 FOUNDATIONS OF HUMAN COMMUNICATION (3). LEC. 3. Pr., Sophomore standing and 2.0 GPA. Theories examining the nature of human communication.

COMM 3500 FOUNDATIONS OF RHETORIC AND SOCIAL INFLUENCE (3). LEC. 3. Pr., Sophomore standing and 2.0 GPA. Rhetorical theory from its classical roots to contemporary thinkers. Relates rhetorical theory and analysis to understanding persuasive discourse in our society.

COMM 3700 ARGUMENTATIVE DISCOURSE (3). LEC. 3. Pr., Sophomore standing and 2.0 GPA. Examination of the critical tools necessary to evaluate arguments in current public discourse.

COMM 4100 COMMUNICATION STRATEGIES OF SOCIAL MOVEMENTS (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600 and 2.0 GPA. Examines persuasive strategies used in social movements to attract members, solidify support, and effect social change.

COMM 4400 GENDER COMMUNICATION (3). LEC. 3. Pr., COMM 3500, COMM 3600, RTVF 3300 and 2.0 GPA. Examination of the ways in which gender is communicated interpersonally, through small groups and organizations, and through the mass media.

COMM 4410 THEORIES OF LEADERSHIP (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. Examination of theory and research in leadership as a communication variable and behavioral practice in small group and organizational settings.

COMM 4470 HEALTH COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. The history, functions, and concepts central to the practice of health communication.

COMM 4500 MESSAGE STRUCTURES AND INFORMATION PROCESSING (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. Relationship between message structures and information processing in both cognitive and affective domains during speaking and listening.

COMM 4600 POLITICAL COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. Critical analysis and evaluation of political communication.

COMM 4700 LEGAL COMMUNICATION (3). LEC. 3. Pr., COMM 1000, RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. Examination of the trial process including jury selection, opening statement, direct examination, cross examination, and closing arguments.

COMM 4800 INTERPERSONAL COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. The relationship between communication and the formation of self identity and maintenance of relationships.

COMM 4810 NONVERBAL COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, and 2.0 GPA. Focuses on the theory of non-language based communication and the impact of these messages on the overall communication process.

COMM 4900 INDEPENDENT STUDY IN COMMUNICATION (3). LEC. 3. Independent study on a specific topic of interest not already addressed in any regular Communication course. May repeat with a change of topic for a maximum of 6 credit hours. Fall, Spring.

COMM 4920 INTERNSHIP (3-6). INT. 3. Pr., Senior standing, admission to internship program. Opportunity to apply classroom experience in a job setting. Course may be repeated for a maximum of 6 credit hours.

COMM 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College, COMM 3500, COMM 3600, RTVF 3300, junior or senior standing. Course may be repeated for a maximum of 3 credit hours.

COMM 4970 SPECIAL TOPICS IN COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600. Topics in communication.

COMM 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College, COMM 3500, COMM 3600, RTVF 3300, senior standing. Course may be repeated for a maximum of 3 credit hours.

COMM 7000 COMMUNICATION THEORY (3). LEC. 3. A critical examination of contemporary theories in the field of communication.

COMM 7010 HISTORICAL, DESCRIPTIVE, AND CRITICAL APPROACHES TO COMMUNICATION RESEARCH (3). LEC. 3. Consideration of the scope and nature of these types of research and their contribution to understanding human communication.

COMM 7020 EMPIRICAL APPROACH TO COMMUNICATION RESEARCH (3). LEC. 3. Quantitative research in communication; emphasis on understanding and doing empirical research.

COMM 7220 EXPERIMENTAL METHODS IN COMMUNICATION (3). LEC. 3. Consideration of the scope and nature of experimental research to our understanding of human communication.

COMM 7230 RHETORICAL CRITICISM (3). LEC. 3. Advanced methods in rhetorical criticism including tools for the analysis of persuasive messages.

COMM 7410 DEVELOPMENT OF RHETORICAL THEORY (3). LEC. 3. Historical survey of rhetorical theory from ancient to contemporary era; special attention to the role of rhetoric in shaping attitudes towards persuasion.

COMM 7420 SEMINAR IN PERSUASION AND ATTITUDE CHANGE (3). LEC. 3. A critical examination of current theory and research in the area of the persuasive act and its effects.

COMM 7430 SEMINAR IN AMERICAN PUBLIC ADDRESS (3). LEC. 3. Investigates key issues and debates that have emerged in post-WW II America.

COMM 7440 SEMINAR IN ARGUMENTATION AND DEBATE (3). SEM. 3. The fundamental theories of argumentation will be analyzed.

COMM 7450 SEMINAR IN INTRAPERSONAL PROCESSES IN COMMUNICATION (3). SEM. 3. Theories of cognitive and affective processing of information during speaking and listening.

COMM 7460 SEMINAR IN INTERPERSONAL COMMUNICATION (3). SEM. 3. Theories of the structure and function of interpersonal (dyadic) communication focusing on conversational behavior, traits, relationships, and persuasion.

COMM 7470 SEMINAR IN SMALL GROUP COMMUNICATION (3). SEM. 3. Advanced study of the principles of communication as they apply to the small group setting.

COMM 7480 SEMINAR IN ORGANIZATIONAL COMMUNICATION (3). SEM. 3. An in-depth approach to the study of communication processes within the setting of modern organizations.

COMM 7490 HEALTH COMMUNICATION (3). LEC. 3. Examination and application of social science research approaches to the study of health communication.

COMM 7500 GENDER COMMUNICATION (3). LEC. 3. Explores current theories and research on the relationship between communication and gender.

COMM 7600 MASS COMMUNICATION THEORY (3). LEC. 3. Explores major areas of concern to the theoretical study of mass communication and the social impact of mediated messages.

COMM 7610 STUDIES IN POPULAR CULTURE AND MASS COMMUNICATION (3). LEC. 3. Critical approaches to identifying, interpreting and experiencing popular culture texts within historical, cultural and communicative contexts.
COMM 7620 BROADCAST PROGRAMMING AND CRITICISM (3). LEC. 3. Explores critical, theoretical, and organizational issues relevant to programming and the production of culture within mass media environments.

COMM 7640 SEMINAR IN FILM THEORY AND CRITICISM (3). SEM. 3. Explores classical and contemporary film theories and criticism.

COMM 7650 THE MASS MEDIA AND AMERICAN POLITICS (3). LEC. 3. Examination of the role of the mass communication system in the American political system.

COMM 7660 CULTURAL STUDIES IN MASS MEDIA (3). LEC. 3. Examination of communication research approaches to the study of culture and media.

COMM 7810 PUBLIC RELATIONS THEORY (3). LEC. 3. Current areas of concern in the theoretical study of public relations.

COMM 7820 PUBLIC RELATIONS CAMPAIGNS (3). LEC. 3. Focuses on the application of Public Relations and communication concepts to real campaign challenges.

COMM 7830 PUBLIC RELATIONS CASE STUDIES (3). LEC. 3. Examination of research on Public Relations case studies to provide a theoretical basis for analyzing real-life Public Relations situations.

COMM 7840 COMMUNICATION TRAINING AND CONSULTING (3). LEC. 3. The theory, concepts and skills needed to be an effective communications trainer or consultant.

COMM 7900 INDEPENDENT STUDY (1-3). IND. Conferences, readings, research, and reports in one of the fields listed: a) general communication, b) mass communication, or c) public relations. Course may be repeated for a maximum of 3 credit hours.

COMM 7970 SPECIAL TOPICS IN COMMUNICATION (3). SEM. 3. Advanced treatment of contemporary topics, trends, current research findings and opportunities. May be repeated for credit with change in topic.

COMM 7980 NON-THESIS PROJECT IN COMMUNICATIONS (3-6). LEC. 3, SU. Pr., Minimum 27 graduate hours including COMM 7000, COMM 7010, COMM 7020. Professional experience in communication area of interest. Must include managerial experience. Only 3 hours will apply to the degree.

COMM 7990 RESEARCH AND THESIS (1-6). MST., TD. Course may be repeated with change in topic.

JOURNALISM (JRNL)


JRNL 2210 NEWSWRITING (3). LEC. 2, LAB. 2. Pr., JRNL 1100, and 2.3 GPA. Introduction to newswriting techniques, with emphasis on learning news values, recognizing parts of a story and writing stories that meet standards of accuracy, grammar, style, spelling, law and ethics.

JRNL 2310 REPORTING (3). LEC. 2, LAB. 2. Pr., JRNL 1100, JRNL 2210, and 2.3 GPA. Traditional and electronic methods of gathering news; the writing of clear, accurate and meaningful news stories, and codes of ethical journalistic behavior. Includes coverage of speeches and meetings outside of class.

JRNL 2320 BASICS OF JOURNALISM (2). LEC. 3. Primarily for non-journalism and non-communications majors. Modern journalistic techniques and practices, with emphasis on daily and weekly newspapers.

JRNL 2910 PRACTICUM IN JOURNALISM (1). LEC. 1, SU. Pr., JRNL 1100 for Journalism majors; JRNL 2320 for College of Education majors, and 2.3 GPA. Required for all Journalism majors. Working a minimum of 45 hours for The Auburn Plainsman in reporting, feature writing, editing and design.

JRNL 3220 FEATURE WRITING (3). LEC. 3. Pr., JRNL 1100, JRNL 2210, and 2.3 GPA. Various techniques of writing and selling features, both short and long pieces, for newspapers and magazine markets.

JRNL 3410 PHOTOJOURNALISM (3). LEC. 3. Pr., 2.3 GPA. Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing and enlarging of pictures are covered.

JRNL 3470 NEWSPAPER EDITING AND DESIGN (3). LEC. 1, LAB. 4. Pr., JRNL 1100, JRNL 2210, and 2.3 GPA. The basics of newspaper copy editing and design; with emphasis on hands-on techniques.

JRNL 4230 ADVANCED REPORTING (3). LEC. 2. Pr., JRNL 2310, JRNL 3220 and JRNL 3470. Developing and writing news stories under deadline pressure; investigative and interpretative reporting.

JRNL 4320 NEWSPAPER MANAGEMENT (3). LEC. 2. Pr., JRNL 1100. All aspects of newspaper operation, with particular emphasis on problems and opportunities facing print-media management.

JRNL 4410 JOURNALISM HISTORY (3). LEC. 2. Pr., 2.3 GPA. Issues facing the American press, from colonial times to the present, with emphasis on regional and state issues.

JRNL 4420 SENIOR SEMINAR IN SPECIAL TOPICS (2). LEC. 2. Pr. Departmental approval and 2.3 GPA. Research, writing or performance involving a special topic, medium or issue in journalism not covered in other courses.

JRNL 4430 JOURNALISM WORKSHOP (1). LEC. 1. Pr., JRNL 2310, JRNL 3220, JRNL 3470, departmental approval, and 2.3 GPA. Supervised, closely monitored work experience. Should be taken two consecutive semesters. Students must also enroll for one-hour Journalism Special Studies (JRNL 4930) one semester to complete the three-hour requirement. Credit will not be given for both JRNL 4430 and JRNL 4920.

JRNL 4460 PRESS LAW AND ETHICS (3). LEC. 2. Pr., 2.3 GPA. Professional ethics and principal legal headings of press law with emphasis on libel, invasion of privacy, access to information and advertising law.

JRNL 4470 ADVANCED FEATURE WRITING (3). LEC. 2. Pr., JRNL 1100. Feature writing skills and magazine and freelance writing.

JRNL 4480 ADVANCED PUBLICATION DESIGN (3). LEC. 1, LAB. 4, Pr., JRNL 2310, JRNL 3470, JRNL 3220, and 2.3 GPA. Desktop publishing knowledge required to produce print publications, including brochures and newsletters, and with exposure to web page, advertising and magazine design.

JRNL 4490 LITERARY JOURNALISM (3). LEC. 2. Pr., JRNL 1100. Creative writing techniques for newspaper and magazine articles, through the study of notable examples of the genre of literary journalism.

JRNL 4900 JOURNALISM INDEPENDENT STUDY (1-4). IND. Pr., 2.3 GPA. Research and analysis of specific areas of journalism. Course may be repeated for a maximum of 6 credit hours.

JRNL 4920 JOURNALISM INTERNSHIP (3-6). LEC. 3. Pr., JRNL 2310, JRNL 3220, and JRNL 3470, departmental approval, and 2.3 GPA. Supervised, closely monitored work experience.

JRNL 4967 HONORS READINGS (1-3). LEC. 3. Pr., Membership in the Honors College; departmental approval and 2.3 GPA. Course may be repeated for a maximum of 3 credit hours.

JRNL 4997 HONORS THESIS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval and 2.3 GPA.

PUBLIC RELATIONS (PRCM)

PRCM 3040 FOUNDATIONS OF PUBLIC RELATIONS (3). LEC. 3. Pr., JRNL 1100 and 2.3 GPA. Communication skills and technologies necessary for successful public relations.

PRCM 4020 STYLE AND DESIGN IN PUBLIC RELATIONS MESSAGES (3). LEC. 3. Pr., JRNL 1100, PRCM 3040, COMM 3500, COMM 3600, RTVF 3300, sophomore standing and 2.3 GPA. Introduction to the use of style and design in public relations messages.

PRCM 4040 CASE STUDIES AND ETHICS IN PUBLIC RELATIONS (3). LEC. 3. Pr., JRNL 1100, PRCM 3040, COMM 3500, COMM 3600, RTVF 3300, sophomore standing, and 2.3 GPA. Investigation and analysis of public relations problems through case studies.

PRCM 4080 WRITING FOR PUBLIC RELATIONS (3). LEC. 3. Pr., JRNL 1100, PRCM 3040, COMM 3500, COMM 3600, RTVF 3300, sophomore standing, and 2.3 GPA. Writing skills necessary for the practice of public relations.

PRCM 4090 PUBLIC RELATIONS CAMPAIGNS (3). LEC. 3. Pr., JRNL1100, RTVF3300, COMM3500, COMM3600, PRCM4040, PRCM4080, PRCM 4510, sophomore standing, and 2.3 GPA. Capstone course designed to apply Public Relations and Communication principles to a campaign situation.

PRCM 4510 SURVEY RESEARCH METHODS (3). LEC. 3. Pr., COMM 3500, COMM 3600, RTVF 3300, 2.3 GPA. Basic research principles and survey research as it is used by mass media and public relations.

PRCM 4900 INDEPENDENT STUDY IN PUBLIC RELATIONS (3). LEC. 3. Pr., COMM 3500, COMM 3600, RTVF 3300, 2.3 GPA. Independent Study
on a specific topic of interest not already addressed in any regular Public Relations course. Fall, Spring.

PRCM 4920 INTERNSHIP (3-6). INT. 3, SU. Pr., Senior standing, admission to internship program, 2.3 GPA. Opportunity to apply classroom experience to real job setting. Course may be repeated for a maximum of 6 credit hours.

PRCM 4970 SPECIAL TOPICS IN PUBLIC RELATIONS (3). LEC. 3. Pr., COMM 3500, COMM 3600, RTVF 3300, 2.3 GPA. This course focuses on narrowly-defined Public Relations topics not already covered in the current PRCM curriculum. Fall, Spring.

RADIO/TELEVISION/FILM (RTVF)

RTVF 2330 LIVE EVENT VIDEO PRODUCTION (3). LEC. 3. Pr., 2.3 GPA Development and production of live video events.

RTVF 2350/2353 INTRODUCTION TO FILM STUDIES (3). LEC. 2, LAB. 2. Pr., Sophomore standing and 2.3 GPA. Introduction to film analysis, modes of film practice and critical approaches to the study of cinema.

RTVF 2354 DIST-ED INTRODUCTION TO FILM STUDIES (3). LEC. 3. Pr., Sophomore standing and 2.3 GPA. Introduction to film analysis, modes of film practice and critical approaches to the study of cinema.

RTVF 2360 TELEVISION PRODUCTION AND DIRECTING (3). LEC. 2, LAB. 2. Pr., Sophomore standing and 2.3 GPA. Development and production of studio-based programs.

RTVF 2370 ELECTRONIC FIELD PRODUCTION (3). LEC. 2, LAB. 2. Pr., Sophomore standing and 2.3 GPA. The principles and techniques of video tape production with emphasis on portable equipment, including production of electronic news gathering projects and short creative, field-produced programs.

RTVF 2800 MULTIMEDIA PRODUCTION (3). LEC. 3. Pr., 2.3 gpa Introduction to basic multimedia production, with emphasis on radio and web-based audio/visual production.

RTVF 3300 FOUNDATION OF MASS COMMUNICATION (3). LEC. 3. Pr., Sophomore standing and 2.3 GPA. Historical and theoretical bases of mass communication in the U. S., emphasizing social, cultural, regulatory and economic aspects.

RTVF 3350 WRITING FOR RADIO, TELEVISION AND FILM (3). LEC. 3. Pr., Departmental approval, sophomore standing, and 2.3 GPA. The study, practice, and development of writing skills and techniques for radio, television, and film, including commercials, features, PSAs, and dramatic scripts.

RTVF 3380 BROADCAST NEWSWRITING (3). LEC. 3. Pr., Departmental approval, sophomore standing, and 2.3 GPA. Writing and editing news stories for broadcast.

RTVF 3970 SPECIAL TOPICS IN PRODUCTION (3). LEC. 3. Pr., COMM 3500, COMM 3600, RTVF 3300, and 2.3 GPA. Specialized topics concentrating on production skills. Course may be repeated for a maximum of 6 credit hours.

RTVF 4200 HISTORY OF AMERICAN BROADCASTING (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, 2.3 GPA, or departmental approval. The social, economic, and technological evolution of radio and television in the United States.

RTVF 4210 POPULAR CULTURE AND MASS COMMUNICATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, and 2.3 GPA. Examines myths, icons, rituals, heroes, genres, narratives, stereotypes as experienced and presented within communication processes.

RTVF 4240 WOMEN AND MASS MEDIA (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, 2.3 GPA, or departmental approval. Analysis of the relationship between media messages of women and sociocultural definitions of women.

RTVF 4280 DIVERSITY ISSUES IN THE MASS MEDIA (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, 2.3 GPA, or departmental approval. Analysis of the relationship between media messages of minorities and sociocultural definitions of minorities.

RTVF 4300 BROADCAST PROGRAMMING AND CRITICISM (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, and 2.3 GPA. Introduces critical, theoretical, and organizational concepts, strategies, processes, and frameworks for programming for mass media systems.

RTVF 4310 MEDIA AND SOCIETY (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, and 2.3 GPA. Examination of the relationship between the mass communication industry and a mass society.

RTVF 4320 BROADCAST MANAGEMENT (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, and 2.3 GPA. Investigates principles and practices of managing broadcast stations and cable operations.

RTVF 4330 MEDIA LAW AND REGULATION (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, and 2.3 GPA. Legal, professional and ethical constraints on the mass media.

RTVF 4340 TV AND THE FAMILY (3). LEC. 3. Pr., RTVF3300, COMM3500, COMM3600, 2.3 GPA Examination of the relationship between television and the American Family.

RTVF 4350 MEDIA RELATIONS (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, RTVF 3300, 2.3 GPA Major concepts and theories of media relations management with special emphasis on electronic media.

RTVF 4360 HISTORY OF INTERNATIONAL CINEMA (3). LEC. 2, LAB. 2. Pr., RTVF 2350, RTVF 3300, COMM 3500, COMM 3600, sophomore standing, 2.3 GPA, or departmental approval. History of international cinema, including national cinemas, film movements, directors, and style.


RTVF 4384 DIST-ED HISTORY OF AMERICAN FILM INDUSTRY (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, sophomore standing, 2.3 GPA, or departmental approval. Examination of celebrity and fame as distinguishing cultural phenomena.

RTVF 4500 INDEPENDENT STUDY IN RADIO/TELEVISION/FILM (3). IND. 3, Pr., RTVF 3300, COMM 3500, RTVF 3300, 2.3 GPA. Independent study on a specific topic of interest not already addressed in any regular Radio/Television/Film courses. May repeat with a change in topic for a maximum of 6 credit hours. Fall, Spring.

RTVF 4920 INTERNSHIP (3-6). INT. 3, SU. Pr., Senior standing, admission to internship program, 2.3 GPA. Opportunity to apply classroom experience to real job setting. Course may be repeated for a maximum of 6 credit hours.

RTVF 4970 SPECIAL TOPICS IN RADIO/TELEVISION/FILM (3). LEC. 3. Pr., RTVF 3300, COMM 3500, COMM 3600, RTVF 3300, 2.3 GPA. This course focuses on narrowly-defined Radio/Television/Film topics not already covered in the current RTVF curriculum. May repeat with a change in topic for a maximum of 6 credit hours. Fall, Spring.

Computer Science and Engineering (COMP)

Dr. James Cross - 844-4330

COMP 1@@0 COMPUTER COMPETENCY TEST (0). TST. SU. Introduction to personal computers and software applications including word processing, spreadsheets, databases, and presentation graphics; generation and retrieval of information with the Internet; integration of data among applications. Credit for the major will not be given to CSCI and SWEN majors.

COMP 1000 PERSONAL COMPUTER APPLICATIONS (2). LEC. 2. Introduction to personal computers and software applications including word processing, spreadsheets, databases, and presentation graphics; generation and retrieval of information with the Internet; integration of data among applications. Credit for the major will not be given to CSCI and SWEN majors.

COMP 1200 INTRODUCTION TO COMPUTING FOR ENGINEERS AND SCIENTISTS (2). LEC. 2. Computer programming in a high-level language, with emphasis on use of the computer as a tool for engineering or science.

COMP 1201 INTRODUCTION TO COMPUTING LAB (1). LAB. 2. Coreq., COMP 1200. Laboratory activities focused on computer programming in a high-level language. Fall, Spring.

COMP 1210 FUNDAMENTALS OF COMPUTING I (3). LEC. 2. LAB. 3. Introduction to the fundamental concepts of programming from an object-oriented perspective. Emphasis on good software engineering principles
and development of the fundamental programming skills in the context of a language that supports the object-oriented paradigm.

**COMP 2000 NETWORK PROGRAMMING WITH HTML AND JAVA** (3). LEC. 3. Pr., COMP 1000 or higher, or ENGR 1110. Introduction to network programming using HTML and Java to build web pages and web-based applications; presentation graphics; retrieval of information from the Internet; integration of data among applications. Credit for the major will not be given to CSCI and SWEN majors. Fall, Spring.


**COMP 2210 FUNDAMENTALS OF COMPUTER SCIENCE II** (4). LEC. 3. LAB. 3. Pr., COMP 1210. Continuation of COMP 2200 with emphasis on data structures such as lists, trees, graphs and hash tables.

**COMP 2710 SOFTWARE CONSTRUCTION** (3). LEC. 3. Pr., COMP 2210. Intensive experience in software construction, to include topics such as testing, debugging, and associated tools; configuration management; low-level file and device I/O; systems and event-driven programming.

**COMP 3000 OBJECT-ORIENTED PROGRAMMING FOR ENGINEERS AND SCIENTISTS** (3). LEC. 3. Pr., departmental approval. Fundamentals of object-oriented design and programming principles; data abstraction, identifying objects, problem decomposition, design and implementation of classes. Credit for the major will not be given to CSCI and SWEN majors.

**COMP 3220 PRINCIPLES OF PROGRAMMING LANGUAGES** (3). LEC. 3. Pr., COMP 2210. Study of programming language principles supporting procedural abstraction, data abstraction, storage allocation, and parallel execution; language types and examples; language translation.

**COMP 3240 DISCRETE STRUCTURES** (3). LEC. 3. Pr., COMP 1210. Characterization of computer science data structures and algorithms in terms of sets and relations, functions, recurrence relations. Use of propositional and predicate calculus to describe algorithms. Proving correctness and running time bounds for algorithms by induction and structural induction.

**COMP 3270 INTRODUCTION TO ALGORITHMS** (3). LEC. 3. Pr., COMP 3240 and COMP 2210. Algorithms for standard computational problems and techniques for analyzing their efficiency; designing efficient algorithms and experimentally evaluating their performance.

**COMP 3350 COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING** (3). LEC. 3. Pr., ELEC 2200 or ELEC 2210. Stored Program Computers, hardware and software components; data representation, instruction sets, addressing modes; assembly language programming; loaders linkers, and operating systems.

**COMP 3500 INTRODUCTION TO OPERATING SYSTEMS** (3). LEC. 3. Pr., COMP 2710; COMP 3350 or ELEC 2220. Structure and functions of operating systems; processes and process scheduling; synchronization and mutual exclusion; memory management; auxiliary storage management; resource allocation and deadlock; security, privacy, and ethical concerns; design tradeoffs.

**COMP 3510 EMBEDDED SYSTEMS DEVELOPMENT** (3). LEC. 3. Pr., COMP 2710; COMP 3350 or ELEC 2220. Operating system design and analysis for embedded systems: Real-time issues, resource management, scheduling, exception handling, device driver development, kernel development, synchronization, network support.


**COMP 4000 SYSTEMS ADMINISTRATION FOR INFORMATION TECHNOLOGY** (3). LEC. 3. Pr., COMP 2000 or departmental approval. Principles and techniques of systems administration, including configuration of mail, file servers, print servers, databases systems, and networks. Credit for the major will not be given to majors in CSCI and SWEN. Fall, Spring.

**COMP 4200 LANGUAGE TRANSLATION** (3). LEC. 3. Pr., COMP 3240. Fundamentals of formal languages including mathematical models of regular sets, context-free languages and Turing machines; deterministic and non-deterministic models.

**COMP 4270 ADVANCED ALGORITHMS** (3). LEC. 3. Pr., COMP 3270 or departmental approval. Fundamentals of designing and analyzing advanced algorithms. Algorithm design theory; computational complexity; relationship of data structures to algorithm design; study of design strategies including divide-and-conquer, the greedy method, and dynamic programming.

**COMP 4300 COMPUTER ARCHITECTURE** (3). LEC. 3. Pr., COMP 3350. Comparison of computer architectures, emphasizing the relationships between system software and hardware. Includes processor control and datapath organization, memory subsystem design, instruction set design, processor simulation, and quantitative analysis of computer performance.

**COMP 4320 INTRODUCTION TO COMPUTER NETWORKS** (3). LEC. 3. Pr., COMP 3500 or COMP 3510 or departmental approval. Fundamentals of computer networks, OSI model, LAN, WAN, packet transmission, interworking, Internet Protocol, WWW and Java technology.

**COMP 4640 INTELLIGENT AND INTERACTIVE SYSTEMS** (3). LEC. 3. Pr., COMP 3270 or departmental approval. Theory and design of intelligent and interactive software; basic treatments of intelligent agents and human-computer interaction.

**COMP 4650 INTERFACE DESIGN FOR WIRELESS APPLICATIONS** (3). LEC. 3. Pr., COMP 3270 or departmental approval. Principles of user interface design, usability, for wireless devices: Consequences of low bandwidth network connections for interface design; consequences of battery power, small screen, other limited resources on interface design; case studies; design project using technology such as WAP.

**COMP 4710 SENIOR DESIGN PROJECT** (3). LEC. 3. Pr., COMP 3700 or COMP 3710 and senior standing. Development of requirement definitions, architectural design specification, detailed design specification, testing plan and documentation for the software and/or hardware components of a comprehensive project.

**COMP 4730 COMPUTER ETHICS** (1). LEC. 1. Pr., PHIL 1040. Application of ethical principles to computing-related topics, including privacy, property rights, autonomy, access, and diversity.

**COMP 4970 SPECIAL TOPICS** (3-4). LEC. Pr., departmental approval. Investigation of current topics in computer science and software engineering. Course may be repeated for a maximum of 6 credit hours.

**COMP 4980 SPECIAL PROJECT** (1-4). IND. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

**COMP 4997 HONORS THESIS** (3-6). IND. Pr., membership in the Honors College, departmental approval, CSCI or SWEN major. Individual student endeavor consisting of directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

**COMP 5000 WEB APPLICATION DEVELOPMENT** (3). LEC. 3. Pr., senior or graduate standing or departmental approval. Design and implementation of web sites and associated applications. Emphasis on user interface design and information organization and presentation. Fall, Spring.

**COMP 5010 INTERACTIVE APPLICATIONS IN VISUAL BASIC** (3). LEC. 3. Pr., COMP 5000 or departmental approval. Design and implementation of applications like simulations, front-ends to Excel for modeling, interfaces to databases and multimedia applications.

**COMP 5020 ADVANCED WEB APPLICATION DEVELOPMENT** (3). LEC. 3. Pr., COMP 5000 or departmental approval. Design and implementation of interactive web applications in Java as applets and servlets. Use of concepts like security, internationalization, multi-threading and server/client architectures. Fall, Spring.

**COMP 5030 OBJECT-ORIENTED TECHNOLOGIES** (3). LEC. 3. Pr., COMP 5000 or departmental approval. Object-oriented design and implementation of a variety of applications including databases and intelligent agents with one or more object-oriented programming language.

**COMP 5120 DATABASE SYSTEMS I** (3). LEC. 3. Pr., COMP 3270. Theoretical and applied issues related to the analysis, design, and implementation of relational database systems.

**COMP 5200 THEORETICAL COMPUTER SCIENCE** (3). LEC. 3. Pr., COMP 4200 or departmental approval. The nature of the recursive sets and recursively enumerable sets. Decidability. Context-sensitive grammars and linear-bounded automata, including closure properties; oracles; reduction; the arithmetic hierarchy; the analytic hierarchy.

**COMP 5210 COMPILER CONSTRUCTION** (3). LEC. 3. Pr., COMP 3220 and COMP 4200. Compiler organization; lexical analysis; parsing; syntax-direction translation; symbol tables; basic dependence analysis; intermediate forms; interpreters vs. compilers; run-time storage management; code generation; error detection and recovery.
COMP 5220 ADVANCED TOPICS IN PROGRAMMING LANGUAGES (3). LEC. 3. Pr., COMP 3220. Advanced topics in programming language concepts, design, and implementation.

COMP 5230 DECLARATIVE PROGRAMMING LANGUAGES AND PRINCIPLES (3). LEC. 3. Pr., COMP 3220. Functional and logic programming theoretical foundations, models and implementation issues; example language studies.

COMP 5280 OBJECT ORIENTED PROGRAMMING LANGUAGES AND PRINCIPLES (3). LEC. 3. Pr., OMP 3220. Object oriented language principles and study of the language support for these principles. Example languages and distributed object programming principles.

COMP 5320 DESIGN AND ANALYSIS OF COMPUTER NETWORKS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Computer networks design, including multiplexing, switching, routing, internetworking, transport protocols, congestion control, and performance evaluation.

COMP 5330 PARALLEL AND DISTRIBUTED COMPUTING (3). LEC. 3. Pr., COMP 3500 or COMP 3510. Overview of hardware and software issues in parallel systems: fundamental parallel architectures, programming issues in parallel systems: fundamental parallel architectures, programming languages, tools and algorithms, parallel applications.


COMP 5360 WIRELESS AND MOBILE NETWORKS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Mobile IP, wireless routing, location management, ad-hoc wireless networks, wireless TCP personal communication systems, and GSM.


COMP 5380 PERSONAL AREA NETWORKS (3). LEC. 3. Pr., COMP 4320 or ELEC 6220. Fundamentals of very low power, short-range high-bandwidth personal network technologies such as Bluetooth and direct diffusion.

COMP 5390 3G AND 4G WIRELESS (3). LEC. 3. Coreq., COMP 5360 or ELEC 5110. Exploration of technology types, design issues for handset and network systems, economics. Exploration of standards such as CT2, CT3, IS-91A. Future challenges for 4G.

COMP 5400 FUNDAMENTALS OF COMPUTER GRAPHICS (3). LEC. 3. Pr., COMP 2710 and MATH 2660. Graphics hardware and software components, coordinate systems, 2-D and 3-D transformations, 3-D viewing and projection, clipping and windowing, scan conversion and algorithms, visibility determination and shadowing, and software projects using a graphics software package.

COMP 5500 DISTRIBUTED OPERATING SYSTEMS (3). LEC. 3. Pr., COMP 4320. Basic concepts of distributed systems. Concurrent process communication and synchronization mechanisms, distributed process scheduling, distributed file systems, distributed shared memory, distributed system security and case studies.

COMP 5510 NETWORKED MULTIMEDIA SYSTEMS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Basic concepts, architecture and design of networked multimedia systems.


COMP 5600 ARTIFICIAL INTELLIGENCE (3). LEC. 3. Pr., COMP 3270 and COMP 4640 or departmental approval. Introduction to intelligent agents, search knowledge representation and reasoning, machine learning.

COMP 5610 ARTIFICIAL INTELLIGENCE PROGRAM (3). LEC. 3. Pr., COMP 6600 or departmental approval. Design and implementation of advanced artificial intelligence techniques including expert systems, planning, logic and constraint programming, knowledge representation and heuristic search methods.

COMP 5620 USER INTERFACE DESIGN AND EVALUATION (3). LEC. 3. Pr., COMP 4640 or departmental approval. Theory and practice of designing interfaces for interactive systems, usability engineering techniques; implementing and evaluating interfaces.

COMP 5700 SOFTWARE PROCESS (3). LEC. 3. Pr., COMP 3700 or COMP 3710 or departmental approval. Process models of the software life cycle as well as methods and tools for software development.

COMP 5710 SOFTWARE QUALITY ASSURANCE (3). LEC. 3. Pr., COMP 3700 or COMP 3710 or departmental approval. Processes, methods, and tools associated with the production of robust, high-quality software.

COMP 5720 REAL TIME AND EMBEDDED SYSTEMS (3). LEC. 3. Pr., COMP 3500 or COMP 3510. Concepts of real-time and embedded computer systems. Studies of real-time algorithm issues such as timeliness, time-constrained scheduling and communication. Embedded system issues such as limited memory, low power, and high latency communication. Fall, Spring.

COMP 6000/6006 WEB APPLICATION DEVELOPMENT (3). LEC. 3. Pr., Senior or graduate standing or departmental approval. Design and implementation of web sites and associated applications. Emphasis on user interface design and information organization and presentation. Fall, Spring.

COMP 6010/6016 INTERACTIVE APPLICATIONS IN VISUAL BASIC (3). LEC. 3. Pr., COMP 6000 or departmental approval. Design and implementation of applications like simulations, front-ends to Excel for modeling, interfaces to databases and multimedia applications.

COMP 6020/6026 ADVANCED WEB APPLICATION DEVELOPMENT (3). LEC. 3. Pr., COMP 6000 or departmental approval. Design and implementation of interactive web applications in Java as applets and servlets. Use of concepts like security, internationalization, multi-threading and server/client architectures. Fall, Spring.

COMP 6030/6036 OBJECT-ORIENTED TECHNOLOGIES (3). LEC. 3. Pr., COMP 6000 or departmental approval. Object-oriented design and implementation of a variety of applications including databases and intelligent agents with one or more object-oriented programming language.

COMP 6120/6126 DATABASE SYSTEMS I (3). LEC. 3. Pr., COMP 3270. Theoretical and applied issues related to the analysis, design, and implementation of relational database systems.

COMP 6200/6206 THEORETICAL COMPUTER SCIENCE (3). LEC. 3. Pr., COMP 4200 or departmental approval. The nature of the recursive sets and recursively enumerable sets. Decidability. Context-sensitive grammars and linear-bounded automata, including closure properties; oracles; reduction; the arithmetic hierarchy; the analytic hierarchy.

COMP 6210/6216 COMPILER CONSTRUCTION (3). LEC. 3. Pr., COMP 3220 and COMP 4200. Compiler organization; lexical analysis; parsing; syntax-direction translation; symbol tables; basic dependence analysis; intermediate forms; interpreters vs. compilers; run-time storage management; code generation; error detection and recovery.

COMP 6220/6226 ADVANCED TOPICS IN PROGRAMMING LANGUAGES (3). LEC. 3. Pr., COMP 3220. Advanced topics in programming language concepts, design, and implementation.

COMP 6230/6236 DECLARATIVE PROGRAMMING LANGUAGES AND PRINCIPLES (3). LEC. 3. Pr., COMP 3220. Functional and logic programming theoretical foundations, models and implementation issues; example language studies.

COMP 6280/6286 OBJECT ORIENTED PROGRAMMING LANGUAGES AND PRINCIPLES (3). LEC. 3. Pr., COMP 3220. Object oriented language principles and study of the language support for these principles. Example languages and distributed object programming principles.

COMP 6320/6326 DESIGN AND ANALYSIS OF COMPUTER NETWORKS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Computer network design, including multiplexing, switching, routing, internetworking, transport protocols, congestion control, and performance evaluation.

COMP 6330/6336 PARALLEL AND DISTRIBUTED COMPUTING (3). LEC. 3. Pr., COMP 3500 or COMP 3510. Overview of hardware and software issues in parallel systems: fundamental parallel architectures, programming languages, tools and algorithms, parallel applications.

COMP 6340 NETWORK QUALITY ASSURANCE & SIMULATION (3). LEC. 3. Pr., COMP 4320 or ELEC 5220/6220 or departmental approval. Theoretical and practical aspects of network simulation and quality assurance.

COMP 6360/6366 WIRELESS AND MOBILE NETWORKS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Mobile IP, wireless routing, location management, ad-hoc wireless networks, wireless TCP personal communication systems, and GSM.

COMP 6380/6386 PERSONAL AREA NETWORKS (3). LEC. 3. Pr., COMP 4320 or ELEC 6220. 125damentals of very low power, short-range high-bandwidth personal network technologies such as Bluetooth and direct diffusion.

COMP 6390/6396 3G AND 4G WIRELESS (3). LEC. 3. Coreq., COMP 6360 or ELEC 6110. Exploration of technology types, design issues for handset and network systems, economics. Exploration of standards such as CT2, CT3, IS-91A. Future challenges for 4G.

COMP 6400/6406 FUNDAMENTALS OF COMPUTER GRAPHICS (3). LEC. 3. Pr., COMP 2710 and MATH 2660. Graphics hardware and software components, coordinate systems, 2-D and 3-D transformations, 3-D viewing and projection, clipping and windowing, scan conversion and algorithms, visibility determination and shadowing, and software projects using a graphics software package.

COMP 6500/6506 DISTRIBUTED OPERATING SYSTEMS (3). LEC. 3. Pr., COMP 4320. Basic concepts of distributed systems. Concurrent process communication and synchronization mechanisms, distributed process scheduling, distributed file systems, distributed shared memory, distributed system security and case studies.

COMP 6510/6516 NETWORKED MULTIMEDIA SYSTEMS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Basic concepts, architecture and design of networked multimedia systems.


COMP 6600/6606 ARTIFICIAL INTELLIGENCE (3). LEC. 3. Pr., COMP 3270 and COMP 4640 or departmental approval. Introduction to intelligent agents, search knowledge representation and reasoning, machine learning.

COMP 6610/6616 ARTIFICIAL INTELLIGENCE PROGRAMMING (3). LEC. 3. Pr., COMP 6600 or departmental approval. Design and implementation of advanced artificial intelligence techniques including expert systems, planning, logic and constraint programming, knowledge representation and heuristic search methods.

COMP 6620/6626 USER INTERFACE DESIGN AND EVALUATION (3). LEC. 3. Pr., COMP 4640 or departmental approval. Theory and practice of designing interfaces for interactive systems, usability engineering techniques; implementing and evaluating interfaces.

COMP 6700/6706 SOFTWARE PROCESS (3). LEC. 3. Pr., COMP 3700 or COMP 3710 or departmental approval. Process models of the software life cycle as well as methods and tools for software development.

COMP 6710/6716 SOFTWARE QUALITY ASSURANCE (3). LEC. 3. Pr., COMP 3700 or COMP 3710 or departmental approval. Processes, methods, and tools associated with the production of robust, high-quality software.

COMP 6720/6726 REAL TIME AND EMBEDDED SYSTEMS 125 (3). LEC. 3. Pr., COMP 3500, COMP 3510, or departmental approval. Concepts of real-time and embedded computer systems. Studies of real-time algorithm issues such as timeliness, time-constrained scheduling and communication. Embedded system issues such as limited memory, low power, and high latency communication. Fall, Spring.

COMP 7120/7126 DATABASE SYSTEMS II (3). LEC. 3. Pr., COMP 6120. Theoretical and applied issues related to the analysis, design, and implementation of object-oriented database systems.


COMP 7270/7276 ADVANCED TOPICS IN ALGORITHMS (3). LEC. 3. Pr., COMP 4270 or departmental approval. In-depth study of advanced topics in algorithms.


COMP 7300/7306 ADVANCED COMPUTER ARCHITECTURE (3). LEC. 3. Pr., COMP 4300 or departmental approval. Modern instruction level parallel computer design, including superscalar and very-long instruction word processor design.

COMP 7310/7316 VLSI CAD TOOL DESIGN (3). LEC. 3. Pr., COMP 6210 or departmental approval. Design of CAD tools for VLSI design, including high-level synthesis and hardware-software co-design, logic synthesis, floorplanning, optimization, placement and routing. Software development of a CAD tool as a comprehensive project.

COMP 7320/7326 ADVANCED COMPUTER NETWORKS (3). LEC. 3. Pr., COMP 6320 or departmental approval. Advanced network topics, including ISDN, ATM, active networks, security, Internet, wireless and mobile networks, and network management.

COMP 7330/7336 TOPICS IN PARALLEL AND DISTRIBUTED COMPUTING (3). LEC. 3. Pr., COMP 6330 or departmental approval. Parallel programming languages, environments and tools, parallel algorithms performance issues, distributed memory systems, group communication, fault tolerance.

COMP 7340/7346 HIGH SPEED NETWORKS (3). LEC. 3. Pr., COMP 6320 or departmental approval. High-speed networks design, including ATM and gigabit Ethernets, quality of service, ATM traffic, congestion control, ATM switching, and signaling.

COMP 7350/7356 MULTIMEDIA NETWORKING (3). LEC. 3. Pr., COMP 6320 or departmental approval. Multimedia network requirements, coding, compression, multicast, traffic shaping and analysis, quality of service, scheduling, buffer design and congestion control.

COMP 7360/7366 WIRELESS AND MOBILE NETWORKS (3). LEC. 3. Pr., COMP 6320 or departmental approval. Mobile IP, wireless routing, location management, ad-hoc wireless networks, wireless TCP, personal communication systems, and GSM.

COMP 7370 ADVANCED COMPUTER AND NETWORK SECURITY (3). LEC. 3. Pr., COMP 6370 or departmental approval. Advanced, research-based examination of computer network attack and defense techniques, viruses and other malware; operating system vulnerabilities and safeguards.

COMP 7400/7406 ADVANCED COMPUTER GRAPHICS (3). LEC. 3. Pr., COMP 6400 or departmental approval. Advanced 3-D topics including visual realism issues, visible surface determination algorithms, illumination and shading models, surface and solid modeling, advanced modeling techniques, special purpose graphics architectures, and animation. Software projects will be assigned.

COMP 7440 SIMULATION OF COMPUTER NETWORKS (3). LEC. 3. Pr., COMP 4320 or departmental approval. Research-based examination of network simulation, including TCP/IP networks, wireless networks and verification and validation of a network simulation.

COMP 7500/7506 ADVANCED TOPICS IN OPERATING SYSTEMS (3). LEC. 3. Pr., COMP 6500 or departmental approval. Advanced topics in operating system concepts, design and implementation.

COMP 7600/7606 COMPUTATIONAL INTELLIGENCE (3). LEC. 3. Pr., COMP 6600 or departmental approval. A study of computational intelligence with emphasis on the design and implementation of neural, genetic and fuzzy computing techniques.

COMP 7610/7616 COMPUTATIONAL COGNITION (3). LEC. 3. Pr., COMP 6600 or departmental approval. Computational models of cognition, including knowledge representations and processes mechanisms like means-ends analysis, semantic networks, frames.

COMP 7620/7626 HUMAN-COMPUTER INTERACTION (3). LEC. 3. Coreq., COMP 6620 or departmental approval. Theoretical principles and practical aspects of interaction between humans and computers, design and evaluation of interactive systems.

COMP 7700/7706 SOFTWARE ARCHITECTURE (3). LEC. 3. Pr., COMP 6700 and COMP 6710. Methods and tools related to the analysis, specification and design of software architecture.
COMP 7710/7716 SOFTWARE ENVIRONMENTS (3). LEC. 3. Pr., COMP 6700 and COMP 6710. Issues associated with the design, implementation, and use of software engineering environments.


COMP 7730/7736 FORMAL METHODS FOR SOFTWARE (3). LEC. 3. Pr., COMP 6700 and COMP 6710. Precise, abstract models for characterizing and reasoning about properties of software systems.

COMP 7930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Course may be repeated with change in topic.

COMP 7950/7956 INTRODUCTION TO GRADUATE STUDY IN COMPUTER SCIENCE AND SOFTWARE ENGINEERING (1). LEC. 1. SU. Introduction to graduate study and research topics in computer science and software engineering.

COMP 7970/7976 SPECIAL TOPICS (1-3). LEC. Course may be repeated with change in topic.

COMP 7980/7986 MASTER OF SOFTWARE ENGINEERING DESIGN PROJECT (1-15). IND., SU. Planning, implementation, and completion of a design project. Project culminates in both a written report and an oral presentation. Course may be repeated with change in topic.

COMP 7990 RESEARCH AND THESIS (1-15). MST., TD. Course may be repeated with change in topic.

COMP 8120 CURRENT TOPICS IN DATABASE SYSTEMS (3). LEC. 3. Pr., COMP 6120. Theoretical and applied research issues related to database systems. Topics will reflect current research in the field.

COMP 8220 RESEARCH TOPICS IN PROGRAMMING LANGUAGES (3). LEC. 3. Pr., COMP 7220. Topics of current research in the area of programming languages, their design and implementation.


COMP 8400 CURRENT TOPICS IN COMPUTER GRAPHICS (3). LEC. 3. Pr., COMP 7400 or departmental approval. In-depth study of current research topics in computer graphics. Topics may include theoretical, performance, implementation, and system integration issues. Extensive literature survey, issue identification, performance comparison, and future research trends will be discussed.

COMP 8500 RESEARCH TOPICS IN OPERATING SYSTEMS (3). LEC. 3. Pr., COMP 7500. Topics of current research in the area of operating systems, their design and implementation.

COMP 8600 ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE (3). LEC. 3. Pr., COMP 6610 or COMP 7600 or COMP 7610 or departmental approval. In-depth study of current research topics in Artificial Intelligence, e.g., reasoning mechanisms, heuristic search methods, cognitive modeling.

COMP 8620 ADVANCED TOPICS IN HUMAN-COMPUTER INTERACTION (3). LEC. 3. Pr., COMP 7620 or departmental approval. In-depth study of current research topics in Human-Computer Interaction, e.g., evaluation and assessment methods, multimodal interfaces, educational technology.

COMP 8700/8706 CURRENT TOPICS IN SOFTWARE ENGINEERING (3). LEC. 3. Pr., COMP 6700, COMP 6710, or departmental approval. Current theoretical and applied research issues in software engineering.

COMP 8930 DIRECTED STUDY (1-3). IND. Course may be repeated for a maximum of 6 credit hours.

COMP 8970 SPECIAL TOPICS (1-3). IND. Course may be repeated with change in topic.

COMP 8990 RESEARCH AND DISSERTATION (1-15). DSR., TD. Course may be repeated with change in topic.

Counselor Education, Counseling Psychology, and School Psychology (COUN)

Dr. Holly A. Stadler - 844-2878

COUN 1000 CAREER ORIENTATION AND EXPLORATION (2). LEC. 1. LAB. 2. The process of career decision-making through hands-on activities, in-class exercises and job shadowing.

COUN 2900 INDEPENDENT STUDY (1-3). IND., SU. Reading, research or other work undertaken by a student focused on an area of special interest. Directed by faculty member. Course may be repeated for a maximum of 9 credit hours.

COUN 2940 DIRECTED FIELD EXPERIENCE (1-3). FLD. Pr., departmental approval. Course may be repeated for a maximum of 9 credit hours.

COUN 2970 SPECIAL TOPICS IN COLLEGE STUDENT DEVELOPMENT (1-3). LEC. Pr., Sophomore standing. Selected topics in college student development. Fall, Spring. Course may be repeated for a maximum of 12 credit hours.

COUN 3100 COUNSELING AND HUMAN SERVICES (3). LEC. 3. Pr., junior standing. Counseling concepts and skills appropriate in the helping professions. Not open to graduate students in counseling education.

COUN 7100 INTRODUCTION TO SCHOOL PSYCHOLOGY (3). LEC. 3. Orientation to profession of school psychology; history of the profession, professional roles, ethical and legal standards, and current issues.

COUN 7200 INTRODUCTION TO MEASUREMENT AND ASSESSMENT (3). LEC. 3. Pr., COUN 7100 or COUN 7410, COUN 7420, COUN 7430, COUN 8520. Introduction to the history and theory of measurement and assessment as it applies to counselors and psychologists.


COUN 7230 CAREER DEVELOPMENT AND VOCATIONAL APPRAISAL (3). LEC. 3. Pr., FOUN 7100 or COUN 7200. Career development theories appraising vocationally related interests, aptitudes and personal characteristics. Laboratory practice in test procedures.

COUN 7250 ADVANCED ASSESSMENT AND DIAGNOSIS IN COUNSELING (3). LEC. 3. Pr., COUN 7200; COUN 7100 or COUN 7410, COUN 7420, COUN 7430, COUN 8520. Assessment/diagnostic skills related to counseling: intake, assessment, diagnostic criteria, treatment planning, counseling interventions.

COUN 7310 COUNSELING APPLICATIONS OF LIFESPAN DEVELOPMENT (3). LEC. 3. Theories and current research in development across the lifespan with emphasis on applications to counseling.

COUN 7320/7326 COUNSELING THEORIES (3). LEC. 3. Coreq., COUN 7100 or COUN 7410, COUN 7420, COUN 7430 or COUN 8510, COUN 8520, COUN 8530. Study of major counseling theories.

COUN 7330 COUNSELING DIVERSE POPULATIONS (3). LEC. 3. Pr., departmental approval. Special counseling and advocacy issues. Needs of diverse populations are considered.

COUN 7340 GROUP COUNSELING (3). LEC. 3. Pr., COUN 7320. Leading, developing, evaluating a counseling group; including group proposal, session development, group dynamics, group leadership and evaluation, treatment planning, group intervention, counseling skills.

COUN 7350 INTRODUCTION TO COUNSELING PRACTICE IN SCHOOLS (3). LEC. 3. SU. Pr., COUN 7320; COUN 7100 or COUN 7400. Methods, interventions and skills essential to counseling. Content is specific to school settings.

COUN 7400 ORIENTATION TO PROFESSIONAL COUNSELING (3). LEC. 3. Pr., departmental approval. Orientation to the counseling field with emphasis on philosophical, historical, psychological, and organizational foundations of professional practice.

COUN 7410 COUNSELING IN THE COMMUNITY (3). LEC. 3. Pr., departmental approval. Counselors in mental health settings (such as community agencies, substance abuse treatment programs). Historical, philosophical, psychological, and sociological foundations of community counseling.

COUN 7420 ORIENTATION TO SCHOOL COUNSELING (3). LEC. 3. Pr., departmental approval. Orientation to the role and activities of the K-12
school counselor. Emphasis on the components of a developmentally-ori-
tented school counseling program.
COUN 7430 COLLEGE STUDENT DEVELOPMENT (3). LEC. 3. Pr.,
departmental approval. Theory and practice of counseling and student
services in higher education.
COUN 7900 INDEPENDENT STUDY (1-3). IND. Independent learning
effort directed at desired objectives. Includes evaluation by professor and
student at regular intervals. Course may be repeated for a maximum of 9
credit hours.
COUN 7910 PRACTICUM (3). LEC. 3, SU. Pr., COUN 7320, COUN 7350,
COUN 7410, COUN 7420, COUN 7430 or COUN 7100; departmental
approval. Supervised experiences appropriate to student’s program
emphasis area. Course may be repeated for a maximum of 9 credit hours.
COUN 7920 INTERNSHIP (1-9). INT., SU. Pr., COUN 7910 and depart-
mental approval. Supervised on-the-job experiences. Course may be
repeated for a maximum of 9 credit hours.
COUN 7940 DIRECTED FIELD EXPERIENCE (1-10). FLD., SU. Pr.,
departmental approval. Course may be repeated for a maximum of 10 cre-
dit hours.
COUN 7960 DIRECTED READINGS (1-10). LEC., SU. Pr., departmental
approval. May be taken more than one semester. Course may be repeated
for a maximum of 10 credit hours.
COUN 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be
repeated with change in topic.
COUN 8100 PERSONALITY AND INDIVIDUAL DIFFERENCES (3). LEC.
3. Origins and structure of individual differences in personality and intelli-
gence, and their application to counseling.
COUN 8200 INTELLECTUAL ASSESSMENT OF ADULTS (3). LEC. 2,
Administration and interpretation of selected tests.
COUN 8300 RESEARCH DESIGN IN COUNSELING AND EVALUATION
(3). LEC. 3. Pr., departmental approval. Methods for counseling research
design. Studies, experimental, quasi-experimental, non-experimental, sur-
vey, between subjects and within subjects.
COUN 8510 CONTEMPORARY ISSUES IN COUNSELOR EDUCATION
(3). LEC. 3. Pr., departmental approval. History, development, current
issues, Philosophical assumptions, legal and ethical considerations, new
research service initiatives.
COUN 8520 CONTEMPORARY ISSUES IN SCHOOL PSYCHOLOGY (1-
3). LEC. Pr., departmental approval. History, development, and current
issues. Legal and ethical considerations, research and service initiatives,
and new client populations. Course may be repeated for a maximum of 3
credit hours.
COUN 8530 CONTEMPORARY ISSUES IN COUNSELING PSYCHO-
LOGY (3). LEC. 3. History, development, and current professional issues.
Philosophical and cultural assumptions, legal and ethical considerations,
and current research topics.
COUN 8610 ADVANCED THEORIES: EXISTENTIAL/HUMANISTIC (3).
LEC. 3. Pr., departmental approval. Theorpy and practice of humanistic/existential approaches to individual and group therapy.
COUN 8620 ADVANCED THEORIES: COGNITIVE/BEHAVIORAL Theo-
RIES (3). LEC. 3. Pr., departmental approval. Current cognitive/behavioral
models for understanding human problems and behavior change.
COUN 8630 ADVANCED THEORIES: PSYCHODYNAMIC THEORIES (3).
LEC. 3. Pr., departmental approval. The origins, current status, and emerg-
ing applications of psychodynamic approaches to counseling.
COUN 8910 PRACTICUM (3). LEC. 3. SU. Pr., departmental approval;
entry level practica. Advanced supervised experiences appropriate to stu-
dent’s program emphasis. Course may be repeated for a maximum of 9
credit hours.
COUN 8920 INTERNSHIP (1-9). INT., SU. Pr., departmental approval and
entry level clinical experiences. Advanced supervised on-the-job experi-
ences appropriate to doctoral-level study. Course may be repeated for a
maximum of 9 credit hours.
COUN 8930 INTERNSHIP IN COUNSELING PSYCHOLOGY (0). INT. Pr.,
departmental approval. Supervised, full-time experience in Counseling
Psychology at the doctoral level. Course may be repeated for a maximum
of 5 credit hours.
COUN 8950 ALTERNATIVE RESIDENCY SEMINAR (2). SEM. 2. Pr.,
acceptance in Doctoral Program. Provides intensive study in leadership
and trends in counselor education and supervision. Permits students to
achieve full-time residency. Course may be repeated for a maximum of 8
credit hours.
COUN 8980 FIELD PROJECT (1-10). FLD., SU. Pr., departmental
approval. Required for completion of the Education Specialist degree.
Course may be repeated for a maximum of 10 credit hours.
COUN 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course
may be repeated with change in topic.

Curriculum and Teaching (CTCH)

Dr. Andrew M. Weaver - 844-4434

CTCT 1010 ORIENTATION TO TEACHER EDUCATION (1). LEC. 1, SU.
Pr., Enrolled n the College of Education. Orientation to the teaching profes-
sion.
CTCT 1200 KEYBOARDING AND FORMATTING (3). LEC. 1, LAB. 4.
Mastery of alphanumeric keyboard with basic keyboarding and formatting
applications of business documents. (Students with previous
keyboarding/typing instruction consult with CTBU faculty for place-
ment.)
CTCT 2200/2203 DOCUMENT PROCESSING (3). LEC. 1, LAB. 4. Pr.,
CTCT 1200 or departmental approval. Advanced formatting, processing,
and evaluation of business correspondence, as well as administrative and
employment documents. (Students with previous keyboarding/typing
instruction consult with CTBU faculty for placement.)
CTCT 3000 LEADERSHIP SKILLS FOR PERSONAL AND ORGANIZA-
TIONAL DEVELOPMENT (3). LEC. 3. Pr., junior standing or departmental
approval. Organizational and leadership skills needed to become success-
ful professionals in work or community activities; skills and strategies for
conducting efficient meetings.
CTCT 3100 POWER EQUIPMENT TECHNOLOGY (3). LEC. 2, LAB. 3. Pr.,
MATH 1130. Repair and maintenance of small air-cooled engines and
power equipment in agriculture.
CTCT 3200/3203 RECORDS MANAGEMENT (2). LEC. 2. Pr., satisfactory
score on AU Computer Competency Test or COMP 1000 or departmental
approval. Integrated records management systems, records management
functions, classification systems, micrographics, electronic records, and
records management careers.
CTCT 3240/3243 INFORMATION PROCESSING I (3). LEC. 2, LAB. 2. Pr.,
CTCT 2200 or departmental approval. Exploration of organizational needs
for text-based information processing. Functions and capabilities of text-
based information processing components.
CTCT 3250/3253 INFORMATION PROCESSING II (3). LEC. 2, LAB. 2. Pr.,
CTCT 3240 or departmental approval. Decision-making and business prob-
lem solving using microcomputer software applications including spread-
sheets, database management programs, and operating systems.
CTCT 4000/4003 CLASSROOM/LABORATORY MANAGEMENT, ORGA-
NIZATION AND EVALUATION IN CAREER AND TECHNICAL EDUCA-
TION (2). LEC. 2. Pr., Admission to Teacher Education. Organization,
objectives, principles, management, and evaluation of career and technical
education classrooms, laboratories, and programs.
CTCT 4030 CAREER AND TECHNICAL STUDENT ORGANIZATIONS
(3). LEC. 3. Survey of career and technical student organizations; proce-
dures involved in developing and implementing informal and co-curricular
educational programs for students and preparing students for state and
national competitions.
CTCT 4110 AGRICULTURAL STRUCTURE AND METAL FABRICATION
TECHNOLOGY (3). LEC. 2. LAB. 3. Pr., MATH 1130. Materials selection
and construction procedures for carpentry, concrete, masonry, electricity,
plumbing, and metal fabrication.
CTCT 4160 SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS
(2). LEC. 2. Pr., junior standing. Responsibility for SAEP planning, superi-
orsion, and evaluation of entrepreneurship, placement, exploratory, analyti-
cal, and experimental SAEPs and record books; completing award applica-
tions.
CTCT 4200/4203 MANAGING OFFICE SYSTEMS (3). LEC. 2. LAB. 2. Pr.,
CTCT 3250 or departmental approval. Capstone course with emphasis on
integration of information processing procedures, administrative support,
and management functions.
CTCT 4900 DIRECTED INDEPENDENT STUDY (1-6). IND. Pr., depart-
mental approval. The student’s learning efforts are guided toward desired

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CTCT 4200 or departmental approval and junior standing. Management of administrative services.

CTCT 6050/6058 METHODS OF TEACHING IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., Departmental approval. Coordination, placement, and supervision of students in work-experience programs; development of employability skills and habits in students.

CTCT 6050/6056 METHODS OF TEACHING IN AREA OF SPECIALIZATION (3). LEC. 2. LAB. 2. Pr., admission to 5th-Year Program. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for programs within the area of specialization. Credit will not be given for both CTCT 5060 and CTCT 6050.

CTCT 5060 PROGRAM PLANNING IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., admission to Teacher Education. Coreq., CTCT 5050. Introduction to principles and practices involved in designing education programs in the area of specialization. Credit will not be given for both CTCT 5060 and CTCT 6050.

CTCT 6060 PROGRAM PLANNING IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., admission to 5th-Year Program. Introduction to principles and practices involved in designing education programs in the area of specialization. Credit will not be given for both CTCT 6050 and CTCT 6060.

CTCT 6080/6086 COORDINATION AND SUPERVISION OF WORK-BASED LEARNING (3). LEC. 3. Pr., Departmental approval. Coordination, placement, and supervision of students in work-experience programs; development of employability skills and habits in students.

CTCT 7000 FOUNDATIONS OF VOCATIONAL EDUCATION (3). LEC. 3. Philosophical, historical, economic, and sociological perspectives of vocational education in relation to the organization of vocational education programs.

CTCT 7010 YOUTH PROGRAM DEVELOPMENT (3). LEC. 3. Pr., Departmental approval. Developing, managing, and evaluating formal and informal youth education programs; training volunteers for youth development programs; securing and developing supporting resources.

CTCT 7100 TEACHING MECHANICAL TECHNOLOGY (3). LEC. 2. LAB. 2. Pr., CTCT 4050 or CTCT 7050 or departmental approval. Theory and practice of managing agricultural mechanics laboratories, theories of machine operation, and practice of maintaining laboratory equipment.

CTCT 7120 COURSES OF STUDY IN AGRISCIENCE EDUCATION (3). LEC. 3. Pr., CTCT 4060 or CTCT 7060 or departmental approval. Emerging technologies in agriscience education; principles and procedures of curriculum construction applied to courses of study in agriscience education.

CTCT 7200 CAREER AND OCCUPATIONAL INFORMATION (3). LEC. 3. Trends and issues in occupational structure, job qualifications and requirements, and sources of occupational information for new and emerging occupations; analysis of career education models for students.

CTCT 7240/7246 ADMINISTRATIVE MANAGEMENT (3). LEC. 3. Pr., CTCT 4200 or departmental approval and junior standing. Management of office systems, information and personnel. Managing and controlling administrative services.

CTCT 7300 LEARNING RESOURCES IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., CTCT 4050 and junior standing or CTCT 7050 or departmental approval. Selecting, developing, utilizing, and evaluating instructional resources and technology for teaching.

CTCT 7710/7716 ADVANCED TEACHING METHODS (3). LEC. 3. Pr., CTCT 5050/5053 or CTCT 6050/6056 or departmental approval. Analysis of research in theories of teaching and learning, effective teacher characteristics, learning styles, teaching methodologies, and diversity in teaching.

CTCT 7720 ADVANCED PROGRAM PLANNING IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., CTCT 4060 or CTCT 7060 or departmental approval. Issues affecting the development and management of educational programs; strategies for improving educational programs.

CTCT 7730 PROGRAM EVALUATION (3). LEC. 3. Pr., CTCT 7720 or departmental approval. Principles and procedures used in evaluating vocational, technical, extension and training programs. Alternative approaches to evaluation and practical guidelines for conducting evaluations.

CTCT 7750 ADMINISTRATION OF VOCATIONAL EDUCATION (3). LEC. 2. LAB. 2. Pr., departmental approval. Introduction to concepts, theories and practices related to administration, organizational behavior, and leadership in secondary and post-secondary vocational education programs.

CTCT 7760 COMPREHENSIVE PLANNING IN VOCATIONAL EDUCATION (3). LEC. 2. LAB. 2. Pr., CTCT 7750 or departmental approval. Processes of comprehensive planning for vocational education programs at high school and secondary school levels using local, state, and regional data.

CTCT 7770 CLINICAL SUPERVISION (3). LEC. 3. Pr., CTCT 7710 or departmental approval. Theories, concepts, models, and techniques of student teacher and beginning teacher supervision by administrators, school district personnel, and university supervisors. Recommended for individuals who supervise or plan to supervise student teachers.

CTCT 7780 RESEARCH IN VOCATIONAL AND ADULT EDUCATION (3). LEC. 3. Pr., 3-6 hours of graduate-level statistics, departmental approval. Review, analysis and interpretation of research procedures and data with emphasis on designing new research in vocational and adult education.

CTCT 7810 SUPERVISED COLLEGE TEACHING (1). LEC. 1. Pr., Departmental approval. Practical experience in the classroom under the supervision of a faculty mentor. Course may be repeated for a maximum of 2 credit hours.

CTCT 7900 INDEPENDENT STUDY (1-3). IND. Pr., departmental approval. Independent learning effort directed toward desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 3 credit hours.

CTCT 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-3). LEC. 3. Pr., Departmental approval. Experiences closely relating theory and practice. Course may be repeated for a maximum of 3 credit hours.

CTCT 7920 INTERNSHIP (1-10). INT., SU. Pr., CTCT 7050 or departmental approval. Supervised internship experiences in a school, college or other appropriate setting. Evaluation and analysis of the internship experience. Course may be repeated for a maximum of 10 credit hours.

CTCT 7950 SEMINAR IN AREA OF SPECIALIZATION (1-3). SEM., SU. Pr., departmental approval. Presentation by graduate students of research projects and/or findings. Analysis of procedures and findings. Course may be repeated for a maximum of 3 credit hours.

CTCT 7960/7966 READINGS IN AREA OF SPECIALIZATION (1-3). IND. Pr., departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 3 credit hours.

CTCT 7970/7976 TOPICS IN AREA OF SPECIALIZATION (1-6). LEC. Pr., departmental approval. Current or advanced topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

CTCT 7980 RESEARCH AND THESIS (1-10). INT., SU. Pr., CTCT 7050 or departmental approval. Supervised research experiences in a school, college or other appropriate setting. Evaluation of procedures and findings. Course may be repeated for a maximum of 10 credit hours.

CTCT 8730 CURRICULUM DEVELOPMENT IN VOCATIONAL EDUCATION (3). LEC. 3. Pr., CTCT 7730 or departmental approval. Principles involved in vocational education curriculum planning, identification of educational needs of students, selecting technical content, designing curriculum, and evaluating materials.

CTCT 8770 SUPERVISION OF INSTRUCTION (3). LEC. 3. Pr., CTCT 7770 or departmental approval. Principles and models to become effective supervisors of vocational and adult education programs; philosophies and
styles of supervision used to improve schools, instruction, curriculum and personnel.

CTCT 8800 TEACHER EDUCATION (3). LEC. 3. Pr., departmental approval. Emphasis on beliefs, philosophy, issues, research, roles, student selection, curriculum, methodology, internships, organization, and administration of teacher education programs.

CTCT 8810 SUPERVISED COLLEGE TEACHING (1-10). LEC., 3-, 9G. Practical experience in the classroom under the supervision of a faculty mentor. Course may be repeated for a maximum of 10 credit hours.

CTCT 8900 ADVANCED INDEPENDENT STUDY (1-6). IND. Pr., departmental approval. Independent learning efforts at desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTCT 8910 ADVANCED PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Experiences closely relating theory and practice. Course may be repeated for a maximum of 6 credit hours.

CTCT 8920 INTERNSHIP (1-10). INT., SU. Pr., departmental approval. Supervised internship experiences in a school, college or other appropriate setting. Evaluation and analysis of the internship experience. Course may be repeated for a maximum of 10 credit hours.

CTCT 8950 ADVANCED SEMINAR IN AREA OF SPECIALIZATION (1-6). SEM., SU. Pr., departmental approval. Selected concepts and theoretical formulations of common interest. Course may be repeated for a maximum of 6 credit hours.

CTCT 8960 READINGS IN AREA OF SPECIALIZATION (1-6). IND. Pr., departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 6 credit hours.

CTCT 8970 ADVANCED TOPICS IN AREA OF SPECIALIZATION (1-6). LEC. Pr., departmental approval. Current or advanced topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

CTCT 8980 FIELD PROJECT (1-10). FLD. 1, SU. Pr., departmental approval. Field project. Course may be repeated for a maximum of 10 credit hours.

CTCT 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Course may be repeated for a maximum of 20 credit hours.

CTCT 1010 ORIENTATION TO TEACHER EDUCATION (1). LEC. 1. SU. Pr., Enrolled in the College of Education. Orientation to the teaching profession.

CTCT 3020 PRIMARY MATH AND SCIENCE (3). LEC. 3. Pr., admission to Teacher Education. Exploration of learning and pedagogy for the development of math and science concepts appropriate for children in kindergarten through Grade 3.


CTCT 3150 LANGUAGE DEVELOPMENT: IMPLICATIONS FOR THE CHILDHOOD EDUCATOR (3). LEC. 3. Applications of language development theories to teaching children. Emphasis on the effects theories have on curriculum and teaching.

CTCT 3200 A WORKING THEORY FOR THE CONSTRUCTIVIST EDUCATOR (3). LEC. 3. Pr., admission to Early Childhood Teacher Education. Constructivist theory for pre-service teachers preparing to teach at the early childhood level.


CTCT 4900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Reading, research or other work undertaken independently by a student focused on a content area of special interest. Course may be repeated for a maximum of 6 credit hours.

CTCT 4910 PRACTICUM (1-6). PRA., SU. Pr., departmental approval. Students and faculty cooperatively select and execute an appropriate field experience. Course may be repeated for a maximum of 6 credit hours.
CTEC 8950 ALTERNATIVE RESIDENCE SEMINAR (2-4). SEM. 2. SU. Pr., enrollment in Alternative Residence Program. Must complete this two semester sequence during the fall and winter semesters. Credit does not count toward minimum requirements for the doctoral program.

CTEC 8970 SPECIAL TOPICS (3-9). LEC. Pr., Departmental Approval. Cooperative pursuit of selected concepts and theories, normally in small groups. Course may be repeated for a maximum of 9 credit hours.

CTEC 8980 FIELD PROJECT (1-3). FLD., SU. Pr., departmental approval. Course may be repeated for a maximum of 3 credit hours.

CTEC 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

ELEMENTARY EDUCATION (CTEE)

CTEE 1010 ORIENTATION TO TEACHER EDUCATION (1). LEC. 1. SU. Pr., Enrolled in College of Education. Orientation to the teaching profession.


CTEE 4020 CURRICULUM: LANGUAGE ARTS (3). LEC. 2, LAB. 3. Pr., Admission to Teacher Education. Coreq., CTEE 4010. Content and methodology of teaching language arts (reading, writing, listening, speaking, and viewing) in kindergarten through grade six in order to develop communicative competence.


CTEE 4900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Reading, research, or other work undertaken by a student focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTEE 4910 PRACTICUM (1-6). PRA., SU. Pr., departmental approval. Students and faculty cooperatively select an appropriate field experience. Course may be repeated for a maximum of 6 credit hours.

CTEE 4920 INTERNSHIP (5-10). INT. 5. SU. Pr., CTRD 3710 and FOUN 3100, CTEE 4010, CTEE 4030, and CTEE 4040. Coreq., CTEE 4950. Supervised teaching in a public elementary school accompanied by scheduled discussions to analyze and evaluate the intern's experience. Course may be repeated for a maximum of 10 credit hours.

CTEE 4950 PROFESSIONAL DEVELOPMENT SEMINAR (1-4). IND. 1. SU. Pr., admission to Elementary Teacher Education Program. Reflection, exploration, and study of elementary education practices in kindergarten through grade six. Course may be repeated for a maximum of 4 credit hours.

CTEE 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College; departmental approval. Individual readings program. Course may be repeated for a maximum of 3 credit hours.

CTEE 4970 SPECIAL TOPICS (1-6). IND. Pr., senior standing; departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 6 credit hours.

CTEE 4997 HONORS THESIS (1-3). IND. Pr., senior standing, membership in the Honors College; departmental approval. The student thesis is finalized in this course. Course may be repeated for a maximum of 3 credit hours.

CTEE 7010 APPROACHES TO TEACHING (3). LEC. 3. Organizational patterns, planning and approaches to instruction in the elementary school.

CTEE 7490 THE ELEMENTARY SCHOOL PROGRAM (3). LEC. 3. Major curriculum areas and teaching practices in the modern elementary school. Implications of research and theory for the total elementary school program.

CTEE 7510 RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (3). RES. 3. A review, analysis and interpretation of data with emphasis on designing research to meet the changing needs of the school.

CTEE 7520 CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (3). LEC. 3. Teaching practices and re-appraisal of selected experiences and content for curriculum improvement. Course may be repeated for a maximum of 9 credit hours.

CTEE 7530 ORGANIZATION OF PROGRAMS IN ELEMENTARY EDUCATION (3). LEC. 3. Organization and development of basic and supplementary materials for guiding teachers and school systems in improvement of curriculum and teaching practices.

CTEE 7540 EVALUATION OF PROGRAMS IN AREAS OF SPECIALIZATION (3). LEC. 3. Evaluation methods and exploration of evaluation literature in areas of specialization.

CTEE 7900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Independent study related to student’s respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTEE 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Provides individual students with experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTEE 7920 INTERNSHIP (1-9). INT., SU. Pr., departmental approval. Supervised on-the-job experiences in a school, college or other appropriate setting, accompanied by regularly scheduled, on-campus discussion periods. Course may be repeated for a maximum of 9 credit hours.

CTEE 7970 SPECIAL TOPICS (1-6). LEC. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

CTEE 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated for a maximum of 10 credit hours.

CTEE 8950 ALTERNATIVE RESIDENCE SEMINAR (2). LEC. 2, SU. Pr., Enrollment in Alternative Residence Program. Students must complete this two semester sequence during the fall and winter semesters. Credit does not count toward minimum requirements for the doctoral program.

CTEE 8970 SPECIAL TOPICS (1-6). LEC. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

CTEE 8980 FIELD PROJECT (1-10). FLD., SU. Course may be repeated for a maximum of 10 credit hours.

CTEE 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated for a maximum of 20 credit hours.

ENGLISH AS A SECOND LANGUAGE (CTES)

CTES 5410/6410 LANGUAGE MINORITY STUDENTS K-12 (3). LEC. 3. Non-major course to prepare elementary and secondary teachers to work effectively with English language learners (ELLs). Topics include instructional models for teaching ELLs.

CTES 7400 TECHNOLOGY AND MEDIA IN ESL (3). LEC. 3. Application of instructional technology in second language instruction, authentic materials in the ESL classroom.

CTES 7420 SECOND LANGUAGE ACQUISITION (3). LEC. 3. Analysis of theories of second language acquisition from psycholinguistic, neurolinguistic and sociolinguistic perspectives.

CTES 7460 TEACHING ENGLISH AS A SECOND LANGUAGE (ESL) IN PRE-K-12 (3). LEC. 3. Teaching practices and curriculum selection in Pre-K-12 ESL.

CTES 7470 ISSUES IN ESL EDUCATION (3). LEC. 3. Examination of central issues in the teaching and learning of ESL including language policy, language diversity, and multiculturalism.


CTES 7920 INTERNSHIP: ENGLISH AS A SECOND LANGUAGE (3-9). INT., SU. Supervised teaching in a K-12 public school accompanied by scheduled discussions to analyze and evaluate the intern’s experience.
MIDDLE SCHOOL EDUCATION (CTMD)

CTMD 4010 TEACHING MATHEMATICS: MIDDLE SCHOOL (4). LEC. 2, LAB. 4. Pr., CTSE 4040 or departmental approval. Specific teaching strategies for a comprehensive middle school program grades 4-8.

CTMD 4190 CURRICULUM AND TEACHING IN THE MIDDLE SCHOOL (3). LEC. 2, LAB. 2. Pr., FOUN 3000; admission to Teacher Education; junior standing; or departmental approval. To introduce and prepare undergraduate education students for the middle school setting, middle school teaching, and middle level philosophy while incorporating reflective decision making.

CTMD 4900 INDEPENDENT STUDY (1-6). IND. Pr., departmental approval. Independent study directed at desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMD 4910 PRACTICUM IN MIDDLE SCHOOL EDUCATION (1-6). PRA., SU. Pr., departmental approval. Provides experience relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 6 credit hours.

CTMD 4920 INTERNSHIP (9). INT. 9, SU. Pr., CTSE 4150 and CTSE 4160. Coreq., CTSE 4160. Supervised teaching in a public middle or secondary school, accompanied by scheduled discussions to analyze and evaluate the intern's experience. CTMD 4970 SPECIAL TOPICS (1-4). IND. Course may be repeated for a maximum of 4 credit hours.

CTMD 7900 INDEPENDENT STUDY (1-6). IND. Pr., departmental approval. Independent study directed toward desired objectives related to the respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMD 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTMD 7970 SPECIAL TOPICS (1-6). LEC. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

MUSIC EDUCATION (CTMU)

CTMU 1010 ORIENTATION TO TEACHER EDUCATION (1). LEC. 1. SU. Pr., Enrolled in the College of Education. Orientation to the teaching profession.

CTMU 3040 MUSIC AND RELATED ARTS (4). LEC. 2. LAB. 4. Pr., admission to Teacher Education. Interdisciplinary instruction appropriate for students' developmental characteristics which synthesize the content, professional resources, curriculum goals and instructional strategies of music.

CTMU 4900 INDEPENDENT STUDY (1-6). IND. Pr., departmental approval. Independent reading, research or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTMU 4910 PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Cooperatively selected field experience. Course may be repeated for a maximum of 6 credit hours.

CTMU 4920 INTERNSHIP (10). INT. 9, SU. Pr., departmental approval. Coreq., CTSE 4200. Supervised on-the-job experience in a school, college or other appropriate setting, accompanied by regularly scheduled discussions with supervising faculty provide evaluation and analysis of the intern experience.

CTMU 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College; departmental approval. Individual readings program. Course may be repeated for a maximum of 3 credit hours.

CTMU 4970 SPECIAL TOPICS IN AREA OF SPECIALIZATION (1-6). IND. Pr., Departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 6 credit hours.

CTMU 4997 HONORS THESIS (1-3). IND. Pr., senior standing; membership in the Honors College. The student's thesis is finalized in this course. Course may be repeated for a maximum of 3 credit hours.

CTMU 5940 ELEMENTARY/MIDDLE SCHOOL MUSIC METHODS (3). LEC. 3. Pr., admission to Teacher Education Methodology, materials, organization and activities for elementary and middle school music programs. Includes professional field experiences in public school music programs.

CTMU 5960 SECONDARY MUSIC METHODS (3). LEC. 3. Pr., admission to Teacher Education. Methodology, materials, organization and activities for secondary music programs. Includes professional field experiences in public school music programs.

CTMU 6910 ELEMENTARY/MIDDLE SCHOOL MUSIC METHODS (3). LEC. 3. Pr., Admission to Teacher Education Methodology, materials, organization and activities for elementary and middle school music programs. Includes professional field experiences in public school music programs.

CTMU 6960 SECONDARY MUSIC METHODS (3). LEC. 3. Pr., admission to Teacher Education. Methodology, materials, organization and activities for secondary music programs. Includes professional field experiences in public school music programs.

CTMU 7510/7516 RESEARCH STUDIES IN MUSIC EDUCATION (3). RES. 3. Review, analysis and interpretation of available research with emphasis on designing new research to meet the changing needs of school musicians.

CTMU 7520/7526 CURRICULUM AND TEACHING IN MUSIC EDUCATION (3). LEC. 3. Teaching practices and evaluation of experiences and content for curriculum improvements. Students develop recommendations for music curriculum.

CTMU 7530/7536 ORGANIZATION OF PROGRAM IN MUSIC EDUCATION (3). LEC. 3. Program, organization and development of basic and supplementary materials for guiding teachers, facilities and school systems in continuous improvement of curriculum and teaching practices in music education.

CTMU 7540/7546 EVALUATION OF PROGRAM IN MUSIC EDUCATION (3). LEC. 3. Evaluation and investigation of teaching effectiveness including the utilization of human and material resources and the coordination of areas of specialization and issues in evaluation which are unique to music education settings.

CTMU 7550/7556 APPLICATIONS OF TECHNOLOGY IN MUSIC EDUCATION (3). LEC. 3. An overview of applications of current technology in music classroom, studios, and offices.

CTMU 7560/7566 DIGITAL MEDIA PRODUCTION FOR MUSIC EDUCATION (3). LEC. 3. Pr., CTMU 7550 or departmental approval. Current tools, skills, and concepts for creating aural and visual interactive applications.

CTMU 7570 MUSIC INSTRUCTION MULTIMEDIA RESEARCH AND DEVELOPMENT (3). LEC. 3. Pr., CTMU 7550 or departmental approval. Current research music instructional technology, design of interactive applications.

CTMU 7900/7906 INDEPENDENT STUDY (1-6). IND. Pr., departmental approval. Independent study directed toward desired objectives related to student's respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTMU 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTMU 7920 INTERNSHIP (1-10). INT. 9, SU. Pr., departmental approval. Supervised on-the-job experiences in a school, college or other appropriate setting, accompanied by regularly scheduled, on-campus discussion periods. Course may be repeated for a maximum of 10 credit hours.

CTMU 7970/7976 SPECIAL TOPICS (1-6). LEC. Pr., Departmental Approval. Provides an opportunity for graduate students and professors to pursue cooperatively selected topics.

CTMU 7990 RESEARCH AND THESIS (1-10). MST, TD. Course may be repeated with change in topic.

CTMU 8950 ALTERNATIVE RESIDENCE SEMINAR (2). SEM. 2. SU. Pr., enrollment in Alternative Residence Program. Students must complete this two semester sequence during the fall and winter semesters. Credit does not count toward minimum requirements for the doctoral program.

CTMU 8980/8986 FIELD PROJECT (1-3). FLD., SU. Course may be repeated for a maximum of 3 credit hours.

CTMU 8990 RESEARCH AND DISSERTATION (1-10). DSR, TD. Course may be repeated with change in topic.
READING EDUCATION (CTRD)


CTRD 3710 FUNDAMENTALS OF LANGUAGE AND LITERACY INSTRUCTION II (3). LEC. 2, LAB. 2. Pr., CTRD 3700, admission to Teacher Education. Research-based theory and teaching strategies to meet the language and literacy needs of all children, especially those at risk of reading difficulties. Includes laboratory teaching experience.

CTRD 4900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Independent reading, research, or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTRD 5030 THE READING OF ADOLESCENTS (3). LEC. 3. Reading patterns of adolescents and uses of young adult literature in reading and English language arts programs, grades 6-12.

CTRD 5700 DEVELOPMENTAL READING K-12 (3). LEC. 3. Pr., admission to Teacher Education. Theoretical and research foundations for a balanced approach to reading assessment and instruction, K-12.


CTRD 6030 THE READING OF ADOLESCENTS (3). LEC. 3. Reading patterns of adolescents and uses of young adult literature in reading and English language arts programs, grades 6-12.

CTRD 6700 DEVELOPMENTAL READING K-12 (3). LEC. 3. Pr., admission to Teacher Education. Theoretical and research foundations for a balanced approach to reading assessment and instruction, K-12.


CTRD 7510 RESEARCH STUDIES IN READING EDUCATION (3). RES. 3. Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.

CTRD 7520 CURRICULUM AND TEACHING IN READING EDUCATION (3). LEC. 3. Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.

CTRD 7530 ORGANIZATION OF PROGRAM IN READING EDUCATION (3). LEC. 3. Program, organization and development of basic and supplementary materials for guiding teachers, faculties and school systems in the continuous improvement of curriculum and teaching practices.

CTRD 7540 EVALUATION OF PROGRAM IN READING EDUCATION (3). LEC. 3. Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

CTRD 7900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Independent study directed toward desired objectives related to respective areas of specialization. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

CTRD 7910 PRACTICUM IN AREA OF SPECIALIZATION (1-6). PRA., SU. Pr., departmental approval. Experience relating theory and practice, usually in a school setting. Course may be repeated for a maximum of 6 credit hours.

CTRD 7920 INTERNSHIP (1-9). INT., SU. Pr., departmental approval. Supervised on-the-job experiences in a school, college or other appropriate setting, accompanied by regularly scheduled, on-campus discussion periods. Course may be repeated for a maximum of 9 credit hours.

CTRD 7970 SPECIAL TOPICS (1-6). LEC. Pr., Departmental Approval. Provides an opportunity for graduate students and professors to pursue cooperatively selected topics.

CTRD 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.

CTRD 8950 ALTERNATIVE RESIDENCE SEMINAR (2). SEM. 2, SU. Pr., Enrolled in Alternative Residence Program. Required of students in an alternative residence plan. These students must complete this two-semester sequence during the fall and winter semesters. Credit does not count toward minimum requirements for the doctoral program.

CTRD 8990 FIELD PROJECT (1-10). FLD., SU. Course may be repeated for a maximum of 10 credit hours.

CTRD 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

SECONARY EDUCATION (CTSE)

CTSE 1010 ORIENTATION TO TEACHER EDUCATION (1). LEC. 1, SU. Pr., Enrolled in the College of Education. Orientation to the teaching profession.

CTSE 1020 DEVELOPMENTAL STUDIES: MATHEMATICS (2). LEC. 1, LAB. 2. Pr., Departmental approval. Develops mathematics skills conducive to successful college study. Credit counts toward enrollment, but not graduation.

CTSE 1030 DEVELOPMENTAL STUDIES: ENGLISH LANGUAGE ARTS (2). LEC. 1, LAB. 2. Pr., SU. Pr., Departmental approval. Develops reading/study and composition skills conducive to successful college study. Credit not counted toward graduation. Course may be repeated for a maximum of 4 credit hours.


CTSE 4060 CURRICULUM AND TEACHING II: SOCIAL SCIENCE (4). LEC. 2, LAB. 4. Pr., CTSE 4050, CTSE 4210, and pending internship. Curriculum decision making and planning for instruction, evaluation, and classroom management.

CTSE 4070 CURRICULUM AND TEACHING I: FOREIGN LANGUAGE (4). LEC. 2, LAB. 4. Pr., admission to Teacher Education. Strategies for teaching foreign language students with a special emphasis on developing good instruction for comprehensible input and emerging speech tasks.

CTSE 4080 CURRICULUM AND TEACHING II: FOREIGN LANGUAGE (4). LEC. 2, LAB. 4. Pr., CTSE 4070. Teaching strategies based on language acquisition theories that are appropriate for teaching foreign language students.

CTSE 4090 CURRICULUM AND TEACHING II: SCIENCE (4). LEC. 2, LAB. 4. Pr., Admission to Teacher Education. Planning, teaching strategies, evaluation techniques and classroom management procedures needed to be a successful science teacher.


CTSE 4150 CURRICULUM AND TEACHING I: ENGLISH LANGUAGE ARTS (4). LEC. 2, LAB. 4. Pr., junior standing; CTSE 4010, CTSE 6020, FOUN 3000; admission to Teacher Education or departmental approval. Teaching the expressive English language arts, writing and speaking, in middle and high school classrooms.

CTSE 4160 CURRICULUM AND TEACHING II: ENGLISH LANGUAGE ARTS (4). LEC. 2, LAB. 4. Pr., junior standing; CTSE 4150, CTRD 6030, CTRD 6710 and admission to Teacher Education or departmental approval. Teaching the receptive English language arts; reading, listening, and viewing; in middle and high school classrooms.

CTSE 4200 MANAGING MIDDLE AND HIGH SCHOOL CLASSROOMS (2). LEC. 2. Pr., Senior or graduate student. Coreq., CTSE 4920 or CTRD 7920. The role of the teacher in classroom management. Methods for developing a positive learning environment.

CTSE 4210 SOCIAL SCIENCE CONCEPTS AND METHODS (3). LEC. 3. Pr., 15 hours in social sciences (2000 level or above) and pending internship. For pre-service teachers. Organizing social science disciplinary
knowledge into an integrated framework that is meaningful, useful, and relevant to high school students.

CTSE 4900 INDEPENDENT STUDY (1-6). IND., SU. Pr., departmental approval. Independent reading, research, or other work focused on a content area of special interest. The student is directed by a faculty member. Course may be repeated for a maximum of 6 credit hours.

CTSE 4910 PRACTICUM (1-6). PRA., SU. Pr., departmental approval. Cooperatively selected field experience. Course may be repeated for a maximum of 6 credit hours.

CTSE 4920 INTERNSHIP (10). INT. 10. SU. Pr., Departmental approval. Coreq., CTSE 4200. Supervised teaching in a public secondary school, accompanied by scheduled discussions to analyze and evaluate the Intern’s experience.

CTSE 4967 HONORS READINGS (1-3). IND., SU. Pr., membership in the Honors College; departmental approval. Individual readings program. Course may be repeated for a maximum of 3 credit hours.

CTSE 4970 SPECIAL TOPICS (1-4). IND. Pr., departmental approval. Cooperatively selected concepts and theories pursued, normally in small groups. Course may be repeated for a maximum of 4 credit hours.

CTSE 4997 HONORS TESIS (1-3). IND., SU. Pr., membership in the Honors College. The student thesis is finalized in this course. Course may be repeated for a maximum of 5 credit hours.

CTSE 5010 LANGUAGE STUDY FOR TEACHERS (3). LEC. 3. Pr., junior standing or departmental approval. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics.

CTSE 5020 RHETORIC AND COMPOSITION FOR TEACHERS (3). LEC. 3. Pr., junior standing. Theories of rhetoric and composition applicable to middle and high school classrooms; implications for planning writing curricula, instruction, and assessment/evaluation.

CTSE 5710 LANGUAGE STUDY FOR TEACHERS (3). LEC. 3. Pr., junior standing or departmental approval. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics.

CTSE 6010 LANGUAGE STUDY FOR TEACHERS (3). LEC. 3. Pr., junior standing or departmental approval. Theories of language development and language study applicable to middle and high school classrooms; implications for teaching grammar, usage, dialects, and semantics.

CTSE 6020 RHETORIC AND COMPOSITION FOR TEACHERS (3). LEC. 3. Pr., junior standing. Theories of rhetoric and composition applicable to middle and high school classrooms; implications for planning writing curricula, instruction, and assessment/evaluation.

CTSE 6710 LANGUAGE STUDY FOR TEACHERS (3). LEC. 3. Pr., ECON 2020 or ECON 2037, 2.2 GPA. Description of the many substantive areas in which law has an economics foundation and an analysis of how law affects economic theory, inflation and unemployment, money and banking and fiscal and monetary policy.


ECON 2037 PRINC OF MACROECONOMICS (3). LEC. 3. Pr., ECON 2020 or ECON 2027, 2.2 GPA. Economic principles emphasizing economic aggregates, including: measuring economic performance, macroeconomic theory, inflation and unemployment, money and banking and fiscal and monetary policy.

ECON 3020 INTERMEDIATE MICROECONOMICS (3). LEC. 3. Pr., ECON 2020 or ECON 2027, 2.2 GPA. Theoretical and institutional analysis of monetary systems, foreign exchange and commercial banking.

ECON 3300 ECONOMICS OF SPORTS (3). LEC. 3. Pr., ECON 2020 or ECON 2027, 2.2 GPA. Application of economic analysis to matters of litigation, especially the calculation of economic damages, or economic loss.

ECON 3500 COMPARATIVE ECONOMIC SYSTEMS (3). LEC. 3. Pr. ECON 2030 or ECON 2037, 2.2 GPA. Analysis of alternative government approaches to solving basic economic problems.
ECON 3700 HISTORY OF ECONOMIC THOUGHT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. The development of economic ideas, principles and systems of analysis from early times to the present.

ECON 3800 PUBLIC CHOICE (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Economic analysis of public sector decision making. Emphasis on actions taken by government, local government, bureaucrats, lobbyists and elected to influence public sector outcomes.

ECON 4000 ECONOMICS OF WORK AND PAY (3). LEC. 3. Pr., ECON 3020 or ECON 2030 and departmental approval, 2.2 GPA. Theoretical and institutional examination of the labor market, including wage theories, unionism, occupational choice and public policy.

ECON 4100 INDUSTRIAL ORGANIZATION (3). LEC. 3. Pr., ECON 2030 or ECON 2037, ECON 3020, 2.2 GPA. Relationship of market structure to the pricing behavior and economic performance of firms. Topics include regulation, research and development and technical change.

ECON 4200 GOVERNMENT, BUSINESS AND SOCIETY (3). LEC. 3. Pr., ECON 2030 or ECON 2037, ECON 3020, 2.2 GPA. Economic role of government in a free enterprise economy. Application of microeconomic theory to policy issues, particularly antitrust and regulation.

ECON 4300 INTERNATIONAL ECONOMICS (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Economic consequences of free trade, including identification and measurement of gains and losses. Analysis of trade restrictions such as quotas, tariffs and VERs, Examination of labor and capital movements between nations.

ECON 4500 ECONOMIC HISTORY OF EUROPE (3). LEC. 3. Pr., ECON 2030 or 2037 or departmental approval, 2.2 GPA. Survey of the economic development of Europe and the resulting impact on the U.S. and the world economies.

ECON 4700 BUSINESS HISTORY OF THE UNITED STATES (3). LEC. 3. Pr., ECON 2030 or ECON 2037, or departmental approval, 2.2 GPA. The study of business as the driving force in American economic history.

ECON 4920 INTERNSHIP (1-3). INT. SU. Pr., ECON 2030 or ECON 2037 and departmental approval, 2.2 GPA. Course may be repeated for a maximum of 3 credit hours.

ECON 4967 HONORS READINGS (1-3). IND. Pr., ECON 3020; membership in the Honors College; departmental approval, 2.2 GPA. Directed readings on a topic of special interest. Course may be repeated for a maximum of 3 credit hours.

ECON 4970 SPECIAL PROBLEMS (1-3). IND., SU. Pr., ECON 3020 and departmental approval, 2.2 GPA. Investigation and research into economic problems of special interest to the student and instructor. Course may be repeated for a maximum of 6 credit hours.

ECON 4997 HONORS THESIS (1-3). IND. Pr., ECON 3020; membership in the Honors College; departmental approval, 2.2 GPA. Directed honors thesis research. Course may be repeated for a maximum of 3 credit hours.

ECON 5020 ADVANCED MICROECONOMICS (3). LEC. 3. Pr., ECON 3020, MATH 1610 or higher, 2.2 GPA. Mathematical analysis of market-based pricing and production. Includes the economics of information and uncertainty, and strategic behavior.

ECON 5030 MACROECONOMIC THEORY AND POLICY (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Analysis of the national economy and impact of government policies on aggregate economic variables.

ECON 5100 ECONOMICS OF GROWTH AND DEVELOPMENT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Analysis of the economics of health care, including demand for and supply of health care, and health care policy.

ECON 5800 GOVERNMENT SPENDING AND TAXATION (3). LEC. 3. Pr., ECON 3020 or departmental approval, 2.2 GPA. The economic rationale for government expenditures, economic consequences of public spending, and methods of taxation and funding of government programs.

ECON 6020 ADVANCED MICROECONOMICS (3). LEC. 3. Pr., ECON 3020, MATH 1610 or higher, 2.2 GPA. Mathematical analysis of market-based pricing and production. Includes the economics of information and uncertainty, and strategic behavior.

ECON 6030 MACROECONOMIC THEORY AND POLICY (3). LEC. 3. Pr., ECON 2030 or 2037, or departmental approval, 2.2 GPA. Analysis of the national economy and impact of government policies on aggregate economic variables.

ECON 6100 ECONOMICS OF GROWTH AND DEVELOPMENT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Cause/effects of economic growth and development. Measuring growth, role of government policy, growth and trade, investment, etc.

ECON 6200 URBAN AND REGIONAL ECONOMIC DEVELOPMENT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Cause/effects of economic growth and development. Measuring growth, role of government policy, growth and trade, investment, etc.

ECON 6200 URBAN AND REGIONAL ECONOMIC DEVELOPMENT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Cause/effects of economic growth and development. Measuring growth, role of government policy, growth and trade, investment, etc.

ECON 6200 URBAN AND REGIONAL ECONOMIC DEVELOPMENT (3). LEC. 3. Pr., ECON 2030 or ECON 2037, 2.2 GPA. Cause/effects of economic growth and development. Measuring growth, role of government policy, growth and trade, investment, etc.

ECON 6600 BUSINESS AND ECONOMIC FORECASTING (3). LEC. 3. Pr., ECON 2030 or ECON 2037, STAT 2610 or STAT 2010, or departmental approval. 2.2 GPA. Interpretation of macroeconomic forecasting methods and development of competency in forecasting at the firm level.

ECON 6700/6706 HEALTH ECONOMICS (3). LEC. 3. Pr., ECON 3020 or departmental approval, 2.2 GPA. Analysis of the economics of health care, including demand for and supply of health care, and health care policy.

ECON 6800 GOVERNMENT SPENDING AND TAXATION (3). LEC. 3. Pr., ECON 3020 or departmental approval, 2.2 GPA. The economic rationale for government expenditures, economic consequences of public spending, and methods of taxation and funding of government programs.

ECON 7000 MANAGERIAL ECONOMICS (3). LEC. 3. Pr., Consent of MBA program director. Microeconomic theories of the firm and of markets, with emphasis on their applications to current business issues.

ECON 7110 MICROECONOMICS I (3). LEC. 3. Pr., ECON 3020 or departmental approval. Consumer behavior and market models of competition and monopoly. Traditional and contemporary theories of consumer/ house- hold behavior under constraint; models of competitive behavior.

ECON 7120 MICROECONOMICS II (3). LEC. 3. Pr., ECON 7110 or departmental approval. Analysis of producer behavior, including production theory, cost theory, profit maximization, theories of various market structures and derived demand for inputs.


ECON 7210 MACROECONOMICS I (3). LEC. 3. Pr., ECON 6030 or departmental approval. Evaluation of fundamental theoretical and policy-oriented issues in macroeconomics, emphasizing post-Keynesian developments.

ECON 7220 MACROECONOMICS II (3). LEC. 3. Pr., ECON 6030 or departmental approval. Foundations of macroeconomics, neoclassical production and growth theory, overlappinggenerations models, optimal saving, open economy macroeconomics, applied time series macrodynamics.

ECON 7310 ECONOMETRICS I (3). LEC. 3. Pr., departmental approval. Advanced treatment of the standard linear model of least square theory, including assumptions and properties of the SLM, and the statistical testing of behavioral hypotheses.

ECON 7320 ECONOMETRICS II (3). LEC. 3. Pr., ECON 7310. Econometric techniques employed in advanced empirical research. Topics include estimation and inference in simultaneous equation systems, limited dependent variables, non-nested testing, time-series analysis.
ECON 7410 HISTORY OF ECONOMIC THOUGHT I (3). LEC. 3. Pr., ECON 3700 or departmental approval. Analysis of classical contributions to economics, from early times to Karl Marx.


ECON 7990 RESEARCH AND THESIS (1-6). MST., TD. Pr., departmental approval. Course may be repeated with change in topic.

ECON 8110 ADVANCED MICROECONOMICS I (3). LEC. 3. Pr., ECON 7120. Advanced analysis, integrating the economics of time and uncertainty into mainline price theory.

ECON 8120 ADVANCED MICROECONOMICS II (3). LEC. 3. Pr., ECON 7120. Advanced analysis, integrating imperfect information and strategic behavior into economic models of trade and investment.

ECON 8210 TOPICS IN MACROECONOMICS (3). LEC. 3. Pr., ECON 7220 or departmental approval. Goals, procedures and achievements in attaining monetary objectives domestically and abroad. Emphasis on macro-money models and effects of monetary policy on economic activity.

ECON 8310 MICROECONOMETRICS (3). LEC. 3. Pr., ECON 7320. Analysis of limited dependent variable models, including Logit, Probit and Tobit models, censored and truncated regression models, frontier models and mixture models.


ECON 8420 ECONOMIC INSTITUTIONS AND CONTEMPORARY ECONOMICS THEORY (3). LEC. 3. Pr., departmental approval. How contemporary economic theory helps explain the emergence, hey-day and decline of economic institutions, including "Social" and regulatory institutions.

ECON 8510 ECONOMICS OF TAXATION (3). LEC. 3. Pr., ECON 7120 or departmental approval. Examines tax structures in the U.S. evaluates tax reform proposals and the effects of taxation on resource allocation and economic welfare.

ECON 8520 PUBLIC CHOICE (3). LEC. 3. Pr., departmental approval. Advanced analysis of governmental expenditures and other not-for-profit sectors of the economy.

ECON 8530 ECONOMIC ANALYSIS OF THE LAW (3). LEC. 3. Pr., ECON 3020 and departmental approval. Advanced analysis of the substantive areas in which law has an economic foundation and ways law affects economic relations.

ECON 8540 SEMINAR IN ENVIRONMENTAL ECONOMICS (3). LEC. 3. Pr., ECON 3020 and departmental approval. Advanced analysis of pricing and allocation of renewable and non-renewable resources.

ECON 8550 EXTERNALITIES AND PUBLIC GOODS (3). LEC. 3. Pr., ECON 7120 OR departmental approval. Advanced analysis of pricing and allocation of economic goods when property rights are not well defined.

ECON 8610 INDUSTRIAL ORGANIZATION I (3). LEC. 3. Pr., ECON 7120 or departmental approval. Determinants of market structure, effects of market structure on industry performance, theory of the firm, research and development, advertising and vertical integration.

ECON 8620 INDUSTRIAL ORGANIZATION II (3). LEC. 3. Pr., ECON 7120 or departmental approval. Primary focus is on case studies in the history and current practice of regulation in the United States at all levels.


ECON 8720 INTERNATIONAL MACROECONOMICS (3). LEC. 3. Pr., departmental approval. Theoretical and applied time series analysis at open economy macroeconomic models, international monetary and financial theory, balance of payments theory, and exchange rates.

ECON 8810 LABOR MARKET ANALYSIS (3). LEC. 3. Pr., ECON 7110 or departmental approval. Analysis of labor markets, and determination of wages and other terms of employment. Emphasis on academic studies of labor market issues.

ECON 8820 TOPICS IN LABOR ECONOMICS (3). LEC. 3. Pr., ECON 7110 or departmental approval. Selected topics, including education and on-the-job training, Labor mobility/immigration, employment discrimination, and the impact of labor unions.

ECON 8970 SPECIAL PROBLEMS (1-3). LEC., SU. Pr., departmental approval. Variable content in the economics area. Course may be repeated for a maximum of 3 credit hours.

ECON 8980 ECONOMICS WORKSHOP (1). LEC. 1. Pr., departmental approval. Individual research project, presentations, and discussion of the economics profession.

ECON 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

Interdepartmental Education (EDUC)

Dr. William A. Spencer - 844-4460

EDUC 3000 DIVERSITY OF LEARNERS AND SETTINGS (6). LEC. 6. Exploration of socio-cultural factors, individual differences, and exception- alities of learners; understanding diversity and communicating with stu- dents with differing cultural backgrounds, abilities, and values.

Educational Foundations, Leadership and Technology (EFLT)

Dr. William A. Spencer - 844-4460

ADED 4010 LEARNING RESOURCES IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., ADED 4050 and junior standing, or ADED 7050, or depart- mental approval. Selecting, developing, utilizing, and evaluating instruction- al resources and technology for teaching.

ADED 4050 METHODS OF TEACHING IN ADULT EDUCATION (2). LEC. 2, LAB. 2. Methods and techniques of instruction using appropriate instruc- tional materials; planning and evaluation of instruction for programs within adult education.

ADED 4600 NATURE OF ADULT EDUCATION (3). LEC. 3. Pr., junior standing. History and principles of adult education applied to the develop- ment and implementation of programs in remedial, occupational, continu- ing, and life-long learning. Credit will not be allowed for both ADED 4600 and ADED 7600.

ADED 4610 DIRECTED WORK EXPERIENCE (3). LEC. 3. SU. Pr., ADED 4600 and junior standing, or departmental approval. In-service, supervised work experience individually designated for part-time or summer work experience.

ADED 4620 COMMUNITY CONCEPTS, PROGRAMS, AND RESOURCES IN ADULT EDUCATION (3). LEC. 3. Pr., ADED 4600 or departmental approval. Processes by which adult education is merged with community organizations to maximize the effective use of physical and human resources. Credit will not be allowed for both ADED 4620 and ADED 7620.

ADED 4650 TEACHING THE DISADVANTAGED ADULT (3). LEC. 3. Pr., ADED 4600 and junior standing, ADED 7600, or departmental approval. Problems of the disadvantaged adult with emphasis on the unique sociolog- ical, psychological, and physiological factors that influence learning and participation in remedial learning activities.

ADED 4660 TEACHING IN THE NON-SCHOOL SETTING (3). LEC. 3. Pr., junior standing or departmental approval. Planning, conducting, and supervising instruction for adults in varied non-school settings.

ADED 4900 DIRECTED INDEPENDENT STUDY (1-6). IND. Pr., depart- mental approval. Independent study directed toward desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

ADED 4910 PRACTICUM IN ADULT EDUCATION (1-6). PRA., SU. Pr., departmental approval. Experience relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 6 credit hours.

ADED 4920 PROFESSIONAL INTERNSHIP IN ADULT EDUCATION (9). INT. 9, SU. Pr., Adult Education majors, ADED 4660. Supervised internship experiences in a school or other appropriate setting. Evaluation and analy- sis of the internship experience.

ADED 4970 SPECIAL TOPICS IN ADULT EDUCATION (1-6). LEC. Pr., senior standing or departmental approval. Current or special topics within adult education. Course may be repeated for a maximum of 6 credit hours.

ADED 7010/7016 LEARNING RESOURCES IN AREA OF SPECIALIZATION (3). LEC. 3. Pr., ADED 4050 and junior standing, or ADED 7050, or departmental approval. Selecting, developing, utilizing, and evaluating instructional resources and technology for teaching.
ADED 7050 METHODS OF TEACHING IN ADULT EDUCATION (3). LEC. 2, LAB. 2. Pr., admission to Fifth-Year Program. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for programs within adult education. Credit will not be given for both ADED 4600 and ADED 7050.

ADED 7060 CURRICULUM AND PROGRAM PLANNING IN ADULT EDUCATION (3). LEC. 3. Pr., admission to Fifth-Year Program. Introduction to principles and practices involved in designing education programs in the area of specialization.

ADED 7600/7606 NATURE OF ADULT EDUCATION (3). LEC. 3. History and principles of adult education applied to the development and implementation of programs in remedial, occupational, continuing and life-long learning. Credit will not be given for both ADED 4600 and ADED 7600.

ADED 7620 COMMUNITY CONCEPTS, PROGRAMS, AND RESOURCES IN ADULT EDUCATION (3). LEC. 3. Pr., ADED 7600 or departmental approval. Processes by which adult education is merged with community organizations to maximize the effective use of physical and human resources. Credit will not be given for both ADED 4620 and ADED 7620.

ADED 7640 WORKFORCE EDUCATION (3). LEC. 3. Pr., ADED 6640 or departmental approval. Identification and evaluation of basic skills problems in the workplace. Strategies for addressing workplace education issues.

ADED 7650/7656 TEACHING THE DISADVANTAGED ADULT (3). LEC. 3. Pr., ADED 4600 and junior standing, ADED 7600, or departmental approval. Problems of the disadvantaged adult with emphasis on the unique sociological, psychological, and physiological factors that influence learning and participation in remedial learning activities.

ADED 7900 INDEPENDENT STUDY (1-3). IND. Pr., departmental approval. Independent study directed toward desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 3 credit hours.

ADED 7910 PRACTICUM IN ADULT EDUCATION (1-3). PRA., SU. Pr., departmental approval. Experiences closely relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 3 credit hours.

ADED 7920 PROFESSIONAL INTERNSHIP (1-10). INT. Pr., ADED 7050. Supervised internship experiences in a school, college or other appropriate setting. Evaluation and analysis of the internship experience. Course may be repeated for a maximum of 10 credit hours.

ADED 7950 SEMINAR IN ADULT EDUCATION (1-3). SEM., SU. Pr., presentation of research projects, analysis of procedures and findings. Course may be repeated for a maximum of 3 credit hours.

ADED 7960 READINGS IN ADULT EDUCATION (1-3). IND. Pr., departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 6 credit hours.

ADED 7970 TOPICS IN ADULT EDUCATION (1-6). LEC. Pr., departmental approval. Current or advanced topics within area of specialization. Course may be repeated for a maximum of 6 credit hours.

ADED 7990 RESEARCH AND THESIS (1-10). MST., TD. Pr., departmental approval. Individualized support and direction for students writing their thesis. Course may be repeated with change in topic.

ADED 8900 ADVANCED INDEPENDENT STUDY IN ADULT EDUCATION (1-6). IND. Pr., departmental approval. Independent study directed toward desired objectives. Includes evaluation at regular intervals by professor and student. Course may be repeated for a maximum of 6 credit hours.

ADED 8910 ADVANCED PRACTICUM IN ADULT EDUCATION (1-6). PRA., SU. Pr., departmental approval. Experiences closely relating theory and practice, usually carried on simultaneously. Course may be repeated for a maximum of 6 credit hours.

ADED 8920 INTERNSHIP (1-10). INT., SU. Pr., departmental approval. Supervised internship experiences in a school, college, or other appropriate setting. Evaluation and analysis of the internship experience. Course may be repeated for a maximum of 10 credit hours.

ADED 8950 ADVANCED SEMINAR IN ADULT EDUCATION (1-6). SEM., SU. Presentation by graduate students of research projects and/or analysis of procedures and findings. Course may be repeated for a maximum of 6 credit hours.

ADED 8960 READINGS IN ADULT EDUCATION (1-6). IND. Pr., departmental approval. Critical analysis of current and classical research writings. Course may be repeated for a maximum of 6 credit hours.

ADED 8970 ADVANCED TOPICS IN ADULT EDUCATION (1-6). LEC. Pr., departmental approval. Current or advanced topics within adult education. Course may be repeated for a maximum of 6 credit hours.

ADED 8980 FIELD PROJECT (1-10). FLD., SU. Pr., departmental approval. Course may be repeated for a maximum of 10 credit hours.

ADED 8990 RESEARCH AND DISSERTATION (03 - 10). DSR., TD. Pr., departmental approval. Individualized support and direction for students writing their dissertation. Course may be repeated for a maximum of 10 hours.

EDUCATIONAL LEADERSHIP (EDLD)

EDLD 7200 SUPERVISION AND PERSONNEL MANAGEMENT (3). LEC. 3. Supervision theory and practice with responsibility for leadership in the recruitment, evaluation and staff development of employees. Required for Class “A” Certification.

EDLD 7210 MULTI-PROFESSIONAL LEADERSHIP (3). LEC. 3. Theories, concepts and principles of leadership from a multi-disciplinary, multi-professional perspective. Students will apply knowledge to practice in diverse settings and situations. Required for Class “A” Certification.


EDLD 7230 STUDENT SERVICES ADMINISTRATION IN POST-SECONDARY EDUCATION (3). LEC. 3. Organization, administration and evaluation of student personnel services in post-secondary education.


EDLD 7330 INTRODUCTION TO CURRICULUM AND INSTRUCTIONAL LEADERSHIP (3). LEC. 3. Principles of curriculum development and the leadership skills required to enact it with emphasis on school settings. Required for Class “A” Certification.

EDLD 7340 OVERVIEW OF CURRICULUM PROCESSES (3). LEC. 3. Curriculum as a field of study; the first course required for the ASC concentration in curriculum; an overview of curriculum history, processes, models, and designs.

EDLD 7900 INDEPENDENT STUDY (1-9). IND. Independent study directed toward desired objectives. Includes evaluation by professor and student at regular intervals. Course may be repeated for a maximum of 9 credit hours.

EDLD 7910 PRACTICUM IN ATHLETIC ADMINISTRATION (1-6). PRA., departmental approval. Experience in the management of specific administrative offices. Course may be repeated for a maximum of 6 credit hours.

EDLD 7920 ADMINISTRATIVE INTERNSHIP (1-6). INT. Pr., departmental approval. Opportunities for interns to internalize and employ administrative skills learned during graduate coursework. Required for Class “A” Certification. Course may be repeated for a maximum of 6 credit hours.

EDLD 7970 SPECIAL PROBLEMS (1-9). LEC. Variable content for advanced studies in the area of educational leadership. Required for Class “AA” Certification. Course may be repeated for a maximum of 9 credit hours.

EDLD 8200 ASSESSMENT AND EVALUATION IN LEARNING ORGANIZATIONS (3). LEC. 3. Study of assessment and evaluation practices that enable learning organizations to use data for decision-making purposes.

EDLD 8220 PERSONAL AND PROFESSIONAL DEVELOPMENT (3). LEC. 3. Includes theoretical frameworks and applications for successful and systematic mentoring of professionals in organizations. Required class “AA” certification

EDLD 8230 SYSTEMIC PLANNING AND BUDGETING (3). LEC. 3. Covers the components and implementation of a comprehensive, ongoing planning and budgeting program for learning organizations. Required for class “AA” certification.

EDLD 8240 TRENDS AND ISSUES IN EDUCATIONAL ADMINISTRATION (3). LEC. 3. Trends and issues affecting educational institutions with
particular attention to development of administrative procedures to cope with educational changes. Required for class “AA” certification.

EDLD 8250 ORGANIZATIONAL POWER, POLITICS AND POLICY FORMATION (3). LEC. 3. Analysis of social forces, antecedent movements, and political actions affecting organizations. The study of policy development and practice. Required for Class “AA” Certification.

EDLD 8270 LEADERSHIP IN FINANCE AND MANAGEMENT (3). LEC. 3. Educational finance including revenues, expenditures, cost, budgeting and accounting, and the local, state and federal role in supporting education. Required for Class “AA” Certification.

EDLD 8300 CURRICULUM THEORY AND PRACTICE (3). LEC. 3. Pr., EDLD 7340 or other General Curriculum course. Coreq., departmental approval. Advanced course dealing with application of curriculum theories with an emphasis on the impact of philosophical and theoretical beliefs on practice. Required for Class “AA” Certification.

EDLD 8310 LEADERSHIP IN THE DEVELOPMENT AND APPLICATION OF CURRICULUM THEORY AND DESIGN (3). LEC. 3. Pr., EDLD 7340 and EDLD 8300, or departmental approval Application of transformative leadership in the design, delivery, and evaluation of curriculum in a wide variety of organizational settings.

EDLD 8320 CURRICULUM LEADERSHIP FOR ORGANIZATIONS (3). LEC. 3. Pr., EDLD 7340, EDLD 8300, EDLD 8310 or equivalent or departmental approval. For those considering a career in upper level management. Focuses on context, societal, and political influences related to curriculum processes and organizational change.

EDLD 8340 TRANSFORMATIONAL PROCESSES AND ORGANIZATIONAL CHANGE (3). LEC. 3. Organizational and transformational change at personal, interpersonal, and institutional levels.

EDLD 8400 ETHICS FOR LEADERS (3). LEC. 3. Theory and practice of ethics and the role of ethical and personal integrity for leaders in the context of educational organizations and the communities they serve.

EDLD 8480 INSTITUTIONAL RESEARCH AND DECISION SUPPORT (3). LEC. 3. Components of institutional research and assessment programs that can support the comprehensive planning, decision support, and management needs of the institution.

EDLD 8810 DOCTORAL SEMINAR IN EDUCATIONAL LEADERSHIP I (2). SEM. 2. Professional and social integration into the doctoral program; structured inquiry, professional dialogue, and reflective thinking.

EDLD 8820 DOCTORAL SEMINAR IN EDUCATIONAL LEADERSHIP II (2). SEM. 2. Pr., acceptance into the Educational Leadership Doctoral Program. EDLD 8810. Professional and social integration into the doctoral program; structured inquiry, professional dialogue, and reflective thinking.

EDLD 8830 DOCTORAL SEMINAR IN EDUCATIONAL LEADERSHIP III (2). SEM. 2. Pr., acceptance into Educational Leadership Doctoral Program and EDLD 8810 and EDLD 8820. Professional and social integration into the doctoral program; structured inquiry, professional dialogue, and reflective thinking.


EDLD 8940 DIRECTED FIELD EXPERIENCE IN EDUCATIONAL LEADERSHIP (1-6). FLD. Field-based experience in diverse settings to develop knowledge, skills, and abilities in an area of special interest. Course may be repeated for a maximum of 6 credit hours.

EDLD 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Individualized support and direction for students writing their dissertation. Course may be repeated for a maximum of 10 hours. Course may be repeated with change in topic.

EDMD 3000 INTRODUCTION TO INSTRUCTIONAL TECHNOLOGY (1). LEC. 1. Basics of current and emerging instructional and communication technologies with primary emphasis on computer use.

EDMD 3300 UTILIZATION OF INSTRUCTIONAL TECHNOLOGY FOR EDUCATORS (2). LEC. 1. LAB. 2. Basics of current and emerging instructional & communication technologies with primary emphasis on curricular integration, location, selection, and application of technology resources (WWW, commercially authored software, etc.) for curricular needs with emphasis on developmental stages, learning styles and learning technologies.

EDMD 5000 INSTRUCTIONAL TECHNOLOGY FOR TEACHING AND LEARNING (3). LEC. 3. Introduction to the systematic application of instructional technologies in teaching and learning environments.

EDMD 5100 MEDIA FOR CHILDREN (3). LEC. 3. Examination and evaluation of current literature in print and other formats, including oral literature. Focuses on literary and instructional criteria for selecting and utilizing media.

EDMD 6000 INSTRUCTIONAL TECHNOLOGY FOR TEACHING AND LEARNING (3). LEC. 3. Introduction to the systematic application of instructional technologies in teaching and learning environments.

EDMD 6100 MEDIA FOR CHILDREN (3). LEC. 3. Examination and evaluation of current literature in print and other formats, including oral literature. Focuses on literary and instructional criteria for selecting and utilizing media.

EDMD 7000 INSTRUCTIONAL DESIGN AND DEVELOPMENT (3). LEC. 3. Theory, problems, procedures, and standards in the utilization of technology in instructional design and development.


EDMD 7020 PRINCIPLES OF GRAPHIC DESIGN FOR INSTRUCTION (3). LEC. 3. Principles of graphic design and visual literacy to facilitate the presentation of information, Criteria for graphics utilization examined.

EDMD 7100/7105 SELECTION AND USE OF MEDIA FOR YOUTH (3). LEC. 3. Evaluation, selection, and use of print and non-print media for youth, including materials for multi-cultural, special and gifted education.

EDMD 7110 BIBLIOGRAPHIC DESCRIPTION, ORGANIZATION AND CONTROL (3). LEC. 3. Principles and procedures of describing, classifying and organizing resources with applications using new technologies.

EDMD 7120/7125 INFORMATION SOURCES, SERVICES AND INSTRUCTION (3). LEC. 3. An overview of information needs, services, and print and electronic resources; ways to teach information literacy skills.

EDMD 7130 ADMINISTRATION OF MEDIA AND TECHNOLOGY SERVICES (3). LEC. 3. Functions of and planning for media and technology services. Budget, evaluation, facilities, guidelines, legal issues, personnel and policies.

EDMD 7200 COMPUTER-BASED INSTRUCTIONAL DESIGN (3). LEC. 3. Applying computer-based instructional design skills, students will develop instructional products using desktop publishing, hypermedia and optical technologies.

EDMD 7210 INTEGRATION OF TECHNOLOGY INTO CURRICULUM (3). LEC. 3. Learner competence in integration of technology into curriculum, including designing and writing software and plans for using computers in instruction.


EDMD 7300 RESEARCH IN INSTRUCTIONAL TECHNOLOGY (3). LEC. 3. Pr., FOUN 7200. A forum for sharing research perspectives, exploring processes involved in defining research problems and analyzing research theories, problems, and methods in instructional technology.
EDMD 7300 BASIC METHODS IN EDUCATIONAL RESEARCH (3). LEC. 3. Major modes of inquiry in contemporary educational research including experimental, casual comparative, descriptive, qualitative inquiry, and action research models.

EDMD 7210 THEORY AND METHODOLOGY OF QUALITATIVE RESEARCH (3). LEC. 3. Major modes of qualitative research, their underlying philosophical assumptions about knowledge, and the major strategies for collecting and analyzing relevant data.

EDMD 7220 APPLIED QUALITATIVE RESEARCH (3). LEC. 3., Pr., FOUN 7210. Study of detailed strategies of data collection, principles of observation, interviewing, focus groups, recording and coding data, triangulation, strategies for analyzing coded data, and writing up of one’s findings.

EDMD 7300/7306 DESIGN AND ANALYSIS IN EDUCATION I (3). LEC. 3. Pr., FOUN 7200 or departmental approval. Basic methods of inferential analysis including t-tests, between and within subjects ANOVA, mixed ANOVAs and hierarchical designs as they are utilized in educational research.

EDMD 7310 DESIGN AND ANALYSIS IN EDUCATION II (3). LEC. 3. Pr., FOUN 7300. Bivariate and multiple correlation and regression analysis, trend analysis, analysis of covariance, logistic regression, and path analysis as they are utilized in educational research.

EDMD 7400/7406 EDUCATIONAL PSYCHOLOGY AND EDUCATIONAL IMPLICATIONS (3). LEC. 3. Educational psychology theory and research addressing critical problems, challenges, and opportunities in education or other growth-oriented settings. Content ranges from the study of learning to educational evaluation and authentic assessment.

EDMD 7410 THE INDIVIDUAL IN THE TEACHING-LEARNING PROCESS (3). LEC. 3. The study of human growth, development, and motivation theory and research, including culture, socio-economic status, language, gender and race as a base for understanding individual differences and their sources.

EDMD 7420/7426 LEARNING THEORY AND EDUCATIONAL PRACTICE (3). LEC. 3., Pr., FOUN 7400 or departmental approval. Advanced study of learning theory and research with an emphasis on application to effective design, implementation, and evaluation of instruction. Motivation and management models will also be addressed.

EDMD 7430 MOTIVATION AND ACHIEVEMENT (3). LEC. 3. Social, cultural, and psychological antecedents of achievement motivation are examined. This process requires reviewing theories and research, and emphasis is placed on discerning implications for practice and policy.

EDMD 7440 CLASSROOM MANAGEMENT: SKILLS AND REFLECTION (3). LEC. 3. Advanced study and analysis of existing classroom management/discipline models including observation/action research activity.

EDMD 7450 PERSONAL AND PROFESSIONAL DEVELOPMENT AND PERSONALITY DYNAMICS (3). LEC. 3. Survey of different theories and models of personality leading to in-depth study of theories and models most applicable for use in conceiving of and building personal and professional development plans.

EDMD 7930 DIRECTED STUDY (1-6). IND. Special study in which the student’s learning efforts are guided toward desired objectives. Course may be repeated for a maximum of 9 credit hours.

EDMD 7970 SPECIAL TOPICS IN INSTRUCTIONAL TECHNOLOGY (3-9). IND. Opportunity for study of current topics related to the field of instructional technology. Course may be repeated for a maximum of 9 credit hours.

EDMD 7950 PERSONAL AND PROFESSIONAL DEVELOPMENT AND PERSONALITY DYNAMICS (3). LEC. 3. Survey of different theories and models of personality leading to in-depth study of theories and models most applicable for use in conceiving of and building personal and professional development plans.

EDMD 7970 SPECIAL TOPICS IN FOUNDATIONS OF EDUCATION (3-6). LEC. Consideration of historical, philosophical, social, psychological, measurement, statistics or research issues, and their impact on education. Course may be repeated for a maximum of 6 credit hours.

EDMD 8010 MODERN EDUCATION AND COMPARATIVE PERSPECTIVES (3). LEC. 3. Advanced comparative study of selected contemporary educational issues within the American and international urban context.

EDMD 8100 PROGRAM EVALUATION (3). LEC. 3. Study of various theories and models of curriculum evaluation, methodological issues regarding planning and conducting evaluation studies, reporting and using information from evaluation.

EDMD 8120 TEACHER EVALUATION (3). LEC. 3. Analysis of research on teaching, classroom observation methods, teaching portfolios, supervision of teachers, license and certification assessment, ethical and legal considerations, and using information to improve teaching.

Electrical and Computer Engineering (ELEC)

Dr. J. David Irwin - 844-1800


ELEC 2110 ELECTRIC CIRCUIT ANALYSIS (3). LEC. 3. Pr., PHYS 1610, COMP 1200, or COMP 1210. Coreq., MATH 2650, ENGR 1110. Basic laws and concepts; resistive circuits; Laplace transforms and transient circuits; phasors and frequency response of circuits; RMS values and complex power; magnetically-coupled circuits.


ELEC 2200 DIGITAL LOGIC CIRCUITS (3). LEC. 3. Pr., COMP 1200 or COMP 1210. Electronic devices and digital circuits; binary numbers; Boolean algebra and switching functions; gates and flip-flops; combination- and sequential logic circuits; hierarchical design of digital systems; computer-aided design tools for digital design, simulation, and testing.

ELEC 2210 DIGITAL ELECTRONICS (3). LEC. 3. Pr., ELEC 2110. Coreq., ELEC 2200. History of electronics; semiconductors; biasing and operation of PN junction diodes; field-effect transistors and bipolar junction transistors; logic families and logic technologies; flip-flops and memory circuitry.

ELEC 2220 COMPUTER SYSTEMS (3). LEC. 3. Pr., ELEC 2210 or ELEC 2220. Computer hardware and software organization, processor programming models, data representation, assembly language programming, design of memory systems, input and output device interfacing and programming and multiprocessing.

ELEC 3303 ELECTRICAL ENGINEERING LABORATORY III (1). LAB. 3. Pr., ELEC 2210. Assembly, testing and analysis of an AM/FM radio. Integration of basic concepts of electronics, electromagnetics, and signals and systems.

ELEC 3340 ELECTRICAL ENGINEERING LABORATORY IV (1). LAB. 3. Pr., ELEC 2220, ELEC 3303. Coreq., ELEC 3500. Exploration and integration of electrical engineering concepts through the design of two contemporary engineering systems: a mobile robot and a motor speed control system.

ELEC 3350 COMPUTER SYSTEM DESIGN LABORATORY (1). LAB. 3. Pr., ELEC 2020, ELEC 2220. Experiments include interfacing memory and various peripheral devices to a microcomputer, the design of software to control these devices, and the integration of computer hardware and software to control a system.

ELEC 3360 WIRELESS DESIGN LAB (1). LAB. 3. Pr., ELEC 3400. Laboratory experiments geared towards understanding the implementation and testing of components used in wireless communication systems.

ELEC 3370 FUNDAMENTALS OF APPLIED ELECTROMAGNETICS (3). LEC. 3. Pr., MATH 2660. ELEC 2110. The study of electric and magnetic fields, using vector algebra, culminating in Maxwell's equations and an introduction to electromagnetic waves.

ELEC 3380 ELECTROMAGNETS FOR WIRELESS COMMUNICATIONS (3). LEC. 3. Pr., ELEC 3310. Maxwell's equations and circuit theory used in the study of transmission lines and guided waves, with an emphasis on fiber optics, electromagnetic compatibility and interference, antennas and radiation, and satellite communication systems.

ELEC 3390 COMMUNICATION SYSTEMS (3). LEC. 3. Pr., ELEC 3800. Pulse code modulation, line coding, information rate, equalization, amplitude modulation, angle modulation, noise in communication systems.

ELEC 3500 CONTROL SYSTEMS (3). LEC. 3. Pr., ELEC 2120. Analog and Discrete Transfer function models, system response specifications, control system characteristics, root locus analysis and design, frequency response analysis and design.

ELEC 3600 ELECTRIC POWER ENGINEERING (3). LEC. 3. Pr., ELEC 2110. Introduction to the basic concepts in electric power engineering.

ELEC 3700 ANALOG ELECTRONICS (3). LEC. 3. Pr., ELEC 2210, ELEC 2120. Design and analysis of single-stage and multistage transistor amplifiers; biasing for integrated circuit design; small-signal modeling; operational amplifier circuits; IC design techniques; noise and RF amplifiers; D/A and A/D converters.


ELEC 3810 FUNDAMENTALS OF ELECTRICAL ENGINEERING (3). LEC. 3. Coreq., MATH 2650. Electrical circuit analysis; electronic devices, digital systems, amplifier concepts, power devices and systems. (Not open to Electrical Engineering majors).

ELEC 3820 INDUSTRIAL INSTRUMENTATION (3). LEC. 2. LEC. 3. Pr., ELEC 3810. Principles of instrumentation. The detection and measurement of physical quantities with emphasis on sensors and signal processing. Programmable logic controllers. (Not open to Electrical Engineering majors).

ELEC 4000 SENIOR DESIGN PROJECTS (3). LEC. 3. Pr., ELEC 3040, ELEC 3320, ELEC 3400, ELEC 3500, ELEC 3600, ELEC 3700 and departmental approval; or ELEC 3050, ELEC 3700, ELEC 4200, COMP 3500, COMP 3270 and departmental approval. Particular project sections may have additional prerequisites. Coreq., One of ELEC 3320, ELEC 3400, ELEC 3500, ELEC 3600, ELEC 3700, ELEC 4200, COMP 3500 or COMP 3270 may be taken concurrently. A capstone design project which draws on the accumulated curricular experience. Particular project sections may have additional requisites.
ELEC 4200 DIGITAL SYSTEM DESIGN (3). LEC. 2. Pr., ELEC 2210, ELEC 2220. Hierarchical, modular design of digital systems, synchronous and asynchronous sequential circuit analysis and design, programmable logic devices, and field-programmable gate arrays, and circuit simulation for design verification and analysis.

ELEC 4800 INSTRUMENTATION ENGINEERING (3). LEC. 2. LAB. 3. Pr., ELEC 3040 or ELEC 3050. Study and application of sensors, instrumentation and computer technology to research and industrial process control.

ELEC 4970 SPECIAL TOPICS IN ELECTRICAL ENGINEERING (1-5). IND. Pr., departmental approval. Course may be repeated with change in topic.

ELEC 4980 SPECIAL PROJECTS IN ELECTRICAL ENGINEERING (1-3). IND. Pr., departmental approval. Course may be repeated with change in topic.

ELEC 4997 HONORS THESIS (1-6). IND. Pr., ELEC major; membership in the Honors College; departmental approval. Directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

ELEC 5100 WIRELESS COMMUNICATION SYSTEMS (3). LEC. 3. Pr., ELEC 3400, ELEC 3320. Introduction to mobile cellular radio and wireless personal communications, cellular concept, mobile radio propagation, modulation techniques, multiple.

ELEC 5110 WIRELESS NETWORKS (3). LEC. 3. Pr., ELEC 5100. Introduction to wireless broadband, satellite communication, wireless local area networks, Bluetooth and Home RF standards and Internet protocol and wireless access.

ELEC 5120 TELECOMMUNICATION NETWORKS (3). LEC. 3. Pr., ELEC 3400. Plain Old Telephone System (POTS), Public Switching Telephone Network (PSTN), circuit switching, packet switching, frame relay, local subscriber loop, trunk, Signal System 7 (SS7), ISDN, DSL, ATM, SONET, wavelength division multiplexing (WDM), SMDS, voice over IP, network management.


ELEC 5150 INFORMATION SECURITY (3). LEC. 3. Pr., senior standing and departmental approval. Emerging protocols, standards and technologies of information security; design of information network security, firewall, virtual private networks and secured applications.

ELEC 5200 COMPUTER ARCHITECTURE AND DESIGN (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Structural organization and hardware design of digital computers; register transfers; micro-operations, control units and timing; instruction set design; input/output devices, multiprocessors, automated hardware design aids.

ELEC 5210 PERSONAL COMPUTER SYSTEM DESIGN (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Personal computer hardware components, microprocessors, motherboard design, cache and main memory technologies and subsystems, standard expansion buses and interfacing.

ELEC 5220 INFORMATION NETWORKS AND TECHNOLOGY (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Architectures, protocols, standards and technologies of information networks; design and implementation of information networks based on requirements; applications of information networks for data, audio and video communications.

ELEC 5230 PARALLEL PROCESSING (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Hardware components of multiprocessor systems including processor, inter-connection, memory and control architectures; software elements of parallel processing.


ELEC 5250 COMPUTER-AIDED DESIGN OF DIGITAL CIRCUITS (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Computer-automated design of digital logic circuits, using discrete gates, programmable logic devices, and standard cells, hardware description languages, circuit simulation for design verification and analysis, fault diagnosis and testing.

ELEC 5260 EMBEDDED COMPUTING SYSTEMS (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. The design of systems containing embedded computers. Microcontroller technology, assembly language and C programming, input/output interfacing, data acquisition hardware, interrupts, and timing. Real-time operating systems and application programming. Embedded system application examples.

ELEC 5310 DESIGN OF ANTENNAS AND ANTENNA SYSTEMS (3). LEC. 3. Coreq., ELEC 3320. Application of electromagnetic and circuit concepts to the design of practical antennas and antenna systems.


ELEC 5350 RADAR AND SONAR PRINCIPLES (3). LEC. 3. Pr., ELEC 3320, ELEC 3800. Study of the fundamentals of RADAR systems including detection of non-deterministic signals in noise, and introduction to the principles of wave acoustics with emphasis on SONAR systems.


ELEC 5430 DIGITAL IMAGE PROCESSING (3). LEC. 3. Pr., ELEC 3400, ELEC 3800. Digital image processing principles and applications such as enhancement, restoration and compression.

ELEC 5510 MODELING AND SYSTEM IDENTIFICATION (3). LEC. 3. Pr., ELEC 3500 and ELEC 3800 or departmental approval. Development of physical models (linear and nonlinear) from first principles and estimation of model parameters from experimental data. System identification in closed loop. Data collection under output feedback.

ELEC 5520 DISCRETE EMBEDDED CONTROL SYSTEMS (3). LEC. 3. Pr., ELEC 3500. Discrete state equation models, control system characteristics, pole placement design and implementation, estimator design and implementation.


ELEC 5620 POWER SYSTEM ANALYSIS (3). LEC. 3. Pr., ELEC 3600 or departmental approval. Power system modeling, power flow analysis, analysis of faulted power systems.


ELEC 5650 POWER SYSTEM PROTECTION (3). LEC. 3. Pr., ELEC 3600. Fault analysis using symmetrical components. Power switchgear, including switches, disconnects, fuses, relays and circuit breakers. Fundamentals of electric power system protection, including bus, transformer and line protection.

ELEC 5700 SEMICONDUCTOR FUNDAMENTALS (3). LEC. 3. Pr., ELEC 3700. Introduction to semiconductors: crystal structure, energy band theory, equilibrium electron and hole statistics, doping, generation and recombination processes, carrier drift and diffusion, transport equations.


ELEC 5730 MICROELECTRONIC FABRICATION (3). LEC. 3. Pr., ELEC 2210 or departmental approval. Introduction to monolithic integrated circuit technology, Bipolar and MOS processes and structures. Elements of layout, design, fabrication, and applications. Experiments in microelectronic technologies.

ELEC 5740 ELECTRONICS MANUFACTURING (3). LEC. 3. Pr., ELEC 3700 or departmental approval. Materials and processes used to manufacture electronic products. Particular attention is given to substrate technology and electronics assembly.

ELEC 5750 INTRODUCTION TO PLASMA ENGINEERING (3). LEC. 3. Pr., ELEC 3320 or departmental approval. Electrical breakdown and discharges in gases, basic plasma theories, applications of plasmas, plasma processing for microelectronic fabrication.

ELEC 5760 SOLID STATE SENSORS (3). LEC. 3. Pr., ELEC 3700 or departmental approval. Theory, technology and design of micro-mechanical sensors, electrochemical microsensors, photodetectors, and integrated smart sensors.

ELEC 5770 VLSI DESIGN (3). LEC. 3. Pr., ELEC 2210, ELEC 2220. Review of MOS transistor fundamentals, CMOS logic circuits; VLSI fabriva-
ELEC 5780 ANALOG CIRCUIT DESIGN (3). LEC. 3. Pr., ELEC 3700 or departmental approval. Circuit design techniques used for implementing analog integrated circuits in both CMOS and bipolar technologies.

ELEC 5810 COMPUTED IMAGING SYSTEMS (3). LEC. 3. Pr., ELEC 2120 or departmental approval. Introduction to computed imaging systems such as magnetic resonance imaging (MRI), computed tomography (CT), and synthetic aperture radar (SAR).

ELEC 5970 SPECIAL TOPICS IN ELECTRICAL ENGINEERING (1-5). LEC., Pr., departmental approval. Course may be repeated with change in topic.

ELEC 6100/6106 WIRELESS COMMUNICATION SYSTEMS (3). LEC. 3. Pr., ELEC 3400, ELEC 3320. Introduction to mobile cellular radio and wireless personal communications, cellular concept, mobile radio propagation, modulation techniques, multiple access techniques, wireless systems and standards.

ELEC 6620/6116 WIRELESS NETWORKS (3). LEC. 3. Pr., ELEC 6100. Introduction to wireless broadband, satellite communication, wireless local area networks, Bluetooth and Home RF standards and Internet protocol and wireless access.

ELEC 6120/6126 TELECOMMUNICATION NETWORKS (3). LEC. 3. Pr., ELEC 3400. Plain Old Telephone System (POTS), Public Switching Telephone Network (PSTN), circuit switching, packet switching, frame relay, local subscriber loop, trunk, Signal System 7 (SS7), ISDN, DSL, ATM, SONET, wavelength division multiplexing (WDM), SMDS, voice over IP, network management.


ELEC 6150/6156 INFORMATION SECURITY (3). LEC. 3. Pr., Senior Standing and departmental approval. Emerging protocols, standards and technologies of information security; design of information network security, firewall, virtual private networks and secured applications.

ELEC 6200/6206 COMPUTER ARCHITECTURE AND DESIGN (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Structural organization and hardware design of digital computers; register transfers; micro-operations, control units and timing; instruction set design; input/output devices, multiprocessors, automated hardware design aids.

ELEC 6210/6216 PERSONAL COMPUTER SYSTEM DESIGN (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Personal computer hardware components, microprocessors, motherboard design, cache and main memory technologies and subsystems; standard expansion busses and interfacing.

ELEC 6220/6226 INFORMATION NETWORKS AND TECHNOLOGY (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Architectures, protocols, standards and technologies of information networks; design and implementation of information networks based on requirements; applications of information networks for data, audio and video communications.

ELEC 6230/6236 PARALLEL PROCESSING (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Hardware components of multiprocessor systems including processor, inter-connection, memory and control architectures; software elements of parallel processing.


ELEC 6250/6256 COMPUTER-AIDED DESIGN OF DIGITAL CIRCUITS (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. Computer-automated design of digital logic circuits, using discrete gates, programmable logic devices, and standard cells, hardware description languages, circuit simulation for design verification and analysis, fault diagnosis and testing.

ELEC 6260/6266 EMBEDDED COMPUTING SYSTEMS (3). LEC. 3. Pr., ELEC 2220 or COMP 3350. The design of systems containing embedded computers. Microcontroller technology, assembly language and C programming, input/output interfacing, data acquisition hardware, interrupts, and timing. Real-time operating systems and application programming. Embedded system application examples.

ELEC 6310/6316 DESIGN OF ANTENNAS AND ANTENNA SYSTEMS (3). LEC. 3. Coreq., ELEC 3320. Application of electromagnetic and circuit concepts to the design of practical antennas and antenna systems.


ELEC 6350/6356 RADAR AND SONAR PRINCIPLES (3). LEC. 3. Pr., ELEC 3320, ELEC 3800. Study of the fundamentals of RADAR systems including detection of non-deterministic signals in noise, and introduction to the principles of wave acoustics with emphasis on SONAR systems.


ELEC 6420/6426 WIRELESS COMMUNICATION SYSTEMS (3). LEC. 3. Pr., ELEC 3400, ELEC 3320. Introduction to mobile cellular radio and wireless personal communications, cellular concept, mobile radio propagation, modulation techniques, multiple access techniques, wireless systems and standards.

ELEC 6430/6436 DIGITAL IMAGE PROCESSING (3). LEC. 3. Pr., ELEC 3400, ELEC 3800. Digital image processing principles and applications such as enhancement, restoration and compression.

ELEC 6510/6516 MODELING AND SYSTEM IDENTIFICATION (3). LEC. 3. Pr., ELEC 3500 and ELEC 3800 or departmental approval. Development of physical models (linear and nonlinear) from first principles and estimation of model parameters from experimental data. System identification in closed loop. Data collection under output feedback.

ELEC 6520/6526 DISCRETE EMBEDDED CONTROL SYSTEMS (3). LEC. 3. Pr., ELEC 3500. Discrete state equation models, control system characteristics, pole placement design and implementation, estimator design and implementation.


ELEC 6620/6626 POWER SYSTEM ANALYSIS (3). LEC. 3. Pr., ELEC 3600 or departmental approval. Power system modeling, power flow analysis, analysis of faulted power systems.


ELEC 6650/6656 POWER SYSTEM PROTECTION (3). LEC. 3. Pr., ELEC 3600. Fault analysis using symmetrical components, Power switchgear, including switches, disconnects, fuses, relays and circuit breakers. Fundamentals of electric power system protection, including bus, transformer and line protection.


ELEC 6730/6736 MICROELECTRONIC FABRICATION (3). LEC. 2, LAB. 3. Pr., ELEC 2210 or departmental approval. Introduction to monolithic integrated circuit technology. Bipolar and MOS processes and structures. Elements of layout, design, fabrication, and applications. Experiments in microelectronic technologies.

ELEC 6740/6746 ELECTRONICS MANUFACTURING (3). LEC. 2, LAB. 3. Pr., ELEC 3700 or departmental approval. Materials and processes used to manufacture electronic products. Particular attention is given to substrate technology and electronics assembly.

ELEC 6750/6756 INTRODUCTION TO PLASMA ENGINEERING (3). LEC. 3. Pr., ELEC 3320 or departmental approval. Electrical breakdown and discharge in gases, basic plasma theories, applications of plasmas, plasma processing for microelectronic fabrication.

ELEC 6760/6766 SOLID STATE SENSORS (3). LEC. 3. Pr., ELEC 3700 or departmental approval. Theory, technology and design of micro-mechanical components.
sensors, electrochemical microsensors, photodetectors, and integrated smart sensors.

ELEC 6770/6775 VLSI DESIGN (3). LEC. 3. Pr., ELEC 2210, ELEC 2220. Review of MOS transistor fundamentals, CMOS logic circuits; VLSI fabrication and design rules; clocking strategies and sequential design; performance estimation; memories and programmable arrays; standard cell design methodologies; computer aided design (CAD) tools.

ELEC 6780/6786 ANALOG CIRCUIT DESIGN (3). LEC. 3. Pr., ELEC 3700 or departmental approval. Circuit design techniques used for implementing analog integrated circuits in both CMOS and bipolar technologies.

ELEC 6810/6816 COMPUTED IMAGING SYSTEMS (3). LEC. 3. Pr., ELEC 2120 or departmental approval. Introduction to computer imaging systems such as magnetic resonance imaging (MRI), computed tomography (CT), and synthetic aperture radar (SAR).

ELEC 6970/6975 SPECIAL TOPICS IN ELECTRICAL ENGINEERING (1-5). LEC. Pr., departmental approval. Study of a specialized area of Electrical & Computer Engineering not covered by regularly offered courses. Course may be repeated for a maximum of 5 credit hours.

ELEC 7200/7206 ADVANCED TOPICS IN COMPUTER ARCHITECTURE (3). LEC. 3. Pr., ELEC 6200. Current topics in the field of modern computer architecture and design, with emphasis varying according to current research interests. Course may be repeated with change in topic. Course may be repeated for a maximum of 6 credit hours.


ELEC 7220/7226 ADVANCED INFORMATION NETWORKS & TECHNOLOGY (3). LEC. 3. Pr., ELEC 6220. Emerging architectures, protocols, standards and technologies of information networks; design of data, video and audio information networks; emerging multimedia applications of information networks.


ELEC 7250/7256 VLSI TESTING (3). LEC. 3. Pr., ELEC 6760. Exponential nature of the test problem, fault models, test generation algorithms, test generation for sequential circuits, fault simulation, testability measures, fault coverage, yield and defect levels, design-for-testability approaches.


ELEC 7330 ELECTROMAGNETIC MEASUREMENTS (3). LEC. 1, LAB. 6. Pr., ELEC 6310, ELEC 6340, ELEC 6350. Electromagnetic theory is supported by lab experiments, including microphone circuit characterization using a vector network analyzer, antenna and radar cross section measurements in an anechoic chamber, and optical measurements using an optical spectrometer.


ELEC 7350/7356 COMPUTATIONAL ELECTROMAGNETICS II (3). LEC. 3. Pr., ELEC 7310. Solutions of electromagnetic scattering, radiation, and coupling problems using a variety of common asymptotic techniques.

ELEC 7410/7416 STOCHASTIC SIGNAL AND SYSTEM ANALYSIS (3). LEC. 3. Pr., departmental approval. Applications of probability, random variables and stochastic processes in electrical engineering.

ELEC 7420/7426 ADAPTIVE SIGNAL PROCESSING (3). LEC. 3. Coreq., ELEC 7410. Least mean square and recursive least square algorithms; adaptive FIR and IIR filters, lattice filters, Kalman filters; adaptive system identification and its application in communications and control.

ELEC 7430/7436 ADVANCED COMMUNICATION THEORY (3). LEC. 3. Pr., ELEC 3400. Principles of modern communication systems. Elements of information theory, source encoding, efficient signaling with coded waveforms, convolutional codes; carrier recovery and synchronization under AGN channel; adaptive equalization; maximum likelihood estimation, Viterbi algorithm.

ELEC 7500/7506 STATE-ARRAYABLE SYSTEMS (3). LEC. 3. Pr., departmental approval. Matrices and linear spaces; state variable for linear continuous and discrete systems; applications in analysis and design of control systems.

ELEC 7510/7516 OPTIMAL AND STOCHASTIC CONTROL SYSTEMS (3). LEC. 3. Pr., departmental approval. Theory of extrema, calculus of variations, LQR/LQG theory, optimal control, observability, controllability, sensitivity, observers and state estimators, pole assignments.


ELEC 7550/7556 FUZZY LOGIC CONTROL SYSTEMS (3). LEC. 3. Pr., ELEC 7500. Fuzzy logic as information representation and decision making paradigm; stability analysis, system identification and estimation, adaptive fuzzy control, supervisory control, gain scheduling.

ELEC 7560/7566 NONLINEAR SYSTEMS AND CONTROL (3). LEC. 3. Pr., ELEC 7500 or departmental approval. Nonlinear systems modeling and analysis; nonlinear control systems design; nonlinear system state estimation.

ELEC 7610/7616 POWER SYSTEM DYNAMICS AND STABILITY (3). LEC. 3. Pr., ELEC 6620 and ELEC 6650 or departmental approval. Dynamic models of power systems and analysis of power system stability.

ELEC 7620/7626 POWER SYSTEM OPERATION (3). LEC. 3. Pr., ELEC 6620 or departmental approval. Unit commitment, power system security, state estimation, power system control centers and real-time applications.


ELEC 7640/7646 POWER SYSTEM TRANSIENTS (3). LEC. 3. Pr., ELEC 6620 or departmental approval. Transients in electric power systems, including lightning and switching phenomena. Traveling waves on power transmission lines, BIL, BSL, line insulation. System modeling.

ELEC 7710/7716 THE FIELD-EFFECT TRANSITOR (3). LEC. 3. Pr., ELEC 6710. Advanced treatment of the modern field-effect transistor: the state-of-the-art, the MOS capacitor, the 4-terminal MOSFET, short and narrow-channel effects, reliability, scaling theory, modeling, silicon-on-insulator technology, heterostructure devices.

ELEC 7720/7726 THE BIPOLAR TRANSITOR (3). LEC. 3. Pr., ELEC 6710. Advanced treatment of the modern bipolar junction transistor; the state-of-the-art, terminal currents, solutions for arbitrary doping profiles, the polysilicon emitter contact, high-injector effects, dynamic operation, device models, heterojunction bipolar transistors.

ELEC 7730/7736 ADVANCED PLASMA PROCESSING FOR MICRO-ELECTRONIC FABRICATION (3). LEC. 3. Pr., ELEC 6750 or departmental approval. Plasma reactor design and process optimization, plasma-assisted etching and deposition processes, plasma-assisted oxidation and surface modification processes, plasma polymerization, plasma-induced damages to semiconductor devices.

ELEC 7740/7746 ELECTRONIC PACKAGING (3). LEC. 3. Pr., ELEC 6740 or departmental approval. Design issues in the packaging of electronics. Emphasis is placed on physical design, electrical performance, thermal characteristics and mechanical stress-induced failures.


ELEC 7770/7776 ADVANCED VLSI DESIGN (3). LEC. 3. Pr., ELEC 6770 or departmental approval. Review of CMOS logic circuits; impact of fabrication issues on design; high speed switching circuits; high performance memory structures; advanced clocking strategies and clock distribution; performance optimization; deep submicron design issues; ASIC design flow: logic synthesis, placement and routing; design verification; low power design.
ELEC 7780/7786 RF MICROELECTRONICS (3). LEC. 3. Pr., ELEC 6780 or departmental approval. Techniques used in the design of monolithic integrated circuits for RF applications.

ELEC 7800/7806 ADVANCED COMPUTATIONAL TECHNIQUES FOR ELECTRICAL ENGINEERING (3). LEC. 3. Pr., ELEC 2120, ELEC 3320. Introduction to high level programming techniques in electrical engineering applications; topics include linear systems analysis, system identification, nonlinear dynamic systems, and electromagnetic applications.

ELEC 7900 INDEPENDENT STUDY IN ELECTRICAL ENGINEERING (1-3). IND. Pr., departmental approval. Course may be repeated for a maximum of 3 credit hours.

ELEC 7950 ELECTRICAL ENGINEERING SEMINAR (1-10). SEM., SU. Course may be repeated for a maximum of 10 credit hours.

ELEC 7970/7976 SPECIAL TOPICS IN ELECTRICAL ENGINEERING (1-5). LEC. Pr., departmental approval. Course may be repeated for a maximum of 9 credit hours.

ELEC 7990 RESEARCH AND THESIS (1-6). M.S., T.D. Course may be repeated for a maximum of 6 credit hours.

ELEC 8310 ADVANCED TOPICS IN ELECTROMAGNETICS (3). LEC. 3. Pr., ELEC 7320. Continued development of analytical and numerical applications of Maxwell's equations in arbitrary media in both the frequency and time domains. Includes individual and group projects.

ELEC 8410 SPECTRAL ESTIMATION AND SYSTEM IDENTIFICATION (3). LEC. 3. Pr., ELEC 7410. Elements of parameter estimation theory; Nonparametric spectral estimation: periodogram and spectral windows; Parametric approaches; applications; higher-order spectral analysis; input-output system identification.


ELEC 8710 ADVANCED TOPICS IN SEMICONDUCTOR DEVICES (3). LEC. 3. Pr., ELEC 6710. Advanced treatment of selected topics in semiconductor devices. Course may be repeated for a maximum of 6 credit hours.

ELEC 8780 CONTEMPORARY TOPICS IN ELECTRONIC CIRCUIT DESIGN (3). LEC. 3. Pr., ELEC 6780 or departmental approval. Contemporary topics in electronic circuit design such as Delta-Sigma A/D and D/A conversion, switched capacitor circuitry, continuous time and discrete time filter design, communications electronics. Course may be repeated for a maximum of 6 credit hours.

ELEC 8900 INDEPENDENT STUDY IN ELECTRICAL ENGINEERING (1-3). IND. 1. Pr., departmental approval Course may be repeated for a maximum of 3 credit hours.

ELEC 8970 SPECIAL TOPICS IN ELECTRICAL ENGINEERING (1-5). LEC. Pr., departmental approval. Course may be repeated for a maximum of 9 credit hours.

ELEC 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated for a maximum of 20 credit hours.

English (ENGL)


ENGL 1107 HONORS WRITING SEMINAR I (3). LEC. 3. Pr., membership in the Honors College. English Composition Core. Topics in writing for students in Honors.

ENGL 1120 ENGLISH COMPOSITION II (3). LEC. 3. Pr., Grade of C or better in ENGL 1100. English Composition core. Emphasis on research.

ENGL 1127 HONORS WRITING SEMINAR II (3). LEC. 3. Pr., membership in the Honors College; ENGL 1107 with grade of C or better. English Composition core. Emphasis on research.

ENGL 1800 ORAL PROFICIENCY IN ENGLISH FOR INTERNATIONAL STUDENTS (3). LEC. 3. SU. Skills that international students need to communicate orally in English.

ENGL 1820 CLASSROOM COMMUNICATION SKILLS FOR INTERNATIONAL TEACHING ASSISTANTS (3). LEC. 3. SU. Pr., graduate standing. Oral language skills required for effective classroom communication.

ENGL 1900 WRITING PROFICIENCY IN ENGLISH FOR INTERNATIONAL STUDENTS (3). LEC. 3. SU. Skills that international students need to undertake successful research writing in English.

ENGL 2120 UNDERSTANDING POETRY (3). LEC. 3. Pr., ENGL 1100 or ENGL 1107. Approaches to reading and writing about poetry.

ENGL 2140 UNDERSTANDING FICTION (3). LEC. 3. Pr., ENGL 1100 or ENGL 1107. Approaches to reading and writing about fiction.

ENGL 2160 UNDERSTANDING DRAMA (3). LEC. 3. Pr., ENGL 1100 or ENGL 1107. Approaches to reading and writing about drama.

ENGL 2200 WORLD LITERATURE I (3). LEC. 3. Pr., Grade of C or better in ENGL 1120 or ENGL 1127. Culturally diverse readings in world literature from the ancient period to c. 1600.

ENGL 2207 HONORS WORLD LITERATURE I (3). LEC. 3. Pr., Grade of C or better in ENGL 1127; membership in the Honors College. Culturally diverse readings in world literature from the ancient period to c. 1600.

ENGL 2210 WORLD LITERATURE II (3). LEC. 3. Pr., ENGL 2200. Culturally diverse readings in world literature from c.1600 to the present.

ENGL 2217 HONORS WORLD LITERATURE II (3). LEC. 3. Pr., ENGL 2207 and membership in the Honors College. Culturally diverse readings in world literature from c.1600 to the present.

ENGL 3040 TECHNICAL WRITING (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127; junior standing. Credit will not be given for both ENGL 3040 and ENGL 3080. Writing in engineering, scientific, and technical fields.

ENGL 3080 BUSINESS WRITING (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127; junior standing. Credit will not be given for ENGL 3080 and ENGL 3040. Writing in business management or governmental service fields.

ENGL 3110 SURVEY OF LINGUISTICS (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. The structure of language, especially American English sounds, words, and syntax, along with study in such areas as dialects and language change.

ENGL 3190 STUDIES IN CHILDREN'S LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127.

ENGL 3350 CLASSICAL MYTHOLOGY (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. The character and influence of Greek and Roman mythology.

ENGL 3360 THE BIBLE FOR STUDENTS OF LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Biblical backgrounds to English and American literature; the Bible as literature.

ENGL 3530 SURVEY OF BRITISH LITERATURE I (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature from its beginnings to the end of the 18th century.

ENGL 3540 SURVEY OF BRITISH LITERATURE II (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature from the end of the 18th century to the present.

ENGL 3700 SURVEY OF AMERICAN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American literature from its beginnings to the present.

ENGL 3710 SURVEY OF AFRICAN-AMERICAN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. African-American literature from its beginnings to the present.

ENGL 3840 LITERATURE AND CULTURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. The relation of literary works to their cultural contexts.

ENGL 3870 WORLD ENGLISH LITERATURES (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Non-British and non-American literature written in English.


ENGL 4010 THE PERSONAL ESSAY (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. History, reading, analysis, and writing of the personal essay.
ENGL 4030 INTERPRETING TEXTS (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Theory and practice of interpreting literary and non-literary texts.

ENGL 4140 LANGUAGE VARIATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Concentrated investigation of varying topics in linguistics or rhetoric. Course may be repeated for a maximum of 6 credit hours.

ENGL 4160 TECHNOLOGY, LITERACY, AND CULTURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. COMP 1000, computer competency test, or consent of instructor. Connections between technology, literacy, and culture. Includes instruction in advanced computer applications.

ENGL 4180 RHETORICAL THEORY AND PRACTICE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Classical and contemporary rhetorical theory, rhetorical analysis, and modern stylistics applied to a variety of literary and non-literary texts.

ENGL 4200 FICTION WRITING I (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Introduction to the craft of fiction writing; reading, studying, and writing short stories.

ENGL 4210 FICTION WRITING II (3). LEC. 3. Pr., ENGL 4200, ENGL 1120 or ENGL 1127. Advanced fiction writing.

ENGL 4220 POETRY WRITING I (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Introduction to the craft of poetry writing; reading, studying, and writing poems.

ENGL 4230 POETRY WRITING II (3). LEC. 3. Pr., ENGL 4220, ENGL 1120 or ENGL 1127. Advanced poetry writing.

ENGL 4240 SPECIAL PROJECT IN CREATIVE WRITING (3). LEC. 3. Pr., ENGL 4200 or ENGL 4220. Course may be repeated for a maximum of 6 credit hours.

ENGL 4300 CHAUCER (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. The major works of Chaucer in Middle English.

ENGL 4310 BRITISH DRAMA, BEGINNINGS TO 1642 (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature, 1485-1603.


ENGL 4330 EARLY SHAKESPEARE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Comedies, histories, and early tragedies.

ENGL 4340 LATER SHAKESPEARE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Tragedies, dark comedies, and romances.

ENGL 4350 EARLY 17TH-CENTURY BRITISH LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature, 1603-1660.

ENGL 4360 MILTON (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Milton's principal poems, especially "Paradise Lost", with some attention to his prose.


ENGL 4390 18TH-CENTURY BRITISH NOVEL (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127.

ENGL 4400 ROMANTIC LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature, 1798-1830.


ENGL 4420 19TH-CENTURY BRITISH NOVEL (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127.


ENGL 4440 CONTEMPORARY BRITISH LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. British literature, 1945-present.

ENGL 4500 EARLY AMERICAN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American literature from its beginnings to 1800.

ENGL 4510 AMERICAN ROMANTICISM (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. 19th-century American literature to approximately 1865.

ENGL 4520 AMERICAN REALISM AND NATURALISM (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American literature of the later 19th and early 20th centuries.


ENGL 4540 CONTEMPORARY AMERICAN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American literature, 1945-present.

ENGL 4550 THE AMERICAN NOVEL (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127.

ENGL 4560 AMERICAN POETRY (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Major poets from the colonial period to the present.

ENGL 4570 SOUTHERN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Literature of the American South.

ENGL 4580 TOPICS IN AFRICAN-AMERICAN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Concentrated investigation of varying topics in African-American literature and culture. Course may be repeated for a maximum of 6 credit hours.

ENGL 4600 THE CLASSICAL BACKGROUND (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Readings from the major Greek and Roman writers.

ENGL 4610 MEDIEVAL LITERATURE IN TRANSLATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Significant novels by major European writers.

ENGL 4620 THE EUROPEAN NOVEL (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American, British, and world drama from Ibsen through World War II.

ENGL 4640 CONTEMPORARY DRAMA (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. American, British, and world drama of the post-World War II era.

ENGL 4650 STUDIES IN COMPARATIVE LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Non-British and non-American literature written in English or studied in translation. Course may be repeated for a maximum of 6 credit hours.

ENGL 4700 THE SHORT STORY (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Development of the short story in America and Europe from the early 19th- century to the present.

ENGL 4710 POPULAR GENRES (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Study of one or more of the genres represented in the literature of past and present popular cultures. Course may be repeated for a maximum of 6 credit hours.

ENGL 4720 TOPICS IN LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Concentrated investigation of varying topics in literature. Course may be repeated for a maximum of 6 credit hours.

ENGL 4730 TOPICS IN CRITICAL THEORY (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Course may be repeated for a maximum of 6 credit hours.

ENGL 4740 TOPICS IN GENDER AND LITERATURE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Examination of varying topics related to the intersection between literature and gender. Course may be repeated for a maximum of 6 credit hours.

ENGL 4920 INTERNSHIP IN ENGLISH STUDIES (3). IND. SU. Pr., ENGL 1120 or ENGL 1127, departmental approval. Supervised experience in applying reading, writing and research skills to the workplace.

ENGL 4950 SENIOR SEMINAR (3). LEC. 3. Pr., Senior standing, English major core courses, English major. Research seminar on a significant topic in literature and/or language.

ENGL 4960 DIRECTED READINGS (3). IND. Pr., Junior standing. 3.0 overall GPA, 3.5 GPA in at least five 4000-level English courses, departmental approval. Readings in a specific area of literature or language. Course may be repeated for a maximum of 6 credit hours.

ENGL 4967 READINGS FOR HONORS (3). IND. Pr., ENGL 1120 or ENGL 1127, membership in the Honors College. Individual reading programs determined by the instructor and student. An honors essay and a written examination will be required.

ENGL 4997 HONORS THESIS (3). IND. Pr., ENGL 1120 or ENGL 1127, membership in the Honors College. Course may be repeated for a maximum of 6 credit hours.

ENGL 5000 TECHNICAL AND PROFESSIONAL EDITING (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing, and a technical writing, business writing, or advanced composition course or departmental approval.

ENGL 5010 DOCUMENT DESIGN IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior
standing, and a technical writing, business writing, or advanced composition course or departmental approval.

ENGL 5030 TOPICS IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing, and a technical writing, business writing, or advanced composition course or departmental approval.

ENGL 5410 HISTORY OF THE ENGLISH LANGUAGE (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing. The chronological development of the English language.

ENGL 5840 MODERN ENGLISH GRAMMARS (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing. Examination of several grammatical theories, with emphasis on English syntax.

ENGL 5910 PRACTICUM IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing, and departmental approval. Supervised experience in editing technical, business, and scientific documents.

ENGL 6000 TECHNICAL AND PROFESSIONAL EDITING (3). LEC. 3.

ENGL 6010 DOCUMENT DESIGN IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3.

ENGL 6030 TOPICS IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Course may be repeated for a maximum of 6 credit hours.

ENGL 6410 HISTORY OF THE ENGLISH LANGUAGE (3). LEC. 3. The chronological development of the English language.

ENGL 6840 MODERN ENGLISH GRAMMARS (3). LEC. 3. Examination of several grammatical theories, with emphasis on English syntax.

ENGL 6910 PRACTICUM IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127, junior standing, and departmental approval. Supervised experience in editing technical, business, and scientific documents.

ENGL 7010 TECHNICAL AND PROFESSIONAL COMMUNICATION: ISSUES AND APPROACHES (3). LEC. 3. Introduction to the history, practice, and profession of technical and professional communication.

ENGL 7020 THE PEDAGOGY OF TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Methods, practices, and theories of technical and professional communication for prospective teachers.

ENGL 7030 STUDIES IN TECHNICAL AND PROFESSIONAL COMMUNICATION (3). LEC. 3. Extensive study of selected types of research and writing for special purposes and novel situations. Course may be repeated for a maximum of 6 credit hours.


ENGL 7050 STUDIES IN COMPOSITION (3). LEC. 3. The advanced study of an approach or an issue in composition studies. Course may be repeated for a maximum of 9 credit hours.

ENGL 7130 FICTION WRITING (3). LEC. 3. Workshop in the craft and writing of fiction. Course may be repeated for a maximum of 6 credit hours.

ENGL 7140 POETRY WRITING (3). LEC. 3. Workshop in the craft and writing of poetry. Course may be repeated for a maximum of 6 credit hours.

ENGL 7150 BRITISH LITERATURE TO 1500 (3). LEC. 3. Major works and genres in Middle English and related literary traditions.

ENGL 7160 BRITISH LITERATURE: 1500-1660 (3). LEC. 3. Major literary movements, authors, and/or genres.

ENGL 7170 BRITISH LITERATURE: 1660-1800 (3). LEC. 3. Major literary movements, authors, and/or genres.

ENGL 7180 BRITISH LITERATURE: 1800-1900 (3). LEC. 3. Major literary movements, authors, and/or genres.

ENGL 7190 AMERICAN LITERATURE TO 1900 (3). LEC. 3. Major literary movements, authors, and/or genres.

ENGL 7200 WORLD LITERATURE IN ENGLISH 1900-PRESENT (3). LEC. 3. Major literary movements, authors, and/or genres.

ENGL 7230 OLD ENGLISH LANGUAGE AND LITERATURE (3). LEC. 3. Anglo-Saxon language, literature, and culture.

ENGL 7250 ENGLISH LANGUAGE LEARNING AND DEVELOPMENT (3). LEC. 3. Theories underlying the learning of English, especially as a non-native language.

technical sketching, instrument drawing and computer-aided drafting and design.

**ENGR 2010 THERMODYNAMICS** (3). LEC. 2, LAB. 3. Pr., CHEM 1030 or CHEM 1110, MATH 1620 or MATH 1720. Coreq., CHEN 2100, CHEN 2101, and PHYS 1600. Principles and applications of thermodynamics to engineering problems. Laboratory includes multi-disciplinary team projects on thermodynamics applications and fundamentals of engineering thermodynamics.

**ENGR 2050 STATICS** (3). LEC. 3. Pr., PHYS 1600. Coreq., MATH 2630. Principles of vectors, forces, moments, free body diagrams, force systems, 2-D and 3-D equilibrium, friction, geometric properties of plane areas.

**ENGR 2070 MECHANICS OF MATERIALS** (3). LEC. 3. Pr., ENGR 2050. Coreq., MATH 2650. Principles of stress and strain; stress-strain relationships; uniaxially loaded members; torsion; bending; beam shear; shear, moment and thrust diagrams; transformed sections; column buckling.

**ENGR 2100 FUNDAMENTALS OF ENGINEERING MECHANICS** (3). LEC. 3. Pr., PHYS 1600. Basic principles of two-dimensional force systems, free body diagrams, concepts of stress and strain, centroids of composite areas, kinematics and kinetics of particles and rigid bodies.

**ENGR 2200 INTRODUCTION TO THERMODYNAMICS, FLUIDS AND HEAT TRANSFER** (3). LEC. 3. Pr., CHEM 1030, PHYS 1610. Coreq., MATH 2650. Principles and applications of thermodynamics, fluids and heat transfer.

**ENGR 2350 DYNAMICS** (3). LEC. 3. Pr., ENGR 2050. Fundamental principles of dynamics including kinematics and kinetics of particles, kinematics and kinetics of rigid bodies, mass moments of inertia, three-dimensional dynamics of rigid bodies, and simple harmonic motion.


**ENGR 3520 INTEGRATING BUSINESS AND ENGINEERING THEORIES WITH PRACTICE** (3). LEC. 2, LAB. 3. Coreq., BUSI 3530 Case study problems from business and engineering practice.

**ENGR 4957 ENGINEERING HONORS SEMINAR** (3). SEM. 3. Pr., junior standing; membership in the Honors College, departmental approval. Topics of interest to honors students and engineering faculty. Interaction with successful engineering alumni.

**ENGR 4970 CAPSTONE PROJECT I: DESIGN PROPOSAL** (1). LEC. 3. Coreq., BUSI 4540. Processes to develop and present design proposal for cooperating industry. Credit will not be given for both BUSI 4970 and ENGR 4970.

**ENGR 4980 CAPSTONE PROJECT II: DESIGN PROJECT** (3). LEC. 3. Pr., BUSI 4970 or ENGR 4970. Cross-functional team design projects sponsoring industry.

**Entomology (ENTM)**

Dr. Michael L. Williams - 844-5006

**ENTM 2040/2403 INSECTS: AN INTRODUCTION TO ENTOMOLOGY** (3). LEC. 3. Life processes, importance, and occurrence of insects. Fall, Spring.


**ENTM 4040 INSECTS AFFECTING HUMANS, DOMESTIC ANIMALS AND WILDLIFE** (3). LEC. 3. Pr., BIOL 1030 or ENTM 3040 or departmental approval. Insects and other arthropods which attack animals or otherwise cause problems of public-health, veterinary, or wildlife importance. Fall.

**ENTM 4150 INTEGRATED FOREST PEST MANAGEMENT** (3). LEC. 2. LAB. 3. Pr., ENTM 2150, FORY 3100. Identification, principles of integrated management, and computer modeling of insects and fungi that attack forest and shade trees. Spring.

**ENTM 4920 ENTOMOLOGY INTERNSHIP** (5). INT. 5. SU. Practical professional experience under the supervision of internship faculty and/or representatives of state, federal or private agency.

**ENTM 4970 SPECIAL PROBLEMS** (1-3). LEC. Pr., senior standing; departmental approval. Credit to be arranged. Course may be repeated for a maximum of 3 credit hours.

**ENTM 4997 HONORS THESIS** (1-6). IND. Pr., junior or senior standing; membership in the Honors College; departmental approval. Course may be repeated for a maximum of 6 credit hours.

**ENTM 5010 ENTOMOLOGY FOR EDUCATORS** (4). LEC. 4. LAB. 3. Pr., BIOL 1030. Biology and diversity of insects and related arthropods with applications for educators. An insect collection and an entomological exposition are required. Summer.


**ENTM 5140 AQUATIC INSECTS** (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or BIOL 4010 or departmental approval. Biology and ecology of aquatic and semi-aquatic insects. Laboratory sessions focus on identification at the family and generic levels, and experience in collecting and field techniques. Spring.

**ENTM 5150 ARACHNOLOGY** (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or departmental approval. Biology, behavior and systematics of all arachnid groups, with major emphasis on spiders and mites. Fall.

**ENTM 5220 INSECT ECOLOGY** (4). LEC. 3. LAB. 3. Pr., BIOL 1060 or departmental approval. Ecological interactions of insects and their environment, with emphasis on herbivory, predation, parasitism and mutualism, as well as population and community dynamics. Fall.

**ENTM 5300 SYSTEMATIC ENTOMOLOGY** (4). LEC. 3. LAB. 4. Pr., ENTM 3040 or ENTM 4020 or departmental approval. Learn to use the tools of the taxonomist to identify common families of insects. A collection is required. Field trips will be taken. Fall.


**ENTM 5340 URBAN FOREST INSECTS** (3). LEC. 2. LAB. 3. Pr., ENTM 2150, ENTM 3040 or ENTM 4020. Identification, importance, biology and management of principal insects of the urban forest. Fall.

**ENTM 5360 LANDSCAPE ENTOMOLOGY** (4). LEC. 3. LAB. 3. Pr., BIOL 1020 or BIOL 1030. Identification and management of arthropod pests in the landscape. Recognition of pests and damage to trees, turf and ornamental plants. Fall.


**ENTM 5440 INSECT MORPHOLOGY** (4). LEC. 3. LAB. 4. Pr., ENTM 3040, ENTM 4020 or departmental approval. Form and function in insects and related arthropods emphasizing morphological characteristics used in insect identification. Spring.

**ENTM 6010 ENTOMOLOGY FOR EDUCATORS** (4). LEC. 4. LAB. 3. Pr., BIOL 1030. Biology and diversity of insects and related arthropods with applications for educators. An insect collection and an entomological exposition are required. Summer.


**ENTM 6140 AQUATIC INSECTS** (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or BIOL 4010 or departmental approval. Biology and ecology of aquatic and semi-aquatic insects. Laboratory sessions focus on identification at the family and generic levels, and experience in collecting and field techniques. Spring.

**ENTM 6150 ARACHNOLOGY** (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or departmental approval. Biology, behavior and systematics of all arachnid groups, with major emphasis on spiders and mites. Fall.

**ENTM 6220 INSECT ECOLOGY** (4). LEC. 3. LAB. 3. Pr., BIOL 3060 or departmental approval. Ecological interactions of insects and their environment, with emphasis on herbivory, predation, parasitism and mutualism, as well as population and community dynamics. Fall.
ENTM 6300 SYSTEMATIC ENTOMOLOGY (5). LEC. 3. LAB. 6. Pr., ENTM 3040, or ENTM 4020 or departmental approval. Principles of systematics and identification of insects through orders, families, genera, and species. Collections are required. Credit will not be given for both ENTM 4300 and ENTM 7300. Fall.


ENTM 6340 URBAN FOREST INSECTS (3). LEC. 2. LAB. 3. Pr., ENTM 2150, ENTM 3040 or ENTM 4020. Identification, importance, biology and management of principal insects of the urban forest. Fall.

ENTM 6360 LANDSCAPE ENTOMOLOGY (4). LEC. 3. LAB. 3. Pr., BIOL 1020 or BIOL 1030. Identification and management of arthropod pests in the landscape. Recognition of pests and damage to trees, turf and ornamental plants. Fall.


ENTM 6440 INSECT MORPHOLOGY (5). LEC. 3. LAB. 6. Pr., ENTM 3040, or ENTM 4020 or departmental approval. Comparative external anatomy and generalized internal structures of insects. Characteristics used in taxonomy will be emphasized. Credit will not be given for both ENTM 5440 and ENTM 6440. Spring.


ENTM 7190 PLANT AND ANIMAL INTERACTIONS (3). LEC. 3. Pr., BIOL 3060 or departmental approval. Ecological and evolutionary interrelationships emphasizing pollination biology, seed dispersal and plant-herbivore interactions. Spring.

ENTM 7200 INSECT PHYSIOLOGY (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or departmental approval. Introduction to insect physiology stressing structure and function of each organ system. Methods used in physiological research will be emphasized. Spring.

ENTM 7330 MEDICAL-VETERINARY ENTOMOLOGY (4). LEC. 3. LAB. 3. Pr., ENTM 3040 or BIOL 6110, or departmental approval. Insects, mites, and other arthropods of medical or veterinary importance, identification of species, their biology and role as vectors of disease agents. Fall.

ENTM 7345 TROPICAL BIOLOGY: AN ECOLOGICAL APPROACH (8). LEC. 4. LAB. 12. Pr., 15 hours of biological courses at or above the 7000 level; departmental approval. The principles of ecology in the tropics.

ENTM 7920 GRADUATE INTERNSHIP (3). LEC. 3. Pr., M.Ag. candidates or departmental approval. Practical professional experience under supervision of faculty internship adviser. Course may be repeated for a maximum of 12 credit hours.

ENTM 7950 SEMINAR (1). SEM. 1. SU. Presentation and discussion of scientific literature of thesis research findings. Required of all M.S. candidates.

ENTM 7970 SPECIAL PROBLEMS AND TOPICS (1-5). LEC. Discussion groups on specific topics, assigned readings, or laboratory and field research. Course may be repeated for a maximum of 5 credit hours.

ENTM 7990 RESEARCH AND THESIS (1-10). MST., TD. Pr., admission to the M.S. Program. Topics may focus on technical laboratory problems or field research related to arthropod biology. Course may be repeated with change in topic.

ENTM 8950 SEMINAR (1). LEC. 1. SU. Presentation and discussion of scientific literature or dissertation research findings. Required of all Ph.D. students.

ENTM 8970 SPECIAL PROBLEMS OR TOPICS (1-5). LEC. Pr., admission to the Ph.D. Program. Research projects or study topics at an advanced level directed by individual faculty members. Course may be repeated for a maximum of 5 credit hours.

ENTM 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., admission to the Ph.D. program. Course may be repeated with change in topic.

Environmental Science (ENVI)

Dr. Joe Morgan - 844-4326

ENVI 1010 INTRODUCTION TO ENVIRONMENTAL SCIENCE (0). LEC. 1. SU. Introduction to the environmental science field and the ENVI major.

ENVI 1020 FUNDAMENTALS OF ENVIRONMENTAL SCIENCE (2). LEC. 2. Survey of fundamental concepts, issues, and concerns related to environmental science.

ENVI 2010 ENVIRONMENTAL SCIENCE SEMINAR (1). LEC. 1. Pr., ENGL 1120 and departmental approval. Discussion of current issues in environmental science.

Finance (FINC)

Dr. Daniel Page - 844-4344

FINC 2400 PERSONAL FINANCE (3). LEC. 3. Pr., 2.2 GPA. Plans for managing personal financing problems involving insurance, housing, household budgeting, investments, personal and bank loans, personal credit and time value of money.

FINC 3200 RISK AND INSURANCE (3). LEC. 3. Pr., 2.2 GPA and junior standing. Essentials of risk management, with emphasis on the use of insurance, including the characteristics of property, liability, life and health insurance.

FINC 3250 PRINCIPLES OF REAL ESTATE (3). LEC. 3. Pr., 2.2 GPA and junior standing. Fundamental principles and practices as applied to the purchase, sale and lease and management of real estate.

FINC 3610 PRINCIPLES OF BUSINESS FINANCE (3). LEC. 3. Pr., 2.2 GPA, ACCT 2110 and junior standing. Corporate finance from the perspective of a financial manager. Topics include financial planning and forecasting, cash budgeting, capital budgeting, basic valuation, dividends.

FINC 3617 HONORS PRINCIPLES OF BUSINESS FINANCE (3). LEC. 3. Pr., ACCT 2117. Membership in the honors college junior standing, cumulative GPA of 2.2 or higher. Corporate finance from the perspective of a financial manager. Topics include financial planning and forecasting, cash budgeting, capital budgeting, basic valuation, dividends. Fall, Spring.

FINC 3620 SMALL BUSINESS FINANCE (3). LEC. 3. Pr., FINC 3610 and 2.2 GPA. Financial control, financial forecasting, working capital and sources of financing in a small and closely-held business environment.

FINC 3630 ADVANCED BUSINESS FINANCE (3). LEC. 3. Pr., 2.2 GPA. FINC 3610 and STAT 2610. In-depth analysis of financial concepts including valuation, capital budgeting, cost of capital, leasing, financial analysis, and working capital management.

FINC 3640 INVESTMENTS (3). LEC. 3. Pr., 2.2 GPA and FINC 3610. Types of investment security markets, investment instruments, concepts and strategies for institutional and individual investors.

FINC 3700 FINANCIAL MARKETS AND INSTITUTIONS (3). LEC. 3. Pr., 2.2 GPA and FINC 3610. Overview of the financial system, organization and regulation of financial markets and institutions, the behavior and structure of interest rates.

FINC 4210 PROPERTY AND LIABILITY INSURANCE (3). LEC. 3. Pr., 2.2 GPA, FINC 3200 or departmental approval. Commercial risks and the insurance contracts used to address these risks.

FINC 4220 LIFE INSURANCE (3). LEC. 3. Pr., 2.2 GPA, FINC 3200 or departmental approval. Individual life, health, annuity contracts and other investments, with a focus on financial planning, estate planning and business continuation arrangements.

FINC 4250 REAL ESTATE INVESTMENT (3). LEC. 3. Pr., 2.2 GPA, FINC 3610 and FINC 3250. Analysis and evaluation of real estate investments including cash flow measurement for both residential and commercial investment projects.

FINC 4510 MULTINATIONAL FINANCIAL MANAGEMENT (3). LEC. 3. Pr., 2.2 GPA and FINC 3610. Advantages and problems associated with the multinational corporation, including analysis of currency risk, hedging and political risk.

FINC 4520 INTERNATIONAL FINANCIAL MARKETS (3). LEC. 3. Pr., 2.2 GPA, FINC 4510 or departmental approval. Analysis of multinational finan-
cials, their use by the multinational corporation in managing currency risk, as a source of funds, and for portfolio investment.

FINC 4630 FINANCIAL STRATEGY (3). LEC. 3. Pr., 2.2 GPA, ACCT 3110 and FINC 3630. The advanced application of corporate finance through case analysis, company analysis and current topics.


FINC 4660 SECURITY ANALYSIS (3). LEC. 3. Pr., 2.2 GPA, ACCT 3110, FINC 3630 and FINC 3640. Analysis, techniques and selection of securities to meet specific investment objectives. Focus on individual security analysis and portfolio management.

FINC 4700 MANAGEMENT OF FINANCIAL INSTITUTIONS (3). LEC. 3. Pr., 2.2 GPA and FINC 3700. Management strategies for firms including management of credit, liquidity, capital and interest rate risks in a regulated environment.

FINC 4900 INDEPENDENT STUDY (1-3). IND., SU. Pr., 2.2 GPA and departmental approval. Advanced individual research and study in finance under the direction of a faculty member. Course may be repeated for a maximum of 6 credit hours.

FINC 4920 INTERNSHIP (1-6). INT., SU. Pr., 2.2 GPA and departmental approval. The internship program offers the opportunity to gain relevant and meaningful work experience. Course may be repeated for a maximum of 9 credit hours.

FINC 4970 SPECIAL TOPICS (3). IND. 3. Pr., 2.2 GPA and departmental approval. Specialized topics and current developments and innovations in finance. Course may be repeated for a maximum of 6 credit hours.

FINC 4997 HONORS THESIS (1-6). IND., Pr., Membership in the Honors College and departmental approval. Course may be repeated for a maximum of 6 credit hours.

FINC 5680 FINANCIAL ENGINEERING (3). LEC. 3. Pr., 2.2 GPA, FINC 3630 or FINC 3640 or FINC 3700. Examination of derivative securities with emphasis on applying derivative securities to the management of corporate financial risk.

FINC 6860/6868 FINANCIAL ENGINEERING (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Theory and pricing of derivative securities with emphasis on applying derivative securities in corporate financial risk management.

FINC 7410/7416 BUSINESS RISK MANAGEMENT (3). LEC. 3. Pr., departmental approval. An analysis of business risk and the risk management methods, including loss control, insurance and other forms of risk financing, used to handle these risks.

FINC 7510/7516 MULTINATIONAL FINANCIAL MANAGEMENT (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Finance-related problems of the multinational firm, emphasizing currency markets and derivatives, accounting and operational issues, and management of exchange and political risk.

FINC 7600/7606 ADVANCED CORPORATE FINANCE (3). LEC. 3. Pr., FINC 3610 or departmental approval. Intensive study of theory and problems in corporate finance from an internal decision making point of view.

FINC 7620/7626 ADVANCED REAL ESTATE FINANCE (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Study of real estate markets including regulatory and legal issues, valuation of income producing property, financing sources, corporate real estate, investment performance measurement.

FINC 7630/7636 HEALTH CARE FINANCE (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Techniques and analysis of financial management in a health care setting. Emphasis on financial planning and forecasting, budgeting, capital investment analysis in the regulated health-care marketplace.

FINC 7640/7646 ADVANCED INVESTMENTS (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Types of investment securities, regulation and operation of securities markets and the theory and practice of investments.

FINC 7650/7656 APPLIED FINANCIAL MANAGEMENT (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. The integration of financial theory with practice through spreadsheets, case analysis, company analysis and current topics in finance.

FINC 7660/7666 SECURITY ANALYSIS AND MANAGEMENT (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Advanced analytical methods for security valuation, managing investment portfolios, and developing appropriate investment strategies.

FINC 7670/7676 Mergers, Acquisitions and Restructuring (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Strategic analysis of corporate restructuring and governance including valuation, control issues, joint ventures, divestitures, takeover defense measures, diversification issues.

FINC 7690/7696 ADVANCED FINANCIAL SYSTEMS (3). LEC. 3. Pr., FINC 7600 or BUSI 7110 or departmental approval. Analysis and examination of financial institutions and markets in an evolving regulatory and global marketplace for financial services and products.

FINC 7900/7906 INDEPENDENT STUDY (1-3). IND., SU. Pr., departmental approval. In-depth research and study under the direction of a faculty member. Topics are variable within finance and finance-related areas. Course may be repeated for a maximum of 6 credit hours.

FINC 7970/7976 SPECIAL TOPICS (1-3). IND. Pr., departmental approval. Specialized topics in finance and finance-related areas not otherwise covered in existing courses. Course may be repeated for a maximum of 6 credit hours.

FINC 7990 RESEARCH AND THESIS (1-10). MST, TD., Pr., departmental approval. Course may be repeated with change in topic.

Fisheries and Allied Aquacultures (FISH)

Dr. David B. Rouse - 844-4786

FISH 2100 INTRODUCTION TO FISHERIES SCIENCES (6). LEC. 8, LAB. 24, Pr., BIOL 1030, CHEM 1040. The diverse disciplines in aquatic ecology, fisheries management and aquaculture. Daily field work and frequent trips. Summer.

FISH 2130 RECREATIONAL FISHING (2). LEC. 2. A review of species, gear and features of various sport fisheries with emphasis on Southeastern practices. Spring.

FISH 3950 UNDERGRADUATE SEMINAR (1). LEC. 1, SU. Pr., junior standing or departmental approval. Consideration of various aspects of fisheries work, career options as related to individual interests, and career planning. Fall.

FISH 4715 COMMERCIAL MARINE FISHERIES OF ALABAMA (2). LEC. 2. Exploitation and biology of marine organisms of Alabama and adjoining Gulf of Mexico with emphasis on distribution, harvest, processing and economic value. Taught at Dauphin Island Sea Lab. Summer.

FISH 4920 INTERNSHIP (1-10). INT., SU. Pr., junior standing and departmental approval. Discipline-related learning while employed with cooperating private industry or public agency. Course may be repeated for a maximum of 10 credit hours.

FISH 4967 HONORS READING (1-4). IND. Pr., membership in the Honors College; FISH major; departmental approval. Course may be repeated for a maximum of 4 credit hours.

FISH 4970 UNDERGRADUATE SPECIAL PROBLEMS (1-4). IND. Pr., junior standing and departmental approval. Course may be repeated for a maximum of 4 credit hours.

FISH 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College; FISH major; departmental approval. Course may be repeated for a maximum of 3 credit hours.

FISH 5210 PRINCIPLES OF AQUACULTURE (3). LEC. 3. Pr., BIOL 1030. Principles underlying aquatic productivity and levels of management as demonstrated by present practices of aquaculture around the world.

FISH 5215 MARINE AQUACULTURE (2). LEC. 1, LAB. 2. Introduction to culture of marine species with emphasis in nutrition and feeding, reproductive biology, production techniques, processing, marketing and economics. Taught at the Dauphin Island Sea Lab. Summer.

FISH 5220 WATER SCIENCE (3). LEC. 3. Pr., CHEM 1040, FISH 2100, or departmental approval. Properties of water, the water cycle, basic water chemistry and water quality with emphasis on water in managed ecosystems. Fall.

FISH 5240 HATCHERY MANAGEMENT (4). LEC. 2, LAB. 8. Pr., FISH 5620. Study of warm-water hatchery techniques and application of those techniques in the field. Spring.


FISH 5410 INTRODUCTION TO FISH HEALTH (2). LEC. 2. Pr., BIOL 1030. Introduction to parasitic, bacterial and viral pathogens of wild and cultured finfish and shellfish. Fall.

FISH 5425 MARINE FISH DISEASES (4). LEC. 7. LAB. 6. Pr., BIOL 1030, BIOL 3200 or departmental approval. Introduction to diseases of marine finfish and shellfish and practical techniques used to isolate and identify diseases. Taught at Dauphin Island Sea Lab, Summer, First Term. Summer.

FISH 5510 FISHERIES BIOLOGY AND MANAGEMENT (3). LEC. 2. LAB. 4. Pr., BIOL 1030. An overview of fisheries management with particular emphasis on freshwater examples introducing students to the basic tools and complex issues of fisheries. Fall.

FISH 5520 SMALL IMPOUNDMENT MANAGEMENT (3). LEC. 5. LAB. 10. Pr., BIOL 1030. Major aspects of primarily recreational fishing pond management, including construction, stocking, water quality management, harvest strategy, diagnosis of problems and communication of analyses. Summer.

FISH 5530 FACILITIES FOR AQUACULTURE (3). LEC. 2. LAB. 4. Principles and practice of site selection, design and construction of aquacultural facilities, with emphasis on impoundments and ponds. Fall.

FISH 5560 FISH AND SEAFOOD PROCESSING TECHNOLOGY (3). LEC. 3. Pr., CHEM 2030, BIOL 3200. Emphasis on important species, market forms, preservation techniques, and rules and regulations of the seafood industry.

FISH 5570 FISHERIES AND AQUACULTURE EXTENSION METHODS (2). LEC. 2. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation. Summer.

FISH 5725 MARINE ICHTHYOLOGY (6). LEC. 6. Pr., BIOL 3060, FISH 6380 and departmental approval. Coreq., Admission to Gulf Coast Research Laboratory. General background in the biology of marine fishes and their taxonomy. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, MS. Summer.


FISH 5745 MARINE FISHERIES MANAGEMENT (4). LEC. 4. Pr., departmental approval. Coreq., admission to GCRL. Overview of practical marine fishery management problems. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, MS. Summer.

FISH 6210 PRINCIPLES OF AQUACULTURE (3). LEC. 3. Pr., BIOL 1030. Principles underlying aquatic productivity and levels of management as demonstrated by present practices of aquaculture around the world. Fall.

FISH 6215 MARINE AQUACULTURE (2). LEC. 1. LAB. 2. Introduction to culture of marine species with emphasis in nutrition and feeding, reproductive biology, production techniques, processing, marketing and economics. Taught at the Dauphin Island Sea Lab. Summer.

FISH 6220 WATER SCIENCE (3). LEC. 3. Pr., CHEM 1040, FISH 2100 or departmental approval. Properties of water, the water cycle, basic water chemistry and water quality with emphasis on water in managed ecosystems. Fall.

FISH 6240 HATCHERY MANAGEMENT (4). LEC. 2. LAB. 8. Pr., FISH 6210. Study of warm-water hatchery techniques and application of those techniques in the field. Summer.


FISH 6410 INTRODUCTION TO FISH HEALTH (2). LEC. 2. Pr., BIOL 1030. Introduction to parasitic, bacterial and viral pathogens of wild and cultured finfish and shellfish. Fall.

FISH 6425 MARINE FISH DISEASES (4). LEC. 2. LAB. 2. Pr., BIOL 1030, BIOL 3200 or departmental approval. Introduction to diseases of marine finfish and shellfish and practical techniques used to isolate and identify diseases. Taught at Dauphin Island Sea Lab, Summer, First Term. Summer.

FISH 6510 FISHERIES BIOLOGY AND MANAGEMENT (3). LEC. 2. LAB. 4. Pr., BIOL 1030. An overview of fisheries management with particular emphasis on freshwater examples introducing students to the basic tools and complex issues of fisheries. Fall.

FISH 6520 SMALL IMPOUNDMENT MANAGEMENT (3). LEC. 5. LAB. 10. Pr., BIOL 1030. Major aspects of primarily recreational fishing pond management, including construction, stocking, water quality management, harvest strategy, diagnosis of problems and communication of analyses. Summer.

FISH 6530 FACILITIES FOR AQUACULTURE (3). LEC. 2. LAB. 4. Principles and practice of site selection, design and construction of aquacultural facilities, with emphasis on impoundments and ponds. Fall.

FISH 6560 FISH AND SEAFOOD PROCESSING TECHNOLOGY (3). LEC. 3. Pr., CHEM 2030, BIOL 3200. Emphasis on important species, market forms, preservation techniques, and rules and regulations of the seafood industry.

FISH 6570 FISHERIES AND AQUACULTURE EXTENSION METHODS (2). LEC. 2. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation. Summer.

FISH 6725 MARINE ICHTHYOLOGY (6). LEC. 6. Pr., BIOL 3060, FISH 6380 and departmental approval. Coreq., Admission to Gulf Coast Research Laboratory. General background in the biology of marine fishes and their taxonomy. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, MS. Summer.

FISH 6745 MARINE FISHERIES MANAGEMENT (4). LEC. 4. Pr., departmental approval. Coreq., admission to GCRL. Overview of practical marine fishery management problems. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, MS. Summer.

FISH/BIOL 7030 ADVANCED ICHTHYOLOGY (6). LEC. 6. LAB. 32. Pr., BIOL/FISH 6380, Summer, second term. 5 week course. Survey of biodiversity of freshwater fishes in the southeastern United States through intensive field sampling. Credit will not be given for both FISH 7030 and BIOL 7030. Summer.

FISH 7120 PROFESSIONAL AND RESEARCH ORIENTATION (2). LEC. 2. Concepts of professionalism, professional ethics, technical writing, research design and operations. Fall.


FISH 7270 CRUSTACEAN AND MOLLUSCAN AQUACULTURE (3). LEC. 3. Pr., FISH 6210 or departmental approval. General biology and culture techniques of the major shrimp, crawfish and shellfish species cultured throughout the world. Spring.

FISH 7330 RESERVOIR LIMNOLOGY (3). LEC. 2. LAB. 5. Pr., FISH 6320. Consideration of the ecological characteristics of reservoirs as they relate to modern concepts of ecosystem management. Even years. Summer.

FISH 7340 FISH ECOLOGY (3). LEC. 2. LAB. 3. Pr., BIOL 3060 or equivalent. Study of interactions among fish and their environment. Laboratory will emphasize critical literature reading and experimental approaches. Even years. Fall.

FISH 7360 MANAGEMENT OF AQUATIC FLORA IN FISHERIES AND AQUACULTURE (4). LEC. 3. LAB. 3. Pr., BIOL 7360 or equivalent or departmental approval. Role of aquatic vegetation in fish production, its utilization and control. Odd years. Summer.

FISH 7420 FISH DISEASES (4). LEC. 3. LAB. 3. Pr., BIOL 3200 or Departmental Approval. Coreq., FISH 6410. Diagnostic techniques for viral, bacterial, fungal and parasitic diseases of fishes, including etiologic agents, geographical ranges, species susceptibility, clinical signs, clinical pathology, epizootiology and management. Fall.


FISH 7450 FISH PATHOLOGY (3). LEC. 2. LAB. 3. Pr., FISH 5410 or FISH 6410 or FISH 7420. Morphological and physiological changes in fish with infectious or non-infectious diseases. Even years. Fall.

FISH 7460 CLINICAL FISH DISEASE DIAGNOSIS (1-3). LEC. Pr., FISH 6410, FISH 7420, FISH 7430. Practical experience in necropy of diseased fish. Identification of causative agents and prescription of appropriate disease control. Course may be repeated for a maximum of 3 credit hours.

FISH 7530 FISH POPULATION DYNAMICS (3). LEC. 2. LAB. 4. Pr., FISH 6510, STAT 7040. Derivation of fish population estimates, growth, recruitment and mortality; use of modeling techniques to assess exploited fish populations. Even years. Spring.

FISH 7540 QUANTITATIVE TECHNIQUES IN FISHERY ASSESSMENT (3). LEC. 2. LAB. 4. Pr., FISH 6510, STAT 7000, STAT 7040. Quantitative techniques to assess and manage fish populations in freshwater. The laboratory will analyze actual fisheries data using SAS on personal computers. Odd years. Spring.

FISH 7640 FISH NUTRITION (3). LEC. 3. Pr., ANSC 7210. Fundamental and applied aspects of fish nutrition, including nutrient requirements, physiology of food assimilation, feed preparation and practical feeding. Summer.


FISH 7775 FISHERIES OCEANOGRAPHY (2). LEC. 2. An examination of the relationship between fish life history, recruitment dynamics, harvest and mortality; use of modeling techniques to assess exploited fish populations. Taught at the Dauphin Island Sea Lab.

FISH 7920 INTERNSHIP IN FISHERIES AND AQUACULTURE (1-10). INT., SU. Pr., departmental approval. Field experience in aquaculture, fisheries or aquatic resource management on farm or with research, extension or aquatic management agency. Course may be repeated for a maximum of 10 credit hours.

FISH 7950 SEMINAR (1). SEM. 1. SU. Acquaint students with current research and related activities.

FISH 7970 SPECIAL PROBLEMS (1-5). IND. Credit to be arranged. Individualized work and study in consultation with faculty member on problem of mutual concern. May include directed readings and research. Course may be repeated for a maximum of 5 credit hours.

FISH 7990 RESEARCH AND THESIS (1-10). MST., TD. Credit to be arranged. Course may be repeated with change in topic.

FISH 8950 SEMINAR (1). SEM. 1. SU. Acquaint students with current research and related activities.

FISH 8970 SPECIAL PROBLEMS (1-5). LEC. 3. Individualized work and study in consultation with faculty member on problem of mutual concern. May include directed readings and research. Course may be repeated for a maximum of 5 credit hours.

FISH 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

Foreign Languages and Literatures (FLNG)

FLR 1000 ELEMENTARY FRENCH ABROAD (1-10). FLD. Pr., depart- mental approval. Course work at the elementary level. This credit may substi- tute for required 1000 level courses in French. Course may be repeated for a maximum of 10 credit hours.

FLR 1010 ELEMENTARY FRENCH I (4). LEC. 3. LAB. 2. Basic language skills, grammar review, readings in French culture, literature and history. Exposure to culture.

FLR 1020 ELEMENTARY FRENCH II (4). LEC. 3. LAB. 2. Pr., FLR 1010 or two or more years of high school French. Basic language skills with emphasis on conversation. Exposure to culture. Fulfills College of Liberal Arts core foreign language requirement.

FLR 1960 READING PROFICIENCY IN FRENCH (3). LEC. 3. SU. For graduate students, who should consult their advisors for specific depart- mental language requirements. May not be used to fulfill undergraduate language requirements.

FLR 2000 INTERMEDIATE FRENCH ABROAD (1-10). FLD. Pr., departmental approval. For course work at the intermediate level, taken on an approved study program abroad. The student should consult with the French undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLR 2010 INTERMEDIATE FRENCH I (4). LEC. 3. LAB. 2. Pr., FLR 1020 or 4 or more years of high school French or departmental approval. Language skills, grammar review, readings in French culture, literature and history.


FLR 3000 JUNIOR/ADVANCED FRENCH ABROAD (1-9). FLD. Pr., departmental approval. Course work at the junior/advanced level, taken on an approved study program abroad. The student should consult with the French undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 9 credit hours.

FLR 3010 FRENCH PHONETICS AND DICTION (3). LEC. 3. Pr., FLR 2010 or departmental approval. Basic principles of French phonetics through sound recognition discrimination and intensive practice.

FLR 3030 FRENCH CONVERSATION (3). LEC. 3. Pr., FLR 2010 or departmental approval. Practice in spoken, everyday French, based on texts and situations concerning contemporary life, especially in France.

FLR 3040 FRENCH COMPOSITION (3). LEC. 3. Pr., FLR 2010 or departmental approval. Review of grammar and practice in writing on top- ics ranging from descriptions and personal opinions to current affairs and social problems.

FLR 3100 INTRODUCTION TO FRENCH LITERATURE (3). LEC. 3. Pr., FLR 3030 and FLR 3040 or departmental approval. Provides grounding in basic analytical approaches, language and organizational skills needed to discuss French literature effectively and coherently, orally or in writing.

FLR 3110 FRENCH CIVILIZATION (3). LEC. 3. Pr., FLR 3040 or departmental approval. Consideration of topical aspects of the cultural heritage of France, as reflected in present day life patterns, traditions and institutions.

FLR 3140 SURVEY OF FRENCH LITERATURE I (3). LEC. 3. Pr., FLR 3100 or departmental approval. The Middle Ages to the 1800's. Coherent and effective writing in French.

FLR 3150 SURVEY OF FRENCH LITERATURE II (3). LEC. 3. Pr., FLR 3100 or departmental approval. Readings in French literature from the 19th century to the present (prose, theatre, and poetry), centered on a theme or topic.

FLR 3310 BUSINESS FRENCH (3). LEC. 3. Pr., One FLR 3000-level course. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in French. Emphasis will be placed on the acquisition of a business-oriented vocabu-
FLFR 3510 TOPICS IN FRENCH LITERATURE AND CULTURE (IN ENGLISH) (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Topics drawing on French literature, history, fine arts, or culture of general interest to students with little or no previous study of French and in English under simulated real life pressures.

FLFR 3900 INDEPENDENT STUDY IN FRENCH LANGUAGE, LITERATURE OR CULTURE (1-3). IND. Pr., Two 3000-level FLFR courses and departmental approval. Directed study in an area of special interest to the superior student in French. Course may be repeated for a maximum of 6 credit hours.

FLFR 4000 SENIOR/ADVANCED FRENCH ABROAD (1-9). FLD. Pr., departmental approval. Course work at the senior/advanced level, taken on an approved study program abroad. The student should consult with the undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 9 credit hours.

FLFR 4020 ADVANCED GRAMMAR AND STYLISTICS (3). LEC. 3. Pr., FLFR 3040 or equivalent. Practice in writing and analyzing French texts, with emphasis on advanced grammar topics and stylistics.

FLFR 4030 FRENCH CONTINUING CONVERSATION (1). LEC. 1. Pr., FLFR 3030 and FLFR 3040 or departmental approval. Continuing practice in spoken French to maintain and upgrade proficiency. Major credit will not be given for FLFR or FLFT majors. Course may be repeated for a maximum of 2 credit hours.

FLFR 4040 FRENCH CONTINUING COMPOSITION (3). LEC. 3. Pr., FLFR 3030 and FLFR 3040 or departmental approval. Continuing practice in written French to maintain and upgrade proficiency.

FLFR 4310 FRENCH FOR INTERNATIONAL TRADE (3). LEC. 3. Pr., FLFR 3310 or departmental approval. Practical exercises in preparing and translating trade correspondence and documents in French as well as assigned group work and case studies under simulated real life pressures.

FLFR 4410 ADVANCED TOPICS IN FRENCH LITERATURE, CULTURE OR LANGUAGE (3). LEC. 3. Pr., Three 3000-level French courses or departmental approval. The study of a special aspect or theme in the French Language, Literature, or Culture. Course may be repeated for a maximum of 9 credit hours.

FLFR 4610 FRENCH FOR FASHION & APPAREL MERCHANDISING I (3). LEC. 3. Pr., Two 3000-level French courses or approval departmental. French vocabulary and the understanding of French concepts used in the fashion and apparel industry, including, types of garments, textiles and accessories, and apparel design, display, advertising and merchandising.

FLFR 4620 FRENCH FOR FASHION & APPAREL MERCHANDISING II (3). LEC. 3. Pr., Two 3000-level courses and FLFR 4610 or departmental approval. In-depth study of the language and style used in the design, advertising, and merchandising of French fashion, including trends among various French designers, their products, and their clientele.

FLFR 4740 TRANSLATION (3). LEC. 3. Pr., FLFR 3040 and 9 hours of 3000-level or higher FLFR credit. Basic techniques and problem areas in translating from French into English and from English into French.

FLFR 4900 ADVANCED INDEPENDENT STUDY IN FRENCH LANGUAGE, LITERATURE OR CULTURE (1-3). IND. Pr., Three 3000-level courses in French and departmental approval. Directed study in an area of special interest for the superior student in French. Course may be repeated for a maximum of 6 credit hours.

FLFR 4980 SENIOR CAPSTONE (1). IND. 1. SU. Pr., senior standing. French major. Assessment of language skills through written paper and oral exam. Fall, Spring.

FLFR 5310 FRENCH FOR INTERNATIONAL TRADE (3). LEC. 3. Pr., four 3000-level FLFR courses or departmental approval, or graduate standing. Practice in handling, preparing and translating international trade correspondence documents and related legal procedures in French. Development of case studies and other international trade group work in French and in English under simulated real life pressures.

FLFR 5970 SPECIAL TOPICS IN ADVANCED LANGUAGE SKILLS (3). LEC. 3. Pr., at least four FLFR 3000-level courses or departmental approval, or graduate standing. Review of principal grammatical structures, develop skills through appropriate exercises and class assignments, and improve stylistic sensitivity by exposure to a variety of language samples.

FLFR 5980 SEMINAR IN FRENCH LITERARY GENRES AND MOVEMENTS (3). LEC. 3. Pr., Four 3000-level FLFR courses or departmental approval, or graduate standing. Seminar in advanced languages skills or topics from French literary genres and movements.

FLFR 6310 FRENCH FOR INTERNATIONAL TRADE (3). LEC. 3. Pr., Four 3000-level FLFR courses or departmental approval, or graduate standing. Practice in handling, preparing and translating international trade correspondence documents and related legal procedures in French. Development of case studies and other international trade group work in French and in English under simulated real life pressures.

FLFR 6970 SPECIAL TOPICS IN ADVANCED LANGUAGE SKILLS (3). LEC. 3. Pr., at least four FLFR 3000-level courses or departmental approval, or graduate standing. Review of principal grammatical structures, develop skills through appropriate exercises and class assignments, and improve stylistic sensitivity by exposure to a variety of language samples.

FLFR 6980 SEMINAR IN FRENCH LITERARY GENRES AND MOVEMENTS (3). SEM. 3. Pr., Four FLFR 3000-level courses or departmental approval, or graduate standing. Seminar in advanced languages skills or topics from French literary genres and movements.

FLFR 7000 GRADUATE FRENCH ABROAD (1-9). FLD. Pr., departmental approval. For course work at the graduate level taken on an approved study program abroad. Course may be repeated for a maximum of 9 credit hours.

FLFR 7010 ADVANCED FRENCH CIVILIZATION (3). LEC. 3. Pr., departmental approval. An in-depth study of French civilization with emphasis on the relationship of history, arts, and literature from prehistoric times to the present.

FLFR 7020 ADVANCED COMPOSITION AND STYLISTICS (3). LEC. 3. Pr., Graduate status, or departmental approval. Acquisition of advanced writing skills in French. Techniques and strategies of appropriate stylistic expression through analysis of various sources of texts; Literary, historical, commercial, popular, etc.

FLFR 7090 INTRODUCTION TO COLLEGE-LEVEL FRENCH INSTRUCTION (1). LEC. 1. SU. Pr., departmental approval. Orientation to French graduate studies. Introduction to College-level French instruction, critical observation of performance and guidance by designated instructors. This course must be taken every semester while student is holding a teaching assistantship.

FLFR 7430 FRENCH PRESS (3). LEC. 3. Pr., departmental approval. Political, intellectual and cultural events in France, Europe, and the world as reflected in major French daily and weekly publications.

FLFR 7740 ADVANCED TRANSLATION (3). LEC. 3. Pr., Graduate status, or departmental approval. Acquisition of skills for translation from French to English and from English to French using a wide variety of texts, including historical, literary, commercial, and popular sources.

FLFR 7920 FOREIGN LANGUAGE CAREER INTERNSHIP (1-6). INT. Pr., departmental approval. Experiential learning either in the business community or in university-sponsored programs outside the United States. Course may be repeated for a maximum of 6 credit hours.

FLFR 7930 SPECIAL TOPICS IN LANGUAGE SKILLS (3). LEC. 3. Course may be repeated for a maximum of 6 credit hours.

FLFR 7960 DIRECTED READINGS IN FRENCH LANGUAGE, LITERATURE OR CULTURE (1-3). IND. Pr., departmental approval. Study in a specialized area under close supervision of an instructor. Course may be repeated for a maximum of 6 credit hours.

FLFR 7970 SEMINAR IN FRENCH LITERATURE, CULTURE OR LANGUAGE (1-3). SEM. Pr., Graduate standing and departmental approval. The detail study of a specific aspect of the French language, literature, or Culture. Fall. Course may be repeated for a maximum of 9 credit hours.

GREEK (FLGK)

FLGK 1010 ELEMENTARY CLASSICAL GREEK I (4). LEC. 3. LAB. 2. Classical Greek. Introduction to the knowledge and skills necessary for reading ancient Greek. Fall.


FLGK 3110 CLASSICAL GREEK LITERATURE (3). LEC. 3. LAB. 2. Pr., FLGK 2010 or departmental approval. Advanced readings in ancient Greek prose and poetry. Course may be repeated with change in topic.
FLGR 3510 CLASSICAL GREEK LITERATURE AND CULTURE IN TRANSLATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Classical Greek cultural practices and ideology with a focus on literary evidence. Readings in English.

FLGR 3900 INDEPENDENT STUDY IN ANCIENT GREEK LITERATURE (1-3). IND. Pr., FLGR 2010, departmental approval. Independent study of classical Greek text(s). Topic proposed by student in conjunction with faculty adviser. Course may be repeated with change in topic.

GERMAN (FLGR)

FLGR 1000 ELEMENTARY GERMAN ABROAD (1-10). IND. Pr., departmental approval. Course work at the elementary level. This credit may substitute for required 1000 level courses in German. Course may be repeated for a maximum of 10 credit hours.

FLGR 1010 ELEMENTARY GERMAN I (4). LEC. 3, LAB. 2. Fundamentals of German language skills stressed. Exposure to Germanic civilization. For students with no previous background or less than two years of high school German.

FLGR 1020 ELEMENTARY GERMAN II (4). LEC. 3, LAB. 2. Pr., FLGR 1010 or departmental approval. Review of basic German grammar and vocabulary. Fundamentals of German language skills with progressive emphasis on conversation. Fulfills the College of Liberal Arts foreign language core requirement.

FLGR 1960 READING PROFICIENCY IN GERMAN (3). LEC. 3, SU. Pr., FLGR 1010 or departmental approval. From Goethe to Thomas Mann. Reading and analysis of representative authors from the periods of German Classicism, Romanticism, Naturalism and Realism. Fall.

FLGR 2000 INTERMEDIATE GERMAN ABROAD (1-10). FLD. Pr., departmental approval. Course work at the intermediate level taken on an approved study program abroad. The student should consult with the German undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLGR 2010 INTERMEDIATE GERMAN I (4). LEC. 3, LAB. 2. Pr., FLGR 1020 or 4 years of high school German, or departmental approval. Language skills stressed; structural review and composition; readings in German literature and German civilization.


FLGR 3000 JUNIOR/ADVANCED GERMAN ABROAD (1-10). FLD. Pr., departmental approval. Course work at the advanced level taken on an approved study program abroad. The student should consult with the German undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLGR 3010 BEGINNING GERMAN COMPOSITION AND CONVERSATION (3). LEC. 3. Pr., FLGR 2020 or equivalent. Concentration on developing skills in written and spoken German. Review of German grammar and syntax, vocabulary building. Work in German phonology. Fall.

FLGR 3020 INTERMEDIATE GERMAN COMPOSITION AND CONVERSATION (3). LEC. 3. Pr., FLGR 3010 or equivalent. Further development of skills in written and spoken German. Continued review of selected topics of grammar and syntax, and vocabulary acquisition. Spring.

FLGR 3030 ADVANCED GERMAN COMPOSITION AND CONVERSATION (3). LEC. 3. Pr., FLGR 3020 or equivalent. Intensive practice and refinement of skills in written and spoken German. Strategies of vocabulary acquisition and retention. Fall.

FLGR 3100 INTRODUCTION TO GERMAN LITERATURE (3). LEC. 3. Pr., FLGR 2020 or departmental approval. Basic literary genres and major figures in German literature from the 18th century to the present; literary methodologies and bibliographical tools. Required of all German majors. Fall.

FLGR 3110 GERMAN CULTURE AND CIVILIZATION I (3). LEC. 3. Pr., FLGR 2020 or departmental approval. Social, political and cultural history of Germany from the Germanic tribes to 1945. Fall.

FLGR 3120 GERMAN CULTURE AND CIVILIZATION II (3). LEC. 3. Pr., FLGR 2020 or departmental approval. Social, political and cultural history of Germany from 1945 to the present. Spring.

FLGR 3150 SELECTED TOPICS IN GERMAN LITERATURE, LANGUAGE AND CULTURE (3). LEC. 3. Pr., FLGR 2020 or departmental approval. Critical study of specific literary, linguistic and/or cultural topics in German studies. Course may be repeated with change in topic.

FLGR 4000 SENIOR/ADVANCED GERMAN ABROAD (1-10). FLD. Pr., departmental approval. Course work at the senior/advanced level taken on an approved study program abroad. The student should consult with the German undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLGR 4110 MASTERPIECES OF GERMAN LITERATURE I (3). LEC. 3. Pr., FLGR 3010 or departmental approval. Selected readings by representative authors from the periods of German Classicism, Romanticism, Naturalism and Realism. Fall.

FLGR 4120 MASTERPIECES OF GERMAN LITERATURE II (3). LEC. 3. Pr., FLGR 3010 or departmental approval. Selected readings by representative authors from the periods of the early 20th century, Weimar Republic, and Postwar Germany. Winter.

FLGR 4150 GERMAN DRAMA (3). LEC. 3. Pr., Three FLGR 3000-level German courses or departmental approval. Consideration, analysis and criticism of selected German theater works by representative authors. Fall.

FLGR 4160 CONTEMPORARY GERMAN LITERATURE (3). LEC. 3. Pr., 3 FLGR 3000-level German courses or departmental approval. Consideration, analysis and criticism of recent selected German literary works. Winter.

FLGR 4310 GERMAN FOR BUSINESS AND ECONOMICS I (3). LEC. 3. Pr., FLGR 2020 or departmental approval. Emphasis on speaking, listening, reading and writing skills in professional, commercial German. Familiarization with German and European business practices. Fall.


FLGR 4510 GERMAN LITERATURE TRANSLATION I (3). LEC. 3. Pr., departmental approval. From Goethe to Thomas Mann. Reading and analysis of significant literary works by major German writers from 1750 to 1945. Fall.

FLGR 4520 GERMAN LITERATURE TRANSLATION II (3). LEC. 3. Pr., departmental approval. Postwar German literature. Reading and analysis of significant literary works by major German writers from 1945 to the present. Spring.

FLGR 4900 INDEPENDENT WORK IN GERMAN (1-3). IND. Pr., at least one FLGR 4000-level German course, departmental approval. Directed study in area of special interest for the superior student in German. Course may be repeated for a maximum of 6 credit hours.

FLGR 4910 PRACTICUM IN GERMAN (1-6). PRA. Pr., departmental approval. Number of hours and applicability toward major to be determined in consultation with the adviser. Course may be repeated for a maximum of 6 credit hours.

FLGR 4950 SEMINAR IN GERMAN LITERATURE (3). SEM. 3. Pr., FLGR 3010 or departmental approval. Readings in German literature from selected periods or in selected genres.

FLGR 4980 SENIOR CAPSTONE (1). IND. 1, SU. Pr., senior standing. German major. Assessment of language skills through written paper and oral exam. Fall, Spring.

ITALIAN (FLIT)

FLIT 1000 ELEMENTARY ITALIAN ABROAD (1-10). IND. Pr., departmental approval. Course work at the elementary level taken on an approved study program abroad. The student should consult the Italian undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLIT 1010 ELEMENTARY ITALIAN I (4). LEC. 3, LAB. 2. For students with little or no knowledge of Italian. Basic language skills. Exposure to culture. Fall.

FLIT 1020 ELEMENTARY ITALIAN II (4). LEC. 3, LAB. 2. Pr., FLIT 1010 or departmental approval. Continuation of basic language skills. Exposure to culture. Fulfills the College of Liberal Arts foreign language core requirement. Spring.

FLIT 2000 INTERMEDIATE ITALIAN ABROAD (1-10). FLD. Pr., departmental approval. Course work at the intermediate level taken on an approved study program abroad. The student should consult with the Italian undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.
### FLIT 3000 JUNIOR/ADVANCED ITALIAN ABROAD (1-9). FLD. Pr., departmental approval. Course work at the junior/advanced level taken on an approved study program abroad. The student should consult with the Italian undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 9 credit hours.

### FLIT 3110 SPECIAL TOPICS IN ITALIAN (3). LEC. 3. Pr., FLIT 2010 or departmental approval. Supplementary instruction in Italian language, literature, culture.

### FLIT 3510 INTRODUCTION TO ITALIAN CULTURE IN ENGLISH (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127. Significant aspects of Italian culture, as reflected in arts, film, literature, history.

### FLIT 3900 INDEPENDENT STUDY IN ITALIAN (1-3). IND. Pr., departmental approval. Directed study in area of special interest for the superior student in Italian. Course may be repeated with change in topic.

### JAPANESE (FLJP)

- **FLRU 2510 RUSSIAN CULTURE (IN ENGLISH) (3).** LEC. 3. Intensive exposure to Russian culture from the 10th century to the Revolution as reflected in the fine arts and literature.
- **FLRU 2520 RUSSIA TODAY (IN ENGLISH) (3).** LEC. 3. Intensive introduction to Russian culture from the Revolution to the present, as reflected in the fine arts and literature.

### LATIN (FLLN)

- **FLLN 1010 ELEMENTARY LATIN I (4).** LEC. 3. LAB. 2. For students with little or no knowledge of Latin. Knowledge and skills necessary for reading classical Latin. Fall.
- **FLLN 1020 ELEMENTARY LATIN II (4).** LEC. 3. LAB. 2. Pr., FLLN 1010 or departmental approval. Introduction to the knowledge and skills necessary for reading classical Latin. Fulfills College of Liberal Arts core foreign language requirement. Spring.
- **FLLN 2010/2013 ELEMENTARY SPANISH I (4).** LEC. 3. Pr., FLSP 1010 or 2-3 years of high school Spanish. Fundamentals of Spanish language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization. For students with less than 2 years of high school Spanish.
- **FLLN 2020/2023 ELEMENTARY SPANISH II (4).** LEC. 3. Pr., FLSP 1010 or 2-3 years of high school Spanish. Fundamentals of Spanish language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization. Fulfills College of Liberal Arts foreign language core requirement.
- **FLLN 2030/2033 ELEMENTARY SPANISH III (4).** LEC. 3. Pr., FLSP 1010 or 2-3 years of high school Spanish. Basic language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization. Enables graduate students to read and understand scholarly material in Spanish related to their field of study. May not be used to satisfy undergraduate language requirements. Spring.
- **FLLN 3010 INDEPENDENT STUDY IN LATIN LITERATURE (1-3).** IND. Pr., FLLN 2010 or departmental approval. Independent study of Latin Text(s). Topic proposed by student in conjunction with faculty adviser. Course may be repeated with change in topic.
- **FLLN 3020/3023 ELEMENTARY SPANISH IV (4).** LEC. 3. Pr., FLSP 1020 or departmental approval. Stress on language skills, progressive emphasis on conversation. Exposure to Hispanic civilization. Fulfills College of Liberal Arts foreign language core requirement.
- **FLLN 3510 ROMAN LITERATURE AND CULTURE IN TRANSLATION (3).** LEC. 3. Pr., ENGL 1120. Roman cultural practices and ideology with a focus on literary evidence. Readings in English.
- **FLLN 3900 INDEPENDENT STUDY IN LATIN LITERATURE (1-3).** IND. Pr., FLLN 1010 or departmental approval. Independent study of Latin Text(s). Topic proposed by student in conjunction with faculty adviser. Course may be repeated with change in topic.
- **FLLN 3960 READING PROFICIENCY IN LATIN (3).** LEC. 3. Pr., graduate standing and FLLN 1020 or departmental approval. To prepare graduate students to pass the graduate proficiency exam in Latin. Students should check with their Graduate Director for Departmental language requirements before enrolling.

### FOREIGN LANGUAGE (FLNG)

- **FLNG 1000 ELEMENTARY FOREIGN LANGUAGE ABROAD (1-10).** LEC. Pr., departmental approval. For languages not currently taught in the department of Foreign Languages and Literatures, but taken through approved distance learning or study abroad programs. Credit awarded in consultation with departmental adviser. Course may be repeated for a maximum of 10 credit hours.
- **FLNG 2000 INTERMEDIATE FOREIGN LANGUAGE (1-10).** LEC. Pr., departmental approval. For languages not currently taught in the Department of Foreign Languages and Literatures, but taken through approved distance learning or study abroad programs. Credit awarded in consultation with departmental adviser. Course may be repeated for a maximum of 10 credit hours.
- **FLNG 4997 HONORS THESIS (1-6).** IND. Pr., membership in the Honors College; departmental approval. Directed readings and research culminating in a thesis. Course may be repeated for a maximum of 6 credit hours.
FLSP 3000 JUNIOR ADVANCED SPANISH ABROAD (1-9). FLD. Pr., departmental approval. Course work at the junior/advanced level taken on an approved study program abroad. The student should consult with the Spanish undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 10 credit hours.

FLSP 3010 SPANISH PHONETICS (3). LEC. 3. Pr., FLSP 2020 or departmental approval. Training in practical phonetics with an emphasis on pronunciation correctives. Fall, Spring.

FLSP 3020 SPANISH SYNTAX (3). LEC. 3. Pr., FLSP 2020 or departmental approval. Sentence structure in Spanish emphasizing the interrelationship among the various parts of speech. Fall, Spring.

FLSP 3030 SPANISH CONVERSATION (3). LEC. 3. Pr., FLSP 2020 or departmental approval. Intensive practice in the Spanish language and review of vocabulary and structure. Fall, Spring. Course may be repeated for a maximum of 6 credit hours.


FLSP 3110 SPANISH CIVILIZATION I (3). LEC. 3. Pr., FLSP 3040. Culture of Spain up to 1700. Emphasis on geographic, historical, social, artistic, spiritual and political forces in Spanish civilization. Fall.

FLSP 3120 SPANISH CIVILIZATION II (3). LEC. 3. Pr., FLSP 3040. Culture of Spain from 1700 to the present. Emphasis on geographic, historical, social, artistic, spiritual and political forces in Spanish civilization. Spring.

FLSP 3210 SPANISH AMERICAN CIVILIZATION I (3). LEC. 3. Pr., FLSP 3040. Intensive exposure to the culture of Spanish America from Pre-Columbian times through the Independence movement. Fall.

FLSP 3220 SPANISH AMERICAN CIVILIZATION II (3). LEC. 3. Pr., FLSP 3040. Intensive exposure to the culture of Spanish America from Independence to the present, as reflected in the fine arts and literature. Spring.

FLSP 3310 COMMERCIAL SPANISH TRANSLATION (3). LEC. 3. Pr., FLSP 3040. Introduction to the techniques of English/Spanish and Spanish/English translation in a commercial environment, including correspondence, technical documents, advertising and oral translation. Fall.

FLSP 4000 SENIOR ADVANCED SPANISH ABROAD (1-9). FLD. Pr., departmental approval. Course work at the senior/advanced level taken on an approved study program abroad. The student should consult with the Spanish undergraduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 9 credit hours.

FLSP 4020 CONTINUING SPANISH SYNTAX (1-3). IND. Pr., departmental approval. Continuing practice in Spanish syntax. Course may be repeated for a maximum of 3 credit hours.

FLSP 4030 CONTINUING SPANISH CONVERSATION (1-3). IND. Pr., departmental approval. Continuing practice in Spanish conversation. Course may be repeated for a maximum of 3 credit hours.

FLSP 4040 CONTINUING SPANISH COMPOSITION (1-3). IND. Pr., departmental approval. Continuing practice in Spanish composition. Course may be repeated for a maximum of 3 credit hours.

FLSP 4110 MASTERPIECES OF SPANISH LITERATURE (3). LEC. 3. Pr., FLSP 3040. Major works of Spanish literature from medieval times to the present. Fall.


FLSP 4210 MASTERPIECES OF SPANISH AMERICAN LITERATURE (3). LEC. 3. Pr., FLSP 3040. Major works of Spanish American literature from Colonial times to the present. Fall.


FLSP 4330 TOPICS IN BUSINESS SPANISH (3). LEC. 3. Pr., FLSP 3040. Study of an aspect of Spanish business terminology/documentation. Course may be repeated with change in topic.

FLSP 4420 TOPICS IN HISPANIC LITERATURE AND CULTURE (3). LEC. 3. Pr., FLSP 3040. An analysis of the cultural milieu which influences artistic creativity within a historical period.

FLSP 4510 SPANISH LITERATURE TRANSLATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127 or departmental approval. Major works of Spanish literature in English translation.

FLSP 4520 SPANISH AMERICAN LITERATURE IN TRANSLATION (3). LEC. 3. Pr., ENGL 1120 or ENGL 1127 or departmental approval. Major works of Spanish American Literature in English translation.

FLSP 4910 PRACTICUM IN SPANISH (1-3). PRA. Pr., departmental approval. Academic credit for practical work experience related to the major field. Course may be repeated for a maximum of 3 credit hours.

FLSP 4980 SENIOR CAPSTONE (1). IND. 1, SU. Pr., senior standing. Spanish major. Assessment of language skills through written paper and oral exam. Fall, Spring.

FLSP 5010 ADVANCED SPANISH PHONETICS (3). LEC. 3. Pr., four 3000-level Spanish courses or departmental approval. Advanced training in Spanish phonetics with specific course materials determined by needs of students.

FLSP 5020 ADVANCED SPANISH SYNTAX (3). LEC. 3. Pr., four 3000-level Spanish courses or departmental approval. Advanced training in Spanish syntax and stylistics with specific course materials determined by needs of students.

FLSP 6010 ADVANCED SPANISH PHONETICS (3). LEC. 3. Pr., four 3000-level Spanish courses or departmental approval. Advanced training in Spanish phonetics with specific course materials determined by needs of students.

FLSP 6020 ADVANCED SPANISH SYNTAX (3). LEC. 3. Pr., four 3000-level Spanish courses or departmental approval. Advanced training in Spanish syntax and stylistics with specific course materials determined by needs of students.

FLSP 7000 GRADUATE SPANISH ABROAD (1-9). FLD. Pr., departmental approval. Course work at the graduate level taken on an approved study program abroad. The student should consult with the Spanish graduate adviser for an estimation of credit prior to going abroad. Course may be repeated for a maximum of 9 credit hours.

FLSP 7010 HISTORY OF THE SPANISH LANGUAGE (3). LEC. 3. The diachronic study of the development of the Spanish language from its Latin origins to the present.

FLSP 7020 SPANISH LINGUISTICS (3). LEC. 3. A synchronic study of the Spanish language focusing on phonology, morphology, syntax and lexicon, taking into consideration diachronal differences.

FLSP 7050 LITERARY CRITICISM AND THEORY (3). LEC. 3. A study of contemporary literary criticism and theory as it relates to Spanish and Spanish American Literature. FLSP 7060 RESEARCH METHODS (1). LEC. 1, SU. An introduction to the methods of scholarly investigation in literary history and criticism. Credit may not be used to satisfy degree requirements.

FLSP 7090 INTRODUCTION TO COLLEGE-LEVEL SPANISH INSTRUCTION (1). LEC. 1, SU. Instruction for graduate teaching assistants including critical observation in performance and guidance by a designated supervisory professor. Required of all students who hold a graduate teaching assistantship. Credit may not be used to satisfy degree requirements.

FLSP 7110 MEDIEVAL SPANISH LITERATURE (3). LEC. 3. A critical and historical study of medieval Spanish literature through representative texts from the various genres of the period.

FLSP 7120 16TH CENTURY SPANISH LITERATURE (3). LEC. 3. A critical and historical study of representative literary works in all genres from around 1492 to the end of the 16th century.

FLSP 7130 17TH CENTURY SPANISH LITERATURE (3). LEC. 3. A critical and historical study of representative literary works in all genres in the 17th century with emphasis on Baroque literature.


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Foreign Languages and Literatures (FLNG)
FLSP 7160 20TH CENTURY SPANISH LITERATURE (3). LEC. 3. A critical and historical study of 20th-century Peninsular literature from the Generation of 98 to Spanish post-war literature through representative works in all genres.

FLSP 7170 CONTEMPORARY SPANISH LITERATURE (3). LEC. 3. A critical and historical study of contemporary literature from the Spanish Civil War to the present through representative works in all genres.

FLSP 7210 COLONIAL SPANISH-AMERICAN LITERATURE (3). LEC. 3. A critical and historical study of representative literary genres and authors of Vice Regal America from Spanish transcription of Pre-Columbian works to those just prior to the Wars of Independence.

FLSP 7220 SPANISH AMERICAN POETRY I (3). LEC. 3. A critical and historical study of the development of Spanish American poetry from 1824 to the first generation of Modernism.

FLSP 7230 SPANISH AMERICAN POETRY II (3). LEC. 3. A critical and historical study of the development of Spanish American Poetry from Post-Modernism to the present.

FLSP 7240 SPANISH AMERICAN POST-COLONIAL PROSE TEXTS TO THE NEW NARRATIVE (3). LEC. 3. A critical and historical study of representative essayists and fiction writers of the 19th and 20th centuries predating the New Narrative.

FLSP 7250 THE NEW NARRATIVE IN SPANISH AMERICAN FICTION: MODERNIST AND POST-MODERNIST TEXTS (3). LEC. 3. A critical and historical study of major works of Modernist and Postmodernist fiction that achieved international acclaim during the second half of the 20th century.

FLSP 7270 SPANISH AMERICAN THEATER (3). LEC. 3. A critical and historical study of the development of Spanish American Theater in the 19th and 20th centuries with emphasis on the contemporary period.

FLSP 7970/7976 SEMINAR IN LINGUISTICS, LITERATURE, AND CULTURE (3). SEM. 3. Pr., Graduate standing. Coreq., BA in Spanish or BS in Foreign Language Education in Spanish An in-depth study of a movement of author(s) an analysis of the cultural milieu which influences creativity. or an investigation of a specific linguistic phenomenon in Spanish. Course may be repeated with change in topic.

FLSP 7990 RESEARCH AND THESIS (1-10). MST, TD. Directed readings and research culminating in a thesis. Course may be repeated with change in topic.

Forestry and Wildlife Science (FOWS)

Dean Richard Brinker - 844-1007

FOEN 3000 INTRODUCTION TO FORESTRY OPERATIONS (2). LAB. 3. Pr., FORY major. Introduction to basic field operations in Forestry including site preparation and planting, harvesting and primary manufacturing processes. Summer.

FOEN 3040 FOREST SURVEYING (3). LEC. 1, LAB. 8, Pr., FARY major. Basic land surveying concepts and procedures as applied to Forestry. Use of basic surveying instruments and calculations for land areas, boundaries, and topographic features. Summer.

FOEN 4220 LOW-VOLUME ROAD DESIGN (3). LEC. 2, LAB. 3, Pr., FOEN 3040, BSEN 3230. Engineering design of low volume, unpaved roads, especially for forestry applications, including preconstruction planning, construction and maintenance, horizontal and vertical alignment, earthwork volume and distribution analysis, cost analysis, and Best Management Practices. Fall.

FOEN 4730 APPLICATION OF TIMBER HARVESTING TECHNIQUES (2). LEC. 1, LAB. 3, Pr., FOEN 6700. Business considerations including safety, regulations, contracts, deeds and cost accounting and analysis combined with equipment operation and maintenance. Fall.

FOEN 4900 SPECIAL PROBLEMS IN FOREST ENGINEERING (1-4). IND. Pr., departmental approval. Faculty supervision of individual student investigations of specialized problems in forest engineering. Course may be repeated for a maximum of 12 credit hours.

FOEN 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College; departmental approval. Topics of an undergraduate nature pertinent to Forest Engineering. Course may be repeated for a maximum of 3 credit hours.

FOEN 4970 SPECIAL TOPICS IN FOREST ENGINEERING (1-4). LEC. Pr., departmental approval. Individual or small group study of a specialized area in forest engineering. Course may be repeated for a maximum of 12 credit hours.

FOEN 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College; departmental approval. Directed research and Honors Thesis. Course may be repeated for a maximum of 6 credit hours.

FOEN 5230 ENGINEERED WOOD STRUCTURE DESIGN (3). LEC. 2, LAB. 3, Pr., ENGR 2070. Load, deflection criteria; engineering characteristics of wood; designing wood components and mechanical connections; shear walls and diaphragms; trusses; bridges; post-frame construction. Fall.

FOEN 5700 HARVESTING (3). LEC. 2, LAB. 3, Pr., FORY 3180 with a minimum grade of C. Analysis of the administration of timber harvest, equipment choice, planning methods, movement of timber products, machine and system costs, balancing of harvesting systems, logging safety, and environmental impact. Spring.

FOEN 5710 TIMBER HARVESTING ANALYSIS METHODS (3). LEC. 2, LAB. 3, Pr., FOEN 3000. Analysis methods for timber harvesting productivity and costs including gathering of time and production data, preparation of data for analysis and statistical modeling. Spring.

FOEN 6230 ENGINEERED WOOD STRUCTURE DESIGN (3). LEC. 2, LAB. 3, Pr., ENGR 2070. Load, deflection criteria; engineering characteristics of wood; designing wood components and mechanical connections; shear walls and diaphragms; trusses; bridges; post-frame construction. Fall.

FOEN 6700 HARVESTING (3). LEC. 2, LAB. 3, Pr., FORY 3180. Analysis of the administration of timber harvest, equipment choice, planning methods, movement of timber products, machine and system costs, balancing of harvesting systems, logging safety, and environmental impact. Spring.

FOEN 6710 TIMBER HARVESTING ANALYSIS METHODS (3). LEC. 2, LAB. 3, Pr., FOEN 3000. Analysis methods for timber harvesting productivity and costs including gathering of time and production data, preparation of data for analysis and statistical modeling. Spring.

FOEN 7900 SPECIAL PROBLEMS IN FOREST ENGINEERING (1-4). IND. Pr., departmental approval. Faculty supervision of individual student investigations of advanced specialized problems in forest engineering. Course may be repeated for a maximum of 12 credit hours.

FOEN 7970 SPECIAL TOPICS IN FOREST ENGINEERING (1-4). LEC. Pr., departmental approval. Individual or small group study of an advanced specialized area in forest engineering. Course may be repeated for a maximum of 12 credit hours.

FOREST PRODUCTS (FOPR)

FOPR 3390 INTRODUCTION TO WOOD SCIENCE AND FOREST PRODUCTS (3). LEC. 2, LAB. 3, Pr., FORY 3020. The basic properties of wood and their impact on the manufacture of forest products. Identification of important products and woods. Fall.


FOPR 4740 WOOD ADHESIVES AND COATINGS (3). LEC. 2, LAB. 3, Pr., FOPR 3390. Types and characteristics of adhesives and wood coating materials and their uses in primary and secondary wood products manufacturing. Spring.


FOPR 4930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Study of timely topics in forest products on an as needed or as available basis. Course may be repeated for a maximum of 6 credit hours.


FOPR 5300 MECHANICAL AND PHYSICAL PROPERTIES OF WOOD (3). LEC. 2, LAB. 3, Pr., FOPR 4200. Mechanical and physical properties of wood and factors affecting their structural performance, including wood moisture relationships, density, specific gravity, thermal, electrical and acoustical properties.

FOPR 5350 FOREST PRODUCTS PRODUCTION AND OPERATIONS MANAGEMENT (3). LEC. 3, Pr., FOPR 3390. Production and operations management concepts, principles and techniques applied to wood products.
manufacturing. Problem situation analyses with emphasis on economic decision making. Fall.

FOPR 5360 FOREST PRODUCTS MARKETING (3). LEC. 3. Pr., FOPR 3390. Managerial approach to marketing of forest products. In-depth examination of major forest products markets, the Marketing Mix concept, and marketing strategy and tactics. Spring.

FOPR 5500 MODERN SAWMILL TECHNOLOGY AND OPERATIONS MANAGEMENT (3). LEC. 3. Pr., FOPR 3390. Design, operation and management of sawmills with emphasis on computer-aided processing and decision making. Fall.


FOPR 6300 MECHANICAL AND PHYSICAL PROPERTIES OF WOOD (3). LEC. 2. LAB. 3. Pr., FOPR 4200. Mechanical and physical properties of wood and factors affecting their structural performance, including wood moisture relationships, density, specific gravity, thermal, electrical and acoustical properties.

FOPR 6350 FOREST PRODUCTS PRODUCTION AND OPERATIONS MANAGEMENT (3). LEC. 3. Pr., FOPR 3390. Production and operations management concepts, principles and techniques applied to wood products manufacturing. Problem situation analyses with emphasis on economic decision making. Fall.

FOPR 6360 FOREST PRODUCTS MARKETING (3). LEC. 3. Pr., FOPR 3390. Managerial approach to marketing of forest products. In-depth examination of major forest products markets, the Marketing Mix concept, and marketing strategy and tactics. Spring.

FOPR 6500 MODERN SAWMILL TECHNOLOGY AND OPERATIONS MANAGEMENT (3). LEC. 3. Pr., FOPR 3390. Design, operation and management of sawmills with emphasis on computer-aided processing and decision making. Fall.


FOPR 7930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Study of timely topics in forest products on an as needed or as available basis. Course may be repeated for a maximum of 10 credit hours.

FOPR 7970 SPECIAL PROBLEMS (2-6). IND. Pr., departmental approval. Analysis of a problem in forest products or wood science involving library research, laboratory or field work and a report on the findings. Course may be repeated for a maximum of 6 credit hours.

FOPR 7990 RESEARCH AND THESIS (1-15). MST., TD. Pr., departmental approval. Course may be repeated with change in topic.

FOPR 8930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Study of timely topics in forest products on an as needed or as available basis. Course may be repeated for a maximum of 10 credit hours.

FOPR 8970 SPECIAL PROBLEMS (2-6). IND. Pr., departmental approval. Analysis of a problem in forest products or wood science involving library research, laboratory or field work and a report on the findings. Course may be repeated for a maximum of 6 credit hours.

FOPR 8990 RESEARCH AND DISSERTATION (1-15). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

FORESTRY (FORY)

FORY 1010 INTRODUCTION TO RENEWABLE NATURAL RESOURCES (1). LEC. 1. Introduction to the wealth and breadth of renewable natural resources in the state, region, nation, and world. Presentations cover employment opportunities and timely issues surrounding renewable natural resources including timber, wildlife, fisheries, water, and soil. Fall, Spring.

FORY 3020 FOREST BIOLOGY (2). LEC. 1. LAB. 3. Pr., FORY major. Introduction to biological and ecological principles as used in forest management; identification of major tree species. Summer.

FORY 3050 FIELD MENSURATION (3). LEC. 1. LAB. 8. Pr., FORY major. Basic concepts and procedures for measuring trees, stands and other forest resources; units of measure, log rules, volume tables, condition class mapping and timber estimation. Summer.

FORY 3060 INTRODUCTION TO FOREST MANAGEMENT STRATEGIES (2). LAB. 3. Pr., FORY major. Biological, social, and economic principles underlying forest management strategies, the diversity of forestry enterprises, and the complexities facing forest managers. Summer.


FORY 3100 DENDROLOGY (3). LEC. 2. LAB. 3. Pr., FORY 3020. Taxonomy and identification of important forest trees of the U.S., including cover types of forest regions. Fall.

FORY 3180 FOREST MEASUREMENTS I (3). LEC. 2. LAB. 3. Pr., FORY 3050. Theoretical and empirical estimates of tree and log volumes, tree taper, and yield tables. Sampling design and analysis to estimate current conditions of timber stands. Fall.

FORY 3200 FOREST TREE PHYSIOLOGY (3). LEC. 3. Pr., FORY 3020. Relationship between cultural, environmental and genetic factors that affect metabolism and growth of individual trees. Fall.

FORY 3440 ENVIRONMENTAL LAW (3). LEC. 3. Pr., junior standing. A review of environmental law including; competing interests; common law remedies; land use; and Federal statutes on water, air, toxins and waste. Spring.

FORY 3500 FORESTREY FOR SMALL WOODLAND OWNERS (3). LEC. 3. An appreciation of forest trees and the environment, the environmental functions of trees, and the economic potential of a balanced land-use plan.

FORY 3540 ESTATE PLANNING (3). LEC. 3. Pr., junior standing. Planning for the disposition of assets including wills and trusts, the transfer tax system, and strategies to minimize the taxable estate. Spring.

FORY 3600 WILDLAND RECREATION PHILOSOPHY AND POLICY (2). LEC. 2. Laws and traditions at federal, state and local levels of government as well as industrial and other landowners’ outlooks and developments relative to wildland recreation. Spring.

FORY 3640 TAXATION OF TIMBER AND OTHER NATURAL RESOURCES (2). LEC. 2. Pr., junior standing. Income taxation of natural resources, including passive loss rules, depletion and capital gains, and an introduction to taxation of businesses. Fall.


FORY 4230 FOREST ECOLOGY (3). LEC. 2. LAB. 3. Pr., FORY 3100 and FORY 3200 with a minimum grade of C. Forests as functional systems, the biotic and abiotic environment, temporal changes in ecosystem structure and function, application of ecological information. Spring.

FORY 4440 FOREST FIRE MANAGEMENT (9). LEC. 1. LAB. 6. Pr., FORY 4230 or BIOL 3060. The management of fire, both as a tool and wildfire suppression in the management of forested ecosystems. Emphasis placed on experience, technique and administration. Spring.


FORY 4820 FORESTRY IN THE PRIVATE SECTOR (2). SEM. 3. Pr., FORY 5410. Management systems and practices used in wood purchasing, timber harvesting and timberland management in the private sector of forestry including related issues of public relations, forest sustainability, certification and development of personal business skills. Spring.

FORY 4830 INDUSTRIAL WOOD PROCUREMENT PRACTICUM (1). PRA. 1. SU. Pr., FORY 3050. Strategies, field and office procedures involved in purchasing wood for an industrial forestry firm. Taught as a weekend field exercise at Solon Dixon Forest Education Center. Spring. Course may be repeated for a maximum of 2 credit hours.

FORY 4930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.
FORY 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College; departmental approval. Topics of an undergraduate nature pertinent to Forestry. Course may be repeated for a maximum of 3 credit hours.

FORY 4970 SENIOR PROJECT (4). LAB. 6. Pr., FORY 5230 and FORY 5410 with minimum grades of C. Integrated study of Forest Resource Management using a case-study approach through development of a comprehensive plan related to the declared emphasis. Spring.

FORY 4990 SCHOLARS PROJECT (1-3). IND. Pr., departmental approval. A problem in the student’s area of interest. To promote independent work, library research, field work, data analysis or other tasks. Course may be repeated for a maximum of 3 credit hours.

FORY 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College; departmental approval. Directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

FORY 5150 FOREST HEALTH (3). LEC. 3. Pr., FORY 3020 or BIOL 3060. Importance, taxonomy, identification and integrated pest management strategies of principle disease, insect and abiotic disorders of forest and shade trees from seedlings to maturity and forest products. Fall.

FORY 5230 SILVICULTURE (4). LEC. 3. LAB. 3. Pr., FORY 4230 with a minimum grade of C or BIOL 5140 or BIOL 3060. Principles and methods of controlling establishment, growth, and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives. Fall.


FORY 5400 FOREST ECONOMICS (3). LEC. 2. LAB. 3. Pr., FORY 5410 with a minimum grade of C. Marginal analysis, investment theory, resource supply, economics of conservation, and taxation principles applied to forestry. Structure and performance of forest products markets.

FORY 5410 FOREST MANAGEMENT AND ADMINISTRATION (3). LEC. 2. LAB. 3. Pr., FORY 4040 and FORY 4190 with minimum grades of C. Quantitative approaches to decision making in Forestry with an emphasis on the interests of large scale firms and agencies. Fall.

FORY 5420 FOREST POLICY (3). LEC. 3. Pr., FORY 5400 with a minimum grade of C. History and current situations regarding both public and private sector aspects of forest policies, and the effects of political, economic, legal and social dynamics. Spring.

FORY 5440 INTERNATIONAL FORESTRY (2). LEC. 2. Pr., senior standing. Presentation of the world's forested ecosystems, their characteristics, silviculture, utilization, international trade and policies affecting their sustainable use. Spring.

FORY 5450 URBAN FORESTRY (3). LEC. 2. LAB. 3. Pr., departmental approval. Basic understanding of GIS through discussions of the components of a GIS and how GIS are used in natural resource applications. Fall.

FORY 5480 GIS DATABASE DESIGN AND ANALYSIS (2). LEC. 2. Pr., departmental approval. Geographic information system database planning, design, creation, management and analysis using a project oriented approach. Spring.

FORY 5550 URBAN FORESTRY (3). LEC. 2. LAB. 3. Pr., FORY 3100 or HORT 3220. Principles and concepts of tree establishment, management and health in an urban environment. Case studies of urban forestry programs are presented. Spring.

FORY 5710 ADVANCED FOREST SOILS (3). LEC. 2. LAB. 3. Pr., AGRN 2040, FORY 5230 or FORY 6230. Forest soil processes for the individual tree, forest community, and the forest ecosystem. Spring.

FORY 6150 FOREST HEALTH (3). LEC. 3. Pr., FORY 3020 or BIOL 3060. Ecology, Importance, taxonomy, identification and integrated pest management strategies of principle disease, insect and abiotic disorders of forest and shade trees from seedlings to maturity and forest products. Fall.

FORY 6230 SILVICULTURE (4). LEC. 2. LAB. 3. Pr., FORY 4230 or BIOL 3060 or BIOL 5140 or BIOL 6140. Principles and methods of controlling establishment, growth, and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives. Fall.

FORY 6240 FOREST WATERSHED MANAGEMENT (2). LEC. 2. Pr., FORY 5230 or FORY 6230 or BIOL 5140, or BIOL 6140. The hydrologic cycle in forests. Effects of forestry practices on erosion processes, site quality, and water quality. Spring.


FORY 6410 FOREST MANAGEMENT AND ADMINISTRATION (3). LEC. 2. LAB. 3. Pr., FORY 5400, or FORY 4040 and FORY 4190. Quantitative approaches to decision making in Forestry with an emphasis on the interests of large scale firms and agencies. Fall.

FORY 6420 FOREST POLICY (3). LEC. 3. Pr., FORY 5400. History and current situations regarding both public and private sector aspects of forest policies, and the effects of political, economic, legal and social dynamics. Spring.

FORY 6440 INTERNATIONAL FORESTRY (2). LEC. 2. Presentation of the world's forested ecosystems, their characteristics, silviculture, utilization, international trade and policies affecting their sustainable use. Spring.


FORY 6470 GIS APPLICATIONS IN NATURAL RESOURCES (2). LEC. 1. LAB. 3. Pr., departmental approval. Basic understanding of GIS through discussions of the components of a GIS and how GIS are used in natural resource applications. Fall.

FORY 6650 URBAN FORESTRY (3). LEC. 2. LAB. 3. Pr., FORY 3100 or HORT 3220. Principles and concepts of tree establishment, management and health in an urban environment. Case studies of urban forestry programs are presented. Spring.

FORY 7110 ADVANCED FOREST SOILS (3). LEC. 2. LAB. 3. Pr., AGRN 2040, FORY 5230 or FORY 6230. Forest soil processes for the individual tree, forest community, and the forest ecosystem. Spring.


FORY 7210 ECOSYSTEM ECOLOGY (3). LEC. 3. Pr., BIOL 3060, or FORY 4230, or BIOL 6140, or departmental approval. To create a conceptual model of the terrestrial ecosystem for the study of spatial distributions of ecosystems; their development through time; and the impact of human activity and natural disturbance on the structure and function of terrestrial ecosystems. Spring.

FORY 7220 LANDSCAPE ECOLOGY (3). LEC. 3. Pr., BIOL 3060, or FORY 4230 or BIOL 5140 or BIOL 6140. The development and dynamics of spatial heterogeneity, interactions and exchange across heterogeneous landscapes and the influence of spatial heterogenity on biotic and abiotic processes. Fall.

management, tree improvement, seedling establishment, vegetation management, pruning and site interactions. Spring.

FORY 7330 ECOLOGY AND SILVICULTURE OF EASTERN HARDWOOD FORESTS (3). LEC. 2. LAB. 3. Pr., FORY 4230. Silvical characteristics of major hardwood species and community composition, dynamics, site relationships, and silviculture of Southern and Eastern deciduous forests, emphasizing oaks. Spring.

FORY 7440 FOREST FINANCE AND INVESTMENT (3). LEC. 3. Pr., departmental approval. Principles of corporate and real estate finance as applied to commercial timberland and the place of this asset class in individual and institutional portfolios. Fall.


FORY 7510 RESEARCH METHODS (2). LEC. 1, LAB. 3. Overview of the scientific method and its application in forestry/natural resources research. Evaluation and preparation of project proposals with emphasis on research quality and written communication skills. Fall.

FORY 7580 NATURAL RESOURCE POLICY ANALYSIS AND ADMINISTRATION (3). LEC. 3. The policy-making process, the history of natural resource and environmental policy, and applied techniques in policy analysis. Spring.

FORY 7850 URBAN FORESTRY SEMINAR (1). SEM. 1. Presentation and discussion of research, scientific papers and issues related to urban forest establishment, care and planning. Credit will not be given for both FORY 7850 and HORT 7850. Fall.

FORY 7910 PRACTICUM IN COLLEGE TEACHING (1). PRA. 1, SU. Techniques and practice of collegiate teaching at the level of Graduate Assistant. Students work under direct supervision and tutelage of the instructor.

FORY 7930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Course may be repeated for a maximum of 10 credit hours.

FORY 7950 SEMINAR (1). SEM. 3. SU. Develop the ability and confidence in making oral presentations based upon research results and provide constructive criticism of peers’ presentations. Spring.

FORY 7970 SPECIAL PROBLEMS (2-6). IND. Pr., departmental approval. Analysis of a problem in Forestry or wood utilization involving library research, laboratory or field work and a report on the findings. Course may be repeated for a maximum of 6 credit hours.

FORY 7980 MASTER OF FORESTRY PAPER (2). IND., SU. Pr, Departmental approval; student in the Master of Forestry Degree Program. In-depth study involving library review, data collection and/or data analysis.

FORY 7990 RESEARCH AND THESIS (1-15). MST., TD. Pr., departmental approval. Course may be repeated with change in topic.

FORY 8930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Course may be repeated for a maximum of 10 credit hours.

FORY 8970 SPECIAL PROBLEMS (2-6). IND. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

FORY 8990 RESEARCH AND DISSERTATION (1-15). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

FORESTRY AND WILDLIFE SCIENCES (FOWS)

FOWS 1010 INTRODUCTION TO RENEWABLE NATURAL RESOURCES (1). LEC. 1. Introduction to the wealth and breadth of renewable natural resources in the state, region, nation, and world. Presentations cover employment opportunities and timely issues surrounding our renewable natural resources including timber, wildlife, fisheries, water, and soil. Fall, Spring.

WILDLIFE SCIENCES (WILD)

WILD 2050 WILDLIFE CONSERVATION HISTORY AND LAW (3). LEC. 3. The history of wildlife conservation in North America, the conservation problems that have arisen since European settlement, and the laws and practices that have evolved to remedy them. Fall.

WILD 3280 PRINCIPLES OF WILDLIFE MANAGEMENT (3). LEC. 3. Pr., or corequisite BIOL 3060. Fundamentals of wildlife management theory, application and administration. Fall.

WILD 3281 WILDLIFE MANAGEMENT LABORATORY (1). LAB. 3. Coreq., WILD 3280. Laboratory experiences in wildlife management. Fall.

WILD 4310 WILDLIFE MANAGEMENT TECHNIQUES (3). LEC. 1, LAB. 6. Pr., WILD 2580 or WILD 2690. Intensive study of field and laboratory techniques used to manage wildlife populations, including censusing, habitat mapping, prescribed burning, GIS and computer simulation. Spring.

WILD 4920 WILDLIFE MANAGEMENT INTERNSHIP (4). PRA. 4, SU. Pr, departmental approval. Practical job experience under joint supervision of the Internship adviser and appropriate state, federal or private agency. Training will prepare student for potential career employment.

WILD 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College and departmental approval. Topics of an undergraduate nature pertinent to wildlife sciences. Course may be repeated for a maximum of 3 credit hours.

WILD 4970 SPECIAL PROBLEMS IN WILDLIFE SCIENCE (1-5). RES. Pr., departmental approval. Course may be repeated for a maximum of 5 credit hours.

WILD 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College and departmental approval. Directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

WILD 5270 WILDLIFE RESOURCE PHILOSOPHY AND POLICY (3). LEC. 3. Pr., WILD 3280 or WILD 5280, or WILD 5290 with a minimum grade of C. Examination of attitudes, philosophies and policies that govern management of the wildlife resource. Extensive reading and class participation required. Spring.

WILD 5280 WILDLIFE ECOCY AND MANAGEMENT I (3). LEC. 3. Pr., WILD 3280 with a minimum grade of C. Intensive study of the ecology and management of selected waterfowl, galliforms, gruiforms, raptors, shorebirds, doves and pigeons, woodpeckers and neotropical migrants. Fall.

WILD 5281 WILDLIFE ECOCY AND MANAGEMENT I LABORATORY (1). LAB. 4. Pr., WILD 5280. Coreq., WILD 5280. Outdoor and audio-visual identification of selected bird species, habitats, and techniques used to manipulate bird populations and habitats. Some weekend field trips required. Fall.

WILD 5290 WILDLIFE ECOCY AND MANAGEMENT II (3). LEC. 3. Pr., WILD 3280 with a minimum grade of C. Intensive study of the ecology and management of selected artiodactyls, rodents, lagomorphs, bats, carnivores and herps. Spring.

WILD 5291 WILDLIFE ECOCY AND MANAGEMENT II LABORATORY (1). LAB. 4. Pr., or corequisite WILD 5290. Coreq., WILD 5290. Outdoor and audio-visual identification of selected mammal and herb species, habitats, and techniques used to manipulate those populations and habitats. Some weekend field trips required. Spring.

WILD 6270 WILDLIFE RESOURCE PHILOSOPHY AND POLICY (3). LEC. 3. Pr., WILD 328125WILD 6280, or WILD 6290 or departmental approval. Examination of attitudes, philosophies and policies that govern management of the wildlife resource. Extensive reading and class participation required. Spring.

WILD 6280 WILDLIFE ECOCY AND MANAGEMENT I (3). LEC. 3. Pr., WILD 3280. Intensive study of the ecology and management of selected waterfowl, galliforms, gruiforms, raptors, shorebirds, doves and pigeons, woodpeckers and neotropical migrants. Fall.

WILD 6281 WILDLIFE ECOCY AND MANAGEMENT I LABORATORY (1). LAB. 4. Pr., or corequisite WILD 6280. Coreq., WILD 6280. Outdoor and audio-visual identification of selected bird species, habitats, and techniques used to manipulate bird populations and habitats. Some weekend field trips required. Fall.


WILD 6291 WILDLIFE ECOCY AND MANAGEMENT II LABORATORY (1). LAB. 4. Pr., or corequisite WILD 6290. Coreq., WILD 6290. Outdoor and audio-visual identification of selected mammal and herb species, habitats, and techniques used to manipulate those populations and habitats. Some weekend field trips required. Fall.

with emphasis on upland species and habitats. Several overnight field trips may be made. Fall.

WILD 7080 FOREST WILDLIFE ECOLOGY AND MANAGEMENT (4). LEC. 4. Pr., WILD 5280 or WILD 6280. In-depth discussions into life history, biology, ecology and management of important wildlife species of forested ecosystems. Management strategies for each species emphasized. Summer.

WILD 7200 WILDLIFE NUTRITIONAL ECOLOGY (3). LEC. 3. Exploration of the basic nutrient requirements of free-ranging wildlife and comparison of requirements to related domestic species.


WILD 7930 DIRECTED STUDY (1-3). LEC. Pr., Departmental approval. Directed studies in subject matter not covered by an existing course or to supplement knowledge gained from existing course offerings. Course may be repeated for a maximum of 9 credit hours.

WILD 7950 GRADUATE SEMINAR (1). SEM. 1. SU. Students develop ability and confidence in making oral presentations based upon research and provide constructive criticism of their peers’ presentations. Spring.

WILD 7970 SPECIAL PROBLEMS IN WILDLIFE SCIENCE (1-5). RES. Pr., departmental approval. Provides graduate students seeking the master’s degree opportunities to work with individual wildlife science professors to investigate timely research topics. Course may be repeated for a maximum of 5 credit hours.

WILD 7990 RESEARCH AND THESIS (1-12). MST., TD. Pr., Departmental approval. Course may be repeated with change in topic.

WILD 8970 SPECIAL PROBLEMS IN WILDLIFE SCIENCE (1-5). RES. Pr., departmental approval. Provides graduate students seeking the doctoral degree opportunities to work with individual wildlife science professors to investigate timely research topics. Course may be repeated for a maximum of 5 credit hours.

WILD 8990 RESEARCH AND DISSERTATION (1-12). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

Geology and Geography
Dr. Robert B. Cook - 844-4282

GEOGRAPHY (GEOG)

GEOG 1010/1013 GLOBAL GEOGRAPHY (3). LEC. 3. Social Science I Core. Spatial and locational context for analyzing change in the contemporary world, including elements of both physical and cultural environments.

GEOG 1014 DIST-ED GLOBAL GEOGRAPHY (3). LEC. 3. Spatial and locational context for analyzing changes in the contemporary world, including elements of both physical and cultural environments.

GEOG 1017 HONORS GLOBAL GEOGRAPHY (3). LEC. 3. Spatial and locational context for analyzing change in the contemporary world, including elements of both physical and cultural environments.


GEOG 2020 PHYSICAL GEOGRAPHY (3). LEC. 3. Selected elements of the earth’s physical system to include such items as landforms, basic weather elements, soils and vegetation.

GEOG 2800 GEOGRAPHIC METHODS AND TECHNIQUES (4). LEC. 3. LAB. 2. Pr., COMP 1000 or departmental approval. Key geographical concepts and production of basic geographical tools for portraying spatial data through laboratory exercises.

GEOG 3110 UNITED STATES AND CANADA (3). LEC. 3. Survey of the region incorporating physical and cultural elements, providing a synthesis of the economic and political processes of the U.S. and Canada.

GEOG 3120 ALABAMA AND THE SOUTHEAST (3). LEC. 3. Study of the physical and cultural environments of the state.

GEOG 3130 LATIN AMERICA (3). LEC. 3. Survey of physical and human landscape of the region including historical geography, natural resources, economic development and problems and prospects affecting major countries.

GEOG 3140 AFRICA (3). LEC. 3. Analysis of the relationships among diverse population groups and the physical environments of sub-Saharan Africa.

GEOG 3150 EUROPE (3). LEC. 3. Survey of physical and human landscape of the region including historical geography, natural resources, economic development, and problems and prospects affecting several of the major countries.

GEOG 3160 ASIA (3). LEC. 3. Survey of the physical and cultural landscape of Asia, including its development and spatial distribution of resources, with a focus on major countries.

GEOG 3300 INTERNATIONAL TRAVEL AND TOURISM (3). LEC. 3. Environmental and cultural patterns that characterize places attractive to tourists. Provides realistic situations for developing travel plans and programs.

GEOG 3810 CARTOGRAPHY AND GRAPHICS (4). LEC. 3. LAB. 2. Pr., GEOG 2800 or departmental approval. Techniques of map production including relevant computer graphics applications and related laboratory exercises.

GEOG 4900 INDEPENDENT STUDIES IN GEOGRAPHY (1-4). IND. Pr., Senior standing or departmental approval. Conferences, reading, research and/or reports may fulfill course requirement. Course may be repeated for a maximum of 4 credit hours.

GEOG 4920 INTERNSHIP (3). LEC. 3. Pr., senior standing. Opportunity to apply classroom experience to real job setting. Course may be repeated for a maximum of 6 credit hours.

GEOG 5010 URBAN GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Analysis of urban patterns and the processes creating them.

GEOG 5210 CLIMATOLOGY (3). LEC. 3. Pr., senior standing or departmental approval. The atmosphere and global circulation, El Nino, regional patterns, paleoclimate reconstruction, climate change, climate influences on health and human activities, data sources and statistical analysis, and GIS applications.

GEOG 5300 ADVANCED REGIONAL STUDIES IN GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Spatial patterns of socio-economic development of Latin America and the Caribbean.

GEOG 5350 ECONOMIC GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Economic Geography in a global context. Spatial aspects of resource use, agricultural development, manufacturing production and services.

GEOG 5400 HAZARDS GEOGRAPHY (4). LEC. 4. Pr., Senior standing; and GEOG 2010, GEOG 2020 or departmental approval. Geography of natural hazards and their impacts on society.

GEOG 5500 GEOGRAPHY OF ENVIRONMENTAL MANAGEMENT (3). LEC. 3. Pr., senior standing or departmental approval. Understanding and application of the theories and methods for the United States’ version of environmental impact assessment.

GEOG 5600 GLOBAL RESOURCES AND THE ENVIRONMENT (3). LEC. 3. Pr., senior standing or departmental approval. Global environmental problems such as climate change, ozone and deforestation and international public agencies and private volunteer movements protecting our global commons.

GEOG 5800 GEOGRAPHIC THOUGHT (3). LEC. 3. Pr., senior standing or departmental approval. Develops effective thinking skills, evaluates written materials in geography, reviews geographical research and produces written reports and papers related to geographic issues.


GEOG 5830 GEOGRAPHIC INFORMATION SYSTEMS (4). LEC. 3. LAB. 2. Introduction to concepts and techniques used in developing a geographic information system (GIS) for evaluating spatial distribution patterns and spatial relationships.

GEOG 5970 SEMINAR IN GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Development of modern geographic thinking with attention to applied research topics. Course may be repeated for a maximum of 6 credit hours.

GEOG 6010 URBAN GEOGRAPHY (3). LEC. 3. Pr., graduate standing. Analysis of urban pattern and the process creating them.

GEOG 6210 CLIMATOLOGY (3). LEC. 3. Pr., graduate standing. The atmosphere and global circulation, El Nino, regional patterns, paleoclimate reconstruction, climate change, climate influences on health and human activities, data sources and statistical analysis, and GIS applications.
GEOG 6300 ADVANCED REGIONAL STUDIES IN GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Spatial patterns of socio-economic development of Latin America and the Caribbean.


GEOG 6400 HAZARDS GEOGRAPHY (4). LEC. 4. Pr., Senior standing; and GEOG 2010, GEOG 2020 or departmental approval. Geography of natural hazards and their impacts on society.

GEOG 6500 GEOGRAPHY OF ENVIRONMENTAL MANAGEMENT (3). LEC. 3. Pr., senior standing or departmental approval. Understanding and application of the theories and methods for the United States’ version of environmental impact assessment.

GEOG 6600 GLOBAL RESOURCES AND THE ENVIRONMENT (3). LEC. 3. Pr., Graduate standing. Global environmental problems such as climate change, ozone and deforestation and international public agencies and private volunteer movements protecting our global commons.

GEOG 6800 GEOGRAPHIC THOUGHT (3). LEC. 3. Pr., graduate standing or departmental approval. Develops effective thinking skills; evaluates written materials in geography; Reviews geographical research and produces written reports and papers related to geographic issues.


GEOG 6830 GEOGRAPHIC INFORMATION SYSTEMS (4). LEC. 3, LAB. 2. Pr., departmental approval. Introduction to concepts and techniques used in developing a geographic information system (GIS) for evaluating spatial distribution patterns and spatial relationships.

GEOG 6970 SEMINAR IN GEOGRAPHY (3). LEC. 3. Pr., senior standing or departmental approval. Development of modern geographic thinking with attention to applied research topics. Course may be repeated for a maximum of 6 credit hours.

GEOLOGY (GEOL)

GEOL 1100 PHYSICAL GEOLOGY (4). LEC. 3, LAB. 2. Science Core. General physical geography. Survey of the important minerals and rocks. Origin and classification of geologic structures. Credit will not be given for both GEOL 1100 and GEOL 3150.

GEOL 1101 PHYSICAL GEOLOGY LABORATORY (0). LAB. 2., NG. Coreq., GEOL 1100. Examination of rocks and minerals and use of geologic and topographic maps; structural geology and correlation exercises.


GEOL 1111 HISTORICAL GEOLOGY LABORATORY (0). LAB. 2., NG. Pr., GEOL 1100. Coreq., GEOL 1110. Examination of rock, fossil, and related data sets bearing on the geological development of the earth with emphasis on North America.

GEOL 1200 MARINE TECHNICAL METHODS (2). LAB. 8. Pr., departmental approval. Introduction to procedures utilized aboard marine research vessels; physical, biological and geological measurements and sampling techniques. Summer.

GEOL 1220 COASTAL CLIMATOLOGY (2). LEC. 7. Pr., departmental approval. Controlling factors and features of world climates, with attention to coastal areas; application and interpretation of climate data. Summer.

GEOL 2010 MINERALOGY AND OPTICAL CRYSTALLOGRAPHY (5). LEC. 4, LAB. 2. Pr., CHEM 1040 or departmental approval. Introduction to crystal chemistry and crystallography. Theory and applications of light optics as applied to the study of minerals; emphasis on study of rock-forming minerals.

GEOL 2020 MARINE GEOLOGY (4). LEC. 2, LAB. 4. Pr., departmental approval. Geology of ocean basins; special emphasis on continental shelves, their sediments and the sedimentary process at work there. Summer.

approval. Fundamentals of groundwater flow in porous media, hydrodynamic dispersion, determination of aquifer properties and geological aspects of groundwater occurrences.

**GEOL 5240 COASTAL GEOMORPHOLOGY (2).** LEC. 5, LAB. 4. Pr., departmental approval. Introduction to coastal sediment processes and applied coastal geomorphology; emphasis on waves, tides, sediments and their impact of anthropogenic influences.

**GEOL 5300 BASIN ANALYSIS (3).** LEC. 2, LAB. 2. Pr., GEOL 4010 (or concurrent enrollment). Study of analytical techniques of sedimentary basin fills, including thermal history, litho and biofacies analyses, depositional systems, subsurface logs, seismic reflection, provenance history, evolution, sedimentation and subsidence history. Fall.

**GEOL 5400 PRINCIPLES OF EARTH SCIENCE (3).** LEC. 2, LAB. 2. Pr., science education majors or departmental approval. A special course for inservice and future teachers only. Internal and surficial geologic processes, meteorology and oceanography.

**GEOL 5600 APPLIED GEOPHYSICS (4).** LEC. 3, LAB. 2. Pr., GEOL 1100 or GEOL 3150; MATH 1620 or departmental approval; PHYS 1510 or departmental approval. Overview of geophysical methods with applications to resource, tectonic and environmental analyses. Seismic refraction and reflection, gravity, magnetics, electrical and electromagnetic methods will be included.

**GEOL 6060 INVERTEBRATE PALEONTOLOGY (4).** LEC. 3, LAB. 2. Pr., GEOL 3200, BIOL 1030. In-depth coverage of the invertebrate fossil record, focusing on the systematics and evolutionary history of major groups. Laboratory/discussion sessions and field trips included.

**GEOL 6100 HYDROGEOLOGY (3).** LEC. 2, LAB. 2. Pr., GEOL 1100, CHEM 1030, MATH 1610, GEOG 3830, PHYS 1500, or departmental approval. Fundamentals of groundwater flow in porous media, hydrodynamic dispersion, determination of aquifer properties and geological aspects of groundwater occurrences.

**GEOL 6200 GROUNDWATER GEOCHEMISTRY (2).** LEC. 2. Pr., CHEM 1040, GEOL 1100 or GEOL 3015. Chemical principles applied to the understanding of factors controlling groundwater composition with an emphasis on water-mineral reactions. Introduction to chemical equilibrium computer modeling programs.

**GEOL 6240 COASTAL GEOMORPHOLOGY (2).** LEC. 5, LAB. 4. Pr., departmental approval. Introduction to coastal sediment processes and applied coastal geomorphology; emphasis on waves, tides, sediments and their impact of anthropogenic influences.

**GEOL 6300 BASIN ANALYSIS (3).** LEC. 2, LAB. 2. Pr., GEOL 4010 (or concurrent enrollment). Study of analytical techniques of sedimentary basin fills, including thermal history, litho and biofacies analyses, depositional systems, subsurface logs, seismic reflection, provenance history, evolution, sedimentation and subsidence history. Fall.

**GEOL 6400 PRINCIPLES OF EARTH SCIENCE (3).** LEC. 2, LAB. 2. Pr., science education majors or departmental approval. A special course for inservice and future teachers only. Internal and surficial geologic processes, meteorology and oceanography.

**GEOL 6600 APPLIED GEOPHYSICS (4).** LEC. 3, LAB. 2. Pr., GEOL 1100 or GEOL 3150; MATH 1620 or departmental approval; PHYS 1510 or departmental approval. Overview of geophysical methods with applications to resource, tectonic and environmental analyses. Seismic refraction and reflection, gravity, magnetics, electrical and electromagnetic methods will be included.

**GEOL 7100 GECOMMUNICATION (3).** LEC. 3. Pr., departmental approval. Instruction and practice in written and oral communication skills necessary for a successful career in the geosciences; emphasis or preparation of scientific articles, technical reports, abstracts, and thesis; preparation and delivery of oral presentations.

**GEOL 7200 TECTONICS (3).** LEC. 2, LAB. 2. Pr., GEOL 2050 and GEOL 4010 or departmental approval. Emphasis will be placed on plate tectonics and driving forces, evolution of collisional, transform and extensional systems, and the dynamic factors of past and current tectonic processes.

**GEOL 7250 GEOGRAPHIC INFORMATION SYSTEMS AND MARINE RESEARCH (3).** LEC. 10, LAB. 15. Pr., departmental approval. Introduction to geographical information system (GIS) techniques with a focus on application in the marine environment.

**GEOL 7250 GROUNDWATER HYDROGEOLOGIC MODELING (3).** LEC. 2, LAB. 2. Pr., GEOL 6100 or departmental approval. Overview of groundwater modeling techniques with environmental and geologic applications. Interaction of geology and subsurface groundwater flow. Basin hydrology modeling. Practical experience in computer simulations of subsurface hydrogeologic processes.

**GEOL 7260 AQUEOUS AND ENVIRONMENTAL GEOCHEMISTRY (3).** LEC. 2, LAB. 2. Pr., CHEM 1040, GEOL 2050 Study of water-rock reactions that control the chemical composition of groundwater; aqueous geochemistry of trace elements; groundwater pollution, remediation and geomicrobiology.

**GEOL 7300 CYCLES THROUGH EARTH HISTORY (3).** LEC. 2, LAB. 2. Pr., GEOL 4110, GEOL 2200, GEOL 4260. Discussion of the fundamental processes controlling cycles of (1) C, N, O, H, P, and S, (2) climate, and (3) sea-level through geologic history; how interrelationships of these cycles have impacted the biotic and biotic character of Earth.

**GEOL 7310 ISSUES IN PALEONTOLOGY (3).** LEC. 3. Pr., GEOL 3200. Advanced applications of paleontological data sets to topics that may include taphonomy, biogeochemistry, evolution, assemblage functional morphology, paleoecology, paleoecology and biostratigraphy.

**GEOL 7400 ADVANCED ECONOMIC GEOLOGY (3).** LEC. 2, LAB. 2. Pr., GEOL 4210. The practical and theoretical aspects of economic geology as applied to exploration and development of natural resources.

**GEOL 7410 GEOLOGY OF ORGANIC MATTER (3).** LEC. 2, LAB. 2. Pr., GEOL 4010 and GEOL 4110 or departmental approval. The origins, classification, taphonomy of organic matter, modern and ancient processes and environments of deposition of organic-rich strata, including hydrocarbon-source rocks and coals. Laboratory and field trips required.

**GEOL 7450 MINERAL RESOURCES AND THE ENVIRONMENT (3).** LEC. 2, LAB. 2. Pr., CHEM 1040, GEOL 2050. Overview of geology and geographic distribution of mineral resources; economic aspects affecting their extraction; environmental impacts and cost of mineral resource extraction.

**GEOL 7550 ADVANCED GEOPHYSICAL METHODS (3).** LEC. 2, LAB. 2. Pr., GEOL 6600 and departmental approval. Advanced treatment of geophysical methods, data interpretation and modeling. Applications to resource development and environmental assessments will be explored, with emphasis on seismic methods.

**GEOL 7600 PETROLOGY (3).** LEC. 2, LAB. 2. Pr., GEOL 2050, GEOL 4010 or departmental approval. The description, classification, formative processes, and petrologic interpretation of igneous, metamorphic and sedimentary rocks.

**GEOL 7610 STRUCTURAL AND METAMORPHIC ANALYSIS (3).** LEC. 2, LAB. 2. Pr., GEOL 2050, GEOL 3400 and GEOL 3650. Quantitative analysis of dynamic, kinematic and chemical responses of rocks and minerals to crustal movements and dynamo thermal metamorphism.

**GEOL 7650 FACIES ANALYSIS AND SEQUENCE STRATIGRAPHY (3).** LEC. 2, LAB. 2. Pr., GEOL 4010 and GEOL 4110 or departmental approval. Systematic analysis of modern and ancient deposition facies, and their interpretation in a sequence stratigraphic context. Laboratory and field trips required.

**GEOL 7930 DIRECTED STUDIES OR READINGS (1-3).** LEC. 3. Pr., departmental approval. Directed studies. May incorporate literature, field and/or laboratory research in any proportion. Subject matter and credit hours shall be determined by student and directing faculty. Course may be repeated for a maximum of 3 credit hours.

**GEOL 7980 CAPSTONE PROJECT (1-3).** LEC., SU. Pr., departmental approval. Literature, field and/or laboratory research directed towards completion of capstone project required for non-thesis option. Course may be repeated for a maximum of 3 credit hours.

**GEOL 7990 RESEARCH AND THESIS (1-10).** MST., TD. Pr., departmental approval. Credit to be arranged. Course may be repeated with change in topic.

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**Graduate School (GRAD)**

**GRAD 7@@0 THESIS COMPLETION (0).** IND. Coreq., MIN. one (1) hour 7990. Restricted to thesis-option graduate students for a Coreq., maximum of three semesters. Students may not enroll for any additional didactic work but must be engaged full-time in the completion of thesis research or the thesis. No grade.

**GRAD 7000 CLEARING REGISTRATION (0).** LEC. May be used to register graduate students to graduate who have finished all graduation requirements by the last day of the previous semester, to remove incomplete grades, or to complete comprehensive examination for non-thesis students.

**GRAD 8##0 AU/AUM JT PROG IN PUBLIC ADMIN (0).** IND. Pr., Enrollment at AUM. Joint Program in Public Administration. Coreq.,
Human Development and Family Studies (HDFS)

Dr. Marilyn R. Bradbard - 844-4151

HDFS 1850 CURRENT ISSUES IN HUMAN DEVELOPMENT AND FAMILY STUDIES (3). LEC. 3. Current issues facing families and children evaluated in the light of scientific research.

HDFS 2000 MARRIAGE AND FAMILY IN A GLOBAL CONTEXT (3). LEC. 3. Examination of marriage and family systems, including their interface with the broader socio-cultural context.

HDFS 2010 LIFESPAN HUMAN DEVELOPMENT IN FAMILY CONTEXT (3). LEC. 3. Human development within the context of the family and across the family life cycle with a focus on significant life transitions.

HDFS 2020 FAMILY RESOURCE MANAGEMENT (3). LEC. 3. Management of family resources with emphasis on decision-making and problem-solving skills over the life cycle.

HDFS 2030 PROFESSIONAL DEVELOPMENT AND ETHICS (3). LEC. 3. Appraisal of career potential, formulation of a professional code of ethics, and exploration of career options.

HDFS 3010 CHILD DEVELOPMENT IN THE FAMILY (3). LEC. 3. Pr., HDFS 2010 or departmental approval. Social, emotional, physical and intellectual development in early and middle childhood with a special focus on family relationships.


HDFS 3380 STUDY ABROAD OPPORTUNITIES IN HUMAN SCIENCES (1). LEC. 1. Exploration of study abroad opportunities for students interested in the International Minor in Human Sciences. Spring.

HDFS 3470 LEARNING EXPERIENCES FOR YOUNG CHILDREN (5). LEC. 3. LAB. 3. Pr., HDFS 3010. Child development knowledge applied to preschool curriculum planning with supervised participation at Auburn University Early Learning Center. Fall, Spring.

HDFS 3910 PRACTICUM (1-6). PRA. SU. Pr., Departmental approval. Directed experience in a professional setting. A) Human Development; B) Family Studies; C) Marriage and Family Therapy. Course may be repeated for a maximum of 6 credit hours.

HDFS 3920 SERVICE LEARNING IN HUMAN DEVELOPMENT AND FAMILY STUDIES (1-6). LEC. Pr., Junior standing. Application of HDFS-relevant knowledge to real-life situations through active participation in a directed community service experience. A.) Auburn University Early Learning Center; B.) Harris Early Learning Center of Birmingham; C) Other Community Placements.

HDFS 3990 UNDERGRADUATE RESEARCH AND STUDY (1-5). LEC. Pr., Departmental approval. Directed research under faculty supervision. Course may be repeated for a maximum of 5 credit hours.

HDFS 4200 PROGRAM DEVELOPMENT AND EVALUATION (3). LEC. 3. Pr., HDFS 2000, HDFS 3010, and HDFS 3010 or HDFS 3030 or HDFS 3060. Application of research to the development and evaluation of programming for children and families. Spring.

HDFS 4300 FAMILY AND SOCIAL POLICY (3). LEC. 3. Pr., HDFS 2020 and HDFS 3010 or HDFS 3030 or HDFS 3060. Examination and critique of social policies from a family perspective. Fall.

HDFS 4380 STUDY AND TRAVEL IN HUMAN DEVELOPMENT AND FAMILY STUDIES (2-6). FLD. Pr., Human Sciences Core and departmental approval. Study or work in the United States or internationally. Course may be repeated for a maximum of 6 credit hours.


HDFS 4501 HOSPITALIZED CHILDREN AND THEIR FAMILIES LAB (1). LAB. 1. SU. Pr., HDFS 3010 and junior standing in HDFS. Coreq., HDFS 4500. Practical applications in hospital setting working with children and their families. Spring.


HDFS 4680 FAMILY IN CROSS-CULTURAL PERSPECTIVE (3). LEC. 3. Pr., HDFS 2000. Examination of family function and diversity in cultures and family systems around the world. Fall.


HDFS 4920 INTERNSHIP IN HUMAN DEVELOPMENT AND FAMILY STUDIES (12). INT. Pr., HDFS major, completion of required 3000- and 4000-level HDFS courses with a C grade or better; 2.25 unadjusted GPA; departmental approval. Application must be submitted two semesters in advance. A computer and internet access is required.

HDFS 4950 ADVANCED SEMINAR (3). LEC. 3. Pr., junior standing in HDFS; departmental approval. Topical seminar in HDFS. A) Advanced Research (requires 3.0 GPA in HDFS); B) Child Development; C) Family Studies; D) Marriage and Family Therapy. Fall, Spring. Course may be repeated for a maximum of 9 credit hours.

HDFS 4960 DIRECTED READINGS IN HUMAN DEVELOPMENT AND FAMILY STUDIES (1-3). IND. SU. Pr., departmental approval. Supervised readings in one or more topical areas. Course may be repeated for a maximum of 3 credit hours.

HDFS 4990 ADVANCED UNDERGRADUATE RESEARCH IN HUMAN DEVELOPMENT AND FAMILY STUDIES (1-5). IND. Pr., Departmental approval. Junior or senior standing. Conduct research under the direction of a human development and family studies faculty member on a topic of mutual interest. Course may be repeated for a maximum of 5 credit hours.

HDFS 4997 HONORS THESIS (2-6). IND., SU. Pr., membership in the Honors College; junior standing in HDFS. Research in specialized topics. Course may be repeated for a maximum of 6 credit hours.

HDFS 7010 ADVANCED CHILD DEVELOPMENT (3). LEC. 3. Survey and critical examination of research on development from birth through adolescence. Fall.

HDFS 7020 MARITAL AND FAMILY DYNAMICS (3). LEC. 3. Pr., departmental approval. Theoretical and empirical contributions to the understanding of marital and family processes and dynamics. Fall.
HIST 3000 HISTORY OF SOUTHEASTERN INDIANS (3). LEC. 3. History of the southeastern Indians from pre-contact to removal including native culture, culture change, trade, imperial rivalries and wars.


HIST 3020 HISTORY OF WOMEN IN THE UNITED STATES (3). LEC. 3. History of women in America from colonial period to the present; explores differences of region, race and class.

HIST 3030 AFRICAN AMERICAN HISTORY (3). LEC. 3. History of African Americans from African origins to the modern era, focusing on enslavement, emancipation and the struggle for equal rights.

HIST 3040 AMERICAN RELIGIOUS HISTORY (3). LEC. 3. Religious ideas and institutions from the colonial period to the present, including how religion has intersected with political and social history.

HIST 3050 HISTORY OF POLITICAL PARTIES IN THE UNITED STATES (3). LEC. 3. Examines political parties and party systems from the constitution to the present, including party organization, campaign techniques and presidential leadership.

HIST 3060 ISSUES IN AFRICAN AMERICAN HISTORY (3). LEC. 3. Issues and personalities in African American History. Course may be repeated for a maximum of 6 credit hours.

HIST 3070 HISTORY OF UNITED STATES AIR POWER (3). LEC. 3. Development of air and spacecraft as weapons of war including doctrines, technology, major leaders and great events of air power.

HIST 3080 THE CIVIL RIGHTS MOVEMENT (3). LEC. 3. History of the civil rights movement and its place in the broader African American struggle for freedom. Social, political, and cultural history, with geographic and chronological focus on the U.S. South in the Post-World War II period.

HIST 3300 GRECO-ROMAN CIVILIZATION (3). LEC. 3. Classical civilizations of the Greeks and Romans as well as the Egyptian and Persian civilizations that influenced them.

HIST 3310 EUROPE IN THE MIDDLE AGES (3). LEC. 3. Survey of the thousand years which has been called the birth of Europe.

HIST 3320 HISTORY OF IRELAND (3). LEC. 3. History of Ireland from its beginnings to the present, including discussion of the present, troubled state of Ireland.

HIST 3330 ISSUES IN THE HISTORY OF GERMANY AND CENTRAL EUROPE (3). LEC. 3. Variable topics in the history of Germans, Slavs and other Central Europeans from the Era of Enlightened Absolutism through the fall of the Berlin Wall. Course may be repeated for a maximum of 6 credit hours.

HIST 3340 HISTORY OF MODERN FRANCE (3). LEC. 3. Political, social and cultural history of France since the French Revolution.

HIST 3350 SURVEY OF RUSSIAN HISTORY (3). LEC. 3. Russian history from the earliest development of a state in the area of Kiev down to the present Russian Federation.

HIST 3360 CONTEMPORARY RUSSIA SINCE WORLD WAR II (3). LEC. 3. Developments in contemporary Russia beginning with World War II and continuing to the present day.

HIST 3370 EUROPEAN IMAGINATION (3). LEC. 3. Examination of European domination of the globe through an investigation of how and why Europeans have imagined their civilization to be superior.

HIST 3500 HISTORY OF AVIATION (3). LEC. 3. History of aviation from the beginnings of human flight to the present.

HIST 3510 HISTORY OF SPACE TRAVEL (3). LEC. 3. Historical origins of the space age and U.S. space policy, including patterns that define the present and constrain the future of humans and machines.

HIST 3520 SCIENTIFIC REVOLUTIONS (3). LEC. 3. History of science, focusing on the concept of "scientific revolutions" in their social and intellectual context.

HIST 3530 SCIENCE FICTION AS INTELLECTUAL HISTORY (3). LEC. 3. The interaction between science, technology, and other aspects of modern culture as dramatized in classic and contemporary works of science fiction.

HIST 3540 ISSUES IN TECHNOLOGY AND CULTURE (3). LEC. 3. Issues such as the automobile, environment, industrialization and popular culture, relating to the role technology plays in society and culture. Course may be repeated for a maximum of 6 credit hours.

HIST 3600 ISSUES IN WOMEN'S AND GENDER HISTORY (3). LEC. 3. Topics in the history of women and gender. Focus will vary according to the instructor. Course may be repeated for a maximum of 6 credit hours.

HIST 3610 PRIVATE LIVES AND PUBLIC PLACES (3). LEC. 3. Examines shifting boundaries between public and private in history. Topics vary according to instructor, but may include work, family, sexuality and the state. Course may be repeated for a maximum of 6 credit hours.

HIST 3620 LANDSCAPE AND CULTURE (3). LEC. 3. Social and cultural history of architecture and built-space in Europe and/or the United States.

HIST 3630 HISTORY OF MEXICO (3). LEC. 3. History of Mexico in the 19th and 20th centuries.

HIST 3640 WORLD MILITARY HISTORY (3). LEC. 3. Economic, social, political and technological roots of the ways of war employed by different civilizations throughout the ages.

HIST 3650 20TH CENTURY WORLD WARS (3). LEC. 3. The causes, conduct and consequences of World Wars I and II.

HIST 3660 WORLD NAVAL HISTORY (3). LEC. 3. Naval history from its origins in ancient times to the present, including the evolution of strategy and tactics, foreign policy and technological change.

HIST 3670 CONTEMPORARY HISTORY (3). LEC. 3. Examination of issues and events in the contemporary world to provide historical background on developments in selected areas/nations across the globe.

HIST 3800 HISTORIANS CRAFT (3). LEC. 3. Pr., History major and junior standing. Historical research methods and an introduction to historiography.

HIST 3900 INDEPENDENT STUDY (1-3). IND. Pr., 3.0 overall GPA and departmental approval. Individual reading or research projects in a specific area of history. Course may be repeated for a maximum of 3 credit hours.

HIST 3920 HISTORY INTERNSHIP (3). LEC. 3. Pr., junior standing and departmental approval. Supervised on-the-job experience at archives, historical museums, historic preservation authorities, and historical editing projects, and similar historical agencies.

HIST 3970 SPECIAL TOPICS (3). LEC. 3. Topics vary. Course may be repeated for a maximum of 6 credit hours.

HIST 4930 SENIOR THESIS: HISTORICAL RESEARCH AND WRITING (3). LEC. 3. Pr., History major and HIST 3800. Writing of an original paper based on research in primary source materials.

HIST 4967 HONORS READINGS (3). LEC. 3. Pr., membership in the Honors College. The secondary literature on specialized topics in History.

HIST 4997 HONORS THESIS (3). LEC. 3. Pr., membership in the Honors College. Writing of an original paper based on research in primary materials.

HIST 5000 AMERICAN COLONIAL HISTORY (3). LEC. 3. Pr., junior standing or departmental approval. Traces the development of the North American colonies from European settlement to 1763.


HIST 5030 SOUTH TO 1877 (3). LEC. 3. Pr., junior standing or departmental approval. Development of the old South, from southeastern Indians and European contact through Reconstruction including slavery, white social classes, women, and politics.

HIST 5040 CIVIL WAR ERA: 1850-1877 (3). LEC. 3. Pr., junior standing or departmental approval. Secessional conflict, Civil War, and Reconstruction including sectional differences, political crises, secession, Civil War campaigns, emancipation, and presidential and congressional Reconstruction.

HIST 5050 THE SOUTH SINCE 1877 (3). LEC. 3. Pr., junior standing or departmental approval. Examination of the South since 1877, with emphasis on social, economic, cultural, political and ideological developments.

HIST 5060 MAKING MODERN AMERICA: 1877-1929 (3). LEC. 3. Pr., junior level standing. The making of Indo-Islamic culture, British rule of India, and the creation of Muslim Pakistan and "secular" India. Attention to role of individuals and events in history of nation-building.

HIST 5070 MODERN UNITED STATES HISTORY: 1929 TO THE PRESENT (3). LEC. 3. Pr., junior standing or departmental approval. United States History since 1929 with particular emphasis on the economy, changing role of government, America's role in world affairs and social changes.
HIST 5080 20TH CENTURY UNITED STATES DIPLOMACY (3). LEC. 3. Pr., junior standing or departmental approval. Examination of United States diplomatic history since the Spanish-American War.

HIST 5300 EARLY MODERN EUROPE: 1348-1715 (3). LEC. 3. Pr., junior standing or departmental approval. Major topics in European history for the period 1348-1715 including religious and cultural change and the relationship between state and society.

HIST 5310 ENLIGHTENMENT/REVOLUTIONARY EUROPE: 1715-1815 (3). LEC. 3. Pr., junior standing or departmental approval. Major topics in European history for the period 1715-1815, including the French Revolution and the Napoleonic period.

HIST 5320 19TH CENTURY EUROPE: 1815-1918 (3). LEC. 3. Pr., junior standing or departmental approval. Cultural, economic and social developments as well as the politics and international relations of the major European states between 1815-1918.

HIST 5330 20TH CENTURY EUROPE (3). LEC. 3. Pr., junior standing or departmental approval. The history of Europe from the outbreak of World War I to the end of the Cold War.

HIST 5340 EUROPEAN CULTURAL AND INTELLECTUAL HISTORY (3). LEC. 3.

HIST 5350 REVOLUTIONARY RUSSIA: 1861-1939 (3). LEC. 3. Pr., junior standing or departmental approval. Analysis of the Revolutions of 1917, beginning with emancipation of serfs and ending with purges of the 1930's.

HIST 5360 ENGLISH HISTORY TO 1688 (3). LEC. 3. Pr., junior standing or departmental approval. Development of England from Roman times to the triumph of parliament in the Glorious Revolution of 1688.

HIST 5370 GREAT BRITAIN SINCE 1688 (3). LEC. 3. Pr., junior standing or departmental approval. Including industrial revolution, development of empire and international role and social changes of 20th century.

HIST 5500 THE GREAT TRANSFORMATION: THE INDUSTRIAL REVOLUTION (3). LEC. 3. Pr., junior standing or departmental approval. The Industrial Revolution of 18th, 19th and 20th centuries with a major focus on England and the United States with some treatment of Europe and Asia.

HIST 5580 THE HISTORY OF FLIGHT (3). LEC. 3. Pr., junior standing. The history of flight in political, economic, social, and cultural perspective.

HIST 5600 MODERN EAST ASIA (3). LEC. 3. Pr., junior standing or departmental approval. Histories, cultures and philosophies of China and Japan from 1800 to the present.

HIST 5610 COLONIAL LATIN AMERICA (3). LEC. 3. Pr., junior standing or departmental approval. European expansion into the western hemisphere from its Iberian background through the 19th century, fall of the Spanish and Portuguese empires.

HIST 5620 MODERN LATIN AMERICA (3). LEC. 3. Pr., junior standing or departmental approval. History of Latin America in the 19th and 20th centuries using a thematic approach arranged chronologically.

HIST 5640 ISLAM, STATE AND SOCIETY IN MODERN WORLD HISTORY (3). LEC. 3. Pr., junior level standing. Study of adaptation of Islamic social and political theory to modern society and the modern state.

HIST 5650 HISTORY OF MODERN SOUTH ASIA, 1750 TO PRESENT (3). LEC. 3. Pr., junior level standing. The making of Indo-Islamic culture, British rule of India, and the creation of Muslim Pakistan and "secular" India. Attention to role of individuals and events in history of nation-building.


HIST 5680 AFRICA FROM 1800 TO THE PRESENT (3). LEC. 3. Pr., junior level standing. Topics include state formation, ending of Atlantic slave trade and African slave trade and slavery, the rise and fall of colonial rule, and current problems facing independent countries.

HIST 5710 FUNDAMENTALS OF ARCHIVAL THEORY AND PRACTICE (3). LEC. 3. Pr., junior standing or departmental approval. Examines the fundamentals of archival theory and practice; the relationship between archives and records management; and the role of records and archives in society.

HIST 6000 AMERICAN COLONIAL HISTORY (3). LEC. 3. The development of the North American colonies from European settlement to 1763.


HIST 6030 SOUTH TO 1877 (3). LEC. 3. Development of the Old South, from southeastern Indians and European contact through Reconstruction including slavery, white social classes, women and politics.

HIST 6040 CIVIL WAR ERA: 1850-1877 (3). LEC. 3. Sectional conflict, Civil War, and Reconstruction including sectional differences, political crises, secession, Civil War campaigns, emancipation, and presidential and congressional Reconstruction.

HIST 6050 THE SOUTH SINCE 1877 (3). LEC. 3. Examination of the South since 1877, with emphasis on social, economic, cultural, political and ideological developments.


HIST 6070 MODERN UNITED STATES HISTORY: 1929 TO THE PRESENT (3). LEC. 3. United States history since 1929 with particular emphasis on the economy, changing role of government, America's role in world affairs, and social changes.

HIST 6080 20TH CENTURY UNITED STATES DIPLOMACY (3). LEC. 3. Examination of United States diplomatic history since the Spanish-American War.

HIST 6300 EARLY MODERN EUROPE: 1348-1715 (3). LEC. 3. Major topics in European history for the period 1348-1715 including religious and cultural change and the relationship between state and society.

HIST 6310 ENLIGHTENMENT/REVOLUTIONARY EUROPE: 1715-1815 (3). LEC. 3. Culture, society and politics of the 18th century; origins and consequences of the French Revolution; the Napoleonic period.

HIST 6320 19TH CENTURY EUROPE: 1815-1918 (3). LEC. 3. Examines cultural, economic and social developments as well as the politics and international relations of the major European states between 1815-1918.

HIST 6330 20TH CENTURY EUROPE (3). LEC. 3. The history of Europe from the outbreak of World War I to the end of the Cold War.

HIST 6340 EUROPEAN CULTURAL AND INTELLECTUAL HISTORY (3). LEC. 3. Development of European culture and the interfacing of culture, ideas, and social institutions from the early Enlightenment to the present.

HIST 6350 REVOLUTIONARY RUSSIA: 1861-1939 (3). LEC. 3. Analysis of the Revolutions of 1917 beginning with emancipation of serfs and ending with purges of the 1930's.


HIST 6370 GREAT BRITAIN SINCE 1688 (3). LEC. 3. Great Britain since 1688, including industrial revolution, development of empire and international role, and social changes of 20th century.


HIST 6580 TOPICS IN THE HISTORY OF FLIGHT (3). LEC. 3. The history of flight in political, economic, social, and cultural perspective.

HIST 6600 MODERN EAST ASIA (3). LEC. 3. Histories, cultures, and philosophies of China and Japan from 1800 to the present.

HIST 6610 COLONIAL LATIN AMERICA (3). LEC. 3. European expansion into the western hemisphere from its Iberian background through 19th century fall of the Spanish and Portuguese empires.

HIST 6620 MODERN LATIN AMERICA (3). LEC. 3. History of Latin America in 19th and 20th centuries using a thematic approach arranged chronologically.

HIST 6640 ISLAM, STATE AND SOCIETY IN MODERN WORLD HISTORY (3). LEC. 3. Study of adaptation of Islamic social and political theory to modern society and the modern state.
HIST 6650 HISTORY OF MODERN SOUTH ASIA, 1750 TO PRESENT (3). LEC. 3. The making of Indo-Islamic culture, British rule of India, and the creation of Muslim Pakistan and “secular” India. Attention to role of individuals and events in history of nation-building.


HIST 6680 AFRICA FROM 1800 TO PRESENT (3). LEC. 3. Topics include state formation, ending of Atlantic slave trade and African slave trade and slavery, the rise and fall of colonial rule, and current problems facing independent countries.

HIST 6710 FUNDAMENTALS OF ARCHIVAL THEORY AND PRACTICE (3). LEC. 3. Examines the fundamentals of archival theory and practice; the relationship between archives and records management; and the role of records and archives in society.

HIST 7100 INTRODUCTORY SEMINAR IN AMERICAN HISTORIOGRAPHY (3). SEM. 3. Major historiographical trends in general American history and in particular sub-fields.


HIST 7130 SEMINAR IN EARLY AMERICAN REPUBLIC (3). SEM. 3. Issues in the Early Republic, including political transformations, sectional conflict, women and gender roles, industrialization, and reform movements.

HIST 7140 SEMINAR IN OLD SOUTH (3). SEM. 3. History of the Old South, including colonial settlement, slavery, political transformations, sectional conflict, women and gender roles and religion.

HIST 7150 SEMINAR IN CIVIL WAR ERA (3). SEM. 3. Examines sectional conflict, Civil War, and Reconstruction, including political, military and social development.

HIST 7160 SEMINAR IN NEW SOUTH (3). SEM. 3. Examines the South in United States history since 1877.

HIST 7170 SEMINAR IN UNITED STATES PROGRESSIVE ERA (3). SEM. 3. Examines in depth the history of the United States between 1877 - 1929.

HIST 7180 SEMINAR IN MODERN UNITED STATES HISTORY (3). LEC. 3. A broad introduction to the historiography relating to United States history since 1929.

HIST 7190 SEMINAR IN AFRICAN AMERICAN HISTORY (3). SEM. 3. Analysis of the major historiographical works on the social, political and economic history of African Americans.

HIST 7200 SEMINAR IN UNITED STATES WOMEN’S HISTORY (3). SEM. 3. Change and continuity in the lives of American women.

HIST 7210 SEMINAR IN AMERICAN RELIGIOUS HISTORY (3). SEM. 3. The role of religion in American history; recent writing on religion; and sociological and anthropological theories on religion.

HIST 7220 SEMINAR IN CIVIL RIGHTS MOVEMENT (3). LEC. 3. In-depth study of the civil rights movement, with emphasis on the U.S. South in the post-World War II period. Major topics, basic literature, and historiographical debates examined.

HIST 7400 INTRODUCTORY SEMINAR IN EUROPEAN HISTORIOGRAPHY (3). SEM. 3. Major topics and historiographical debates in European history from the early modern period to the twentieth century.

HIST 7410 SEMINAR IN EARLY MODERN EUROPE (3). SEM. 3. Topics in the history of continental Europe, 1348-1715, including religious and cultural change and the relationship between state and society.

HIST 7420 SEMINAR IN POPULAR CULTURE IN EARLY MODERN EUROPE (3). SEM. 3. Major themes in the popular culture of early modern Europe, 1450-1800.

HIST 7430 SEMINAR IN RUSSIAN SOCIETY IN REVOLUTION (3). SEM. 3. Examination of the literature, concepts, and history of the transformation of Russian society between 1861 and 1939.

HIST 7440 SEMINAR IN MODERN EUROPEAN CULTURAL POLITICS (3). SEM. 3. Traditional and revisionist approaches to the study of the political uses of culture in nineteenth and twentieth century Europe.

HIST 7450 SEMINAR IN THE FRENCH REVOLUTION (3). SEM. 3. The historiography in the French Revolution’s origins and legacy.

HIST 7460 SEMINAR IN EARLY MODERN BRITAIN (3). SEM. 3. Main themes and events of British history between 1603 and the 1760’s.

HIST 7470 SEMINAR IN EUROPEAN INTERNATIONAL HISTORY (3). SEM. 3. Relations among the European powers in the period 1870-1945.

HIST 7510 INTRODUCTORY SEMINAR IN HISTORIOGRAPHY OF TECHNOLOGY (3). SEM. 3. Problems and issues in the history of technology, as well as key literature on the subject.

HIST 7520 SEMINAR IN POLITICS AND TECHNOLOGY IN THE SPACE AGE (3). SEM. 3. The political and technological context of the “space age.”

HIST 7530 SEMINAR IN SOUTHERN INDUSTRIALIZATION (3). SEM. 3. Significant scholarly works and primary sources dealing with the history of industrialization and technology in the American South.

HIST 7540 SEMINAR IN AEROSPACE HISTORY (3). SEM. 3. Central problems, issues, and literature in aerospace history.

HIST 7550 SEMINAR IN SCIENCE AND SOCIETY (3). SEM. 3. Exploration of the interactions between science and politics in the twentieth century.

HIST 7560 SEMINAR IN THE INDUSTRIAL REVOLUTION (3). SEM. 3. Examines the central questions and historiography relating to the industrial revolution.

HIST 7570 TECHNOLOGY IN SOCIAL AND CULTURAL HISTORY (3). LEC. 3. Explores the literature in the history of technology that approaches the field from a social and cultural perspective.

HIST 7630 SEMINAR IN LATIN AMERICAN HISTORY (3). SEM. 3. Research tools, major issues, and sources in Latin American history.

HIST 7690 SEMINAR IN MODERN WORLD HISTORY (3). LEC. 3. Examination of world historiography and theory, with topical readings on comparative themes such as imperialism and colonialism, catch-up industrialization, decolonization, the Atlantic world, gender systems, religious diasporas, trade, and exploration.

HIST 7700 SEMINAR IN HISTORICAL METHODS (3). SEM. 3. Methodology and theory of historical research; preparation of a significant original research paper.

HIST 7720 SEMINAR IN ARCHIVAL THEORY AND PRACTICE (3). SEM. 3. Pr., HIST 4710 or HIST 7710 or departmental approval. Development of archival theory in the major functional areas of archival practice: appraisal, acquisition, arrangement, description, preservation, reference and access, outreach and advocacy.

HIST 7730 SEMINAR IN THE HISTORY OF RECORDS AND ARCHIVES (3). SEM. 3. Pr., HIST 4710 or HIST 7710 or departmental approval. Origins, organization, and development of records, record keeping systems, and archival institutions in Europe and North America.

HIST 7800 RESEARCH SEMINAR IN UNITED STATES HISTORY TO 1865 (3). SEM. 3. Research and writing of an original paper based on primary sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

HIST 7810 RESEARCH SEMINAR IN UNITED STATES HISTORY SINCE 1865 (3). SEM. 3. Research and writing of an original paper based on primary sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

HIST 7820 RESEARCH SEMINAR IN EARLY MODERN EUROPEAN HISTORY (3). SEM. 3. Research and writing of an original paper based on primary sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

HIST 7830 RESEARCH SEMINAR IN MODERN EUROPEAN HISTORY (3). SEM. 3. Research and writing of an original paper based on primary sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

HIST 7840 RESEARCH SEMINAR IN HISTORY OF TECHNOLOGY (3). SEM. 3. Research and writing of an original paper based on primary sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

HIST 7850 RESEARCH SEMINAR IN LATIN AMERICAN HISTORY (3). SEM. 3. Research and writing of an original paper based on primary
sources that should be of publishable or near-publishable quality. Course may be repeated for a maximum of 6 credit hours.

**HIST 7920 ARCHIVAL INTERNSHIP** (1-6). INT. Pr., HIST 7710 or departmental approval. Opportunity to apply the principles of archival practice within the context of a functioning archival repository under the supervision of professional archivists. Course may be repeated for a maximum of 6 credit hours.

**HIST 7970 SPECIAL TOPICS IN HISTORY** (3). LEC. 3. Topics vary.

**HIST 7990 RESEARCH AND THESIS** (1-10). MST., TD. Research and writing of the M.A. thesis. Course may be repeated with change in topic.

**HIST 8000 READING COURSE IN AMERICAN HISTORY TO 1877** (3). PRL. 3. Pr., departmental approval. Selected topics in American History to 1877. Course may be repeated for a maximum of 6 credit hours.

**HIST 8010 READING COURSE IN AMERICAN HISTORY SINCE 1877** (3). PRL. 3. Pr., departmental approval. Selected topics in American History since 1877. Course may be repeated for a maximum of 6 credit hours.

**HIST 8300 READING COURSE IN EUROPEAN HISTORY TO 1815** (3). PRL. 3. Pr., departmental approval. Selected topics in European History to 1815. Course may be repeated for a maximum of 6 credit hours.

**HIST 8310 READING COURSE IN EUROPEAN HISTORY SINCE 1815** (3). PRL. 3. Pr., departmental approval. Selected topics in European History since 1815. Course may be repeated for a maximum of 6 credit hours.

**HIST 8500 READING COURSE IN THE HISTORY OF TECHNOLOGY** (3). PRL. 3. Pr., departmental approval. Selected topics in the History of Technology. Course may be repeated for a maximum of 6 credit hours.

**HIST 8600 READING COURSE IN LATIN AMERICAN HISTORY** (3). PRL. 3. Pr., departmental approval. Selected topics in Latin American History. Course may be repeated for a maximum of 6 credit hours.

**HIST 8610 READING COURSE IN WORLD HISTORY** (3). LEC. 3. Directed readings in modern world history, focusing on one or two geographic areas or themes.

**HIST 8700 HISTORIOGRAPHY AND THEORY OF HISTORY** (3). SEM. 3. Explores the nature of history by tracing changing conceptions of historical thought and practice from their origins to the present.

**HIST 8710 INTRODUCTION TO THE TEACHING OF HISTORY** (1). SEM. 1, SU. Introduction to some of the basic challenges involved in teaching History at the college level.

**HIST 8990 RESEARCH AND DISSERTATION** (1-10). DSR., TD. Research and writing of the Ph.D. dissertation. Course may be repeated with change in topic.

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**Health and Human Performance (HLHP)**

**Dr. G. Dennis Wilson - 844-4483**

**HLHP 1010 ORIENTATION TO TEACHER EDUCATION** (1). LEC. 1, SU. Pr., Enrolled in the College of Education. Orientation to the teaching profession.

**HLHP 2250 MOTOR DEVELOPMENT DURING THE SCHOOL YEARS** (2). LEC. 2. Practical strategies and applications for the enhancement of motor development for school-aged children.

**HLHP 2251 LABORATORY IN MOTOR DEVELOPMENT DURING THE SCHOOL YEARS**. (1). LAB. 2, SU. Coreq., HLHP 2250. Laboratory experiences to enhance motor development in school-aged children.

**HLHP 2800 INTRODUCTION TO HEALTH AND HUMAN PERFORMANCE** (3). LEC. 3. People, history and programs that have led to the current status of physical education, exercise science and health promotion.

**HLHP 3010 INSTRUCTION AND TECHNOLOGY IN HEALTH AND HUMAN PERFORMANCE** (2). LEC. 1, LAB. 2. Communication skills, instructional strategies and technological competencies related to conveying information in the health and human performance disciplines.


**HLHP 3024 DIST-ED SCIENTIFIC FOUNDATIONS OF HEALTH & HUMAN PERFORMANCE** (3). LEC. 3.

**HLHP 3200 SKILLS AND CONCEPTS OF RHYTHMIC ACTIVITIES** (3). LEC. 2, LAB. 2. Skilled performance in gymnastics and other rhythmic activities and an understanding of the basic movement concepts in those activities.

**HLHP 3210 SKILLS AND CONCEPTS OF SPORT** (3). LEC. 2, LAB. 2. Coreq., HLHP 3300. Skilled performance in games and sports and an understanding of the tactics in those activities.

**HLHP 3250 SKILL ACQUISITION FOR SCHOOL-AGED CHILDREN** (3). LEC. 2, LAB. 2, Pr., HLHP 2250, HLHP 3020. Principles of skill acquisition applied to instructional settings in teaching and coaching.

**HLHP 3260 PHYSICAL EDUCATION FOR INDIVIDUALS WITH DISABILITIES** (3). LEC. 2, LAB. 2, Pr., HLHP 3020. Program needs of individuals with disabilities in physical education and physical activity settings.

**HLHP 3280 ASSESSMENT IN PHYSICAL EDUCATION** (3). LEC. 3. Pr., admission to Teacher Education. Development of appropriate measurement tools to assess student learning.

**HLHP 3300 INSTRUCTIONAL STRATEGIES IN PHYSICAL EDUCATION** (3). LEC. 2, LAB. 2, Pr., admission to Teacher Education, HLHP 3010. Coreq., HLHP 3210. Instructional and class management strategies appropriate to teach quality elementary and secondary physical education.

**HLHP 3400 HEALTH PROMOTION IN THE WORKPLACE** (3). LEC. 3. Planning, implementation, evaluation and marketing of health promotion programs.


**HLHP 3650 MOTOR LEARNING AND PERFORMANCE** (4). LEC. 3. LAB. 2, Pr., HLHP 3020. Understanding of the basic psychological processes in learning and control of skilled human movement.

**HLHP 3680 PHYSIOLOGY OF EXERCISE** (4). LEC. 3. LAB. 2, Pr., HLHP 3020. Energetics of exercise and physiological responses and adaptations of various organ systems (muscular, circulatory, respiratory, etc.) to acute and chronic exercise in different environments.

**HLHP 3820 PRINCIPLES OF SPORT COACHING** (3). LEC. 3. Pr., HLHP 3020. Basic principles of sport pedagogy and the conduct of sport training programs.

**HLHP 4200 PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS** (4). LEC. 2, LAB. 4, Pr., HLHP 3300. Understanding of the skill theme approach based on skill themes, movement concepts and levels of skill proficiency. Credit will not be given for both HLHP 4200 and HLHP 4360.

**HLHP 4300 PHYSICAL EDUCATION IN SECONDARY SCHOOLS** (4). LEC. 2, LAB. 4, Pr., HLHP 3300. Constructing and implementing appropriate lifetime sports and fitness programs for middle and secondary school students.

**HLHP 4350 TEACHING FOR LIFETIME PHYSICAL ACTIVITY** (3). LEC. 2, LAB. 2, Pr., HLHP 3020. Skills and knowledge to conduct comprehensive fitness education programs in schools.

**HLHP 4360 HEALTH EDUCATION AND PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS** (3). LEC. 2, LAB. 2, Pr., Admission to Teacher Education. Critical topics in health education and physical education for prospective elementary education teachers. Credit will not be given for both HLHP 4360 and HLHP 4200.

**HLHP 4450 PHYSICAL ACTIVITY AND PUBLIC HEALTH** (3). LEC. 3. Pr., HLHP 3020. Basic principles of epidemiology; health benefits of physical activity; strategies to promote physical activity at the individual and community levels.

**HLHP 4610 MOTOR DEVELOPMENT ACROSS THE LIFE SPAN** (3). LEC. 3. Pr., HLHP 3020. Understanding and skills related to motor development across the life span.


**HLHP 4760 INTRODUCTION TO EXERCISE SCIENCE RESEARCH** (3). LEC. 3. Pr., HLHP 3620, HLHP 3650, HLHP 3680. Research literature, experimental design and research interpretation in exercise science.

**HLHP 4780 EXERCISE SCIENCE RESEARCH** (3). LEC. 3. SU. Pr., HLHP 4760. Development of a research proposal including the introduction, review of literature, methods, experimental design and statistics.

**HLHP 4900 INDEPENDENT STUDY** (1-6). IND., SU. Pr., junior standing, departmental approval. In-depth study of specific topics. Course may be repeated for a maximum of 6 credit hours.
HLHP 4910 PRACTICUM (1-6). PRA., SU. Pr., Jr. standing, departmental approval. Application of basic concepts to specific work environments. Course may be repeated for a maximum of 6 credit hours.

HLHP 4920 INTERNSHIP (1-12). IND., SU. Pr., senior standing, departmental approval. Supervised work experiences in schools, fitness or rehabilitation settings. Two hours of work experience per week for each hour course credit. Course may be repeated for a maximum of 12 credit hours.

HLHP 4970 SPECIAL TOPICS (1-3). IND. Advanced presentation of critical issues in physical education, health promotion or exercise science. Course may be repeated with change in topic.

HLHP 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College, departmental approval. Course may be repeated for a maximum of 3 credit hours.

HLHP 5200 RESEARCH PROJECT IN PHYSICAL EDUCATION (3). LEC. 3. Pr., HLHP 4200, HLHP 4300. Focus on action research in teaching and learning in physical education in schools.

HLHP 5250 INSTRUCTIONAL SUPERVISION FOR PHYSICAL EDUCATION (2). LEC. 2. Pr., HLHP 4200, HLHP 4300. Development of systematic observation systems for providing feedback to teachers and strategies for monitoring progress.

HLHP 5300 ADVOCACY PHYSICAL EDUCATION (2). LEC. 2. Pr., HLHP 4200, HLHP 4300. Strategies for development of advocacy programs in physical education.

HLHP 5400 EXERCISE PRESCRIPTION FOR NORMAL AND SPECIAL POPULATIONS (3). LEC. 3. Pr., HLHP 3680 or equivalent. Principles of exercise prescription for normal and special populations with emphasis on specific exercise strategies in elderly, obese, hypertensive and hyperlipidemic populations.


HLHP 5820 SPORT MANAGEMENT (3). LEC. 3. This course is designed to give students critical skills in understanding and analyzing a number of social issues as they related to sport.

HLHP 5920 INTERNSHIP (1-12). INT., SU. Pr., senior standing, departmental approval. Supervised work experiences in schools, fitness or rehabilitation settings. Two hours of work experience per week for each hour course credit.

HLHP 6200 RESEARCH PROJECT IN PHYSICAL EDUCATION (3). LEC. 3. Pr., HLHP 4200, HLHP 4300. Focus on action research in teaching and learning in physical education in schools.

HLHP 6250 INSTRUCTIONAL SUPERVISION FOR PHYSICAL EDUCATION (2). LEC. 2. Pr., HLHP 4200, HLHP 4300. Development of systematic observation systems for providing feedback to teachers and strategies for monitoring progress.

HLHP 6300 ADVOCACY IN PHYSICAL EDUCATION (2). LEC. 2. Pr., HLHP 4200, HLHP 4300. Strategies for development of advocacy programs in physical education.

HLHP 6400/6406 EXERCISE PRESCRIPTION FOR NORMAL AND SPECIAL POPULATIONS (3). LEC. 3. Pr., HLHP 3680 or equivalent. Principles of exercise prescription for normal and special populations with emphasis on specific exercise strategies in elderly, obese, hypertensive and hyperlipidemic populations.


HLHP 6820 SPORT MANAGEMENT (3). LEC. 3. This course is designed to give students critical skills in understanding and analyzing a number of social issues as they related to sport.

HLHP 6920 INTERNSHIP (1-12). IND., SU. Pr., departmental approval. Supervised work experiences in schools, fitness or rehabilitation settings.

HLHP 7010 RESEARCH METHODS IN PHYSICAL ACTIVITY (3). LEC. 3. Study of research methods and analysis of current research in physical education, health promotion and exercise science.

HLHP 7200 CURRICULUM AND TEACHING IN PHYSICAL EDUCATION (3). LEC. 3. Issues in developing and critiquing curricula in physical education.


HLHP 7260 INDIVIDUALS WITH DISABILITIES IN PHYSICAL EDUCATION (3). LEC. 3. Developing inclusive physical activity programs for children and adolescents with disabilities in physical education.

HLHP 7280 NATURALISTIC INQUIRY IN PHYSICAL ACTIVITY SETTINGS (3). LEC. 3. Pr., HLHP 7010. Exploration of naturalistic inquiry in physical activity and educational settings.

HLHP 7300 CONTENT AND PEDAGOGY IN PHYSICAL EDUCATION (3). LEC. 3. Instructional strategies and content for elementary and secondary physical education.

HLHP 7350 ORGANIZATION AND ANALYSIS OF INSTRUCTION IN PHYSICAL EDUCATION (3). LEC. 3. Focus on the teaching-learning process in physical education.

HLHP 7380 INTEGRATING CLASSROOM CONCEPTS THROUGH MOVEMENT (3). LEC. 3. Relationship of development foundations of young children and programing of physical activities.

HLHP 7570 EXERCISE ELECTROCARDIOGRAPHY (3). LEC. 3. Pr., HLHP 3680 or departmental approval. Electrocardiography from an exercise scientist’s perspective, recognition of normal and abnormal electrocardiographic patterns at rest and during exercise.

HLHP 7620 PRINCIPLES OF BIOMECHANICS IN HUMAN MOVEMENT (3). LEC. 3. Pr., HLHP 3620 or departmental approval. Biomechanical principles and laws with applications to human movement in sport, exercise and daily activities.

HLHP 7650 ADVANCED MOTOR LEARNING AND PERFORMANCE (3). LEC. 3. Pr., HLHP 3650 or departmental approval. Theories, experimental studies and current issues in the acquisition, performance and retention of motor skills.

HLHP 7660 BIOMECHANICS OF SPORT INJURY AND REHABILITATION (3). LEC. 3. Pr., HLHP 7620. Biomechanical properties of the human body as related to injuries and rehabilitation in sport and daily activities.

HLHP 7670 LABORATORY TECHNIQUES IN BIOMECHANICS (3). LEC. 1. LAB. 2. Pr., HLHP 7620. Study of equipment and standing practices utilized by a biomechanist in measuring and analyzing motion.

HLHP 7680 ADVANCED PHYSIOLOGY OF EXERCISE I (3). LEC. 3. Pr., HLHP 3680 or departmental approval. Physiological responses to exercise and control of metabolism, the cardiovascular system, and the respiratory system during acute exercise and training.

HLHP 7700 ADVANCED PHYSIOLOGY OF EXERCISE II (3). LEC. 3. Pr., HLHP 3680 or departmental approval. Temperature regulation and endocrine response to exercise; physiological responses and adaptations to aerobic training, strength training, and environmental extremes; limiting factors and fatigue in exercise.


HLHP 7730 NEUROMOTOR CONTROL (3). LEC. 3. Pr., HLHP 3650 or departmental approval. Structure and function of the central and peripheral systems underlying human motor control.
HLHP 7740 ADVANCED MOTOR DEVELOPMENT (3). LEC. 3. Pr., HLHP 4610 or departmental approval. Examination of theoretical and empirical issues in motor development across the life span.

HLHP 7750 ADVANCED SPORT PSYCHOLOGY (3). LEC. 3. Pr., HLHP 4620 or departmental approval. Examination of psychological factors that influence athletic performance.

HLHP 7780 EXERCISE MOTIVATION AND ADHERENCE (3). LEC. 3. Pr., HLHP 4620 or equivalent. Theoretical foundations and recent research in exercise motivation and adherence.

HLHP 7790 MOTOR BEHAVIOR OF INDIVIDUALS WITH DISABILITIES (3). LEC. 3. Pr., HLHP 7650. Examination of motor behavior characteristics of individuals with disabilities.

HLHP 7900 INDEPENDENT STUDY (1-3). IND., SU. Pr., departmental approval. In-depth study of specific topics. Course may be repeated for a maximum of 3 credit hours.

HLHP 7910 PRACTICUM (1-3). PRA., SU. Pr., departmental approval. Application of basic concepts to specific work environments. Course may be repeated for a maximum of 3 credit hours.

HLHP 7920 INTERNSHIP (1-10). INT., SU. Pr., departmental approval. Supervised work experiences in schools, fitness or rehabilitation settings. Course may be repeated for a maximum of 10 credit hours.

HLHP 7940 DIRECTED FIELD EXPERIENCES (1-10). FLD., SU. Pr., departmental approval. Field studies away from campus. Course may be repeated for a maximum of 10 credit hours.

HLHP 7950 SEMINAR (1-3). SEM., SU. Course may be repeated for a maximum of 3 credit hours.

HLHP 7960 READINGS (1-3). IND., SU. Pr., departmental approval. Critical analysis of current and classical research and writings. Course may be repeated for a maximum of 3 credit hours.

HLHP 7970 SPECIAL TOPICS (1-3). LEC. Advanced presentation of critical issues in physical education, health promotion or exercise science. Course may be repeated with change in topic.

HLHP 7990 RESEARCH AND THESIS (1-10). IND., TD. Course may be repeated with change in topic.

HLHP 8710 SCIENTIFIC COMMUNICATION IN EXERCISE SCIENCE (3). LEC. 3. Pr., HLHP 7010 or equivalent. In-depth analysis of the major formats for scientific communication and the peer-review process in exercise science.

HLHP 8750 THREE-DIMENSIONAL ANALYSIS OF HUMAN MOVEMENT (3). LEC. 3. Pr., HLHP 7620. Three-dimensional nature of body segments in human movement, with emphasis on data processing and modeling techniques.

HLHP 8760 PHYSICAL ACTIVITY EPIDEMIOLOGY (3). LEC. 3. Pr., HLHP 7010, HLHP 7680. Development of analytic skills to evaluate and/or conduct population-based research related to physical activity and disease.

HLHP 8770 NEUROMUSCULAR ASPECTS OF EXERCISE AND TRAINING (3). LEC. 3. Pr., HLHP 7680, HLHP 7700 or departmental approval. Examination of neuromuscular mechanisms that allow humans to perform work, including energy output, neural integration, energy metabolism and neuromuscular adaptations to training.

HLHP 8780 BIOCHEMISTRY OF EXERCISE (3). LEC. 3. Pr., HLHP 7680, HLHP 7700 or departmental approval. Regulation of the metabolic pathways of energy metabolism with emphasis on the energetic response to acute exercise and exercise training.

HLHP 8900 INDEPENDENT STUDY (1-3). IND., SU. Pr., departmental approval. In-depth study of specific topics. Course may be repeated for a maximum of 3 credit hours.

HLHP 8910 PRACTICUM (1-3). PRA., SU. Pr., departmental approval. Application of basic concepts to specific work environments. Course may be repeated for a maximum of 3 credit hours.

HLHP 8920 INTERNSHIP (1-10). INT., SU. Pr., departmental approval. Supervised work experiences in schools, fitness and rehabilitation settings. Course may be repeated for a maximum of 10 credit hours.

HLHP 8940 DIRECTED FIELD EXPERIENCES (1-10). FLD., SU. Pr., departmental approval. Field studies away from campus. Course may be repeated for a maximum of 10 credit hours.

HLHP 8950 SEMINAR (1-3). SEM., SU. Course may be repeated for a maximum of 3 credit hours.

HLHP 8960 READINGS (1-3). IND., SU. Pr., departmental approval. Course may be repeated for a maximum of 3 credit hours.

HLHP 8970 SPECIAL TOPICS (1-3). LEC. Advanced presentation of critical issues in physical education, health promotion or exercise science. Course may be repeated with change in topic.

HLHP 8980 FIELD PROJECT (1-6). FLD. 1, SU. Pr., departmental approval. Field project. Course may be repeated for a maximum of 6 credit hours.

HLHP 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

PHED 1100/1103 WELLNESS (2). LEC. 1, LAB. 2. Basic concepts and principles of wellness with laboratory experiences for the self-appraisal of health-related physical fitness.

PHED 1104 WELLNESS (2). LEC. 2. Basic concepts and principles of wellness with laboratory experiences for the self-appraisal of health-related physical fitness.

PHED 1200 CARDIO-RESPIRATORY FITNESS (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with the development and maintenance of cardio-respiratory functioning. Activities may include, but are not limited to, running (jogging), swimming, cycling and aerobic dance. Course may be repeated with change in topic.

PHED 1300 FITNESS AND CONDITIONING (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with the development and maintenance of general physical fitness. Activities may include, but are not limited to calisthenics and weight training. Course may be repeated with change in topic.

PHED 1400 TEAM SPORTS (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with a specific team sport. Team sports may include, but are not limited to, volleyball, basketball and softball. Course may be repeated with change in topic.

PHED 1500 INDIVIDUAL SPORTS (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with a specific individual sport. Sports may include, but are not limited to tennis, golf and racquetball. Course may be repeated with change in topic.

PHED 1600 PERFORMANCE ACTIVITIES (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with a specific performance activity. Activities may include, but are not limited to, dance and gymnastics. Course may be repeated with change in topic.

PHED 1700 AQUATIC SKILLS (2). LEC. 1, LAB. 2. Basic concepts and physical activities associated with specific aquatic skills. Activities may include, but are not limited to, swimming skills instruction, lifeguard training, and scuba diving. When appropriate, successful completion of the course will lead to Red Cross certification or certification by other agencies. Course may be repeated with change in topic.

PHED 1800 VARSITY SPORTS (1). LEC. 1, SU. Skills and training associated with participation in varsity sports. Course may be repeated with change in topic.

Horticulture (HORT)

Horticulture (HORT)

Dr. Charles Gilliam - 844-4862

HORT 1010 INTRODUCTION TO HORTICULTURE (1). LEC. 1. Introduces scientific and practical aspects of horticulture, floriculture and landscape horticulture. Also presents the broad scope of career opportunities in the field of horticultural science. Fall.

HORT 2010 FRUIT AND NUT PRODUCTION (4). LEC. 3. LAB. 1. Introductory course in cultural practices and economics associated with commercial fruit and nut production. Fall.

HORT 2020 HORTICULTURE CROP PRODUCTION (3). LEC. 2. LAB. 1. Pr., BIOL 1010 or BIOL 1030. Techniques of plant propagation and cultural methods for successful fruit and vegetable production. Fall.

HORT 2030 VEGETABLE PRODUCTION (3). LEC. 3. Principles, practices, establishment, production, maintenance, harvesting, storage and marketing of commercial vegetable crops. Spring, Summer, Fall.

HORT 2040 ORGANIC GARDENING (3). LEC. 3. Principles, production practices, maintenance, harvesting and marketing of organically and traditionally home-grown vegetables. Spring, Summer, Fall.

HORT 2050 FOOD FOR THOUGHT (3). LEC. 3. Study of history of food plants, including their impact on world culture, variety of uses, economic botany, production systems, and impact on societies. Fall.
HORT 2210 LANDSCAPE GARDENING (4). LEC. 2, LAB. 4. Principles of landscape gardening applied to residential and small-scale commercial grounds. Involves plant identification and use, basic landscape design, and landscape installation and management concepts. Spring, Summer, Fall.

HORT 2240 PLANT PROPAGATION (3). LEC. 2, LAB. 3. Pr., or corequisite BIOL 1030 or departmental approval. Basic principles and practices involved in the propagation of horticulture plants. Fall, Spring.

HORT 2250 INTERIOR PLANTS AND FLORAL DESIGN (3). LEC. 2, LAB. 2. Basic principles, practices and design with foliage plants and flowers in the interior setting. Fall.

HORT 3000 GROWTH AND DEVELOPMENT OF HORTICULTURAL PLANTS (3). LEC. 3. Pr., BIOL 1030, CHEM 1030. Growth and development of plants with concepts applied to the practice of Horticultural Science. Spring, Summer, Fall.

HORT 3210 SMALL TREES, SHRUBS AND VINES (4). LEC. 2, LAB. 6. Pr., BIOL 1020 and BIOL 1030. Identification, culture and landscape use of small trees, shrubs and vines.

HORT 3220 ARBORICULTURE (4). LEC. 2, LAB. 6. Pr., BIOL 1030 or departmental approval. Identification, culture and use of ornamental trees in landscape plantings. Fall.  

HORT 3280 LANDSCAPE CONSTRUCTION (3). LEC. 3, LAB. 4. Principles and practices used in the interpretation and implementation of landscape construction and planting plans. Fall. 

HORT 3920 HORTICULTURE INTERNSHIP (4). INT. 4. Pr., sophomore standing. Practical on-the-job training for selected commercial horticultural companies. Course may be repeated for a maximum of 8 credit hours. 

HORT 3950 CAREERS IN HORTICULTURE (1). LEC. 1. SU. Pr., sophomore standing. Current developments and career opportunities in horticulture.


HORT 4150 RETAIL GARDEN CENTER MANAGEMENT (3). LEC. 3, LAB. 4. Pr., HORT 3210 or HORT 3220 or departmental approval. The following objectives will be covered: financing, location, design, stocking, selling, personnel management, advertising and maintaining plants. Summer.

HORT 4270 INTERMEDIATE LANDSCAPE DESIGN (3). LEC. 2, LAB. 4. Pr., HORT 3210 or HORT 3220 or HORT 4100. Human nature, art and technology and their influence on landscape design. Spring.

HORT 4280 ADVANCED LANDSCAPE DESIGN (3). LEC. 1, LAB. 4. Pr., HORT 4270. Continuation of HORT 4270 with an emphasis on design projects. Fall.

HORT 4930 DIRECTED STUDY (1-3). IND. Pr., departmental approval. Directed Studies related to research, teaching or outreach educational programs in Horticulture. Course may be repeated for a maximum of 6 credit hours.

HORT 4967 HONORS READINGS (1-3). LEC. Pr., Membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

HORT 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

HORT 5110 TREE FRUIT CULTURE (2). LEC. 2. Pr., HORT 3000 or departmental approval. Manipulation of growth and development of tree fruit crops by cultural methods. Summer.

HORT 5120 SMALL FRUIT AND PECAN CULTURE (3). LEC. 2, LAB. 2. Pr., BIOL 3100, BIOL 3101 or departmental approval. Principles and practices involved in the production and marketing of small fruits and pecans. Spring.

HORT 5130 SUSTAINABLE VEGETABLE CROP PRODUCTION (3). LEC. 2, LAB. 3. Pr., BIOL 1030, HORT 3000 or departmental approval. Best management practices and quality of vegetable crops. Fall.

HORT 5140 POST-HARVEST BIOLOGY AND TECHNOLOGY (3). LEC. 2, LAB. 3. Pr., BIOL 3100, BIOL 3101, PLPA 3000 or departmental approval. Physiological changes occurring in fruits, vegetables and other horticultural products after harvest. Spring.


HORT 5220 GREENHOUSE MANAGEMENT SCIENCE (4). LEC. 3, LAB. 2. Pr., HORT 3000 or BIOL 3100, and BIOL 3101, CHEM 1030, and HORT 2240, and AGRN 2040. Management, culture and economics of commercial greenhouse production. Fall.

HORT 5230 NURSERY MANAGEMENT (3). LEC. 2, LAB. 3. Pr., HORT 2240 and HORT 3000 or departmental approval. Factors affecting plant production. Environmental issues related to facilities design and pest and nutrient management. Fall.

HORT 6110 TREE FRUIT CULTURE (2). LEC. 2. Pr., HORT 3000 or departmental approval. Manipulation of growth and development of tree fruit crops by cultural methods. Summer.

HORT 6120 SMALL FRUIT AND PECAN CULTURE (3). LEC. 2, LAB. 2. Pr., BIOL 3100, BIOL 3101 or departmental approval. Principles and practices involved in the production and marketing of small fruits and pecans.

HORT 6130 SUSTAINABLE VEGETABLE CROP PRODUCTION (3). LEC. 2, LAB. 2. Pr., HORT 3000 or departmental approval. Advanced course in best management practices and quality of vegetable crops. Fall.


HORT 6220 GREENHOUSE MANAGEMENT SCIENCE (4). LEC. 3, LAB. 2. Pr., HORT 3000 or BIOL 3100, and BIOL 3101, CHEM 1030, and HORT 2240, and AGRN 2040. Management, culture and economics of commercial greenhouse production. Fall.

HORT 6230 NURSERY MANAGEMENT (3). LEC. 2, LAB. 3. Pr., HORT 2240 and HORT 3000 or departmental approval. Factors affecting plant production. Environmental issues related to facilities design and pest and nutrient management. Fall.

HORT 7010 EXPERIMENTAL METHODS IN HORTICULTURE (4). LEC. 2. LAB. 4. Coreq., STAT 7000. Principles and methodologies of horticultural research, experimental design, preparation of project and grant proposals, and development of publication skills. Fall.

HORT 7040 ADVANCED GROWTH AND DEVELOPMENT OF HORTICULTURAL PLANTS (3). LEC. 3. Pr., HORT 3000 or BIOL 3100, BIOL 3101. Plant growth and development from seed germination, through maturity and senescence. Summer.

HORT 7050 NUTRITIONAL REQUIREMENTS OF HORTICULTURAL PLANTS (3). LEC. 3, LAB. 2. Pr., HORT 3000 or departmental approval. Nutritional requirements of horticulture crops and factors affecting these requirements. Summer.

HORT 7070 PLANT BIOTECHNOLOGY (4). LEC. 2, LAB. 4. Pr., BIOL 3000. Plant biotechnology, including plant tissue culture technologies and genetic transformation and applications to horticultural crop improvement. Spring.

HORT 7080 CURRENT CONCEPTS IN ENVIRONMENTAL PLANT STRESS (3). LEC. 4. Pr., HORT 3000 or departmental approval. Mechanisms related to adaptation of plants to environmental stresses. Spring.

HORT 7850 URBAN FORESTRY SEMINAR (1). LEC. 3, SU. Presentation and discussion of research, scientific papers and issues related to urban forestry establishment, care and planning. Credit will not be given for HORT 7850 and FORY 7850. Fall, Spring.

HORT 7950 SEMINAR (1). SEM., SU. Graduate students are required to attend all seminars. Spring, Summer, Fall. Course may be repeated with change in topic.

HORT 7960 ADVANCED TOPICS IN HORTICULTURE (1-3). LEC. Principles, methods and techniques involved in gaining an understanding of different horticultural disciplines. Course may be repeated for a maximum of 3 credit hours.

HORT 7970 SPECIAL PROBLEMS IN HORTICULTURE (1-3). IND. Conferences, problems and assigned readings in horticulture. Course may be repeated for a maximum of 3 credit hours.

HORT 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.
HORT 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

Integrated Textile and Apparel Science (ITAS)

Dr. Carol Warfield - 844-4085
Dr. Peter Schwartz - 844-2123


ITAS 8950 INDUSTRY ISSUES SEMINAR (1). LEC. 1, SU. Pr., departmental approval. Research presentations and discussions on issues facing the global textile industrial complex. Course may be repeated for a maximum of 6 credit hours.

ITAS 8960 CURRENT ISSUES IN INTEGRATED TEXTILE AND APPAREL SCIENCE (2). LEC. 2. Pr., departmental approval. Directed readings on current issues in the global textile industrial complex. Spring. Course may be repeated for a maximum of 6 credit hours.

ITAS 8970 ADVANCED TOPICS IN INTEGRATED TEXTILE AND APPAREL QUALITY CONTROL (3). LEC. 3. Pr., TXTN 2700, TXTN 3500 or CAHS 4650 or CAHS 7650 or departmental approval. Quality related topics integrated for textile and apparel operations. Spring.

ITAS 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

Industrial Design (INDD)

Prof. Clark Lundell - 844-2364


INDD 1310 SYNTHESIS OF DRAWING (10). LEC. 3. STU. 12. Pr., INDD 1120 or departmental approval. Developing mechanical and production design drawings, with in-depth study of perspective systems. Product design communication with emphasis on drawing, development, presenta-

INDD 1320 PROTOTYPE FABRICATION (3). LEC. 2. LAB. 2. Pr., INDD 1120 or departmental approval. Coreq., INDD 1310. Fabrication of three-dimensional models utilizing various materials and machineries. Includes model making, creative modeling, study models, presentation models, mock-ups and prototypes.


INDD 2120 COMPUTER AND DESIGN COMMUNICATIONS (3). LEC. 2. LAB. 2. Pr., INDD 1310. Coreq., INDD 2110. Alternative modes of communicating design ideas via computer. Executing design ideas for two-dimen-
sional design fundamentals and mechanical design drawings.

INDD 2130 PRESENTATION RENDERING (3). LEC. 2. LAB. 2. Pr., INDD 1310, INDD 1320. Coreq., INDD 2110. Concept development using drawing and rendering skills with different media for ideas communication and presentation.


INDD 2220 ANTHROPOMETRY (3). LEC. 3. Pr., INDD 2110 or departmental approval. Coreq., INDD 2220. Body measurements, movements and human capacity in relation to design with introduction to ergonomy and human physiology as it relates to design.

INDD 2230 HISTORY OF INDUSTRIAL DESIGN (3). LEC. 3. Pr., INDD 2110. Survey humankind's production of artifacts, from prehistory to present. Emphasis on ideas that mass produced artifacts mirror history and everyday culture.


INDD 3210 PRODUCT DESIGN (6). LEC. 1. STU. 8. Pr., INDD 2210. Product design utilizing design methodology from proposal to working prototype, including planning, research, development, model-making, manufacturing and documentation. Spring.

INDD 3220 MATERIALS AND TECHNOLOGY (3). LEC. 3. Pr., INDD 3120. Coreq., INDD 3210. Characteristics and utility of materials such as plastic, metal and ceramics in manufacture and the study of machine/tool processes used by industry.

INDD 3230 ADVANCED COMPUTER AIDED DESIGN (3). LEC. 2. LAB. 2. Pr., INDD 2120. Introduction to CAD software emphasizing three-dimen-

INDD 4110 ADVANCED PRODUCT DESIGN (6). LEC. 2. STU. 8. Pr., INDD 3210, INDD 3220. Design or redesign of products and systems of advanced complexity. Fall.

INDD 4210 INDUSTRIAL DESIGN THESIS (6). LEC. 2. STU. 8. Pr., INDD 4110. Product design projects involving all design phases; including planning, research, development, finalization, specification and documentation. Spring.

INDD 4220 PROFESSIONAL PRACTICE (3). LEC. 3. Pr., INDD 3110, INDD 3210. Business aspects of industrial design, including property, design contract, letters of agreement, business planning and design market-

ING 4967 HONORS READING (1-3). LEC. Pr., Membership in the Honors College; departmental approval

INDD 4997 HONORS THESIS (1-3). LEC. Pr., Membership in the Honors College; departmental approval.

INDD 5010 HISTORY OF INDUSTRIAL DESIGN II (3). LEC. 3. A survey of humankind's production of artifacts, from prehistory to contemporary times, with an emphasis on the idea that mass produced artifacts mirror the mean-

INGS of historical events and everyday culture.

INDD 5030 CASE STUDIES IN DESIGN (3). LEC. 3. Course projects undertaken by industry studied by examination of artifacts and records, and by class discussions. Focus on the socio-cultural relevancy of the artifacts.

INDD 5120 PROFESSIONAL PORTFOLIO (3). LEC. 3. Pr., INDD 3110, INDD 3210. Design and development of a portfolio and promotional material presenting the student's work to entry-level professional standards.

INDD 5970 SPECIAL PROBLEMS (1-5). LEC. Pr., INDD 2110, INDD 2210. Development of individual projects. Research, design and reports on approved topics. Course may be repeated for a maximum of 15 credit hours.

INDD 6010 HISTORY OF INDUSTRIAL DESIGN II (3). LEC. 3. A survey of humankind's production of artifacts, from prehistory to contemporary times, with an emphasis on the idea that mass produced artifacts mirror the mean-

INGS of historical events and everyday culture.

INDD 6030 CASE STUDIES IN DESIGN (3). LEC. 3. Course projects undertaken by industry studied by examination of artifacts and records, and by class discussions. Focus on the socio-cultural relevancy of the artifacts.

INDD 6120 PORTFOLIO (3). LEC. 3. Preparation of professional portfolio for graduation and employment.

INDD 6970 SPECIAL PROBLEMS (1-5). LEC. Pr., INDD 2110, INDD 2210. Development of individual projects. Research, design and reports on approved topics. Course may be repeated for a maximum of 15 credit hours.

INDD 7010 DESIGN ORIENTATION (3). LEC. 3. Introduction to the Industrial Design graduate program; degree options, study directions, research methods and areas. Students are required to develop a research/project proposal.

INDD 7020 COMPUTER/INDUSTRIAL DESIGN (3). LEC. 3. Synthesizing studies in research, analysis and application based on interdisciplinary con-

cept. Emphasis on the relation of products and systems to those who use them.
INDD 7610 PRINCIPLES OF INDUSTRIAL DESIGN (3). LEC. 3. Detailed study of the communication principles of form qualities with emphasis on these aesthetic principles to the technical and human factors of artifacts.

INDD 7620 DESIGN MANAGEMENT (3). LEC. 3. Detailed study of the industrial design project management and development with emphasis on the interrelationship management concepts of research, product planning, production and marketing.

INDD 7630 HUMAN FACTORS IN DESIGN (3). LEC. 3. Theoretical and empirical examination of human factors (Anthropometrics, Biomechanics, Engineering Psychology, Behavioral Cybermetrics, Ergonomics) as applied to man-machine environmental systems.

INDD 7640 AESTHETICS IN DESIGN (3). LEC. 3. Aesthetics in the context of the designed environment encompassing: non-verbal communication; object language semantics; gestalt and perception systems; information aesthetics and consumer product safety.

INDD 7650 DESIGN THEORIES (3). LEC. 3. Examination of design theories and philosophies related to technical artifacts in man-machine systems. Comparative studies of unifying theories in art, science, design, technology and the humanities.

INDD 7660 INDUSTRIAL DESIGN METHODOLOGY (3). LEC. 3. Industrial design methodologies and specific methods employed in research, analysis, synthesis, and evaluation in comprehensive design problems.

INDD 7670 SYSTEMS DESIGN (3). LEC. 3. Systems approach and interdisciplinary team work to design problems. Inquires into details of sub-systems, components and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.

INDD 7980 NON-THESIS DESIGN (3). STU. 3. Synthesizing studies in research, analysis and application based on interdisciplinary concept. Emphasis on the relation of products and systems to those who use them.

INDD 7990 DESIGN THESIS (1-5). RES., TD. Credit to be arranged. Course may be repeated with change in topic.

Industrial and Systems Engineering (INSY)

Dr. Alice Smith - 844-4340

INSY 3020 OCCUPATIONAL SAFETY AND ERGONOMICS (3). LEC. 3. Basic principles of occupational safety engineering and ergonomics in the evaluation and design of occupation work areas and processes that include human operators.

INSY 3021 METHODS ENGINEERING, WORK MEASUREMENT & ECONOMICS LAB (2). LAB. 3. Pr., STAT 3600. Coreq., INSY 3020. Develops the student's ability to design workspaces and methods while providing an understanding of the work measurements process. Enables students to generate much of the basic methods data utilized in most industrial engineering projects.

INSY 3400 STOCHASTIC OPERATIONS RESEARCH (3). LEC. 3. Pr., ENGR 1110, MATH 2660, STAT 3600. Modeling and analysis of decision-making and operations subject to randomness including decision analysis, stochastic dynamic programming, Markov chains, and queuing theory.

INSY 3410 DETERMINISTIC OPERATIONS RESEARCH (3). LEC. 2. LAB. 3. Pr., ENGR 1110, MATH 2660. Formulation, solution, interpretation, and implementation of mathematical models in operations research including linear programming, integer programming and network flows.


INSY 3700 OPERATIONS PLANNING AND CONTROL (3). LEC. 2. LAB. 3. Pr., INSY 3400, INSY 3410. Analytical methods for operations planning and control, including forecasting systems, production planning, inventory control systems, scheduling systems and project management.


INSY 4500 PROFESSIONAL PRACTICE (1). LEC. Pr.., Senior Standing in Industrial and Systems Engineering Discussion and activities in current problems, the global context of, professional practice, professional opportunities and lifelong learning in Industrial and Systems Engineering.


INSY 4800 SENIOR DESIGN (3). LAB. 9. Pr., INSY 3021, INSY 4700. Capstone course in which undergraduate course-work principles are brought to bear upon a design problem in a cooperating industry or institution.

INSY 4970 INDUSTRIAL AND SYSTEMS ENGINEERING SPECIAL TOPICS (1-5). LEC., LAB. Pr., departmental approval. Special topics in Industrial and Systems Engineering. Specific prerequisites will be determined and announced for each offering. Course may be repeated for a maximum of 5 credit hours.

INSY 4980 INDUSTRIAL AND SYSTEMS ENGINEERING PROBLEMS (1-5). IND. Pr., departmental approval. Individual student endeavor under faculty supervision involving special problems in Industrial and Systems Engineering. Interested student must submit written proposal to department head. Course may be repeated for a maximum of 5 credit hours.

INSY 5010 SAFETY ENGINEERING I (3). LEC. 3. Pr., INSY 3020. Occupational safety engineering and management with emphasis on control of hazardous materials, fire prevention, safety considerations in production facility design and maintenance, and operation of effective safety programs.

INSY 5240 PRODUCTION AND INVENTORY CONTROL SYSTEMS (3). LEC. 3. Pr., INSY 3700. Analysis and design of production and inventory control systems with emphasis on qualitative methods, algorithms, and information technology.

INSY 5250 SCHEDULING AND PROJECT MANAGEMENT (3). LEC. 3. Pr., INSY 3700. Sequencing and scheduling methods and models are presented, with special emphasis on scheduling and controlling projects.

INSY 5500 INFORM TECHNOLOGY FOR OPERATIONS (3). LEC. 3. Pr., COMP 3000 or departmental approval. Role and potential of using computer-integrated systems within manufacturing and service industries. Analysis of relevant data, synthesis of the flow of information in an operations environment, and development of databases to support the production process.

INSY 5600 MANUFACTURING AND PRODUCTION ECONOMICS (3). LEC. 3. Pr., INSY 3600. Continuation of INSY 3600. Emphasis on design economics and cost estimating techniques and applications to various manufacturing and service operations.

INSY 5800 LEAN PRODUCTION (3). LEC. 3. Pr., INSY 4700, INSY 6230, INSY 5240. Manufacturing system design based on a strategy of linked cells providing a continuous flow of materials. Evaluation strategies and analysis tools are studied.

INSY 6010/6016 SAFETY ENGINEERING I (3). LEC. 3. Pr., INSY 3020. Occupational safety engineering and management with emphasis on control of hazardous materials, fire prevention, safety considerations in production facility design and maintenance, and operation of effective safety programs.

INSY 6240/6246 PRODUCTION AND INVENTORY CONTROL SYSTEMS (3). LEC. 3. Pr., INSY 3700. Analysis and design of production and inventory control systems with emphasis on qualitative methods, algorithms, and information technology.

INSY 6250/6256 SCHEDULING AND PROJECT MANAGEMENT (3). LEC. 3. Pr., INSY 3700. Sequencing and scheduling methods and models are presented, with special emphasis on scheduling and controlling projects.

INSY 6500/6506 INFORMATION TECHNOLOGY FOR OPERATIONS (3). LEC. 3. Pr., COMP 3000 or departmental approval. Role and potential of using computer-integrated systems within manufacturing and service industries. Analysis of relevant data, synthesis of the flow of information in an operations environment, and development of databases to support the production process.

INSY 6600/6606 MANUFACTURING AND PRODUCTION ECONOMICS (3). LEC. 3. Pr., INSY 3600. Continuation of INSY 3600. Emphasis on
design economics and cost estimating techniques and applications to various manufacturing and service operations.

**INSY 6800/6806 LEAN PRODUCTION (3).** LEC. 3. Pr., INSY 4700, INSY 6230, INSY 6240. Manufacturing system design based on a strategy of linked cells providing a continuous flow of materials. Evaluation strategies and analysis tools are studied. Experience in proper writing and preparation of laboratory reports.

**INSY 7020/7026 SAFETY ENGINEERING II (3).** LEC. 3. Pr., INSY 6010 and STAT 3600. Systems safety analysis techniques including human error and reliability, fault trees and cost benefit analysis.

**INSY 7030/7036 MANUFACTURING SYSTEMS DESIGN AND ANALYSIS (3).** LEC. 3. Pr., INSY 4700, INSY 3420 or Departmental approval. Modeling and analysis of manufacturing systems. Emphasis on the development of analytical models of serial production lines, flexible manufacturing systems, cellular systems, and facility layout and location problems.

**INSY 7050/7056 INDUSTRIAL HYGIENE AND ENVIRONMENTAL HAZARDS (3).** LEC. 3. Pr., INSY 3020. Introduction to the basic concepts of industrial hygiene with emphasis on the industrial hygiene/safety interface and on the evaluation and control of noise and vibration stress.

**INSY 7060/7066 ERGONOMICS I (3).** LEC. 3. Pr., INSY 3020. Overview of the human body system and evaluation of the physiological response of the human body to occupational activities with emphasis on task design.

**INSY 7070/7076 ERGONOMICS II (3).** LEC. 3. Pr., INSY 7060. Use of biomechanics in the evaluation and design of work activities. Emphasis is placed on biomechanical modeling, manual materials handling, tool design, and repetitive motion trauma.

**INSY 7080/7086 HUMAN FACTORS ENGINEERING (3).** LEC. 3. Pr., INSY 3020. Examination of human factors, ergonomics and safety research methodologies. Emphasis is on human information input, output and control process with the objective of optimizing integration of the human into simple and complex systems.

**INSY 7081 HUMAN FACTORS LAB (1).** LAB. 3. Coreq., INSY 7080. Laboratory experience in testing human factors principles and concepts covered in INSY 7080. Experience in proper writing and preparation of laboratory reports.

**INSY 7100/7106 ADAPTIVE OPTIMIZATION (3).** LEC. 3. Pr., COMP 3000 or departmental approval. Adaptive search methods inspired by nature for continuous and combinatorial optimization. Methods include simulated annealing, genetic algorithms, evolutionary strategies, tabu search and ant colony systems.

**INSY 7200/7206 ENGINEERING APPLICATIONS OF FUZZY SYSTEMS AND NEURAL NETWORKS (3).** LEC. 3. Pr., COMP 3000 or departmental approval. Introduction to fuzzy systems and neural networks with emphasis on their uses in engineering applications in clustering, modeling, optimization, control, forecasting and classification.

**INSY 7230/7236 ADVANCED LAYOUT AND LOCATION (3).** LEC. 3. Pr., INSY 3420, INSY 4700. Facility layout algorithms and the facility design process. Facility location models and their relationship to strategic organization goals.

**INSY 7240/7246 PRODUCTION AND INVENTORY CONTROL THEORY (3).** LEC. 3. Pr., INSY 6240. Theoretical foundations for the analysis and design of production and inventory control systems with emphasis on quantitative methods and current areas of research.

**INSY/STAT 7300/7306 ADVANCED ENGINEERING STATISTICS I (3).** LEC. 3. Pr., STAT 3610. Advanced concepts of experimental design including blocked designs, analysis of variance replacement, multiple regression analysis, and response surface analysis. Credit will not be given for both INSY 7300 and STAT 7300.

**INSY/STAT 7310/7316 ADVANCED ENGINEERING STATISTICS II (3).** LEC. 3. Pr., STAT/INSY 7300. Fractional factorial experimentation applied for the purpose of process and quality improvement and optimization, introduction to analysis of covariance, multiple regression analysis, and response surface analysis. Credit will not be given for both INSY 7310 and STAT 7310.

**INSY 7330/7336 OFF-LINE AND ON-LINE QUALITY CONTROL (3).** LEC. 3. Pr., STAT 7010 or STAT 7300 or INSY 7300, or departmental approval. Taguchi's quality loss functions. Taguchi's orthogonal arrays and their relationships to fractional factorial designs. Taguchi's parameter and tolerance designs, on-line process control concepts and methods. Process capability. CUSUM charts and other process control charts.

**INSY/STAT 7380/7386 RELIABILITY ENGINEERING (3).** LEC. 3. Pr., STAT 7600 or STAT 7300 or INSY 7300, or departmental permission. Reliability, maintainability, replacement with emphasis on failure-rate estimation and life testing. Hazard functions, parameter estimation and reliability testing including exponential and Weibull distributions. Markov models and repairable systems. Credit is not given for both INSY 7380 and STAT 7780.

**INSY 7400/7406 SIMULATION MODELING AND ANALYSIS (3).** LEC. 3. Pr., STAT 3610 or departmental approval. Introduction to discrete event simulation and simulation software. Fundamental concepts of Monte Carlo and discrete event simulation and the application of those concepts using commercial simulation software.

**INSY 7420/7426 LINEAR PROGRAMMING AND NETWORK FLOWS (3).** LEC. 3. Pr., INSY 3410 or departmental approval. Linear programming and network flows emphasizing algorithms and theory.

**INSY 7430/7436 INTEGER AND NONLINEAR PROGRAMMING (3).** LEC. 3. Pr., INSY 7420 or departmental approval. Integer and non-linear programming, emphasizing algorithms and theory.

**INSY 7440/7446 DYNAMIC PROGRAMMING (3).** LEC. 3. Pr., INSY 3400 and COMP 3000, or departmental approval. Aspects of sequential decision making with emphasis on formulation and solution using the dynamic programming algorithm. Approximation methods for problems involving large state spaces. Solution techniques for problems under uncertainty.

**INSY 7470/7476 SEARCH METHODS FOR OPTIMIZATION (3).** LEC. 3. Pr., MATH 2660, INSY 3410. Single and multivariate search techniques and strategies that are used in finding the optimum of discrete and continuous functions.

**INSY 7500/7506 ADVANCED SIMULATION (3).** LEC. 3. Pr., INSY 7400. Coverage of advanced simulation and simulation language design concepts. Includes advanced input/output analysis, modeling concepts, and language design/implementation concepts.

**INSY 7551 STOCHASTIC OPERATIONS RESEARCH (3).** LEC. 3. Pr., STAT 3610, INSY 3420. Stochastic operations research models with emphasis on model formulation, solution and interpretation of results. Emphasis on stochastic processes, queuing theory and their applications.


**INSY 7940 INDUSTRIAL AND SYSTEMS ENGINEERING PROBLEMS (1-5).** IND. Pr., departmental approval. Individual student endeavor under staff supervision involving special problems of an advanced undergraduate or graduate nature in Industrial and Systems Engineering. Interested student must submit written proposal to department head. Course may be repeated for a maximum of 5 credit hours.

**INSY 7950/7956 SEMINAR (1).** LEC. 1. SU. Pr., ISE graduate standing. Presentation and discussion of ISE research by graduate students, faculty and guests. Must be taken at least one term and cannot be used in the plan of study to apply towards the minimum number of hours for a degree. Fall, Spring.

**INSY 7970/7976 INDUSTRIAL AND SYSTEMS ENGINEERING SPECIAL TOPICS (1-5).** LEC. Pr., departmental approval. Special topics of a graduate nature pertinent to Industrial and Systems Engineering. Specific prerequisites will be determined and announced for each offering. Course may be repeated for a maximum of 5 credit hours.

**INSY 7980/7986 MASTER'S IN INDUSTRIAL AND SYSTEMS ENGINEERING PROJECT (1-5).** IND. Pr., SU. Pr., departmental approval. Non-thesis master's project. Course may be repeated for a maximum of 5 credit hours.

**INSY 7990 RESEARCH AND THESIS (1-10).** MST, TD. Pr., departmental approval. Course may be repeated with change in topic.

**INSY 8010 ADVANCED SAFETY ENGINEERING (3).** LEC. 3. Pr., INSY 6020, INSY 7070. Topics of current interest in occupational safety research. Occupational safety research methodology and research priorities.

**INSY 8060/8066 ADVANCED ERGONOMICS (3).** LEC. 3. Pr., INSY 6020, INSY 7070, INSY 7080. Topics of current interest in occupational ergonomics and human factors research. Occupational ergonomics and human factors research methodology and research priorities.

**INSY 8250 SCHEDULING THEORY (3).** LEC. 3. Pr., INSY 6250, INSY 6470, INSY 7420. The theory for various scheduling methods and models is presented. Emphasis is on current research in the scheduling area.

**INSY 8420/8426 TOPICS IN OPTIMIZATION (3).** LEC. 3. Pr., INSY 6470. Basic concepts and theory of optimization, including saddle-
point conditions for differentiable and non-differentiable programs, duality, approximation, decomposition and partitioning, illustrated by application to specific algorithms.

**INSY 670 INDUSTRIAL AND SYSTEMS ENGINEERING SPECIAL TOPICS** (1-5). LEC. Pr., departmental approval. Special topics of an advanced graduate nature pertinent to industrial and systems engineering. Specific prerequisites will be determined and announced for each offering. Course may be repeated for a maximum of 5 credit hours.

**INSY 8990 RESEARCH AND DISSERTATION** (1-10). DSRT. TD. Pr., departmental approval. Course may be repeated with change in topic.

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**Mathematics (MATH)**

Dr. Michel Smith - 844-4290

**MATH 1000 COLLEGE ALGEBRA** (3). LEC. 3. Pr., High school geometry and second-year high school algebra. Fundamental concepts of algebra, equations and inequalities, functions and graphs, polynomial and rational functions. Does not satisfy the core requirement in mathematics. Students who have previous credit in any higher-numbered math course may not receive credit.


**MATH 1120 PRE-CALCULUS ALGEBRA** (3). LEC. 3. Pr., High school geometry and second-year high school algebra. Mathematics Core. Algebra of functions including polynomial, rational, exponential and logarithmic functions. Systems of equations and inequalities, quadratic inequalities, the binomial theorem. Students who have previous credit in any higher-numbered math course may not receive credit.

**MATH 1130 PRE-CALCULUS TRIGONOMETRY** (3). LEC. 3. Pr., MATH 1120. Mathematics Core. Preparatory course for the calculus sequence. Basic analytic and geometric properties of the trigonometric functions. Complex numbers, de Moivre's theorem, polar coordinates. Students who have previous credit in any higher-numbered math course may not receive credit.

**MATH 1150 PRE-CALCULUS ALGEBRA AND TRIGONOMETRY** (4). LEC. 4. Pr., High school geometry and second year high school algebra. Students are further required either to have an appropriate score on the mathematics placement exam or to have passed MATH 1000 with a C or better. Mathematics Core. Algebraic functions. Exponential Logarithmic functions. Analytic and geometric properties of trigonometric functions. Students who have previous credit in any higher-numbered math course may not receive credit.

**MATH 1151 MATHXCEL PRECALCULUS WORKSHOP** (2). LEC. 2. SU. Pr., Appropriate score on the mathematics placement exam or grade of C or better in MATH 1000. Coreq., MATH 1150. Workshop for MATH 1150. Two 2-hour sessions per week. Fall, Spring.

**MATH 1610 CALCULUS I** (4). LEC. 3. RCT. 2. Pr., MATH 1600. Mathematics Core. Limits, the derivative of algebraic, trigonometric, exponential, logarithmic functions. Applications of the derivative, antiderivatives, the definite integral and applications to area problems, the fundamental theorem, the Jacobian. Surface integrals and applications to business. Credit will be given for only one of MATH 1610, MATH 1617, or MATH 1710. Credit will not be given for majors in Engineering or Math or Physics.

**MATH 1620 CALCULUS II** (4). LEC. 4. Pr., membership in the Honors College, MATH 1617. The same material as MATH 1620, but in greater depth appropriate for honors students. Students may receive credit for only one of MATH 1620, MATH 1627 or MATH 1720.

**MATH 1620 CALCULUS WITH BUSINESS APPLICATIONS** (4). LEC. 3. RCT. 2. Pr., MATH 1120 or appropriate score on Math Placement Exam. MATH 1120 or appropriate score on Math Placement Exam. For students in the College of Business. Mathematics Core. Differentiation and integration of exponential and logarithmic functions and applications to business. Functions of several variables, partial derivatives and multiple integrals.

**MATH 1626 HONORS CALCULUS II** (4). LEC. 4. Pr., membership in the Honors College, MATH 1617. The same material as MATH 1620, but in greater depth appropriate for honors students. Students may receive credit for only one of MATH 1620, MATH 1627 or MATH 1720.

**MATH 1627 HONORS CALCULUS II** (4). LEC. 4. Pr., membership in the Honors College, MATH 1617. The same material as MATH 1620, but in greater depth appropriate for honors students. Students may receive credit for only one of MATH 1620, MATH 1627 or MATH 1720.

**MATH 1680 CALCULUS WITH BUSINESS APPLICATIONS** (4). LEC. 3. RCT. 2. Pr., MATH 1120 or appropriate score on Math Placement Exam. MATH 1120 or appropriate score on Math Placement Exam. For students in the College of Business. Mathematics Core. Differentiation and integration of exponential and logarithmic functions and applications to business. Functions of several variables, partial derivatives and multiple integrals.

**MATH 1690 CALCULUS WITH BUSINESS APPLICATIONS** (3). LEC. 3. Pr., MATH 1680 or MATH 1610. For students in the College of Business, or by departmental approval. Probability, random variables, probability distributions. Further topics in calculus: integration, functions of several variables, applications to probability. Applications to business and related areas. Credit will not be given to majors in Engineering or Math or Physics.

**MATH 1710 CALCULUS FOR ENGINEERING AND SCIENCE I** (4). LEC. 4. Pr., MATH 1600. Mathematics Core. Vector algebra, real and vector valued functions, limits, derivatives and antiderivatives of real and vector valued functions and applications. The fundamental theorem of calculus. MATH 1710 and MATH 1720 include and re-order the material of MATH 1610 and MATH 1620, and MATH 1720 may be substituted for MATH 1620. However, MATH 1710 is not a sufficient prerequisite for MATH 1620, and students who pass MATH 1710 and wish to take MATH 1620 must take MATH 1610. Credit will be given for only one of MATH 1610, MATH 1617, or MATH 1710. Credit will not be given for MATH 1680 and MATH 1710.

**MATH 1720 CALCULUS FOR ENGINEERING AND SCIENCE II** (4). LEC. 4. Pr., MATH 1710. Exponentials and logarithms, separation of variables, L'Hopital's rule. Techniques of integration, work and energy, line integrals, the gradient and directional derivatives, the curl. Credit will be given for only one of MATH 1620, MATH 1627, or MATH 1720.

**MATH 2630 CALCULUS III (4).** LEC. 4. Pr., MATH 1620. Multivariate calculus: vector-valued functions, partial derivatives, multiple integration, vector calculus. Credit will be given for only one of MATH 2630, MATH 2637, MATH 2730.

**MATH 2637 HONORS CALCULUS III** (4). LEC. 4. Pr., membership in the Honors College, MATH 1627. The same material as MATH 2630, but in greater depth appropriate for honors students. Credit will be given for only one of MATH 2630, MATH 2637, or MATH 2730.

**MATH 2650 LINEAR DIFFERENTIAL EQUATIONS** (3). LEC. 3. Coreq., MATH 2630. First and second order linear differential equations including the solutions by infinite series, applications.


**MATH 2730 CALCULUS FOR ENGINEERING AND SCIENCE III** (4). LEC. 4. Pr., MATH 2620. Optimization and Lagrange multipliers. Linear, spherical, cylindrical, polar transformations. The Jacobian. Surface integrals and integrals over solids. Divergence, Stokes' theorem, Gauss' theorem. Credit will only be given for one of MATH 2730, MATH 2630, or MATH 2637.

**MATH 2850 MATHEMATICS FOR ELEMENTARY EDUCATION I** (3). LEC. 3. Pr., MATH 1130 or higher. Elementary Education majors or departmental approval. Mathematical insights for elementary school teachers. Sets, the structure of the number system (integers, fraction, decimals).

**MATH 2860 MATHEMATICS FOR ELEMENTARY EDUCATION II** (3). LEC. 3. Pr., MATH 2850. Elementary Education majors or departmental approval. Mathematical insights for elementary school teachers. Probability, informal geometry, measurement.

**MATH 2870 MATHEMATICS FOR ELEMENTARY EDUCATION III** (3). LEC. 3. Pr., MATH 2850. Coreq., MATH 2860. A reexamination of the number system, geometry, probability, graph theory and discrete mathematics with emphasis on multiple problem solving techniques. Open for credit only for elementary education majors except by special permission of the mathematics department. Fall, Spring.

**MATH 3010 HISTORY OF MATHEMATICS** (3). LEC. 3. Pr., MATH 1620 or departmental approval. The evolution of modern mathematics from its motivational roots in the physical sciences; the lives and contributions of outstanding mathematicians; the parallel development of mathematics and western culture.

**MATH 3100 INTRODUCTION TO ADVANCED MATHEMATICS** (3). LEC. 3. Pr., MATH 2630. Teaching of the fundamental abilities necessary for the
Mathematics (MATH)

pursuance of mathematical studies. Logic and set theory, mathematical induction, basic number theory, basic analysis.


MATH 4160 ALGEBRAIC CODING THEORY II (3). LEC. 3. Pr., MATH 4150. Theory of and implementable algorithms for codes of current practical and theoretical interest. Reed-Solomon, convolutional codes with trellis decoding, Reed-Muller codes, Preparata codes. 128

MATH 4900 INDEPENDENT STUDY (1-3). IND. Study of individual problems or topics of interest to students. Course may be repeated for a maximum of 3 credit hours.

MATH 4970 SPECIAL PROBLEMS (1-4). IND. Pr., departmental approval, junior standing. An individual problems course. Each student will work under the direction of a staff member on a problem of mutual interest. Course may be repeated for a maximum of 4 credit hours.

MATH 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College and senior standing. Course may be repeated for a maximum of 6 credit hours.

MATH 5000 MATHEMATICAL MODELING: CONTINUOUS (3). LEC. 3. Pr., MATH 2650, MATH 2660 and programming ability. Introduction to mathematical models and related techniques. Includes general principles involving continuous deterministic problems and a detailed, specific term-project.


MATH 5030 COMPLEX VARIABLES WITH APPLICATIONS I (3). LEC. 3. Pr., MATH 2650. Complex functions and their elementary mapping properties; contour integration and residues; Laurent series; applications to real integrals. MATH 6030-6040 are appropriate for students of engineering or science.

MATH 5040 COMPLEX VARIABLES WITH APPLICATIONS II (3). LEC. 3. Pr., MATH 5030. Linear fractional transformations; conformal mappings; harmonic functions; applications to boundary value problems; analytic continuation; entire functions. MATH 5030-5040 are appropriate for students of engineering or science.


MATH 5060 ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS (3). LEC. 3. Pr., MATH 2650. First and second order linear partial differential equations; applications to heat conductivity; the method of characteristics; Fourier transforms, existence and uniqueness theorems. 128

MATH 5120 INFORMATION THEORY (3). LEC. 3. Pr., MATH 2630. Information and entropy, information rate optimization and channel capacity, variable-length codes, data compression (Kraft-McMillan inequality, Huffman's algorithm), maximum likelihood decoding, Shannon's Noisy Channel Theorem.

MATH 5130 CALCULUS OF VARIATION (3). LEC. 3. Pr., MATH 2650. Fundamental concepts of extrema of functions and functionals; first and second variations; generalizations; sufficient conditions; constrained functionals; the general Lagrange problem; optimal control.

MATH 5140 DATA COMPRESSION (3). LEC. 3. Pr., MATH 1620. Lossless compression methods, including static, dynamic, and higher order Huffman and arithmetic encoding, interval and recency rank encoding, and dictionary methods; lossy transform methods (JPEG).


MATH 5180 CRYPTOGRAPHY (3). LEC. 3. Pr., MATH 2660 or MATH 3370. Classical cryptosystems, the Data Encryption Standard, one-way functions and relevant number theoretic problems (factoring, primality testing, discrete logarithm problem), RSA and other public key cryptosystems.

MATH 5190 INTRODUCTION TO APPROXIMATION THEORY (3). LEC. 3. Pr., MATH 2650. Approximation of functions by polynomials, spline functions or trigonometric function, expansions in series. MATH 6180 is appropriate for students of engineering and science.

MATH 5200 ANALYSIS I (3). LEC. 3. Pr., MATH 3100 or analogous course subject to departmental approval. The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieljes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.


MATH 5280 SYSTEMS OF DIFFERENTIAL EQUATIONS AND APPLICATIONS (3). LEC. 3. Pr., MATH 2650, MATH 2660. Linear systems of differential equations, stability, phase portraits; non-linear systems, linearization, qualitative properties of orbits, Poincare-Bendixson Theorem; numerical methods; applications.

MATH 5300 THEORY OF DIFFERENCE EQUATIONS (3). LEC. 3. Pr., MATH 2660. Linear difference equations, initial value problems, Green's functions, boundary value problems, systems, periodic solutions, nonlinear difference equations, models.

MATH 5310 INTRODUCTION TO ABSTRACT ALGEBRA I (3). LEC. 3. Pr., MATH 3100 or departmental approval. Groups, Groups of Permutations, isomorphisms and homomorphisms; Cyclic Groups, Quotient Groups, The Fundamental Homomorphism Theorem.

MATH 5320 INTRODUCTION TO ABSTRACT ALGEBRA II (3). LEC. 3. Pr., MATH 5310. Theory of rings and fields, Ideals and Homomorphisms, Quotient Rings, Rings of Polynomials, Extensions of Fields, Galois Theory.

MATH 5330 COMPUTATIONAL ALGEBRA (3). LEC. 3. Pr., MATH 5310. Introduction to computation in multivariate polynomial rings and finite fields. Topics include Berlekamp's Algorithm, Groebner bases, Buchberger's Algorithm, kinematic/robotics problems, symbolic manipulation software.


MATH 5380 INTERMEDIATE EUCLIDEAN GEOMETRY I (3). LEC. 3. Pr., MATH 2630. Fundamental concepts and theorems of Euclidean geometry, introduction to higher dimensions. Regular polygons and polyhedra, symmetry groups, convexity, geometric extremum problems. Geometric transformations and their invariants.

MATH 5390 INTERMEDIATE EUCLIDEAN GEOMETRY II (3). LEC. 3. Pr., MATH 5380. Planar graphs and Euler's theorem. The symmetry group of a set, homotheties and similarities, path, arcs and length of curves, advanced theorems on the circle.

MATH 5470 DYNAMICAL SYSTEMS I (3). LEC. 3. Pr., MATH 2650. One dimensional dynamics. The logistic equation, bifurcation theory, chaos, hyperbolicity, symbolic dynamics, Sarkovski's Theorem, maps of the circle, homoclinic points and the theory of kneading sequences.


MATH 5500 INTRODUCTION TO TOPOLOGY (3). LEC. 3. Pr., MATH 3100 or departmental approval. Metric spaces, topological spaces, continuity, compactness, connectedness, product and quotient spaces and local properties.

MATH 5560 MATHEMATICAL COMPUTATION AND SCIENTIFIC VISUALIZATION (3). LEC. 3. Pr., MATH 2650 and a programming language, or departmental approval. An introduction to the computational modeling process, numerical programming tools for large-scale scientific computation, parallel and cluster computing, and to scientific visualization techniques.


MATH 5640 INTRODUCTION TO NUMERICAL ANALYSIS II (3). LEC. 3. Pr., MATH 2660, programming ability. Numerical solutions of systems of lin-
ear equations, numerical computation of eigenvalues and eigenvectors, error analysis. Written programs using the algorithms.

**MATH 5650 THEORY OF NONLINEAR OPTIMIZATION** (3). LEC. 3. Pr., MATH 2650 and 2660. Kuhn-Tucker conditions, quadratic programming, search methods and gradient methods, Lagrangean and penalty function methods.


**MATH 5690 INTRODUCTION TO CHAOTIC AND RANDOM PHENOMENA** (3). LEC. 3. Pr., MATH 1620. Coreq., basic programming. Stochastic properties of random phenomena in computational complexity, data analysis, chaotic nonlinear systems. Computer simulation and experimenting within Mathematica, supported by Internet resources. Credit will not be given for both MATH 5690 and STAT 5690.


**MATH 5770 COMBINATORIAL DESIGNS** (3). LEC. 3. Pr., MATH 1620. Latin squares, mutually orthogonal latin squares, orthogonal and perpendicular arrays, Steiner triple systems, block designs, difference sets and finite geometries.

**MATH 5790 ACTUARIAL SEMINAR I** (3). LEC. 3. Pr., MATH 2630, MATH 5670 (or equivalent). Intensive seminar in calculus, probability, and risk theory primarily intended as preparation for the Society of Actuaries Course 1 examination.


**MATH 5820 ACTUARIAL SEMINAR II** (3). LEC. 3. Pr., ECON 2030, FIN 3630, MATH 5800. Intensive seminar in the mathematical aspects of economics, finance, and the theory of interest primarily intended as preparation for the Society of Actuaries Course 2 examination.

**MATH 5840 FOUNDATIONS OF NUMBER THEORY FOR SECONDARY SCHOOL TEACHERS** (3). LEC. 3. Pr., MATH 2630. Divisibility, Diophantine equations, congruencies.

**MATH 5850 NUMERICAL ANALYSIS FOR SECONDARY TEACHERS** (3). LEC. 3. Pr., MATH 2630 and computer familiarity. The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.

**MATH 5860 FOUNDATIONS OF NON-EUCLIDEAN GEOMETRY FOR SECONDARY SCHOOL TEACHERS** (3). LEC. 3. Pr., MATH 2630. B.L. geometry, hyperbolic geometry, absolute geometry, parallel postulates.

**MATH 5970 SPECIAL TOPICS** (1-3). IND. Pr., departmental approval. Topics may vary as needed. Course may be repeated for a maximum of 3 credit hours.

**MATH 6000 MATHEMATICAL MODELING: CONTINUOUS** (3). LEC. 3. Pr., MATH 2650, MATH 2660 and programming ability. Introduction to mathematical models and related techniques. Includes general principles involving continuous deterministic problems and a detailed, specific term-project.

**MATH 6010 VECTOR CALCULUS** (3). LEC. 3. Pr., MATH 2630 and MATH 2660 or departmental approval. Vector-valued functions, vector fields. Gradient, divergence, curl. Integral theorems: Green’s Theorem, Stoke’s Theorem, Gauss’s Theorem. Tensor and differential forms. Applications.

**MATH 6020/6231 COMPLEX VARIABLES WITH APPLICATIONS I** (3). LEC. 3. Pr., MATH 2650. Complex functions and their elementary mapping properties; contour integration and residues; Laurent series; applications to real integrals. MATH 6030-6040 are appropriate for students of engineering or science.

**MATH 6040 COMPLEX VARIABLES WITH APPLICATIONS II** (3). LEC. 3. Pr., MATH 6030. Linear fractional transformations; conformal mappings; harmonic functions; applications to boundary value problems; analytic continuation; entire functions. MATH 6030-6040 are appropriate for students of engineering or science.

**MATH 6050 MATRIX THEORY AND APPLICATIONS** (3). LEC. 3. Pr., MATH 2660. Canonical forms, determinants, linear equations, characteris tic value problems.

**MATH 6060 ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS** (3). LEC. 3. Pr., MATH 2650. First and second order linear partial differential equations with emphasis on the method of eigenfunction expansions.

**MATH 6120 INFORMATION THEORY** (3). LEC. 3. Pr., MATH 2630. Information and entropy, information rate optimization and channel capacity, variable-length codes, data compression (Kraft-McMillan inequality, Huffman’s algorithm), maximum likelihood decoding, Shannon’s Noisy Channel Theorem.

**MATH 6130 CALCULUS OF VARIATION** (3). LEC. 3. Pr., MATH 2650. Fundamental concepts of extrema of functions and functionals; first and second variations; generalizations; sufficient conditions; constrained functionals; the general Lagrange problem; optimal control.

**MATH 6140 DATA COMPRESSION** (3). LEC. 3. Pr., MATH 1620. Lossless compression methods, including static, dynamic, and higher order Huffman and arithmetic encoding, interval and recency rank encoding, and dictionary methods; lossy transform methods (JPEG).


**MATH 6180 INTRODUCTION TO APPROXIMATION THEORY** (3). LEC. 3. Pr., MATH 2660 or MATH 3370. Classical cryptosystems, the Data Encryption Standard, one-way functions and relevant number theoretic problems (factoring, primality testing, discrete logarithm problem), RSA and other public key cryptosystems.

**MATH 6190 INTRODUCTION TO APPROXIMATION THEORY** (3). LEC. 3. Pr., MATH 2650. Approximation of functions by polynomials, spline functions or trigonometric function, expansions in series. Math 6180 is appropriate for students of engineering and science.

**MATH 6200 ANALYSIS I** (3). LEC. 3. Pr., MATH 3100 or analogous course subject to departmental approval. The real number system, theorems concerning number sets, sequences, graphs of functions.

**MATH 6210 ANALYSIS II** (3). LEC. 3. Pr., MATH 6200. The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.


**MATH 6280 SYSTEMS OF DIFFERENTIAL EQUATIONS AND APPLICATIONS** (3). LEC. 3. Pr., MATH 2650, MATH 2660. Linear systems of differential equations, stability, phase portraits; non-linear systems, linearization, qualitative properties of orbits, Poincare-Bendixson Theorem; numerical methods; applications.

**MATH 6300 THEORY OF DIFFERENCE EQUATIONS** (3). LEC. 3. Pr., MATH 2660. Linear difference equations, initial value problems, Green’s functions, boundary value problems, systems, periodic solutions, nonlinear difference equations, models.

**MATH 6310 INTRODUCTION TO ABSTRACT ALGEBRA I** (3). LEC. 3. Pr., MATH 3100 or departmental approval. Groups, Groups of Permutations, isomorphisms and homomorphisms, Cyclic Groups, Quotient Groups, The Fundamental Homomorphism Theorem.
MATH 6320 INTRODUCTION TO ABSTRACT ALGEBRA II (3). LEC. 3. Pr., MATH 6310. Theory of rings and fields, Ideals and Homomorphisms, Quotient Rings, Rings of Polynomials, Extensions of Fields, Galois Theory.

MATH 6330 COMPUTATIONAL ALGEBRA (3). LEC. 3. Pr., MATH 6310. Introduction to computation in multivariate polynomial rings and finite fields. Topics include Berlekamp's Algorithm, Groebner bases, Buchberger's Algorithm, kinematic/robotics problems, symbolic manipulation software.


MATH 6380 INTERMEDIATE EUCLIDEAN GEOMETRY I (3). LEC. 3. Pr., MATH 2630. Fundamental concepts and theorems of Euclidean geometry, introduction to higher dimensions. Regular polygons and polyhedra, symmetry groups, convexity, geometric extremum problems. Geometric transformations and their invariants.

MATH 6390 INTERMEDIATE EUCLIDEAN GEOMETRY II (3). LEC. 3. Pr., MATH 6380. Planar graphs and Euler's theorem. The symmetry group of a set, homotheties and similitudes, path, arc and length of curves, advanced theorems on the circle.

MATH 6470 DYNAMICAL SYSTEMS I (3). LEC. 3. Pr., MATH 2650. One dimensional dynamics. The logistic equation, bifurcation theory, chaos, hyperbolicity, symbolic dynamics, Sarkovskii's Theorem, maps of the circle, homoclinic points and the theory of kneading sequences.


MATH 6500 INTRODUCTION TO TOPOLOGY (3). LEC. 3. Pr., MATH 3100 or departmental approval. Metric spaces, topological spaces, continuity, compactness, connectedness, product and quotient spaces and local properties.

MATH 6620 MATHEMATICAL COMPUTATION AND SCIENTIFIC VISUALIZATION (3). LEC. 3. An introduction to the computational modeling process, numerical programming tools for large-scale scientific computation, parallel and cluster computing, and to scientific visualization techniques.


MATH 6640/6646 INTRODUCTION TO NUMERICAL ANALYSIS II (3). LEC. 3. Pr., MATH 2660, programming ability. Numerical solutions of systems of linear equations, numerical computation of eigenvalues and eigenvectors, error analysis. Written programs using the algorithms.

MATH 6650 THEORY OF NONLINEAR OPTIMIZATION (3). LEC. 3. Pr., MATH 2650 and 2660. Kuhn-Tucker conditions, quadratic programming, search methods and gradient methods, Lagrangean and penalty function methods.


MATH/STAT 6690 INTRODUCTION TO CHAOTIC AND RANDOM PHENOMENA (3). LEC. 3. Pr., MATH 1620. Coreq., basic programming. Stochastic properties of random phenomena in computational complexity, data analysis, chaotic nonlinear systems. Computer simulation and experimenting within Mathematica, supported by internet resources. Credit will not be given for both MATH 6690 and STAT 6690.


MATH 6770 COMBINATORIAL DESIGNS (3). LEC. 3. Pr., MATH 1620. Latin squares, mutually orthogonal latin squares, orthogonal and perpendicular arrays, Steiner triple systems, block designs, difference sets and finite geometries.

MATH 6790 ACTUARIAL SEMINAR I (3). LEC. 3. Pr., MATH 2630, MATH 6670 (or equivalent). Intensive seminar in calculus, probability, and risk theory primarily intended as preparation for the Society of Actuaries Course 1 examination.


MATH 6820 ACTUARIAL SEMINAR II (3). LEC. 3. Pr., ECON 2030. FIN 3630, MATH 6800. Intensive seminar in the mathematical aspects of economics, finance, and the theory of interest primarily intended as preparation for the Society of Actuaries Course 2 examination.


MATH 6850 NUMERICAL ANALYSIS FOR SECONDARY TEACHERS (3). LEC. 3. Pr., MATH 2630 and computer familiarity. The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.

MATH 6860 FOUNDATIONS OF NON-EUCLIDEAN GEOMETRY FOR SECONDARY SCHOOL TEACHERS (3). LEC. 3. Pr., MATH 2630. B.L. geometry, hyperbolic geometry, absolute geometry, parallel postulates.

MATH 6970/6976 SPECIAL TOPICS (1-3). IND. Pr., departmental approval. Topics may vary as needed. Course may be repeated for a maximum of 3 credit hours.


MATH 7050/7056 APPROXIMATION THEORY II (3). LEC. 3. Pr., MATH 7040. Least square approximation and rational approximation, and advanced topics of current interest.

MATH 7070 INTERPOLATION I (3). LEC. 3. Pr., departmental approval. Techniques of approximation by interpolation, rates of convergence and methods of estimating error. Simultaneous approximation of functions and their derivatives; spline function interpolation; curve and surface fitting.


MATH 7100 SPECIAL FUNCTIONS (3). LEC. 3. Pr., departmental approval. Special functions from classical complex analysis which play an important role in the mathematics of physics, chemistry and engineering.

MATH 7110 DISCRETE GEOMETRY AND CONVEXITY I (3). LEC. 3. Pr., MATH 6380 and MATH 6390 or departmental approval. Geometric objects and configurations with discrete symmetry groups. Regular polygons and polyhedra. Regular arrangements. Plane tilings and patterns.

MATH 7130 TENSOR ANALYSIS (3). LEC. 3 Pr., departmental approval. Manifolds, differential structure, vector and tensor fields, vector and tensor bundles. Partial differential forms, chains. Elements of differential geometry, advanced topics.

MATH 7140 INTRODUCTION TO MODEL THEORY (3). LEC. 3 Pr., departmental approval. First-order languages, Satisfaction. Consequences. The completeness and compactness theorems, models constructed from constants. Elementary substructures and embeddings, Lowenheim-Skolem-Tarski theorems. Ultraproducts and ultrapowers.

MATH 7150 AXIOMATIC SET THEORY I (3). LEC. 3 Pr., departmental approval. Introduction to modern set theory. The axioms of ZFC, ordinals and cardinals, closed unbounded sets, the constructible universe L, Martin's Axiom.

MATH 7160 AXIOMATIC SET THEORY II (3). LEC. 3 Pr., MATH 7150. Introduction to forcing, independence results, iterated forcing, consistency of Martin's Axiom.

MATH 7170 ALGORITHMS DISCRETE OPTIMIZATION (3). LEC. 3 Pr., MATH 6750. Theory and practice of discrete algorithms: complexity classes, reductions, approximate algorithms, greedy algorithms, search techniques, heuristics, randomized algorithms, and numeric algorithms.


MATH 7200 REAL ANALYSIS I (3). LEC. 3 Pr., departmental approval. Sigma algebras, measures, measurable functions, integrability, properties of Lebesgue's measure, density, Lusin's theorem, Egoroff's theorem, product measures, Fubini's theorem. Limit theorems involving pointwise convergence and integration.


MATH 7230 FUNCTIONS OF A COMPLEX VARIABLE I (3). LEC. 3 Pr., departmental approval. Complex numbers, analytic functions, derivatives, Cauchy integral theorem and formulae, Taylor and Laurent series, analytic continuation, residues, maximum principles, Riemann surfaces.

MATH 7240 FUNCTIONS OF A COMPLEX VARIABLE II (3). LEC. 3 Pr., MATH 7230. Conformal mapping, families of analytic functions and harmonic analysis.

MATH 7280 ADVANCED THEORY OF ORDINARY DIFFERENTIAL EQUATIONS I (3). LEC. 3 Pr., departmental approval. Existence and continuation theorems for ordinary differential equations, continuity and differentiability with respect to initial conditions, linear systems, differential inequalities, Sturm theory.

MATH 7290 ADVANCED THEORY OF ORDINARY DIFFERENTIAL EQUATIONS II (3). LEC. 3 Pr., MATH 7280. Stability theory, periodic solutions, boundary value problems, discontinuity of linear equations, Green's functions, upper and lower solutions, a priori bounds methods, current research.

MATH 7310 ALGEBRA I (3). LEC. 3 Pr., MATH 6320 or departmental approval. Groups, Lagrange's Theorem, normal subgroups, factor groups, Isomorphism and Correspondence Theorems. Symmetric groups, alternating groups, free groups, torsion groups. Introduction to rings, correspondence theorems.

MATH 7320 ALGEBRA II (3). LEC. 3 Pr., MATH 7310. Rings, modules, vector spaces, and semi-simple modules. Commutative rings; prime and primary ideals, PID's, factorizations in integral domains, field extensions, the Galois Correspondence Theorem.

MATH 7330 LINEAR REPRESENTATIONS OF FINITE GROUPS (3). LEC. 3 Pr., MATH 7320. Maschke's Theorem, characters, orthogonality relations, induced modules, Frobenius reciprocity, Clifford's Theorem, Mackey's Subgroup Theorem, Burnside's theorem on solvability.

MATH 7340 RING THEORY (3). LEC. 3 Pr., MATH 7320. Topics on: commutative rings (Cohen-Seidenberg theorems, Krull Intersection Theorem, Dedekind domains), or noncommutative rings (projective modules over Noetherian algebras, representation type, Noether-Skolem Theorem, division algebras).

MATH 7350 ABELIAN GROUPS (3). LEC. 3 Pr., MATH 7320. Torsion groups: Decompositions, Ulm's theorem, uniqueness theorem for Abelian groups, Torsion-free groups: Completely decomposable groups, Butler groups, p-local groups, Warfield groups, splitting criteria. Homological topics.

MATH 7370 MATRICES I (3). LEC. 3 Pr., MATH 6370 or departmental approval. Jordan form, functions of a matrix, spectral theorem, singular values, norms, quadratic forms, field of values, enertia; topics of current interest.

MATH 7380 MATRICES II (3). LEC. 3 Pr., MATH 7370. Matrix stability and inertia, inequalities for matrix eigenvalues and singular values, The Kronecker and Hadamard matrix products, the exponential and logarithm matrix map; topics of current interest.

MATH 7400 FUNCTIONAL ANALYSIS I (3). LEC. 3 Pr., MATH 7210 or departmental approval. Bounded linear transformations and functionals on Banach and Hilbert spaces, weak topologies, linear operators, adjoints, compact operators. Banach algebras, spectral theory, Gelfand transform.

MATH 7410 FUNCTIONAL ANALYSIS II (3). LEC. 3 Pr., MATH 7400. C*-algebras, Hermitian, self adjoint elements, functional calculus for commutative algebras. Normal operators on Hilbert space, spectral theorem, applications, symmetric and self-adjoint operators, normal operators, the spectral theorem.

MATH 7440 PARTIAL DIFFERENTIAL EQUATIONS I (3). LEC. 3 Pr., departmental approval. Second order linear elliptic and hyperbolic equations stressing non-linear and numerical problems, characteristics, domains of dependence, energy integrals, finite difference schemes, Sobolev spaces, maximum principle.

MATH 7450 PARTIAL DIFFERENTIAL EQUATIONS II (3). LEC. 3 Pr., MATH 7440. Parabolic and hyperbolic equations, solving numerical problems, characteristics, domains of dependence, energy integrals, reaction-diffusion problems, Navier-Stokes equations, fixed-point and Galerkin methods.

MATH 7500 TOPOLOGY I (3). LEC. 3 Pr., MATH 6210 or 6500 or departmental approval. Separation and countability axioms, covering properties, completeness, connectedness, metric spaces and metrizability, product and quotient spaces, function spaces.

MATH 7510 TOPOLOGY II (3). LEC. 3 Pr., MATH 7500. Homotopy, elementary properties of retracts, fundamental groups, covering spaces, computations of fundamental groups.

MATH 7520 DIMENSION THEORY (3). LEC. 3 Pr., MATH 7500 or MATH 6500 or departmental approval. Topological study of dimension in separable metric spaces. Topological invariance of dimension of Euclidean spaces. Dimension and measure.

MATH 7530 CONTINUUM THEORY I (3). LEC. 3 Pr., MATH 7510 or departmental approval. Topics such as inverse limits, decompositions, hyperspaces, special mappings, topological structures from the pathological (indecomposable continua), to the straightforward (Peano continua).

MATH 7540 CONTINUUM THEORY II (3). LEC. 3 Pr., MATH 7530. Topics in continuum theory such as confluent mappings, quotient spaces, chains, to-the-boundary theorems, relationship to inverse limits, advanced topics.

MATH 7550 SET THEORETIC TOPOLOGY I (3). LEC. 3 Pr., MATH 7510 or departmental approval. Compactifications, covering properties, metrization theorems and generalized metrizable spaces, topological groups.

MATH 7560 SET THEORETIC TOPOLOGY II (3). LEC. 3 Pr., MATH 7550. Topological Groups, Cardinal invariants, use of set-theoretic axioms such as Martin's Axiom, independence results, advanced topics.

MATH 7570 EUCLIDEAN TOPOLOGY I (3). LEC. 3 Pr., MATH 7510. Introduction to concepts basic in algebraic and geometric topology through the study of simple objects such as polyhedra, manifolds, retracts, and the Brower fixed point theorem.

MATH 7580 EUCLIDEAN TOPOLOGY II (3). LEC. 3 Pr., MATH 7570. Further study of basic geometric topology. Retracts, absolute neighborhood retracts, maps into spheres, invariance of domain.

MATH 7600/7606 ADVANCED NUMERICAL MATRIX ANALYSIS (3). LEC. 3 Pr., MATH 6640 or departmental approval. Topics selected from: discretization matrices, sparse matrices, QR-algorithm, symmetric eigenvalue problems, singular value decomposition, pseudo-inverses, simplex method, matrix algorithms for vector computers.
MATH 7610/7616 NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS (3). LEC. 3. Pr., MATH 6640 or departmental approval. The numerical solution of partial differential equations using finite difference and finite element methods.

MATH 7620 OPTIMIZATION THEORY (3). LEC. 3. Pr., MATH 6640 and an ability to program in a high-level language. Unconstrained problems: basic descent, conjugate gradient and quasi-Newton methods. Constrained problems: gradient projection, penalty, cutting plane and Lagrange methods. Credit will not be given for both MATH 7620 and INSY 8420.

MATH 7650 HARMONIC ANALYSIS I (3). LEC. 3. Pr., MATH 7210 or departmental approval. Fourier series, Fourier transforms, maximal functions, singular integral theory, introduction to function spaces.

MATH 7660 HARMONIC ANALYSIS II (3). LEC. 3. Pr., MATH 7650. Function spaces and interpolation, Calderon's reproducing formulas, wavelets, frames, connections to function spaces applications.

MATH 7680/7686 ADVANCED TOPICS IN NUMERICAL ANALYSIS (3). LEC. 3. Pr., departmental approval. Topics include: sparse systems of equations, parallel and vector algorithms, nonlinear and singular partial differential equations, calculation of eigenvalues and eigenvectors, pseudo-random numbers, filtering techniques.

MATH 7710 COMPUTATIONAL GEOMETRY (3). LEC. 3. Pr., departmental approval. Design and time-complexity of computer algorithms for geometry problems studying the geometric ideas needed for computer-aided design, computer graphics and robotics.

MATH 7720 INTRODUCTION TO CODING THEORY (3). LEC. 3. Pr., MATH 2660 or its equivalent. Introduction to methods and algorithms for reliable communications through error control coding. BCH, Reed-Solomon, Reed-muller codes, convolutional codes, Berlekamp-Massey, Viterbi, and iterated decoding algorithms.

MATH 7730 ADVANCED TOPICS IN CODING THEORY (3). LEC. 3. Pr., MATH 7720 or departmental approval. Structure and theoretical properties of codes and related algorithms. Relations to other combinatorial and algebraic objects stressed.

MATH 7740 COMBINATORIAL DESIGNS (3). LEC. 3. Pr., MATH 6770. Topics of current interest and research in combinatorial design theory. Areas included: latin squares, embeddings, Wilson's constructions, quadruple systems, Hadamard designs, graph designs, orthogonal arrays.

MATH 7750 ADVANCED TOPICS IN GRAPH THEORY (3). LEC. 3. Pr., MATH 6750. Topics of current interest and recent research in graph theory. May include edge colorings, algebraic graph theory, network flows, factor theory.

MATH 7760 INTRODUCTION TO ALGEBRAIC TOPOLOGY I (3). LEC. 3. Pr., MATH 7510 or departmental approval. Homology of chain complexes, the axioms of homology and their verification, computations of homology groups.

MATH 7770 INTRODUCTION TO ALGEBRAIC TOPOLOGY II (3). LEC. 3. Pr., MATH 7760. Homology with coefficients and universal coefficient theorems, Cohomology and universal coefficient theorems, homology of products of spaces, cup and cap products, duality in manifolds.

MATH 7780 ADVANCED ALGEBRAIC TOPOLOGY I (3). LEC. 3. Pr., departmental approval. Advanced topics in homology, cohomology, and duality with relations to and further study of homotopy theory. Applications to and further study of manifolds and geometric topology.

MATH 7790 ADVANCED ALGEBRAIC TOPOLOGY II (3). LEC. 3. Pr., MATH 7780. Continuation of MATH 7780; advanced topics in homology, cohomology, and duality with relations to and further study of homotopy theory. Applications to and further study of manifolds and geometric topology.

MATH/STAT 7810/7616 MODERN STOCHASTIC PROCESSES I (3). LEC. 3. Pr., STAT/MATH 6670. Classical and modern topics in stochastic processes (Markov chains, Poisson process, Brownian motion). Applications and stochastic models (queues, stationary processes, population dynamics, finances). Credit will not be given for both MATH 7810 and STAT 7810.

MATH/STAT 7820/7826 MODERN STOCHASTIC PROCESSES II (3). LEC. 3. Pr., STAT/MATH 7810. Classical and modern topics in stochastic processes (Markov processes, Random Walks, Martingales, Brownian motion). Introduction to stochastic integrals and differential equations. Applications (queues, population dynamics, chaos, finances). Credit will not be given for both MATH 7820 and STAT 7820.

MATH 7870 REAL FUNCTIONS AND DESCRIPTIVE SET THEORY I (3). LEC. 3. Pr., MATH 7210, MATH 7500 recommended. Borel classification of sets, the Baire classification of real functions. Derivatives and approximately continuous functions. The Lebesgue density topology.


MATH 7950 SEMINAR (1-3). SEM. SU. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

MATH 7960 DIRECTED READINGS (1-10). IND. Pr., departmental approval. Topics may vary as needed. Course may be repeated for a maximum of 10 credit hours.

MATH 7970 SPECIAL TOPICS (1-10). IND. Pr., departmental approval. Topics may vary as needed. Course may be repeated with change in topic.

MATH 7980 RESEARCH AND SPECIAL PROJECT IN APPLIED MATHEMATICS (1-10). RES., SU. Pr., departmental approval. For students working on the Master of Applied Mathematics degree with concentration in numerical analysis. Course may be repeated for a maximum of 10 credit hours.

MATH 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.

MATH 8310 HOMOLOGICAL ALGEBRA I (3). LEC. 3. Pr., MATH 7320 or departmental approval. Homology and cohomology. Hom and Tensor functors; the adjoint isomorphisms, injective/projective modules, flat modules, the classification of certain rings using homological tools.

MATH 8320 HOMOLOGICAL ALGEBRA II (3). LEC. 3. Pr., MATH 8310. Localizations of modules, nonsingular rings and modules, the Goldie dimension, homological classification of modules; Whitehead modules, reflexive modules, R-modules as modules over their rings of endomorphisms.

MATH 8400 ADVANCED FUNCTIONAL ANALYSIS I (3). LEC. 3. Pr., MATH 7210 and 7400. Topics concerning bounded and unbounded linear operators in Banach and Hilbert spaces; theory of distributions and topological vector spaces with applications, current research.

MATH 8410 ADVANCED FUNCTIONAL ANALYSIS II (3). LEC. 3. Pr., MATH 8400. Topics from the theory of bounded and unbounded linear operators in Banach and Hilbert spaces; elements of nonlinear functional analysis, topics of current research interest.


MATH 8630 ADVANCED STOCHASTIC PROCESSES I (3). LEC. 3. Pr., MATH 8610. Gaussian processes, Brownian motion, invariance principles, convergence of random processes, measures and sets, stochastic integrals and quadratic variation.

MATH 8640 ADVANCED STOCHASTIC PROCESSES II (3). LEC. 3. Pr., MATH 8630. Continuous martingales and Brownian motion, stochastic differential equations and martingale problems, local time, excursions, one-dimensional SDE's and diffusions.


MATH 8960 DIRECTED READINGS (1-10). IND. Pr., departmental approval. Topics may vary as needed. Course may be repeated for a maximum of 15 credit hours.

MATH 8970 SPECIAL TOPICS (1-10). IND. Pr., departmental approval. Topics may vary as needed. May be repeated with change in topic. Course may be repeated for a maximum of 15 credit hours.

MATH 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.
Mechanical Engineering (MECH)

Dr. David F. Dyer - 844-4820

MATERIALS ENGINEERING (MATL)

MATL 2100 INTRODUCTION TO MATERIALS SCIENCE (3). LEC. 3. The science of solid materials and the relationship between this science and material properties.


MATL 3200 ENGINEERING MATERIALS - POLYMERS (3). LEC. 3. Pr., CHEM 1040. The synthesis, processing, structure and properties of polymers and polymer matrix composites.

MATL 3201 POLYMER AND COMPOSITES LABORATORY (1). LAB. 3. Coreq., MATL 3200. A hands-on lab course on the synthesis, processing, structure and properties of polymers and polymer matrix composites.

MATL 3300 ENGINEERING MATERIALS - CERAMICS (3). LEC. 3. Pr., MATL 2100. The engineering of ceramic materials. Structural property relationships of crystalline and glassy ceramics will be included.


MATL 4900 SENIOR DESIGN PROJECT (3). LEC. 1. LAB. 6. Pr., MATL 4500. Students select, design, schedule, fabricate and perform an engineering design project related to Materials Engineering. Course may be repeated for a maximum of 6 credit hours.

MATL 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College; departmental approval. Individual student directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

MATL 5100 THERMODYNAMICS OF MATERIALS SYSTEMS (3). LEC. 3. Pr., CHEM 1040 and ENGR 2200 or departmental approval. Application of thermodynamics to describe phase stability, crystal imperfections, solubility, oxidation, surface and interface energy and transformations.

MATL 5200 CRYSTALLOGRAPHY (2). LEC. 2. Pr., PHYS 1610 or departmental approval. Principles of crystallography, reciprocal lattice X-ray diffraction techniques.


MATL 5300 PHASE TRANSFORMATIONS IN MATERIAL PROCESSING (3). LEC. 3. Pr., MATH 2650 and ENGR 2200 or departmental approval. Principles that govern phase transformations in materials systems and control of nucleation and growth, microstructure and morphology.

MATL 5400 PHYSICS OF SOLIDS (3). LEC. 3. Pr., PHYS 1610 or departmental approval. The physics of solid-state materials, including the electronic, optical and magnetic properties of materials.


MATL 5970 INTERMEDIATE SPECIAL TOPICS (1-3). LEC. 3. Pr., departmental approval. Regular course addressing an advanced specialized area of Materials Engineering not covered by regularly offered courses. Course may be repeated for a maximum of 3 credit hours.

MATL 6100/6106 THERMODYNAMICS OF MATERIALS SYSTEMS (3). LEC. 3. Pr., CHEM 1040 and ENGR 2200 or departmental approval. Application of thermodynamics to describe phase stability, crystal imperfections, solubility, oxidation, surface and interface energy and transformations.

MATL 6200/6206 CRYSTALLOGRAPHY (2). LEC. 2. Pr., PHYS 1610 or departmental approval. Principles of crystallography, reciprocal lattice X-ray diffraction techniques.


MATL 6300/6306 PHASE TRANSFORMATIONS IN MATERIAL PROCESSING (3). LEC. 3. Pr., MATH 2650 and ENGR 2200 or departmental approval. Principles that govern phase transformations in materials systems and control of nucleation and growth, microstructure and morphology.

MATL 6400/6406 PHYSICS OF SOLIDS (3). LEC. 3. Pr., PHYS 1610 or departmental approval. The physics of solid-state materials, including the electronic, optical and magnetic properties of materials.


MATL 6970/6976 INTERMEDIATE SPECIAL TOPICS IN MATERIALS ENGINEERING (1-3). LEC. 3. Pr., Departmental approval. Regular course addressing an advanced specialized area of Materials Engineering not covered by regularly offered courses. Course may be repeated for a maximum of 3 credit hours.


MATL 7110/7116 PHYSICAL METALLURGY AND APPLICATIONS IN METAL FABRICATION (3). LEC. 3. Pr., MATL 6300 or departmental approval. The physical metallurgy underlying processing-structure-property relationships in metals and alloys, with examples from joining processes.

MATL 7120/7126 ADVANCED CERAMIC MATERIALS (3). LEC. 3. Pr., MATL 6200 or departmental approval. Processing, structure-property relationships and applications of advanced ceramics. Structural and functional applications of ceramics.

MATL 7130/7136 ADVANCED POLYMER SCIENCE AND TECHNOLOGY (3). LEC. 3. Pr., MATL 6100 or departmental approval. Recent developments in both functional and structural polymers including approaches to synthesis, processing techniques, high-strength materials, electronic polymers, optic polymers, and medical polymers.

MATL 7140/7146 ADVANCED COMPOSITE MATERIALS (3). LEC. 3. Pr., MATL 7050 or departmental approval. Processing, mechanics structure and properties of composite materials. Emphasis will be placed on an understanding of processing-structure-property relationships in polymer-, ceramic-, and metal-matrix composites.


MATL 7210/7216 PLASTIC DEFORMATION AND STRENGTHENING OF METALLIC MATERIALS (3). LEC. 3. Pr., MATL 7050 or departmental approval. Mechanisms of plastic deformation and strengthening in metals and alloys. The role of dislocations in plastic deformation.

MATL 7220/7226 RADIATION EFFECTS ON MATERIALS (3). LEC. 3. Pr., MATL 6400 or departmental approval. Theoretical and experimental treatment of the radiation effects and damage in materials as related to the nuclear industry.

MATL 7230/7236 HIGH TEMPERATURE MATERIALS PERFORMANCE (3). LEC. 3. Pr., MATL 6300 or departmental approval. Theoretical and experimental treatment of the behavior of metals at high temperature.


MATL 7310/7316 SOLIDIFICATION PROCESSING (3). LEC. 3. Pr., MATL 6300 or departmental approval. Theoretical science and engineering principles that apply to semiconductor crystal growth, ingot solidification, metal casting, welding and rapid solidification processes.

MATL 7320/7326 THIN FILM SCIENCE AND TECHNOLOGY (3). LEC. 3. Pr., MATL 6300 or departmental approval. Structure, properties, characterization, processing and application of thin films.

MATL 7410/7416 CHEMICAL SENSORS (3). LEC. 3. Pr., MATL 6100 or departmental approval. Fundamentals and application of chemical sensors. Includes electrolyte, semiconductor and acoustic wave-based sensors.

MATL 7420/7426 SMART MATERIALS AND STRUCTURES (3). LEC. 3. Pr., MATL 7050 or departmental approval. An introduction to the principles and applications of various sensor, actuator and functionality smart material systems and structures.
MATL 7430 DIELECTRIC MATERIALS AND DEVICES (3). LEC. 3. Pr., MATL 6100 and MATL 6400 or departmental approval. Processing, structure, properties, and application of dielectrics. Project/design/fabrication processes and application of dielectric materials in high-technological industry.

MATL 7440/7446 MATERIALS PROCESSES MICRO AND NANOSYSTEMS (3). LEC. 3. Pr., MATL 6400 or departmental approval. Materials, processes, and principles involved in manufacturing of micro and nanoelectromechanical systems. Properties of materials used in micromachined transducers as related to current and potential micro and nanofabrication processes.

MATL 7510/7516 ELECTRON MICROSCOPY (3). LEC. 3. Pr., MATL 6200 or departmental approval. Theory, instrumentation, techniques and applications of scanning and transmission electron microscopy.

MATL 7511 ELECTRON MICROSCOPY LABORATORY (1). LAB. 3. Pr., MATL 7510. Laboratory on the use of electron microscopy for materials characterization. Fall, Spring.


MATL 7950 MATERIALS ENGINEERING SEMINAR (0). SEM. 1. SU. Required during each semester of residency, but cannot be used toward minimum requirements for graduate degree in Materials Engineering. Content changes each semester and consists of off-campus speakers and presentations by graduate students and faculty.

MATL 7960/7966 DIRECTED READINGS IN MATERIALS ENGINEERING (1-6). IND. SU. Pr., departmental approval. May be taken more than one semester. Up to 6 hours may count toward the minimum degree requirements. Course may be repeated with change in topic.

MATL 7970/7976 SPECIAL TOPICS IN MATERIALS ENGINEERING (1-3). LEC. Pr., departmental approval. Regular course addressing an advanced specialized area of Materials Engineering not covered by regularly offered courses. Course may be repeated for a maximum of 3 credit hours.

MATL 7980 MASTER MATERIALS ENGINEERING PROJECT (1-6). LEC., SU. Special design project report directed by major faculty. Topics to be determined by the student's graduate committee. Course may be repeated for a maximum of 6 credit hours.

MATL 7990 RESEARCH AND THESIS (1-15). MST., TD. Course may be repeated with change in topic.

MATL 8990 RESEARCH AND DISSERTATION (1-15). DSR., TD. Course may be repeated with change in topic.

MECHANICAL ENGINEERING (MECH)

MECH 2@0@0 MECHANICAL ENGINEERING PROGRESS ASSESSMENT I (0). TST., SU. Progress Assessment Examination in: multivariate calculus, differential equations, chemistry, physics, statics, dynamics.


MECH 3@0@0 MECHANICAL ENGINEERING PROGRESS ASSESSMENT II (0). TST., SU. Progress Assessment Examination in: Statistics, linear algebra, mechanical design, thermo-fluid design, social impact, contemporary issues.


MECH 3030 FLUID MECHANICS (3). LEC. 3. Pr., MECH 2110, ENGR 2010, MATH 2650. Coreq., MECH 3130. Fluid properties; fluid statics; mass conservation; momentum balance; external and internal flows; Euler and Bernoulli equations; dimensional analysis; viscous flows; boundary layers; compressible flow.


MECH 3140 SYSTEM DYNAMICS AND CONTROLS (3). LEC. 3. Pr., MECH 2120, MATH 2650. System dynamics and automatic control theory.

MECH 3220 COMPUTER-AIDED ENGINEERING (3). LEC. 2. LAB. 3. Pr., ENGR 1110, COMP 1200, MATH 2650. The computer as a tool in mechanical engineering.

MECH 3230 MACHINE DESIGN (3). LEC. 3. Pr., MECH 2210, MECH 3130, MECH 3220. Design of systems containing a variety of mechanical elements.

MECH 4240 COMPREHENSIVE DESIGN I (2). LEC. 1. LAB. 3. Pr., MECH 2000, MECH 3230 Coreq., MECH 3040, MECH 3050, MECH 3140, INSY 3600 Capstone engineering design course based on a design project similar to those encountered by the engineer in industry involving thermal and mechanical design.

MECH 4250 COMPREHENSIVE DESIGN II (2). LEC. 1. LAB. 3. Pr., MECH 3040, MECH 3050, MECH 3140, MECH 4240, INSY 3600. Continuation of MECH 4240. Detailed design, fabrication, communication, and presentation of a prototype machine for an industrial sponsor.


MECH 4310 HEATING, VENTILATING, AIR CONDITIONING AND REFRIGERATION (3). LEC. 3. Pr., MECH 3040. Theory and practice of modern heating, ventilation, air conditioning and refrigeration systems; concepts, equipment, and systems design.

MECH 4320 APPLIED CFD AND HEAT TRANSFER (3). LEC. 3. Pr., MECH 3040 and MATH 2660. Introduction to computational fluid dynamics and heat transfer techniques used to analyze thermal performance of devices and systems. Commercial software will be used.

MECH 4410 ENGINES (3). LEC. 3. Pr., ENGR 2200; OR ENGR 2010 and AERO 2300; OR CHEN 2610; OR MECH 3030 or CIVL 3110. Theoretical, design and application issues in internal combustion engine-driven powertrains, including combustion, engines, turbomachinery and drivetrains.

MECH 4420 VEHICLE DYNAMICS (3). LEC. 3. Pr., ENGR 2100 or ENGR 2350 or MECH 2120; and AERO 3110 or CHEN 2610 or CIVL 3110 or MECH 3030. Ground vehicle resistance, propulsion, maneuvering, and control tires, suspensions, braking, aerodynamics, case studies.

MECH 4430 VEHICLE DESIGN (3). LEC. 3. Pr., ENGR 2100 or ENGR 2070 or MECH 3130. Ground vehicle design process: arrangement, structure, systems safety, manufacturing, case studies.

MECH 4440 AUTOMOTIVE DESIGN EXPERIENCE I (2). LEC. 3. Pr., Departmental approval, any two of: MECH 4410, MECH 4420, MECH 4430. Team-based design of a ground vehicle, both whole-vehicle and subsystem design evaluation and modification; oral and written communication.

MECH 4450 AUTOMOTIVE DESIGN EXPERIENCE II (2). LEC. 1. LAB. 3. Pr., MECH 4440; department approval. Team-based fabrication, testing, modification and operation of a ground vehicle; oral and written communication; project management.

MECH 4490 NAVAL ARCHITECTURE (3). LEC. 3. Pr., MECH 3030 or AERO 3110 or CHEN 2610 or ENGR 2200 (broadly, any course in engineering fluid mechanics) Basic engineering of oceangoing vessels. Hydrostatics and stability; ship structures; resistance and propulsion; maneuvering and seakeeping. Exercises using professional software.

MECH 4510 INDUSTRIAL AND ENVIRONMENTAL NOISE CONTROL (3). LEC. 3. Pr., MECH 2120, MECH 3220. Sources of industrial and community noise, criteria for control, noise measuring instrumentation, issues
involved in the design of machinery for minimum noise, noise ordinances and regulations.


**MECH 4700 INTEGRATED ENGINEERING THEORY AND PRACTICE** (3). LEC. 3. Pr., MECH 2210. Real world engineering management decision making. Case studies from industry.

**MECH 4930 DIRECTED STUDIES IN MECHANICAL ENGINEERING** (1-3). INT. Pr., department approval. Individual or small group study of a specialized area of Mechanical Engineering under faculty direction. Course may be repeated for a maximum of 3 credit hours.

**MECH 4970 SPECIAL TOPICS IN MECHANICAL ENGINEERING** (1-3). LEC. Pr., departmental approval. Regular course addressing a specialized area of Mechanical Engineering not covered by a regularly offered course. Topics may vary. Course may be repeated for a maximum of 3 credit hours.

**MECH 4997 HONORS THESIS** (1-6). IND. Pr., membership in the Honors College; MECH major; departmental approval. Individual student directed research and writing of an honors thesis. Course may be repeated for a maximum of 6 credit hours.

**MECH 5010 COMPRESSIBLE FLUID FLOW** (3). LEC. 3. Pr., MECH 3020 and MECH 3030. Properties of ideal gases; General one-dimensional wave motion; Isentropic flow with area change; Normal shock waves; Flow with friction (Fanno Flow) and heat transfer (Rayleigh Flow); Method of characteristics.

**MECH 5110 INTERMEDIATE HEAT TRANSFER** (3). LEC. 3. Pr., MECH 3040. Introduction to the analytical treatment of heat transfer by conduction, convection, and radiation. Suitable for those that require general coverage of advanced theory but whose primary research interest may lie elsewhere.

**MECH 5120 COMBUSTION** (3). LEC. 3. Pr., MECH 3040. Thermodynamics and chemical kinetics of combustion processes, premixed and premixed flames, ignition, characterization and combustion of gaseous, liquid, and solid fuels, environmental aspects of combustion.


**MECH 5300 ADVANCED MECHANICS OF MATERIALS** (3). LEC. 3. Pr., MECH 3130. Stress and strain analysis, plane stress and plane strain concepts, generalization of Hook's law, stress function approach applications to 2-D problem, axisymmetric problems, bending of curved members, torsion of prismatic members, stress concentration problems.


**MECH 5390 FUNDAMENTALS OF THE FINITE ELEMENT METHOD** (3). LEC. 2. LAB. 3. Pr., MECH 3040, MECH 3130, MATH 2660. Introduction to the fundamentals of the finite element method.


**MECH 5420 DYNAMICS OF MULTIBODY SYSTEMS** (3). LEC. 3. Pr., MECH 3140. Concepts in dynamics of multibody systems such as kinematics analysis, Newton Euler, Lagrange and Kane equations of motion, collisions, and vibrations of flexible links.

**MECH 5430 BASICS SENSOR APPLICATIONS** (3). LEC. 3. Pr., MECH 3130. Basic concepts, fabrication and operation of micro machined semiconductor, piezoelectric, piezoresistive, capacitive and fiber-optic sensors.


**MECH 5510 ENGINEERING ACOUSTICS** (3). LEC. 3. Pr., MATH 2650. The fundamentals of acoustics. Vibration of strings, bars, plates. Acoustic plane waves, architectural acoustics and noise control will be emphasized.

**MECH 5610 MECHANICAL VIBRATION** (3). LEC. 3. Pr., MECH 2120, MATH 2650, MATH 2660. Modeling of lumped dynamic systems, free and forced vibration of single degree freedom systems, response to arbitrary excitation, analysis of two and ultiple degrees of freedom systems.


**MECH 5710 KINEMATICS AND DYNAMICS OF ROBOTS** (3). LEC. 3. Pr., MECH 3140. Basic concepts in robotics such as kinematics analysis, coordinate transformation, Lagrange and Newton Euler equations of motion.


**MECH 5810 MECHATRONICS** (3). LEC. 3. Pr., MECH 2120, ELEC 3810. Introduction to the integration of mechanisms, sensors, controllers and actuators for machines and design of automatic machinery.

**MECH 5820 INTRODUCTION TO OPTIMAL SYSTEMS** (3). LEC. 3. Pr., senior standing. 125roduction to the mathematical fundamentals of optimization. Application to multiple solution engineering problems in thermal-fluid and mechanical systems.

**MECH 5970 INTERMEDIATE SPECIAL TOPICS IN MECHANICAL ENGINEERING** (1-3). LEC. Pr., departmental approval. Regular course addressing an advanced specialized area of Mechanical Engineering not covered by a regularly offered course. Topics may vary. Course may be repeated for a maximum of 3 credit hours.

**MECH 6010/6016 COMPRESSIBLE FLUID FLOW** (3). LEC. 3. Pr., MECH 3030. Properties of ideal gases; General one-dimensional wave motion; Isentropic flow with area change; Normal shock waves; Flow with friction (Fanno Flow) and heat transfer (Rayleigh Flow); Method of characteristics.

**MECH 6110/6116 INTERMEDIATE HEAT TRANSFER** (3). LEC. 3. Pr., MECH 3040. Introduction to the analytical treatment of heat transfer by conduction, convection, and radiation. Suitable for those that require general coverage of advanced theory but whose primary research interest may lie elsewhere.


**MECH 6420/6426 DYNAMICS OF MULTIBODY SYSTEMS** (3). LEC. 3. Pr., MECH 3140. Concepts in dynamics of multibody systems such as kinematics analysis, Newton Euler, Lagrange and Kane equations of motion, collisions, and vibrations of flexible links.


Acoustic plane waves, architectural acoustics and noise control will be emphasized.

MECH 6610/6616 MECHANICAL VIBRATION (3). LEC. 3. Pr., MECH 2120, MATH 2650, MATH 2660. Modeling of lumped dynamic systems, free and forced vibration of single degree of freedom systems, response to arbitrary excitation, analysis of two and multiple degrees of freedom systems.


MECH 6710/6716 KINEMATICS AND DYNAMICS OF ROBOTS (3). LEC. 3. Pr., MECH 3140. Basic concepts in robotics such as kinematics analysis, coordinate transformation, Lagrange and Newton Euler equations of motion.


MECH 6810/6816 MECHATRONICS (3). LEC. 3. Pr., MECH 2120, ELEC 3810. Introduction to the integration of mechanisms, sensors, controllers and actuators for machines and design of automatic machinery.

MECH 6820/6826 INTRODUCTION TO OPTIMAL SYSTEMS (3). LEC. 3. Pr., senior standing. Introduction to the mathematical fundamentals of optimization. Application to multiple solution engineering problems in thermo-fluid and mechanical systems.

MECH 6930/6936 INTERMEDIATE DIRECTED STUDIES IN MECHANICAL ENGINEERING (1-3). LEC. Pr., departmental approval. Individual or small group study of an advanced specialized area of Mechanical Engineering under faculty direction. Course may be repeated for a maximum of 3 credit hours.

MECH 6970/6976 INTERMEDIATE SPECIAL TOPICS IN MECHANICAL ENGINEERING (1-3). LEC. Pr., departmental approval. Regular course addressing an advanced specialized area of Mechanical Engineering not covered by a regularly offered course. Topics may vary. Course may be repeated for a maximum of 3 credit hours.


MECH 7120/7126 ADVANCED FLUID MECHANICS II (3). LEC. 3. Pr., MECH 7110. Schwarz-Christoffel Transformation; Hodograph Method; Three-Dimensional Potential Flows; Interface Waves; Low Reynolds Number Solutions; Oseen Approximation; Stability of Laminar Flows.

MECH 7130/7136 BOUNDARY LAYER THEORY (3). LEC. 3. Pr., MECH 7110. Mass Conservation; Momentum Equation; Energy Equation; Dimensional Analysis; Fully-Developed Laminar Flows; Similarity Solutions; Boundary layer Approximation; Stability of Laminar Flows.


MECH 7150/7156 FLUID MECHANICS OF PROCESSING (3). LEC. 3. Pr., MECH 7130. Properties of Fluids; Governing Equations; Mass Dimensional analysis; Particle-Laden Flows; Applications to specific processing problems such as metal flows, polymers, surface deposition.

MECH 7210/7216 DIFFUSIVE TRANSPORT (3). LEC. 3. Pr., MECH 3040. Formulations and analytical solutions of steady, periodic, and unsteady heat and mass diffusion problems in one, two, and three dimensions.

MECH 7220/7226 CONVECTION HEAT TRANSFER (3). LEC. 3. Pr., MECH 3040. Advanced topics in free and forced convection transport within the laminar, transitional and turbulent regimes; confined and external flows.

MECH 7230/7236 THERMAL RADIATION (3). LEC. 3. Pr., MECH 3040. Fundamentals of thermal radiation heat transfer including: absorption, emission and reflection from solids; absorption, emission and scattering by gases; combined mode and conjugate heat transfer; exact and appropriate solution methodologies.

MECH 7240/7246 NUMERICAL METHODS IN HEAT TRANSFER (3). LEC. 3. Pr., MATH 2660, MECH 3040. Advanced topics in finite element and finite difference methods; solution techniques, stability and convergence.


MECH 7370/7376 ANALYSIS OF PLATES AND SHELLS (3). LEC. 3. Pr., MECH 3130. Theories for the bending and stretching of plate and shell structures. Transverse loading, buckling, vibration, and thermal stress problems. Introduction to energy methods, numerical techniques, and large deflection theories.


MECH 7410/7416 OPTICAL METHODS IN MECHANICS (3). LEC. 3. Pr., MECH 3130. Measurement of stresses, strains, and deformations using optical methods; optical interference; Fourier optics; optical spatial filtering, white light methods; coherent optical methods.

MECH 7430/7436 OPTICAL PROPERTIES OF ADVANCED MATERIALS (3). LEC. 3. Pr., MECH 6430 or PHYS 7200. Linear and nonlinear optical properties, correlation with material-structure, electro-optic effects, lasers, frequency conversion, fiber-optics, technological applications.


MECH 7630 MECHANICAL IMPACT (3). LEC. 3. Pr., departmental approval. Investigation of the fundamental concepts used to solve collision problems with friction.


MECH 7710/7716 CONTROL SYSTEMS ANALYSIS AND DESIGN (3). LEC. 3. Pr., MECH 3140. Topics from control theory are introduced in the context of control systems analysis and design, including state variable feedback, modal control, optimal control and adaptive control for both continuous and discrete systems.

MECH 7930 ADVANCED DIRECTED STUDIES IN MECHANICAL ENGINEERING (1-3). IND. Pr., department approval. Individual or small group study of an advanced specialized area of Mechanical Engineering under faculty direction. Course may be repeated for a maximum of 3 credit hours.

MECH 7950 GRADUATE SEMINAR (1). SEM. 1, SU. Topics may vary. Will not fulfill degree requirements. Course may be repeated with change in topic.

MECH 7970/7976 ADVANCED SPECIAL TOPICS IN MECHANICAL ENGINEERING (1-3). LEC. Pr., departmental approval. Regular course addressing an advanced specialized area of Mechanical Engineering not covered by regularly offered course. Topics may vary. Course may be repeated for a maximum of 3 credit hours.

MECH 7990 RESEARCH AND THESIS (1-12). MST., TD. Individual Master's thesis research. May be repeated for credit. Course may be repeated with change in topic.

MECH 8990 RESEARCH AND DISSERTATION (1-12). DSR., TD. Course may be repeated with change in topic.

Military Science (MILS)

Lt. Col. William H. Shaw, III - 844-5656

MILS 1010 INTRODUCTION TO ARMY ROTC I (1). LEC. 1. Coreq., MILS 1011. Introduction to the Reserve Officer Training Corps and the U.S. Army.

MILS 1011 INTRODUCTION TO ARMY ROTC I LAB (1). LAB. 3. Coreq., MILS 1010. Introduction to the Reserve Officer Training Corps and the U.S. Army.

MILS 1020 INTRODUCTION TO ARMY ROTC II (1). LEC. 1. Coreq., MILS 1021. Introduction to the Reserve Officer Training Corps and the U.S. Army.

MILS 1021 INTRODUCTION TO ARMY ROTC II LAB (1). LAB. 3. Coreq., MILS 1020. Introduction to the Reserve Officer Training Corps and the U.S. Army.

MILS 2010 SELF/TEAM DEVELOPMENT (1). LEC. 1. Coreq., MILS 2011. Learn and apply ethics-based leadership skills that develop individual attributes and contribute to effective team building.

MILS 2011 SELF/TEAM DEVELOPMENT LABATORY (1). LAB. 2. Coreq., MILS 2010. Learn and apply ethics-based leadership skills that develop individual attributes and contribute to effective team building.


MILS 2220 SURVIVAL SKILLS (1). LEC. 1. Pr., freshmen and sophomores only. Series of classes designed to develop basic knowledge and skills to improve one's chances of survival in any situation. Major topics include: first aid, fire and shelter building, land navigation, and food procurement. Fall, Spring.

MILS 3010 LEADING SMALL ORGANIZATIONS I (2). LEC. 2. Pr., admittance into the Advanced Course of Army ROTC. Coreq., MILS 3011. Introduction to squad level planning and operations.

MILS 3011 LEADING SMALL ORGANIZATIONS I LAB (1). LAB. 4. Pr., admittance into Advanced Course Army ROTC. Coreq., MILS 3010. Practical application of the foundational skills of small unit leadership.


MILS 3021 LEADING SMALL ORGANIZATIONS II LAB (1). LAB. 4. Pr., MILS 3010, MILS 3011. Coreq., MILS 3020. Series of practical opportunities to lead small groups, receive performance assessments and coaching, and lead again in situations of increasing complexity.


MILS 4040 THE ARMY PROFESSION (0). LEC. 1, SU. Pr., completion of Army ROTC Advanced Course or Early Commissioning Program. U.S. Army current trends and affairs. Army policies and programs.

Marketing (MKTG)

Dr. Rajan Natarajan - 844-4035

MKTG 3310 PRINCIPLES OF MARKETING (3). LEC. 3. Pr., 2.2 GPA, junior standing, ECON 2020. Study of functions, institutions, and basic problems in marketing of goods and services in a global economy. Course may be repeated for a maximum of 6 credit hours.

MKTG 3317 HONORS PRINCIPLES OF MARKETING (3). LEC. 3. Pr., ECON 2027. Membership in the honors college junior standing, cumulative grade Pr., point average of 2.2 or higher. Study of functions, institutions, and basic problems of marketing goods and services in a global economy. Fall, Spring.

MKTG 3410 CONSUMER BEHAVIOR (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Analysis of the buying process as it is affected by environmental and institutional forces.

MKTG 4320 PROMOTION STRATEGY (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Examination of promotional objectives, strategy and tactics in marketing.

MKTG 4330 RETAIL MANAGEMENT (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Principles of retail operation: facility location, layout, purchasing, pricing and merchandise control.

MKTG 4350 SERVICES MARKETING (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Examination of marketing in service industries and implementation of service marketing strategies.

MKTG 4360 MARKETING RESEARCH (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310, MKTG 3410 and STAT 2610. Research methods in marketing and their application to marketing problems.

MKTG 4370 SALES MANAGEMENT (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Principles and practices of organization and administration of sales organizations.

MKTG 4380 MARKETING CHANNEL SYSTEMS (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310 Designing channels: objectives, constraints, alternatives and motivating, evaluating, and controlling channel members.

MKTG 4390 PERSONAL SELLING (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Selling strategy as an interdisciplinary business activity.

MKTG 4400 INTERNATIONAL MARKETING (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Strategy, policy and the variables affecting international marketing decisions.

MKTG 4500 MARKETING ON THE INTERNET (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310, MNGT 3140, and either passing the Univeristy IT exam or C or better in COMP 1000. Use of electronic media and the Internet for marketing strategy.

MKTG 4600 GREEN MARKETING (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 3310. Marketing viewed from an environmental protection perspective and resulting green market strategies.

MKTG 4900 INDEPENDENT STUDY IN MARKETING (3). IND. 3, SU. Pr., 2.2 GPA, senior standing, departmental approval. Provides a relevant and
meaningful learning experience offering advanced research, reading and study in marketing.

**MKTG 4920 MARKETING STUDENT INTERNSHIP PROGRAM** (3). INT. 3, SU. Pr., 2.2 GPA, MKTG 3310, departmental approval. Provides a relevant and meaningful work experience in a marketing or marketing-related business, industry or organization.

**MKTG 4980 MARKETING STRATEGY** (3). LEC. 3. Pr., 2.2 GPA, grade of C or better in MKTG 4360 and in 6 hours of marketing electives. Strategic perspectives of market dynamics in different competitive environments across organizational levels.

**MKTG 4997 HONORS THESIS** (1-3). IND. Pr., Membership in the Honors College; 2.2 GPA; departmental approval. Provides honor’s students with the opportunity to conduct in-depth research. Thesis/research topics will be based on mutual agreement between committee and student. Course may be repeated for a maximum of 3 credit hours.

**MKTG 7050/7056 SOCIAL AND LEGAL ENVIRONMENT OF MARKETING** (3). LEC. 3. Pr., MKTG 3310 or departmental approval. The influence of the social, legal, political, and economic environments on marketing operations.

**MKTG 7310/7316 MARKETING MANAGEMENT** (3). LEC. 3. Pr., BUSI 7110, BUSI 7120 or departmental approval. In-depth analysis of concepts and techniques pertinent to executive decision-making in marketing. (3). LEC. 3. Pr., MKTG 3310 or departmental approval. Managerial perspective of the marketing communication process. (3). LEC. 3. Pr., MKTG 3310 or departmental approval. Examination of marketing in service industries and implementation of service marketing strategies.

**MKTG 7360/7366 MARKETING RESEARCH: METHODOLOGY AND APPLICATIONS** (3). LEC. 3. Pr., MNGT 6040, MKTG 3310 or departmental approval. Marketing research design, implementation and data analysis for marketing managers.

**MKTG 7370/7376 SALES MANAGEMENT** (3). LEC. 3. Pr., MKTG 3310 or departmental approval. In-depth study of sales management strategy and tactics. (3). LEC. 3. Pr., MKTG 3310 or departmental approval. Fundamental concepts, tools and applications of data base, direct marketing and sales promotion to marketing problems.

**MKTG 7400/7406 GLOBAL MARKETING AND DISTRIBUTION** (3). LEC. 3. Pr., MKTG 3310 or departmental approval. A strategic managerial perspective of global marketing and distribution operations.

**MKTG 7410/7416 ANALYSIS OF CONSUMER BEHAVIOR** (3). LEC. 3. Pr., MKTG 3310 or departmental approval. Psychological, sociological, and anthropological foundation of consumer and industrial purchase behavior and their application to marketing decisions.

**MKTG 7500/7506 ELECTRONIC MARKETING** (3). LEC. 3. Pr., MKTG 3310, departmental approval. Ethical and strategic use of electronic media and the Internet for marketing communications and strategy.

**MKTG 7500/7506 ENVIRONMENTALLY CONSCIOUS MARKETING MANAGEMENT** (3). LEC. 3. Pr., STAT 2610, MKTG 3310 or departmental approval. Advanced marketing strategies with an environmental focus.

**MKTG 7720/7726 NEW PRODUCTS DEVELOPMENT AND MANAGEMENT** (3). LEC. 3. Pr., MKTG 3310 or departmental approval. Marketing in the process of developing innovative products and services.

**MKTG 7940 INTERNATIONAL MARKETING ABROAD PROGRAM** (3-6). FLD. Pr., departmental approval. Course may be repeated for a maximum of 6 credit hours.

**MKTG 7970/7976 SPECIAL STUDIES IN MARKETING** (3). LEC. 3. Pr., Departmental approval. Variable content in the marketing and logistics area. Course may be repeated for a maximum of 6 credit hours.

**MKTG 7990 RESEARCH AND THESIS** (1-10). MST., TD. Pr., departmental approval. Course may be repeated with change in topic.

**Management (MNGT)**

Dr. Sharon Oswald - 8444071

**MNGT 3040 BUSINESS TELECOMMUNICATIONS MANAGEMENT** (3). LEC. 3. Pr., MKTG 3140; junior standing, 2.2 GPA (with a “C” or better). Voice communications and technology and data communications (LAN, WAN, Internet broadband), networks, protocols, standards, legislation and project development and management.

**MNGT 3070 BUSINESS COMPUTER APPLICATIONS** (3). LEC. 3. Pr., junior standing, 2.2 GPA. College of Business Information Technology requirement. Advanced applications using object oriented, visual languages for faster development. Explores microcomputer-based languages.

**MNGT 3080 ADVANCED PROGRAMMING AND COMPUTER APPLICATIONS** (3). LEC. 3. Pr., MKTG 3070 with a grade of “C” or better, junior standing, 2.2 GPA. Visual and object-oriented business programming languages are introduced and explored.

**MNGT 3100 PRINCIPLES OF MANAGEMENT** (3). LEC. 3. Pr., Junior Standing, 2.2 GPA. Management functions and the applications of management principles in organization.

**MNGT 3107 HONORS PRINCIPLES OF MANAGEMENT** (3). LEC. 3. Pr., Membership in the honors college junior standing, cumulative GPA of 2.2 or higher. Management functions and the applications of management principles in organization. Fall, Spring.

**MNGT 3140 INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS** (2). LEC. 4. Pr., 2.2 GPA. The fundamental principles of the structure and management of information systems.

**MNGT 3150 INTRODUCTION TO OPERATIONS MANAGEMENT** (2). LEC. 2. Pr., 2.2 GPA, Junior standing. The fundamental principles of the structure and management of business operations.

**MNGT 3250 INTRODUCTION TO ENTERPRISE OPERATIONAL SYSTEMS** (3). LEC. 3. Pr., MKTG 3150, STAT 2610 and 2.2 GPA. Concepts, fundamentals and framework of business enterprise software. Fall, Spring.


**MNGT 3460 ORGANIZATIONAL BEHAVIOR** (3). LEC. 3. Pr., 2.2 GPA. Coreq., MKTG 3100. Study, analysis and application of theories and techniques for understanding, predicting and managing human behavior in the organizational context.

**MNGT 3830 DATABASE MANAGEMENT SYSTEMS** (3). LEC. 3. Pr., MKTG 3830 with a grade of “C” or better and 2.2 GPA. Business applications software in a database environment, complex data and file structures, systems design consideration of global and distributed databases.

**MNGT 4090 ANALYSIS AND DESIGN OF BUSINESS INFORMATION SYSTEMS** (3). LEC. 3. Pr., MKTG 3830 with a grade of “C” or better and 2.2 GPA. General systems techniques, development methodologies, database considerations, project planning and control, system integration.

**MNGT 4100 MANAGEMENT IN GLOBAL BUSINESS ENVIRONMENT** (3). LEC. 3. Pr., MKTG 3100, 2.2 GPA. Issues unique to managing operations in the global business environment.

**MNGT 4140 ESSENTIALS OF ENTREPRENEURSHIP** (3). LEC. 3. Pr., 2.2 GPA, MKTG 3100, MKTG 3310, FINC 3610, ECON 2030. The application of basic business principles to the entrepreneurial environment. Spring.

**MNGT 4160 FAMILY BUSINESS MANAGEMENT** (3). LEC. 3. Pr., MKTG 3100 and 2.2 GPA. Coreq., MKTG 4140. Study of aspects of managing an established family business, on a day-to-day basis, and of planning for succession to the next generation. Spring.

**MNGT 4170 MANAGING ENTREPRENEURIAL START-UPS** (3). LEC. 3. Pr., MKTG 3100 and 2.2 GPA. Coreq., MKTG 4140. Study of aspects of managing an established family business, on a day-to-day basis, and of planning for succession to the next generation. Spring.

**MNGT 4180 GROWTH STRATEGIES FOR EMERGING COMPANIES** (3). LEC. 3. Pr., MKTG 4140 and 2.2 GPA. Coreq., MKTG 4190. Study of the important aspects of starting and managing a franchise business. Fall.

**MNGT 4190 NEW VENTURE CREATION** (3). LEC. 3. Pr., MKTG 4140 and 2.2 GPA. Analysis of industrial, competitive, market and financial aspects of starting a business. Fall.

**MNGT 4200 BUSINESS PLAN FOR THE NEW VENTURE** (3). LEC. 3. Pr., MKTG 4140, MKTG 4190, and 2.2 GPA. Application of entire business education and experience to a practical, hands-on project. Spring.

**MNGT 4210 CORPORATE VENTURING - ENTREPRENEURS IN ORGANIZATIONS** (3). LEC. 3. Pr., MKTG 4140, MKTG 4190, and 2.2 GPA. Study of the entrepreneurial process as it applies to the operations of a department or functional area within an established organization. Spring.
MNGT 4400 ORGANIZATIONAL DEVELOPMENT AND CHANGE (3). LEC. 3. Pr., MNGT 3100, MNGT 3460, MNGT 3420, 2.2 GPA. The complexities involved in implementing change in organizations.

MNGT 4430 LABOR RELATIONS (3). LEC. 3. Pr., junior standing, 2.2 GPA. General survey of the development of collective bargaining, major provisions of labor law and bargaining issues of craft and industrial unions.

MNGT 4610 INTERNATIONAL FIELD ANALYSIS PROJECT COURSE (3). LEC. 3. Pr., 2.2 GPA, junior standing. Field analysis project teams with local or multinational organizations in a foreign county. Course will be taught in conjunction with COB International Studies Programs.

MNGT 4800 STRATEGIC MANAGEMENT (3). LEC. 3. Pr., Senior standing, MKTG 3310, MNGT 3100, FINC 3610, College of Business Information Technology requirement, and 2.2 GPA. Objectives, strategy, and policies pertaining to a total organization. Problem-solving and the relationship between the functional areas of an organization.

MNGT 4807 HONORS STRATEGIC MANAGEMENT (3). LEC. 3. Pr., FINC 3617, MKTG 3317, MNGT 3107, Membership in the honors college junior standing, cumulative GPA of 2.2 or higher. Objectives, strategy, and policies pertaining to a total organization. Problem-solving and the relationship between the functional areas of an organization.

MNGT 4850 COMPETITIVE STRATEGIES THROUGH INFORMATION TECHNOLOGIES (3). LEC. 3. Pr., MNGT 3070, MNGT 3040, 2.2 GPA (with a “C” or better in both classes). Emphasizes how competitive strategies for companies is formulated and implemented using a combination of information technologies.

MNGT 4870 DATABASE SERVER FUNDAMENTALS (3). LEC. 3. Pr., Junior Standing, 2.2 GPA. Coreq., MNGT 3830. Database servers as core components of developing n-Tier information technology are discussed. Practical exercises used to demonstrate the process of using QSQL to manage database through data manipulation language and data definition language. Advanced database objects are introduced.

MNGT 4880 MANAGEMENT INFORMATION SYSTEMS PROJECTS (3). LEC. 3. Pr., junior standing, 2.2 GPA, and corequisite MNGT 4830. Synthesizes theory and principles of management information systems (MIS) using real-life, hands-on-projects.

MNGT 4890 STRATEGIC ENVIRONMENTAL MANAGEMENT (3). LEC. 3. Pr., MNGT 3100, 2.2 GPA. Course will examine the continuous relationship between the natural environment, strategy, and competitive advantage from both a domestic and international perspective.

MNGT 4920 INTERNSHIP (1-6). INT., SU. Pr., MNGT 3100, 2.2 GPA, and approval by departmental intern program committee. Course may be repeated for a maximum of 6 credit hours.

MNGT 4950 SEMINAR IN MANAGEMENT (1-10). SEM. Pr., departmental approval, junior standing, 2.2 GPA. Course may be repeated for a maximum of 10 credit hours.

MNGT 4967 HONORS READINGS (1-3). LEC. 3. Pr., Membership in the Honors College; Jr or Sr standing. Directed readings on a topic of special interest. Course may be repeated for a maximum of 3 credit hours.

MNGT 4997 HONORS THESIS (3). LEC. 3. Pr., Members in the Honors college; Jr or Sr Standing. Directed honors research thesis. Course may be repeated for a maximum of 3 credit hours.

MNGT 5040 ADVANCED BUSINESS DATA COMMUNICATIONS (3). LEC. 3. Pr., MNGT 7140 or MNGT 3040 2.2 GPA. Experienced-based class building on domain knowledge of prerequisites; gives personal and team experience in data communications technology and networks.

MNGT 5250 COMPETITIVE MANUFACTURING OPERATIONS (3). LEC. 3. Pr., 2.2 GPA. Coreq., MNGT 3250. Provides a working model of manufacturing operations and explores how information is revolutionizing the field. Fall.

MNGT 5350 COMPETITIVE SERVICE OPERATIONS (3). LEC. 3. Pr., 2.2 GPA. Coreq., MNGT 3250. Provides a working model of service operations and explores how information technology is revolutionizing the field. Fall.

MNGT 5370 INFORMATION TECHNOLOGY PROJECT MANAGEMENT (3). LEC. 3. Pr., 2.2 GPA, junior standing. Tools and techniques of information technology project management including leading project management software.

MNGT 5460 HUMAN RESOURCE LEGISLATION (3). LEC. 3. Pr., MNGT 3420, 2.2 GPA, junior standing. Legislation that impacts the management of human resources within the organization. Spring, Summer, Fall.

MNGT 5470 EMPLOYEE COMPENSATION (3). LEC. 3. Pr., MNGT 3420, 2.2 GPA. Modern compensation systems, strategic planning, wage and salary management, benefits administration and pay incentive development. Fall, Spring.

MNGT 5480 LABOR RELATIONS LAW (3). LEC. 3. Pr., MNGT 4430 or equivalent course, junior standing, 2.2 GPA. Legal principles and issues under the Labor Management Relations Act and related laws. Case problem analysis. Spring.

MNGT 5510 HUMAN RESOURCE PLANNING, DEVELOPMENT, AND APPRAISAL (3). LEC. 3. Pr., MNGT 3420, 2.2 GPA. Theory, practice and design of managerial systems in these functions. Spring, Summer, Fall.

MNGT 5520 HUMAN RESOURCES AND ORGANIZATIONAL RESEARCH (3). LEC. 3. Pr., STAT 2610, MNGT 3420, 2.2 GPA. Human resource problems studied through a project involving data collection, analysis and a research report. Spring.

MNGT 5540 HUMAN RESOURCES SELECTION AND PLACEMENT (3). LEC. 3. Pr., STAT 2610, MNGT 3420, 2.2 GPA. A review of contemporary issues involved in administering a program for selecting employees. Fall, Spring.

MNGT 5550 HUMAN RESOURCE INFORMATION SYSTEMS (3). LEC. 3. Pr., MNGT 3420, 2.2 GPA, and junior standing. Importance, nature, and application of a modern human resource information system such as SAP Human Resource Module. Spring.

MNGT 5560 ADVANCED OBJECT-ORIENTED AND INTERNET PROGRAMMING (3). LEC. 3. Pr., MNGT 3070 with a “C” or higher, 2.2 GPA. Fundamentals of developing object-oriented, component-based and Internet business applications.

MNGT 5680 ADVANCED DATA BASE ADMINISTRATION AND DEVELOPMENT (3). LEC. 3. Pr., MNGT 4830 with a “C” or higher or MNGT 7830 and 2.2 GPA. Key tasks and functions required of a database administrator in a business environment.

MNGT 5590 KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL LEARNING (3). LEC. 3. Pr., Junior standing or above. Introduction to knowledge management and its role in organizational decision-making and learning. Studies of issues related to management, creation, and use of knowledge as well as issues related to system design and implementation.

MNGT 5740 QUALITY MANAGEMENT SYSTEMS (3). LEC. 3. Pr., STAT 2610, MNGT 3140 with a “C” or higher, 2.2 GPA. Fundamentals of quality assurance; techniques for performing quality control and improvement functions; use of control charts in statistical process control; quality management systems. Spring.

MNGT 5900 SPECIAL PROBLEMS (1-3). IND., SU. Pr., departmental approval, junior standing, 2.2 GPA. Independent study on current topics in management. Course may be repeated for a maximum of 6 credit hours.

MNGT 5960 READINGS IN MANAGEMENT (1-3). IND., Pr., departmental approval, junior standing, 2.2 GPA. Independent study investigating current literature in management. Course may be repeated for a maximum of 6 credit hours.

MNGT 6040/6046 ADVANCED BUSINESS DATA COMMUNICATIONS (3). LEC. 3. Pr., MNGT 7140 or MNGT 3040 2.2 GPA. Experienced-based class building on domain knowledge of prerequisites; gives personal and team experience in data communications technology and networks.

MNGT 6250 COMPETITIVE MANUFACTURING ENTERPRISE (3). LEC. 3. Pr., BUSI 7220. Provides M.B.A. students with a working model of manufacturing operations and lets them explore how information technology can be used to re-engineer the manufacturing process.


MNGT 6350 COMPETITIVE SERVICE ENTERPRISES (3). LEC. 3. Pr., BUSI 7220. Provides M.B.A. students with a working model of service operations and lets them explore how information technology can be used to re-engineer the service process.

MNGT 6370 PROJECT MANAGEMENT (3). LEC. 3. In-depth study of the planning, scheduling and control processes in industrial projects.

MNGT 6460 HUMAN RESOURCE LEGISLATION (3). LEC. 3. Pr., MNGT 3420. Legislation that impacts the management of human resources within the organization.

MNGT 6470 EMPLOYEE COMPENSATION (3). LEC. 3. Pr., MNGT 3420. Study of the theory, procedures, techniques, and practices used to administer modern organization compensation systems.
MNGT 8300 THEORETICAL PERSPECTIVE ON ORGANIZATIONAL CHANGE (3). LEC. 3. Theoretical concepts from an organizational change perspective including organizational structure, effectiveness, culture, configurations, conflict, politics and resistance to change.

MNGT 8310 SEMINAR IN ADVANCED ORGANIZATIONAL BEHAVIOR (3). LEC. 3. Pr., departmental approval. Advanced study of theories and research in organizational behavior. Overarching organizational behavior paradigms and theoretical perspectives and research findings at the individual and group levels of analysis.

MNGT 8400 ADVANCED QUANTITATIVE METHODS FOR MANAGEMENT I (3). LEC. 3. Pr., STAT 7000 or approved equivalent. Study of the application of linear regression analysis to business research. First advanced course in applied linear statistics models.

MNGT 8410 ADVANCED QUANTITATIVE METHODS FOR MANAGEMENT II (3). LEC. 3. Pr., MNGT 8400 and departmental approval. Introduction to multivariate techniques in business research. Study of the theory and applications of ANOVA, ANCOVA, MANOVA, MANCOVA, Discriminate Analysis & Polytomous Logistic Regression.

MNGT 8420 ADVANCED QUANTITATIVE METHODS FOR MANAGEMENT III (3). LEC. 3. Pr., STAT 7100, MNGT 8400, MNGT 8410 or approved equivalents. Third course in statistical modeling. Emphasis on applications of Principal Components Analysis, and Structural Equation Modeling to management research.

MNGT 8500 ADVANCED MITI RESEARCH SEMINAR I (3). SEM. 3. Pr., Departmental approval. Theoretical foundations and research directions in the management of technology and technological innovation, with the primary focus on information technology and research.

MNGT 8660 ADVANCED MITI RESEARCH SEMINAR II (3). LEC. 3. Pr., departmental approval. Theoretical foundations and research directions in the alignment of information technology strategy to business objectives and goals.

MNGT 8740 COMPENSATION THEORY (3). LEC. 3. Pr., MNGT 8030. An examination of compensation theory, design technology, and research methodologies used in developing and analyzing compensation systems.

MNGT 8800 APPRaisal and DEVELOPMENT OF HUMAN RESOURCES (3). LEC. 3. Pr., MNGT 3420 or departmental approval. Coreq., MNGT 7010 and MNGT 7610. Examination of empirical issues pertaining to the performance appraisal and human resource development functions of organizations.

MNGT 8850 ADVANCED HUMAN RESOURCE SELECTION (3). LEC. 3. Pr., graduate statistics course; MNGT 7080 or departmental approval. Study of the technical considerations involved in the implementation of employee selection programs.

MNGT 8960 DOCTORAL SEMINAR IN MANAGEMENT I (3). LEC. 3. Pr., Departmental approval. Foundation course for PhDs in Management. Examination of books and writings that introduced today's management language and theory.

MNGT 8970 DOCTORAL SEMINAR IN MANAGEMENT II (3). SEM. 3. Pr., Departmental approval. Seminar on current literature relating to research methodology, and current perspectives of strategy, organization, change, leadership, knowledge management, and future direction for research.

MNGT 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Course may be repeated with change in topic.

Music (MUSI)

Dr. Thomas Smith - 844-4164
APPLIED MUSIC (MUAP)

MUAP 1010 PERFORMANCE (0). PRL. Pr., departmental approval. Coreq., Music Education Major or Music Minor. Remedial performance instruction to be taken on a limited basis by Music Education Majors and Music Minors. May be repeated only upon departmental approval and unusual circumstances. One half-hour private lesson per week.

MUAP 1110 PERFORMANCE (1). PRL. 1. Pr., Successful audition and departmental approval. Coreq., Music Education major. Instructors in major performance medium for the freshman Music Education major. One half-hour private lesson per week.

MUAP 1210 PERFORMANCE (1). PRL. 1. Pr., MUAP 1110, departmental approval and successful audition. Coreq., Music Education major. Instructors in major performance medium for the freshman Music Education major. One half-hour private lesson per week.

MUAP 1310 PERFORMANCE (1). PRL. 1. Pr., Successful audition and departmental approval. Coreq., Music minor or Music Education major. Instruction in major performance medium for the Music minor or secondary performance medium for the Music Education Major. One half-hour private lesson per week.

MUAP 1410 PERFORMANCE (1). PRL. 1. Pr., MUAP 1310, successful audition and departmental approval. Coreq., Music minor or Music Education major. Instruction in major performance medium for the Music Minor or secondary performance medium for the Music Education Major. One half-hour private lesson per week.

MUAP 2110 PERFORMANCE (1). PRL. 1. Pr., MUAP 1210 and departmental approval. Coreq., Music Education major. Instruction in major performance medium for the sophomore Music Education major. One half-hour private lesson per week.

MUAP 2210 PERFORMANCE (1). PRL. 1. Pr., MUAP 2110 and departmental approval. Coreq., Music Education major. Instruction in major performance medium for the sophomore Music Education major. One half-hour private lesson per week.

MUAP 2310 PERFORMANCE (1). PRL. 1. Pr., MUAP 1410 and departmental approval. Coreq., Music Education major or Music minor. Instruction in major performance medium for the Music Minor or secondary performance medium for the Music Education Major. One half-hour private lesson per week.

MUAP 2410 PERFORMANCE (1). PRL. 1. Pr., MUAP 2310 and departmental approval. Coreq., Music Education major or Music minor. Instruction in major performance medium for the Music minor or secondary performance medium for the Music Education Major. One half-hour private lesson per week.


MUAP 4220 PERFORMANCE (1). PRL. 1. Pr., MUAP 4120 and departmental approval. Coreq., Music Education major. Instruction in major performance medium for the senior Music Education major. One hour private lesson per week.

MUAP 7120 PERFORMANCE (2). PRL. Pr., departmental approval. Coreq., graduate Music Education major. Private instruction in selected performance medium for the graduate Music Education major. One hour private lesson per week.

MUAP 7220 PERFORMANCE (2). PRL. Pr., MUAP 7120 and departmental approval. Coreq., graduate Music Education Major. Private instruction in selected performance medium for the graduate Music Education major. One hour private lesson per week.

MUAP 7320 PERFORMANCE (2). PRL. Pr., MUAP 7220 and departmental approval. Coreq., graduate Music Education major. Private instruction in selected performance medium for the graduate Music Education major. One hour private lesson per week.

MUAP 7420 PERFORMANCE (2). PRL. Pr., MUAP 7320 and departmental approval. Coreq., graduate Music Education major. Private instruction in selected performance medium for the graduate Music Education Major. One hour private lesson per week.

MUSI 1000 PERFORMANCE ATTENDANCE (0). LEC., SU. Coreq., enrollment in MUAP. Required during each Semester of MUAP (Performance) enrollment. Monitored attendance at studio and departmental convocations, as well as approved concerts, lectures, and special presentations within the Music Department and community.

MUSI 1010 GUITAR AND STRING SKILLS (1). LEC. 1. Coreq., Music Education Major. Class instruction and practice in the rudiments of music performance of fretted and unfretted string instruments such as guitar, violin, viola, cello and string bass.


MUSI 1040 BRASS INSTRUMENTS SKILLS (1). LEC. 1. Pr., MUSI 1040 is not a prerequisite for MUSI 1050. Coreq., Music Education major. Class instruction and practice in the rudiments of music as applied to trumpet, trombone, horn and other brass instruments.

MUSI 1050 BRASS INSTRUMENTS SKILLS (1). LEC. 1. Pr., MUSI 1040 is not a prerequisite for MUSI 1050. Coreq., Music Education major. Class instruction and practice in the rudiments of music as applied to trombone, tuba, and other low-brass instruments.

MUSI 1060 WOODWIND INSTRUMENTS SKILLS (1). LEC. 1. Pr., MUSI 1060 is not a prerequisite for MUSI 1070. Coreq., Music Education major. Class instruction and practice in the rudiments of music as applied to double-reed instruments and saxophone.

MUSI 1070 WOODWIND INSTRUMENTS SKILLS (1). LEC. 1. Pr., MUSI 1060 is not a prerequisite for MUSI 1070. Coreq., Music Education major. Class instruction and practice in the rudiments of music as applied to flute and clarinet.

MUSI 1080 PERCUSSION SKILLS (1). LEC. 1. Coreq., Music Education major. Class instruction and practice in the rudiments of music as applied to various percussion instruments.


MUSI 1100 MARCHING BAND (1). LEC. 1. Pr., successful audition. Provides music for athletic contests and halftime shows at football games, various parades, pep rallies and other campus and off-campus events. Course may be repeated with change in topic.

MUSI 1110 CONCERT BAND (1). LEC. 1. A large performance group which rehearses and performs the literature of the concert band. Open to all Auburn University students with band performance experience. Course may be repeated with change in topic.

MUSI 1120 SYMPHONIC BAND (1). LEC. 1. Pr., successful audition. A large performance group which rehearses and performs the literature of the concert band. Open to any Auburn University student by audition only. Course may be repeated with change in topic.

MUSI 1130 JAZZ BAND (1). LEC. 1. Pr., successful audition. A performance group which rehearses and performs the jazz band literature. Open to any Auburn University student by audition only. Course may be repeated with change in topic.

MUSI 1140 CAMPUS BAND (1). LEC. 1. A concert band which gives playing experience to all university with past band experience. No audition required. Course may be repeated with change in topic.

MUSI 1150 ORCHESTRA (1). LEC. 1. Pr., successful audition. The Auburn Orchestra performs once each semester and is open to all university students based on the instrumental needs of the group and successful audition. Course may be repeated with change in topic.

MUSI 1160 UNIVERSITY SINGERS (1). LEC. 1. Pr., successful audition. A select choral ensemble for study and performance of madrigals, pop music, show tunes, and choral music of the jazz idiom. Course may be repeated with change in topic.

MUSI 1170 GOSPEL CHOIR (1). LEC. 1. Pr., departmental approval. Performance of choral works in the African-American gospel tradition. Course may be repeated with change in topic.

MUSI 1180 WOMEN'S CHORUS (1). LEC. 1. Pr., departmental approval. Course may be repeated with change in topic.

MUSI 1190 MEN'S CHORUS (1). LEC. 1. Pr., departmental approval. Course may be repeated with change in topic.

MUSI 1200 OPERA WORKSHOP (1). LEC. 1. Open to all Auburn University students interested in opera including performance, stage craft, make-up, conducting and coaching. The group prepares for a public performance. Course may be repeated with change in topic.

MUSI 1210 CONCERT CHOIR (1). LEC. 1. Pr., Successful audition. Concert choir is a mixed chorus for study and performance of serious choral literature. Course may be repeated with change in topic.

MUSI 1220 MUSIC ENSEMBLE (1). LEC. 1. Pr., departmental approval. Study and performance of musical compositions for small instrumental groups. Course may be repeated with change in topic.

MUSI 1230 VOCAL CHAMBER ENSEMBLE (1). LEC. 1. Pr., departmental approval. Study and performance of musical compositions of small vocal groups. Course may be repeated with change in topic.

MUSI 1310 MUSIC THEORY I (2). LEC. 2. A systematic study of music composition procedures, form and style during the Period of Common Practice.

MUSI 1320 MUSIC SKILLS I (1). LEC. 1. Development of aural, keyboard and sight singing skills with an understanding of basic harmonic practices.


MUSI 1420 MUSIC SKILLS II (1). LEC. 1. Pr., MUSI 1320. Development of aural, keyboard, and sight-singing skills with an understanding of basic harmonic practices.


MUSI 2310 MUSIC THEORY III (2). LEC. 2. Pr., MUSI 1410. A systematic study of music composition procedures, form, and style from the advent of chromaticism through the music of the 20th century.

MUSI 2320 MUSIC SKILLS III (1). LEC. 1. Pr., MUSI 1420. Development of advanced aural, keyboard, and sight-singing skills with the understanding of advanced harmonic practices.

MUSI 2410 MUSIC THEORY IV (2). LEC. 2. Pr., MUSI 2310. A systematic study of music composition procedures, form, and style from the advent of chromaticism through the music of the 20th century.

MUSI 2420 MUSIC SKILLS IV (1). LEC. 1. Pr., MUSI 2320. Development of advanced aural, keyboard, and sight-singing skills with the understanding of advanced harmonic practices.

MUSI 2730 APPRECIATION OF MUSIC (3). LEC. 3. Fine Arts Core. An orientation in the art of listening. Outstanding composers and musical composition. No previous music training required.

MUSI 2737 HONORS APPRECIATION OF MUSIC (3). LEC. 3. Pr., membership in the Honors College.Fine Arts Core. The art and folk musics of western and non-western cultures. No previous music training required.

MUSI 3000 INTRODUCTION TO ELECTRONIC MUSIC (2). LEC. 2. Pr., departmental approval. A study of the basic production and recording techniques of electronic music.

MUSI 3350 MUSIC HISTORY I (3). LEC. 3. Pr., MUSI 1410. MUSI 3510 is not prerequisite for MUSI 3520. A study of the development of music from the earliest times to the early 19th-century styles through recorded examples and readings.

MUSI 3510 MUSIC HISTORY II (3). LEC. 3. Pr., MUSI 1410. MUSI 3510 is not prerequisite for MUSI 3520. A study of music from the early 19th century to the present day through lectures, recorded examples and readings.

MUSI 3610 CHORAL CONDUCTING I (2). LEC. 2. Pr., MUSI 1410. Basic conducting technique and introduction to score reading and interpretation.

MUSI 3620 CHORAL CONDUCTING II (2). LEC. 2. Pr., MUSI 3610. Advanced conducting technique with practical experience in preparing choral groups for performance.

MUSI 3630 INSTRUMENTAL CONDUCTING I (2). LEC. 2. Pr., MUSI 1410. Basic conducting technique and introduction to score reading and interpretation.

MUSI 3640 INSTRUMENTAL CONDUCTING II (2). LEC. 2. Pr., MUSI 3630. Advanced conducting technique with practical experience in preparing instrumental groups for performance.

MUSI 4000 SENIOR RECITAL (0). PRL., SU. Pr., MUAP 3220. Coreq., senior standing. Demonstration of a professional level of achievement in the student's major performance medium by the successful presentation of a senior recital during or before the seventh semester of study.

MUSI 4010 VOCAL PEDAGOGY (2). LEC. 2. For prospective voice teachers. An intensive study of the materials and methods of voice training.

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MUSI 4020 INSTRUMENTAL PEDAGOGY (2). LEC. 2. For prospective instrumental teachers. An intensive study of the materials and methods of teaching various brass, woodwind and percussion instruments.

MUSI 4040 MUSIC INSTRUMENTS REPAIR (1). LEC. 1. Pr., senior standing. Coreq., Music Education Major. Selection, care and repair of woodwind, brass and percussion instruments with emphasis on adjustments which should be made by the instrumental director.

MUSI 4090 MARCHING BAND TECHNIQUES (2). LEC. 2. Fundamental methods and procedures of the marching band including study of computer-aided band charting systems.

MUSI 4100 ORCHESTRAL TECHNIQUES (2). LEC. 2. Fundamental methods and procedures of rehearsing the orchestra in areas of articulation, tone production, blend, balance, intonation, and musical expression.

MUSI 4110 CHORAL TECHNIQUES (2). LEC. 2. Coreq., junior standing. Methods and procedures of rehearsing choral groups in areas of diction, tone production, balance, blend, intonation, and musical expression.

MUSI 4400 INSTRUMENTAL ARRANGING (2). LEC. 2. Pr., junior standing. Designated to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments.

MUSI 4500 CHORAL ARRANGING (2). LEC. 2. Pr., MUSI 2410. Project course in arranging for various instrumental combinations from quartet to symphonic band.

MUSI 4600 ORCHESTRA (2). LEC. 2. Pr., MUSI 2410. Project course in arranging for various orchestra combinations.

MUSI 5520 CHORAL LITERATURE (2). LEC. 2. Pr., departmental approval. Coreq., junior standing. A chronological study of choral music from the Middle Ages to the present.

MUSI 5530 CHORAL LITERATURE (2). LEC. 2. Pr., departmental approval. Coreq., junior standing. History of the development of the wind band and its literature from ca. 1500 to the present.

MUSI 6520/6526 CHORAL LITERATURE (2). LEC. 2. Pr., departmental approval. Coreq., junior standing. A chronological study of choral music from the Middle Ages to the present.

MUSI 6530/6536 WIND BAND LITERATURE (2). LEC. 2. Pr., departmental approval. Coreq., junior standing. History of the development of the wind band and its literature from ca. 1500 to the present.

MUSI 7000/7006 ADVANCED CHORAL CONDUCTING I (2). LEC. 2. Coreq., registration in approved choral ensemble. Laboratory for the development of skills relating to conducting performances of traditional and modern choral works. Participation in an approved choral ensemble is required.

MUSI 7010/7016 ADVANCED CHORAL CONDUCTING II (2). LEC. 2. Pr., MUSI 7000. Coreq., registration in approved choral ensemble. Laboratory for the development of skills relating to conducting performances of traditional and modern choral works.

MUSI 7040/7046 ADVANCED INSTRUMENTAL CONDUCTING I (2). LEC. 2. Coreq., Registration in approved instrumental ensemble. Laboratory for the development of skills relating to conducting performances of traditional and modern instrumental works for large ensembles.

MUSI 7050/7056 ADVANCED INSTRUMENTAL CONDUCTING II (2). LEC. 2. Coreq., registration in approved instrumental ensemble. Laboratory for the development of skills relating to conducting performances of traditional and modern instrumental works for large ensembles. Participation in an approved instrumental ensemble is required.

MUSI 7060 BRASS INSTRUMENTS TECHNIQUES (1). LEC. 1. Coreq., registration in approved instrumental ensemble. Designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments.

MUSI 7070 WOODWIND INSTRUMENTS TECHNIQUES (1). LEC. 1. Coreq., registration in approved instrumental ensemble. Designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments.

MUSI 7080 PERCUSSION INSTRUMENTS TECHNIQUES (1). LEC. 1. Coreq., registration in approved instrumental ensemble. Designed to work out specific problems with graduate students in furthering their knowledge of and skill on various percussion instruments.

Nutrition and Food Science (NUFS)

**NUFS 1010 INTRODUCTION TO HOSPITALITY MANAGEMENT (2).** LEC. 2. Overview of the hotel, restaurant, club, and travel industries and their interaction.


**NUFS 2050 SCIENCE OF FOOD (4).** LEC. 3. LAB. 3. Pr., NUFS 2000, BIOL 1000 or BIOL 1020. Basic chemical and biological principles of food and food preparation methods, concepts of food quality, nutrition, sanitation, processing and food laws.

**NUFS 2070 INTRODUCTION TO DIETETICS AND NUTRITION (1).** LEC. 1. Pr., NUFS 2000 or departmental approval. Overview of professional roles and responsibilities in dietetics and nutrition with emphasis on professional development and conduct. Spring.

**NUFS 2300 HOSPITALITY LAW (3).** LEC. 3. Pr., NUFS 1010. Legal systems and laws relevant to the management of restaurants, hotels, private clubs and other hospitality operations. Spring.

**NUFS 3040 FOOD SYSTEMS OPERATIONS (2).** LEC. 2. Pr., NUFS 2050, junior standing. Principles for managing resources required in planning, purchasing, preparing and serving high quality food in food service operations. Fall.

**NUFS 3041 FOOD SYSTEMS OPERATIONS LABORATORY (2).** LAB. 4. Pr., TB test. Coreq., NUFS 3040. Laboratory experience in food service operations. Food safety certification is included.

**NUFS 3200 HOSPITALITY FINANCIAL MANAGEMENT (3).** LEC. 3. Pr., ACCT 2910. Financial systems and statements in the hospitality industry. Spring.

**NUFS 3380 STUDY ABROAD OPPORTUNITIES IN HUMAN SCIENCES (1).** LEC. 1. Exploration of study abroad opportunities for students interested in the International Minor in Human Sciences.

**NUFS 3400 HOSPITALITY MARKETING (2).** LEC. 2. Pr., NUFS 1010. Coreq., MKTG 3310. Service marketing concepts and issues as applied to the global hospitality industry. Spring.

**NUFS 3600 SERVICE MANAGEMENT (2).** LEC. 2. Pr., NUFS 1010, junior standing. Examination of the characteristics and needs of the premium service segment of the hospitality industry. Fall.

**NUFS 3620 COMMUNITY NUTRITION (2).** LEC. 2. Pr., NUFS 2000. Study of populations at nutrition risk, population-specific public health nutrition problems, and health care system programs. Fall.


**NUFS 4090 PROFESSIONAL ISSUES IN DIETETICS AND NUTRITION (1).** LEC. 1. Pr., NUFS 2070, senior standing. Professional issues and trends affecting dietetics and nutrition practice; planning for professional advancement; includes externship. Fall.

**NUFS 4290 PROFESSIONAL DEVELOPMENT IN FOOD SCIENCE (1).** LEC. 1. Pr., junior standing; NUFS major. Preparing for careers; enhancing computer and communication skills; planning for professional advancement. Spring.

**NUFS 4300 RESTAURANT MANAGEMENT (3).** LEC. 3. Pr., MNGT 3100. Coreq., NUFS 3040. Managerial issues in restaurant operation; fundamental principles of restaurant and menu design. Fall.

**NUFS 4380 STUDY/TRAVEL IN NUTRITION AND FOOD SCIENCE (1-6).** FLD. Pr., departmental approval. Concentrated study in nutrition, food science, or hotel and restaurant management in the US or international locations. Course may be repeated for a maximum of 6 credit hours.

**NUFS 4400 FOOD PROCESSING (4).** LEC. 3. LAB. 3. Pr., NUFS 2050, BIOL 3200. Food processing procedures including heat and cold processes, concentration, irradiation, dehydration and fermentation.

**NUFS 4410 EXPERIMENTAL FOOD SCIENCE (3).** LEC. 2. LAB. 3. Pr., NUFS 2050. Functions and interactions of ingredients and food constituents, factors affecting food quality. Spring.

**NUFS 4500 HOTEL MANAGEMENT (3).** LEC. 3. Pr., NUFS 1010, MNGT 3100. Management of hotels, with emphasis on housekeeping, engineering, reservations, and reception departments. Spring.

**NUFS 4580 NUTRITION AND FOOD SCIENCE: A GLOBAL PERSPECTIVE (2).** LEC. 2. Pr., NUFS 2000 or departmental approval. Factors affect-


NUFS 4900 INDEPENDENT STUDY (1-8). IND. Pr., departmental approval, junior standing. Independent reading or research in a content area of special interest; supervised by a faculty member. Course may be repeated for a maximum of 8 credit hours.

NUFS 4910 FOOD SCIENCE PRACTICUM (3). PRA. Pr., junior standing in the major, departmental approval. Practical experience in food industry, governmental laboratories, or other food science sites.

NUFS 4920 INTERNSHIP IN HOSPITALITY (10). INT. Pr., 2.00 GPA; 400 hours work experience in hospitality; junior standing; departmental approval. Application of principles and theories of hospitality in a professional hospitality setting.

NUFS 4999 UNDERGRADUATE RESEARCH AND STUDY (1-9). IND., SU. Pr., departmental approval. Directed research under faculty supervision. Course may be repeated for a maximum of 9 credit hours.

NUFS 4940 PROFESSIONAL DEVELOPMENT IN HOSPITALITY (2). IND. Coreq., NUFS 4920 or departmental approval. Computer-assisted capstone course to equip students with skills and experience for successful career entry. Internet and computer access required.

NUFS 4997 HONORS THESIS (1-3). IND., SU. Pr., membership in the Honors College; departmental approval. Research in specialized topics. Course may be repeated for a maximum of 3 credit hours.

NUFS 5020 MEDICAL NUTRITION I (3). LEC. 3. Pr., NUFS 3721, NUFS 4820, NUFS 4830 or departmental approval. Application of nutrition principles to the pathophysiological and biochemical changes associated with endocrine, cardiovascular and gastrointestinal tract diseases. Credit will not be given for both NUFS 5020 and NUFS 6020. Fall.

NUFS 5030 MEDICAL NUTRITION II (3). LEC. 3. Pr., NUFS 5020 or departmental approval. Application of nutrition principles to the pathophysiological and biochemical changes associated with sepsis, burns, and trauma as well as renal, respiratory and immune system diseases. Credit will not be given for both NUFS 5030 and NUFS 6030. Spring.

NUFS 5430 FOOD CHEMISTRY (4). LEC. 3. LAB. 3. Pr., BCHE 3180 or departmental approval. Chemistry of food components; chemical and physical changes of food during processing and storage. Credit will not be given for both NUFS 5430 and NUFS 6430.

NUFS 5450 FOOD ANALYSIS AND QUALITY CONTROL (4). LEC. 3. LAB. 3. Pr., NUFS 5430 or departmental approval. Principles and application of chemical and instrumental food analyses; quality control procedures. Credit will not be given for both NUFS 5450 and NUFS 6450. Fall.

NUFS 5530 CONTINUOUS QUALITY IMPROVEMENT IN HOSPITALITY (2). LEC. 2. Pr., NUFS 3600. Examination and analysis of the principles of continuous quality improvement and total quality management for the hospitality industry. Credit will not be given for NUFS 5530 and NUFS 6530/6536. Spring.

NUFS 5540 CONFERENCE COORDINATION (2). LEC. 2. Pr., NUFS 1010 and junior standing. Analysis of systems for management of the conference coordination segment of the conference coordination segment of the hospitality industry. Credit will not be given for NUFS 5540 and NUFS 6540. Spring.

NUFS 5550 CLUB MANAGEMENT (2). LEC. 2. Pr., NUFS 3600. Examination of unique features, opportunities and problems associated with club management. Credit will not be given for NUFS 5550 and NUFS 6550/6556.

NUFS 5560 NUTRITION AND FOOD SERVICE MANAGEMENT (4). LEC. 4. Pr., NUFS 3041, ACCT 2910 or departmental approval. Organization, management and marketing of food and nutrition service systems in health care facilities. Credit will not be given for both NUFS 5560 and NUFS 6560. Spring.

NUFS 5570 GLOBAL HOSPITALITY (2). LEC. 2. Pr., NUFS 3600. Contemporary issues confronting the global hospitality industry. Management and marketing operations emphasized. Credit will not be given for NUFS 5570 and NUFS 6570/6576.

NUFS 5590 RECREATIONAL FOODSERVICE MANAGEMENT (2). LEC. 2. Pr., NUFS 3600 or departmental approval. Methods and systems of managing foodservice operations in recreational facilities. Credit is not allowed for both NUFS 5590 and NUFS 6590/NUFS 6596.

NUFS 5620 SPORTS NUTRITION (3). LEC. 3. Pr., BIOL 2510, BCHE 3180 or departmental approval. Relationships between energy, carbohydrates, proteins, fluids, vitamins, minerals, body weight, ergogenic aids and physical performance. Credit will not be given for both NUFS 5620 and NUFS 6620. Spring.

NUFS 5640 FOOD PRODUCT DEVELOPMENT (4). LEC. 2. LAB. 6. Pr., NUFS 5430 or departmental approval. Food product development from concept to market. Credit will not be given for both NUFS 5640 and NUFS 6640. Spring.

NUFS 5770 FOOD PLANT SANITATION (4). LEC. 3. LAB. 3. Pr., BIOL 3200 or departmental approval. Sanitary regulations and procedures for hazard control and quality assurance in food industry. Credit is not allowed for both NUFS 5770/6770 and NUFS 6676.

NUFS 5820 NUTRITION IN THE LIFE CYCLE (3). LEC. 3. Pr., NUFS 4830 or departmental approval. Metabolic and clinical aspects of nutrition during key periods of the life cycle emphasizing pregnancy, infancy and late adulthood. Credit will not be given for both NUFS 5820 and NUFS 6820. Fall.

NUFS 6020 MEDICAL NUTRITION I (3). LEC. 3. Pr., NUFS 3721, NUFS 4820, 4830 or departmental approval. Application of nutrition principles to the pathophysiological and biochemical changes associated with endocrine, cardiovascular and gastrointestinal tract diseases. Credit will not be given for both NUFS 6020 and NUFS 5020. Fall.

NUFS 6030 MEDICAL NUTRITION II (3). LEC. 3. Pr., NUFS 6020 or departmental approval. Application of nutrition principles to the pathophysiological and biochemical changes associated with sepsis, burns, and trauma as well as renal, respiratory and immune system diseases. Credit will not be given for both NUFS 6030 and NUFS 5030. Spring.

NUFS 6430 FOOD CHEMISTRY (4). LEC. 3. LAB. 3. Pr., BCHE 3180 or departmental approval. Chemistry of food components; chemical and physical changes of food during processing and storage. Credit will not be given for both NUFS 6430 and NUFS 5430. Fall.

NUFS 6450 FOOD ANALYSIS AND QUALITY CONTROL (4). LEC. 3. LAB. 3. Pr., NUFS 6430 or departmental approval. Principles and application of chemical and instrumental food analyses; quality control procedures. Credit will not be given for both NUFS 6450 and NUFS 5450. Fall.

NUFS 6530/6536 CONTINUOUS QUALITY IMPROVEMENT HOSPITALITY (2). LEC. 2. Pr., NUFS 3600 or departmental approval. The principles of continuous quality improvement and total quality management for the hospitality industry. Credit will not be given for NUFS 6530/7536 and NUFS 5530. Spring.

NUFS 6540/6546 CONFERENCE COORDINATION (2). LEC. 2. Pr., departmental approval. Systems for the management of the conference coordination segment of the hospitality industry. Credit will not be given for NUFS 6540/7546 and NUFS 5540.

NUFS 6550/6556 CLUB MANAGEMENT (2). LEC. 2. Pr., NUFS 3600 or departmental approval. Unique features, opportunities, and problems associated with resort and club management. Credit will not be given for NUFS 6550/6556 and NUFS 5550.

NUFS 6560/6566 NUTRITION AND FOOD SERVICE MANAGEMENT (4). LEC. 4. Pr., NUFS 3041, ACCT 2910 or departmental approval. Organization, management and marketing of food and nutrition service systems in health care facilities. Credit will not be given for both NUFS 6560 and NUFS 6566. Spring.

NUFS 6570/6576 GLOBAL HOSPITALITY (2). LEC. 2. Pr., NUFS 3600 or departmental approval. Contemporary issues confronting the global hospitality industry. Credit will not be given for both NUFS 6570/7566 and NUFS 5570.

NUFS 6590/6596 RECREATIONAL FOOD SERVICE MANAGEMENT (2). LEC. 2. Pr., NUFS 3600 or departmental approval. Methods and systems of managing foodservice operations in recreational facilities. Credit is not allowed for both NUFS 5590/NUFS 6590/NUFS 6596.

NUFS 6620 SPORTS NUTRITION (3). LEC. 3. Pr., BIOL 2510, BCHE 3180 or departmental approval. Relationships between energy, carbohydrates, proteins, fluids, vitamins, minerals, body weight, ergogenic aids and physical performance. Credit will not be given for both NUFS 6620 and NUFS 6620. Spring.

NUFS 6640 FOOD PRODUCT DEVELOPMENT (4). LEC. 2. LAB. 6. Pr., NUFS 6430 or departmental approval. Food product development from
concept to market. Credit will not be given for both NUFS 6640 and NUFS 5640. Spring.

NUFS 6770/6776 FOOD PLANT SANITATION (4). LEC. 3, LAB. 3, Pr., BIOL 3200 or departmental approval. Sanitary regulations and procedures for hazard control and quality assurance in food industry. Credit is not allowed for both NUFS 5770/6770 and NUFS 6776.

NUFS 6820 NUTRITION IN THE LIFE CYCLE (9). LEC. 3, Pr., NUFS 4830 or departmental approval. Metabolic and clinical aspects of nutrition during key periods of the life cycle emphasizing pregnancy, infancy and late adulthood. Credit will not be given for both NUFS 6820 and NUFS 5820. Fall.

NUFS 6910 PRACTICUM IN NUTRITION AND FOOD SCIENCE (1-12). PRA., SU. Pr., departmental approval. Application of principles and theories of nutrition or food science in a professional setting. No more the three hours may count toward a graduate degree. Course may be repeated for a maximum of 12 credit hours.

NUFS 7050/7056 METHODS OF RESEARCH (2). LEC. 2. Pr., departmental approval. Research methods and designs applicable to disciplines represented in nutrition and food science. Credit is not allowed for both NUFS 7050 and NUFS 7056. Spring.

NUFS 7200 CARBOHYDRATE CHEMISTRY AND FUNCTIONALITY IN FOODS (3). LEC. 3, Pr., NUFS 6430 or departmental approval. Chemistry and functionality of sugars, starches and hydrocolloids as applied to food systems.

NUFS 7210 FOOD PROTEINS AND FATS (3). LEC. 3. Pr., NUFS 6430 or departmental approval. Advanced theories and practices of food science in the areas of protein and fat.

NUFS 7280 LABORATORY METHODS IN FOOD SCIENCE AND NUTRITION (3). LEC. 2, LAB. 3. Pr., departmental approval. Modern laboratory techniques and instruments used in human nutrition and food science research.

NUFS 7500 MINERALS (2). LEC. 2. Pr., departmental approval. Sources, digestion, absorption, transport, function and metabolism of major and trace minerals in the human body. Fall.

NUFS 7510 VITAMINS (2). LEC. 2. Pr., departmental approval. Advanced study of metabolism, requirements, interactions and deficiencies of the fat and water soluble vitamins as related to humans. Fall.


NUFS 7850 RESEARCH SEMINAR FOR MASTER'S PROGRAM (1). SEM. 1. Pr., departmental approval. Current topics in nutrition and food science presented by doctoral students. Course may be repeated for a maximum of 2 credit hours.

NUFS 8910 SUPERVISED TEACHING (1). IND. 1. Pr., departmental approval. Practical experience teaching in the classroom. Course may be repeated for a maximum of 3 credit hours.

NUFS 8970/8976 ADVANCED TOPICS IN NUTRITION AND FOOD SCIENCE (1-6). LEC. Pr., Departmental approval. A) Nutrition, B) Food Science, C) Hotel and Restaurant Management. Course may be repeated for a maximum of 6 credit hours.

NUFS 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Research in an area of specialization. Course may be repeated with change in topic.

Nursing (NURS)

Dr. Barbara Witt - 844-5665

NURS 1010 ORIENTATION TO NURSING (1). LEC. 1. SU. Introduction to the discipline of nursing as a career.


NURS 3420 NURSING RESEARCH AND DATA MANAGEMENT (2). LEC. 2. Pr., STAT 2510, STAT 2510, STAT 2610, STAT 3010 or departmental approval and admission to the Nursing Professional program. Explores the research process as the systematic means for contributing to nursing knowledge.

NURS 3510 FUNCTIONAL NURSING SKILLS (1). LEC. 1. Pr., admission to the School of Nursing. Coreq., NURS 3511, NURS 3710, NURS 3610, BIOL 4400. Core clinical skills used in nursing practice.

NURS 3511 FUNCTIONAL NURSING SKILLS LAB (1). LAB. 3. SU. Pr., admission to the School of Nursing. Coreq., NURS 3510, NURS 3610, BIOL 4400. Clinical application of core clinical skills used in nursing practice.


NURS 3531 NURSING CARE OF SPECIAL POPULATIONS II LAB (2). LAB. 6. SU. Pr., NURS 3720, NURS 3420, NURS 3320. Coreq., NURS 3530, NURS 3630. Clinical application of concepts and theories underlying the nursing care of the childbearing family and children with special needs.

NURS 3610 COMPREHENSIVE HEALTH ASSESSMENT (3). LEC. 3. Pr., admission to the School of Nursing. Coreq., NURS 3611, NURS 3710, NURS 3510, BIOL 4400. Concepts and theories underlying the health assessment of individuals across the life and in families and communities.

NURS 3611 COMPREHENSIVE HEALTH ASSESSMENT LAB (2). LAB. 6. SU. Pr., admission to the School of Nursing. Coreq., AND and TRAD: NURS 3610, NURS 3710, NURS 3510, BIOL 4400. Clinical application of concepts and theories underlying the health assessment of individuals across the lifespan, and in families and communities.

NURS 3630 NURSING CARE OF SPECIAL POPULATIONS II (3). LEC. 3. Pr., NURS 3720, 3420, 3320, Coreq., NURS 3631, NURS 3630. Theories and concepts related to nursing management of clients with chronic psychosocial and/or physiological impairments.

NURS 3631 NURSING CARE OF SPECIAL POPULATIONS II LAB (2). LAB. 6. SU. Pr., NURS 3720, NURS 3420, NURS 3320. Coreq., NURS 3630, NURS 3630. Clinical application of theories and concepts related to nursing management of clients with chronic psychosocial and/or physiological impairment.

NURS 3710 PROFESSIONAL NURSING CONCEPTS I (2). LEC. 2. Pr., admission to the School of Nursing. Coreq., NURS 3711, NURS 3610, NURS 3510, BIOL 4400. Evolution of principles basic to nursing practice in community and institutional environments. Emphasis on health promotion, nursing process, health care systems and critical thinking.

NURS 3711 PROFESSIONAL NURSING CONCEPTS II LAB (1). LAB. 3. Pr., Admission to the School of Nursing. Coreq., NURS 3710, NURS 3711, NURS 3610, NURS 3610, NURS 3710. An introductory course in computer applications is designed to foster attainment of knowledge, skills, and attitudes for beginning a successful career as a nurse in a computerized environment. Emphasis is given to the nursing application of information technology.


NURS 3810 ADVANCED HEALTH ASSESSMENT (2). LEC. Pr., admission to the School of Nursing. Coreq., NURS 3811, NURS 3831. Concepts and theories underlying health assessment of individuals, families, and communities across the lifespan. Summer.

NURS 3811 ADVANCED HEALTH ASSESSMENT CLINICAL (1). LAB. 2. SU. Pr., admission to School of Nursing. Coreq., NURS 3810. Clinical application of concepts and theories underlying health assessment of individuals, families, and communities across the lifespan. Summer.

NURS 3830 NURSING RESEARCH AND DATA MANAGEMENT (2). LEC. Pr., admission to School of Nursing, successful completion of introductory statistics. Explore the research process as the systematic means for contributing to research. Summer.

NURS 3831 COMPUTER IN NURSING (1). LAB. 2. Pr., Admission to School of Nursing. An introductory course in computer applications designed to foster the attainment of knowledge skills and attitudes for beginning a successful career as a nurse in a computerized healthcare environment. Emphasis is given to the nursing application of information technology. Summer.


NURS 3930 DIRECTED STUDIES IN NURSING (1-6). IND. Pr., admission to professional curriculum. Directed individual study plan designed for students out of sequence in the professional nursing curriculum. Topics and activities will relate to the point in the curriculum in which the student was unsuccessful in the professional nursing curriculum. May not substitute for professional elective.

NURS 4110 CHILDREN WITH CHRONIC ILLNESSES (3). LEC. 3. Pr., senior-level student in Nursing or health-related field. Theories and concepts of care of children with special needs and/or chronic health problems.

NURS 4120 CAMP NURSING (3). LAB. 6. SU. Pr., senior-level nursing student. Clinical experience in the care of children with chronic conditions in a camp setting.

NURS 4130 NURSING: THE ART OF CARING (3). LEC. 3. Pr., senior-level Nursing student. Philosophical, social, and ethical principles inherent in the practice of professional nursing. Emphasis is on caring as a philosophy to guide clinical practice.

NURS 4140 CONTEMPORARY HEALTH ISSUES OF WOMEN (3). LEC. 3. Pr., senior-level Nursing student. Explores the health care delivery system as it pertains to women.

NURS 4150 HUMAN SEXUALITY IN HEALTH AND ILLNESS (3). LEC. 3. Pr., senior-level Nursing student or related medical field. Human sexuality in relation to the health-illness continuum. Sexuality across the lifespan.

NURS 4160 SPIRITUAL PERSPECTIVES IN NURSING (3). LEC. 3. Pr., senior-level Nursing student. Use of the nursing process to help clients with various spiritual orientations meet spiritual needs.


NURS 4180 TRAUMA NURSING (3). LEC. 3. Pr., senior-level Nursing student. A broad overview of the specialty of trauma nursing and the multiple factors that affect patient care in an emergency or trauma situation.

NURS 4190 AIDS: A SOCIAL EPIDEMIC (3). LEC. 3. Pr., senior-level Nursing student. The psychosocial, physical, emotional, ethical, legal, behavioral, and changing health care needs of clients, families, aggregates and populations as a result of AIDS.

NURS 4210 APPLIED CLINICAL NUTRITION FOR NURSES (3). LEC. 3. Pr., senior-level Nursing student; NUFS 2000. Independent function of the nurse as a provider of nutritional care for the individual.

NURS 4220 INTEGRATIVE HEALING THERAPIES (3). LEC. 3. Pr., senior-level Nursing student. Theoretical and empirical bases for the use of selected interventions in clinical nursing practice.


NURS 4810 HOLISTIC PATHOPHYSIOLOGY (3). LEC. Pr., admission to the School of Nursing. Coreq., NURS 3831. Holistic approach to human pathophysiology and psychoneuroimmunology. Fall.

NURS 4811 TRANSITION INTO PROFESSIONAL NURSING LAB (1). LAB. 2. SU. Pr., admission to the EARN Program. Coreq., NURS 4810. Provides registered nurse students with opportunities to apply concepts and theoretical formulations of professional nursing practice in the clinical setting.


NURS 4821 HEALTH PROMOTION IN FAMILY SYSTEMS LAB (1). LAB. 6. SU. Pr., NURS 3810, NURS 3840, NURS 3831. Coreq., NURS 4820. Concepts and theory underlying health promotion and primary prevention in family systems utilized in family health care practices. Fall.

NURS 4830 LEADERSHIP AND MANAGEMENT IN NURSING (2). LEC. 3. Pr., NURS 3840, 3841. Coreq., NURS 4831. Concepts and theoretical foundation for implementation of the leadership and management role to the professional nurse in healthcare organization. Fall.

NURS 4831 LEADERSHIP AND MANAGEMENT IN NURSING CLINICAL (1). LAB. 6. SU. Pr., NURS 3840, 3841, 3831. Coreq., NURS 4830. Concepts and theoretical foundation for implementation of the leadership and management role of the professional nurse in healthcare organization. Fall.

NURS 4840 TRANSITION TO PROFESSIONAL NURSING II (4). LEC. 2. Pr., NURS 3810, NURS 3840, NURS 3830, NURS 3831, NURS 4810, NURS 4820, NURS 4830. Coreq., NURS 4850, NURS 4860. Issues related to transformation into professional nursing practice and continuing professional development are analyzed. Legal and ethical aspects and current trends in nursing are explored. Spring.


NURS 4861 LEADERSHIP/ MANAGEMENT AND INFORMATION MANAGEMENT IN NURSING LAB (1). LAB. 3. SU. Pr., admission to the EARN program. Coreq., NURS 4860. Practice in the management of information and nursing care delivery systems in a rapidly changing technological environment.

NURS 4872 EARN SEMINAR (2). LEC. 2. Pr., EARN clinical courses. Exploration of issues related to nursing and health care to facilitate socialization into the role of the professional nurse.

NURS 4880 ACCELERATED PROFESSIONAL NURSING PRACTICE III (5). LEC. 5. Pr., NURS 3880, NURS 3320. Coreq., NURS 4881, NURS 3420. Theories and concepts of nursing management of clients from multiple aggregates experiencing complex stressors in various settings. Includes special populations with chronic physiological or psychological stressors.

NURS 4881 ACCELERATED PROFESSIONAL NURSING PRACTICE III LAB (5). LAB. 5. SU. Pr., NURS 3880, NURS 3320. Coreq., NURS 4880, NURS 3420. Applications of theories and concepts of nursing management of clients from multiple aggregates experiencing complex stressors in various settings. Includes special populations with physiological and psychological stressors.

NURS 4900 INDEPENDENT STUDY IN NURSING (1-6). IND. Pr., admission to the professional program. Directed readings and/or clinical study in student-selected areas related to nursing.


NURS 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College. Course may be repeated for a maximum of 3 credit hours.

**Philosophy (PHIL)**

**PHIL 1010 INTRODUCTION TO LOGIC** (3). LEC. 3. Philosophy Core. Basic logical principles and applications: definition, informal fallacies, categorical logic, elementary propositional logic, analogy and selected inductive inferences.

**PHIL 1017 HONORS LOGIC** (3). LEC. 3. Pr., membership in the Honors College. Philosophy Core. Basic logical principles and applications: definition, informal fallacies, categorical logic, elementary propositional logic, analogy and selected inductive inferences.

**PHIL 1020 INTRODUCTION TO ETHICS** (3). LEC. 3. Philosophy Core. Major ethical theories from the history of philosophy, their foundations in epistemology and metaphysics, and their extension into social thought.

**PHIL 1027 HONORS ETHICS** (3). LEC. 3. Pr., membership in the Honors College. Philosophy Core. Major ethical theories from the history of philosophy, their foundations in epistemology and metaphysics, and their extension into social thought.

**PHIL 1030 ETHICS AND THE HEALTH SCIENCES** (3). LEC. 3. Philosophy Core. Ethical inquiry into such major issues as abortion, euthanasia, physician-assisted suicide, euthanasia, health-care delivery methods, and informed consent.

**PHIL 1037 HONORS ETHICS AND THE HEALTH SCIENCES** (3). LEC. 3. Pr., membership in the Honors College. Philosophy Core. Ethical inquiry into such major issues as abortion, euthanasia, physician-assisted suicide, euthanasia, health-care delivery methods, and informed consent.

**PHIL 1040 BUSINESS ETHICS** (3). LEC. 3. Philosophy Core. Types of ethical theory; application to such normative issues in commerce as advertising, management, and business abroad.

**PHIL 1100 INTRODUCTION TO PHILOSOPHY** (3). LEC. 3. The methods of philosophical inquiry and an examination of selected philosophical topics.

**PHIL 2010 DEDUCTIVE LOGIC** (3). LEC. 3. Argument structure, symbolic notation and translation, formal proofs and invalidations in propositional logic and in first-order predicate logic.

**PHIL 3050 AESTHETICS** (3). LEC. 3. Modern and contemporary theories of the nature of art.

**PHIL 3110 SYMBOLIC LOGIC** (3). LEC. 3. Pr., PHIL 1010 or departmental approval. Propositional logic and predicate logic through relations: natural language and logic; some philosophical problems in logic.

**PHIL 3160 PHILOSOPHIES OF HUMAN NATURE** (3). LEC. 3. An historical survey of major theories of human nature.

**PHIL 3300 PHILOSOPHY OF RELIGION** (3). LEC. 3. Nature religion, religious language, religious knowledge, religious theories of humanity and evil, examines arguments for the existence of God and immortality of soul.

**PHIL 3330 HISTORY OF PHILOSOPHY I: ANCIENT AND EARLY MEDIEVAL** (3). LEC. 3. Philosophic thought from the pre-Socratics through Aquinas, emphasizing Plato and Aristotle.

**PHIL 3340 HISTORY OF PHILOSOPHY II: LATE MEDIEVAL AND EARLY MODERN PHILOSOPHY** (3). LEC. 3. Philosophical thought from Occam to Kant emphasizing major thinkers.

**PHIL 3350 HISTORY OF PHILOSOPHY III: RECENT AND CONTEMPORARY PHILOSOPHY** (3). LEC. 3. Various representatives of the major philosophical trends during these periods.

**PHIL 3400 MEDIEVAL PHILOSOPHY** (3). LEC. 3. Philosophical thought from late antiquity through the Middle Ages. Emphasis on Plotinus, Islamic thinkers, Augustine, Abelard, Anselm and Thomas Aquinas.

**PHIL 3420 BRITISH EMPIRICISM** (3). LEC. 3. Pr., junior standing. 17th and 18th century empiricism emphasizing Locke, Berkeley, Hume.

**PHIL 3440 CONTINENTAL RATIONALISM** (3). LEC. 3. Pr., junior standing. Major themes in such thinkers as Descartes, Spinoza, Leibniz, Gassendi.

**PHIL 3450 PHILOSOPHICAL PERSPECTIVES ON THE SCIENTIFIC REVOLUTION** (3). LEC. 3. Changes in science and worldview from Copernicus to Newton, including the political and theological implications of the changes.

**PHIL 3500 EPISTEMOLOGY** (3). LEC. 3. Pr., junior standing. The origin, nature, kinds, and validity of knowledge with a consideration of faith, intuition, belief, opinion, certainty and probability.


**PHIL 3540 PHILOSOPHY OF MIND** (3). LEC. 3. Pr., junior standing. Classical and modern texts on the phenomenology of consciousness and mind-body problems.

**PHIL 3550 PHILOSOPHY OF LANGUAGE** (3). LEC. 3. A survey of contemporary philosophical discussions of the nature of language.

**PHIL 3600 POLITICAL PHILOSOPHY** (3). LEC. 3. The political thought of both classical and contemporary thinkers, including Plato, Aristotle, Machiavelli, Hobbes, Locke, Mill, Spencer, Marx, Rawls, and Nozick.

**PHIL 3640 PHILOSOPHY OF LAW** (3). LEC. 3. The function of law including judicial reasoning, ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics.

**PHIL 3660 APPLIED ETHICS** (3). LEC. 3. Advanced philosophical study of the ethical issues that arise in such intellectual endeavors as medicine, law, business, military science, engineering, etc.

**PHIL 3700 METAPHYSICS** (3). LEC. 3. Pr., junior standing. A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism and the mind-body problem.


**PHIL 3740 EXISTENTIALISM** (3). LEC. 3. Pr., junior standing. Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.

**PHIL 3970 SPECIAL TOPICS** (3). LEC. 3. Pr., junior standing, departmental approval. Topics vary. Course may be repeated for a maximum of 6 credit hours.

**PHIL 4500 PHILOSOPHY OF SCIENCE** (3). LEC. 3. Empirical meaning, verifiability, measurement, probability, causality and determinism.


PHIL 4620 MODERN ETHICAL THEORIES (3). LEC. 3. Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.

PHIL 4700 PLATO (3). LEC. 3. Pr., junior standing. Plato’s Methodology, epistemology, metaphysics, ethics, and political theory.

PHIL 4750 ARISTOTLE (3). LEC. 3. Pr., junior standing, Aristotle’s logic, epistemology, metaphysics, ethics, political theory, psychology.

PHIL 4780 KANT AND TRANSCENDENTAL IDEALISM (3). LEC. 3. The philosophy of Kant in particular but also of the early Fichte and Schelling and of neo-Kantians.

PHIL 4960 READINGS IN PHILOSOPHY (1-6). IND. Pr., junior standing. departmental approval. Specific reading programs on a particular philosopher, period or problem. Course may be repeated for a maximum of 6 credit hours.

PHIL 4967 READINGS FOR HONORS IN PHILOSOPHY (1-3). IND. Pr., membership in the Honors College, departmental approval. Reading programs on a philosopher, period or problem. Course may be repeated for a maximum of 3 credit hours.

PHIL 4997 HONORS THESIS (1-3). IND. Pr., enrollment in Honors College. Senior thesis for students in the university Honors College. Course may be repeated for a maximum of 3 credit hours.

PHIL 5950 SEMINAR (1-3). SEM. Pr., departmental approval. The content will vary from movements of thought to an intensive study of one of the great thinkers. Course may be repeated for a maximum of 6 credit hours.

PHIL 6950 SEMINAR (1-3). SEM. Pr., departmental approval. The content will vary from movements of thought to an intensive study of one of the great thinkers. Course may be repeated for a maximum of 3 credit hours.

REligious studies (reLG)

RELG 1010 INTRODUCTION TO RELIGIOUS STUDIES (3). LEC. 3. Major themes in religion, including religious experience, religion and society and the diversity of religions. Examples from various religious traditions.


RELG 3330 EASTERN RELIGIONS (3). LEC. 3. Hinduism, Buddhism and Confucianism with secondary attention to other Asian religions.

RELG 3340 WESTERN RELIGIONS (3). LEC. 3. Islam, Judaism and Christianity, with attention to Druze religion and Bah’al.


RELG 4960 READINGS IN RELIGIOUS STUDIES (3). LEC. 3. Pr., junior standing. Only for PHIL major with Religious Studies option. A program of independent study on a special topic. Course may be repeated for a maximum of 6 credit hours.

RELG 4967 HONORS READING COURSE (3). LEC. 3. Pr., membership in the Honors College; junior or senior standing. Discuss readings on specialized topics in Religious Studies.

RELG 4970 SPECIAL TOPICS (3). LEC. 3. Course may be repeated with change in topic.

Physics (PHYS)

PHYS 1001 FOUN OF PHYSICS LAB (0). LAB., NG. Coreq., PHYS 1000. Laboratory course for PHYS 1000. The 2-hour laboratory emphasizes hands-on experience.

PHYS 1150 ASTRONOMY (4). LEC. 3, LAB. 3. Coreq., PHYS 1151. Science Core. Open to non-science majors. Earth, the solar system, stars, neutron stars, black holes, supernova, the expanding universe, and modern cosmological theories.

PHYS 1150 ASTRONOMY LAB (0). LAB., NG. Coreq., PHYS 1150. Laboratory course for PHYS 1150. The 3-hour laboratory emphasizes studies with the telescope.


PHYS 1501 GENERAL PHYSICS I LABORATORY (0). LAB., NG. Coreq., PHYS 1500. Laboratory course for PHYS 1500. Two 2-hour sessions per week.


PHYS 1511 GENERAL PHYSICS II LABORATORY (0). LAB., NG. Coreq., PHYS 1510. Laboratory course for PHYS 1510. Two 2-hour sessions per week.


PHYS 1601 ENGINEERING PHYSICS I LAB (0). LAB., NG. Coreq., PHYS 1600. Laboratory course for PHYS 1600. Two 2-hour sessions per week.


PHYS 1608 HONORS PHYSICS I LAB (0). LAB., NG. Coreq., membership in the Honors College and PHYS 1607. Laboratory course for PHYS 1607. Two 2-hour sessions per week.


PHYS 1611 ENGINEERING PHYSICS II LAB (0). LAB., NG. Coreq., PHYS 1610. Laboratory course for PHYS 1610. Two 2-hour sessions per week.

PHYS 1617 HONORS PHYSICS II (4). LEC. 3, LAB. 4. Pr., PHYS 1600 or PHYS 1607 and MATH 1610 or MATH 1710. Coreq., membership in the Honors College and PHYS 1618, MATH 1620 or MATH 1720. Honors version of PHYS 1610 recommended for Physics majors.

PHYS 1618 HONORS PHYSICS II LAB (0). LAB., NG. Coreq., membership in the Honors College and PHYS 1617. Laboratory course for PHYS 1617. Two 2-hour sessions per week.


PHYS 2200 INTRODUCTORY QUANTUM PHYSICS AND RELATIVITY (3). LEC. 3. Pr., PHYS 1617 or PHYS 1610. Observational foundations of quantum physics, relativity and developments of several branches of physics up to their present frontiers.

PHYS 2300 PHYSICS LABORATORY SKILLS (2). LAB. 6. Pr., PHYS 1617 or PHYS 1610. The measurement process and its unavoidable uncertainties; standard laboratory instruments; data analysis techniques and tools.

PHYS 3100 INTERMEDIATE ELECTRICITY AND MAGNETISM (3). LEC. 3. Pr., PHYS 1617 or PHYS 1610, MATH 2630 or MATH 2730. Electrostatics, Magnetostatics, Laplace’s equation, boundary-value problems, multipole expansions, dielectric and magnetic materials. Faraday’s law, AC circuits, and Maxwell’s equations.

PHYS 3200 STATISTICAL THERMODYNAMICS (3). LEC. 3. Pr., PHYS 2200. The basic laws of thermodynamics, kinetic theory, and statistical
mechanics including entropy, the partition function, free energy, and the quantum statistic of Fermions and Bosons.

PHYS 3500 PHYSICS OF THE WORLD AROUND US (3). LEC. 3. Interdisciplinary topic e.g. Biophysics, Astrophysics, Physics of Weather, Physics of Music, or Environmental Physics. Course may be repeated for a maximum of 12 credit hours.


PHYS 4100 FUNDAMENTALS OF QUANTUM MECHANICS (3). LEC. 3. Pr., PHYS 2200, MATH 2650. Schrodinger equation, stationary and time-dependent solutions, spin and the exclusion principle, perturbation theory, scattering and resonances, the interpretation of quantum mechanics.

PHYS 4200 FUNDAMENTAL EXPERIMENTS IN PHYSICS (2). LAB. 6. Pr., PHYS 2300. Experiments that demonstrate the fundamental ideas and facts of physics. Data will be collected, analyzed, interpreted and reported in comprehensive lab reports.

PHYS 4900 INDEPENDENT STUDY IN PHYSICS (1-5). IND., SU. Pr., departmental approval. Student will investigate a topic of interest under the direction of a faculty member. Course may be repeated for a maximum of 10 credit hours.

PHYS 4930 DIRECTED READING IN PHYSICS (1-5). IND., Pr., departmental approval. Student will study a topic of interest under the direction of a faculty member. Course may be repeated for a maximum of 10 credit hours.

PHYS 4967 HONORS READING (1-3). IND. Pr., Membership in the Honors College; departmental approval. Course may be repeated for a maximum of 6 credit hours.

PHYS 4990 UNDERGRADUATE RESEARCH IN PHYSICS (1-5). IND. Pr., departmental approval. Student will work under the direction of a faculty member on a problem of mutual interest. Course may be repeated for a maximum of 10 credit hours.

PHYS 4997 HONORS THESIS (1-6). IND. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 6 credit hours.

PHYS 5100 APPLICATIONS OF QUANTUM MECHANICS (3). LEC. 3. Pr., PHYS 4100. Quantum mechanics applied to atomic physics, solid state physics, nuclear physics, particle physics, electrodynamics, and cosmology.

PHYS 5500 FUNDAMENTALS OF PHYSICS (3). LEC. 3. Pr., departmental approval. A subject such as Wave Mechanics, Mathematical Physics, Nonlinear Dynamics, Optics, Nuclear Physics, Elementary Particles, Relativity, or Electrodynamics. Course may be repeated for a maximum of 9 credit hours.

PHYS 5600 FRONTIERS OF PHYSICS (3). LEC. 3. Pr., PHYS 4100 or PHYS 3100 or departmental approval. A subject from the research areas in the Department such as Solid State, Atomic, Plasma, Space, or Computational Physics will be selected by the lecturer. Course may be repeated for a maximum of 9 credit hours.

PHYS 5610 INTRODUCTION TO SOLID STATE PHYSICS (3). LEC. 3. Pr., PHYS 6100 or departmental approval. Lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetism, superconducting and defect properties of solids.

PHYS 5620 SURVEY OF PLASMA PHYSICS (3). LEC. 3. Pr., PHYS 3100 or departmental approval. Single particle motions: fluid description of a plasma; plasma waves and oscillations; kinetic description, diffusion, and resistivity; non-linear effects.

PHYS 6100 APPLICATIONS OF QUANTUM MECHANICS (3). LEC. 3. Pr., PHYS 4100. Quantum mechanics applied to atomic physics, solid state physics, nuclear physics, particle physics, electrodynamics, and cosmology.

PHYS 6500 FUNDAMENTALS OF PHYSICS (3). LEC. 3. Pr., departmental approval. A subject such as Wave Mechanics, Mathematical Physics, Nonlinear Dynamics, Optics, Nuclear Physics, Elementary Particles, Relativity, or Electrodynamics. Course may be repeated for a maximum of 9 credit hours.

PHYS 6600 FRONTIERS OF PHYSICS (3). LEC. 3. Pr., PHYS 4100 or PHYS 3100 or departmental approval. A subject from the research areas in the Department such as Solid State, Atomic, Plasma, Space, or Computational Physics will be selected by the lecturer. Course may be repeated for a maximum of 9 credit hours.

PHYS 6610 INTRODUCTION TO SOLID STATE PHYSICS (3). LEC. 3. Pr., PHYS 6100 or departmental approval. Lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetism, superconducting and defect properties of solids.

PHYS 6620 SURVEY OF PLASMA PHYSICS (3). LEC. 3. Pr., PHYS 3100 or departmental approval. Single particle motions: fluid description of a plasma; plasma waves and oscillations; kinetic description, diffusion, and resistivity; non-linear effects.

PHYS 7100 CLASSICAL MECHANICS (3). LEC. 3. Legrangian and Hamiltonian formulations of mechanics, canonical transforms. Hamilton-Jacobi theories, action angle variables, rigid rotators, normal modes, and mechanics of continuous media.


PHYS 7250 ELECTRICITY AND MAGNETISM II (3). LEC. 3. Pr., PHYS 7200 or departmental approval. Time dependent Maxwell theory, wave propagation and dispersion, diffraction, scattering, radiation, relativistic covariance and applications.

PHYS 7300 QUANTUM MECHANICS I (3). LEC. 3. Schrodinger wave equation, discrete and continuous spectra, matrix formulation, perturbation theory.

PHYS 7350 QUANTUM MECHANICS II (3). LEC. 3. Pr., PHYS 7300 or departmental approval. Time-dependent approximation methods, identical, relativistic wave equations, and second quantization.

PHYS 7400 STATISTICAL PHYSICS (3). LEC. 3. Thermodynamic quantities, equilibrium ensembles for classical and quantum systems, fluctuations, phase transitions and critical phenomena.

PHYS 7520 NONLINEAR DYNAMICS (3). LEC. 3. Pr., PHYS 7100 or departmental approval. Dynamical systems, maps, flows, fixed points and neighborhoods, chaos, fractals and fractal dimensions. Lyapunov exponents, strange attractors, dissipative and Hamiltonian systems, controlling chaos.

PHYS 7540 NON-EQUILIBRIUM STATISTICAL MECHANICS (3). LEC. 3. Pr., PHYS 7400 or departmental approval. Introduces the fundamental concepts of non-equilibrium statistical mechanics, develops basic transport theories, and simulates statistical properties with Monte-Carlo and molecular dynamic methods.

PHYS 7900 INDEPENDENT STUDY IN PHYSICS (1-5). IND., SU. Pr., departmental approval. Student will work with a faculty member to study a topic of interest. Course may be repeated for a maximum of 6 credit hours.

PHYS 7930 DIRECTED READING IN PHYSICS (1-5). IND. Pr., departmental approval. Student will work with a faculty member to study a topic of interest. Course may be repeated for a maximum of 6 credit hours.

PHYS 7950 PHYSICS COLLOQUIUM (1). SEM., SU. Offers a series of talks presented by invited speakers on broad fields of physics. Check with graduate adviser for credit allowed. Course may be repeated for a maximum of 6 credit hours.

PHYS 7970 SPECIAL TOPICS IN PHYSICS (1-5). SEM. Pr., departmental approval. Seminar or lecture series in a rapidly advancing specialty of physics. Course may be repeated for a maximum of 6 credit hours.

PHYS 7990 RESEARCH AND THESIS (1-10). MST., TD. Course may be repeated with change in topic.

PHYS 8100 RELATIVISTIC QUANTUM MECHANICS (3). LEC. 3. Pr., PHYS 7350 or departmental approval. Dirac equation, 1D barrier scattering, 3D central potentials, S-matrix theory, Feynman diagrams, quantum electrodynamics, renormalization, tree and loop level problems.


PHYS 8600 PLASMA PHYSICS (3). LEC. 3. Pr., PHYS 6620 or departmental approval. A detailed study of plasma physics including particle orbit theory, magnetohydrodynamics, plasma waves and transport phenomena.

PHYS 8700 SOLID STATE PHYSICS (3). LEC. 3. Pr., PHYS 6610 or departmental approval. Atomic and electronic structures of solids and the associated electrical, optical and transport properties.

PHYS 8900 INDEPENDENT STUDY IN ADVANCED PHYSICS (1-5). IND., SU. Pr., departmental approval. Students will work with a faculty member to study a topic of interest. Course may be repeated for a maximum of 10 credit hours.
PHYS 8930 DIRECTED READING IN ADVANCED PHYSICS (1-5). IND. Pr., departmental approval. Student will work with a faculty member to study a topic of interest. Course may be repeated for a maximum of 10 credit hours.

PHYS 8970 SPECIAL TOPICS IN ADVANCED PHYSICS (1-5). LEC. Pr., departmental approval. Topic at the forefront of physics research will be chosen by the lecturer. Course may be repeated for a maximum of 10 credit hours.

PHYS 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

Plant Pathology (PLPA)
Dr. Mike L. Williams - 844-5006


PLPA 4930 DIRECTED STUDIES IN PLANT PATHOLOGY (1-3). IND., SU. Pr., departmental approval. Supervised work on a project in plant pathology. Areas of study are: A. Mycology; B. Nematology; C. Virology; D. Bacteriology; E. Extension and Clinic Experience; F. Physiological and Molecular Approaches. Course may be repeated for a maximum of 3 credit hours.

PLPA 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College; junior or senior standing and departmental approval. Assigned readings on topics pertinent to plant pathology or individual student endeavor or consisting of directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

PLPA 5050 PLANT DISEASE DIAGNOSIS (3). LEC. 3. Pr., PLPA 3000. Approaches, techniques, and practical experience in diagnosis of plant diseases. Credit will not be given for both PLPA 5050 and PLPA 6050. Summer.

PLPA 5060 PLANT DISEASE MANAGEMENT (3). LEC. 3. Pr., PLPA 3000 or PLPA 6000. Aspects of plant disease management including cultural practices, plant resistance, biological and chemical control, and disease forecasting. Spring.

PLPA 5200 INTRODUCTORY MYCOLOGY (4). LEC. 3, LAB. 1. Pr., BIOL 1030 or departmental approval. A systematic survey of the fungi with emphasis on morphology. Credit will not be given for both PLPA 5200 and PLPA 6200. Fall, Spring.

PLPA 5400 PLANT VIROLOGY (3). LEC. 3. Pr., PLPA 3000 or departmental approval. Introduction to plant viruses and the diseases they cause; virus particle structure and replication strategies; disease identification by symptoms and detection of pathogen; transmission, ecology, epidemiology and control. Spring.


PLPA 6060 PLANT DISEASE MANAGEMENT (3). LEC. 3. Pr., PLPA 3000 or PLPA 6000. Aspects of plant disease management including cultural practices, plant resistance, biological and chemical control, and disease forecasting. Spring.

PLPA 6200 INTRODUCTORY MYCOLOGY (4). LEC. 3, LAB. 2. Pr., BIOL 1030. A systematic survey of the fungi with emphasis on morphology. Credit will not be given for both PLPA 5200 and PLPA 6200. Fall, Spring.

PLPA 6400 PLANT VIROLOGY (3). LEC. 3. Pr., PLPA 3000 or departmental approval. Introduction to plant viruses and the diseases they cause; virus particle structure and replication strategies; disease identification by symptoms and detection of pathogen; transmission, ecology, epidemiology and control.

PLPA 7080 FIELD SURVEY OF PLANT PATHOLOGY (3). LEC. 1. LAB. 6. Pr., PLPA 3000 or PLPA 6000. Practical aspects of plant diseases under field conditions, on-site visits via field trips; discussion of experimental design for field research. Summer.

PLPA 7300 PLANT-BACTERIAL INTERACTIONS (4). LEC. 3. LAB. 2. Pr., BIOL 3200, equivalent, or departmental approval. Biochemical and molecular basis of plant-bacterial interactions, including colonization, pathogenesis, symbiotic and associative nitrogen fixation, and transformation. Fall.

PLPA 7500 PLANT NEMATOLOGY (3). LEC. 2. LAB. 2. Pr., BIOL 1030 or departmental approval. The various roles of nematodes in relation to plant diseases. Identification of plant nematodes; nature of pathogenicity; principles and practices of control; recent advances in phytom nematology. Fall.

PLPA 7820 RESEARCH PROPOSAL WRITING (2). LEC. 2. Experience in all aspects of writing and reviewing competitive research proposals through a workshop-format culminating in each student writing a proposal on research topics of their choosing. Fall even. Fall.


PLPA 7930 DIRECTED STUDIES IN PLANT PATHOLOGY (1-3). IND. Pr., Departmental approval. Directed studies or projects, under the supervision of faculty, for understanding of topics beyond course materials or due to particular requirements. Course may be repeated for a maximum of 3 credit hours.

PLPA 7950 SEMINAR IN PLANT PATHOLOGY (1). SEM. 1. SU. Pr., departmental approval. Seminar presentations on current departmental research and current issues in plant pathology and related disciplines. Fall, Spring. Course may be repeated for a maximum of 2 credit hours.

PLPA 7990 RESEARCH AND THESIS (1-10). DSR., TD. Pr., departmental approval. Research and thesis on problems in plant pathology. Course may be repeated with change in topic.


PLPA 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Pr., departmental approval. Research and dissertation on problems in plant pathology. Course may be repeated with change in topic.

Political Science (POLI)
Dr. Paul Johnson - 844-4370

HEALTH ADMINISTRATION (HADM)

HADM 2200 HEALTH POLICY (3). LEC. 3. Pr., POLI 1090 or POLI 2100. Political issues affecting health care services.

HADM 3300 INTRODUCTION TO HEALTH ADMINISTRATION (3). LEC. 3. Pr., POLI 1090 or POLI 2100. Basic concepts and principles of administration of health services organizations.

HADM 3700 LEGAL STRUCTURE OF HEALTH ADMINISTRATION (3). LEC. 3. Pr., POLI 1090 or POLI 2100. Legal issues that arise between patients and health care providers.

HADM 4000 DEVELOPING CARE ORGANIZATIONS (3). LEC. 3. Pr., HADM 2200, HADM 3300, MATH 1690. Organizational strategies for effective interfacing of medical, nursing, allied health and administrative staff with patient needs.


HADM 4810 CHANGE IN HEALTH ADMINISTRATION (3). LEC. 3. Pr., HADM 2200 and HADM 3300. Changes in modern technology, cultural diversity, and governmental policies on the administration of health services organizations.

HADM 4820 LONG-TERM CARE ADMINISTRATION (3). LEC. 3. Pr., HADM 2200 and HADM 3300. Analysis of the components (e.g. nursing homes, home health care) of the long-term care system for the elderly.

HADM 4830 COMPARATIVE PUBLIC HEALTH CARE FINANCE (3). LEC. 3. Pr., HADM 2200 and HADM 3300. Comprehensive analysis of the financ-
ing, management and political structure of leading international health care systems.

**HADM 4850 LONG-TERM CARE POLICY** (3). LEC. 3. Pr., HADM 2200 and HADM 3300. Policy issues surrounding the provision of long-term care to the elderly.

**HADM 4920 INTERNSHIP** (6). INT. Pr., senior standing and GPA of at least 2.6 in HADM Courses. Internship in selected areas of Health Administration.

**HADM 4930 DIRECTED STUDIES** (1-3). IND. Directed studies in Health Administration. Course may be repeated for a maximum of 3 credit hours.

**HADM 4950 CAPSTONE SEMINAR** (3). LEC. 3. Pr., senior standing and HADM 4000. Integrates knowledge from courses and internship; applies managerial and research skills to the completion of a research project and the organization of a research symposium.

**HADM 4960 READINGS IN HEALTH ADMINISTRATION** (1-6). IND. Directed readings in Health Administration. Course may be repeated for a maximum of 6 credit hours.

**HADM 4970 SPECIAL TOPICS** (1-3). IND. Pr., HADM 2200 and HADM 3300. Selected topics in Health Administration. Course may be repeated for a maximum of 3 credit hours.

**POLITICAL SCIENCE (POLI)**

**POLI 1020 POLITICAL ECONOMY** (3). LEC. 2. RCT. 1. Social Science II Core. The two-way interaction between politics and the economy with special attention to contemporary issues of public policy.

**POLI 1021 POLITICAL ECONOMY RECITATION** (0). LEC. 2. NG. Coreq., POLI 1020. Small group activities for POLI 1020.

**POLI 1027 HONORS POLITICAL ECONOMY** (3). LEC. 3. Pr., membership in the Honors College. Social Science II Core. The two-way interaction between politics and the economy with special attention to contemporary issues of public policy.

**POLI 1090/1093 AMERICAN GOVERNMENT IN MULTICULTURAL WORLD** (3). LEC. 3. American political institutions, processes and behavior in comparative context, with special attention to the ways in which cultural and social diversity in the U.S. has impacted its politics.

**POLI 1097 HONORS AMERICAN GOVERNMENT IN MULTICULTURAL WORLD** (3). LEC. 3. Pr., Membership in Honors College. American Political Institutions, processes and behavior in comparative context, with special attention to the ways in which cultural and social diversity in the US has impacted its politics.

**POLI 2100 STATE AND LOCAL GOVERNMENT** (3). LEC. 3. The organization and functioning of American state and local governments, including their relationships to the U.S. Federal Systems.

**POLI 3000 POLITICAL SCIENCE RESEARCH METHODS I** (3). LEC. 3. Pr., Core Social Science. Introduction to basic concepts and methodology used in contemporary political analysis.

**POLI 3010 POLITICAL SCIENCE RESEARCH METHODS II** (3). LEC. 3. Pr., POLI 3000 or departmental approval. Introduction to empirical research methods in political science with attention to data collection, retrieval, transformation and analysis.

**POLI 3020 INTRODUCTION TO POLITICAL THOUGHT** (3). LEC. 3. Pr., Core Social Science or Philosophy. Selected major themes in political thought from ancient to modern times.

**POLI 3030 AFRICAN-AMERICAN POLITICAL THOUGHT** (3). LEC. 3. Pr., Core Social Science or Philosophy. African-American political thought along with a theoretical framework that is reflective of the Black experience.

**POLI 3090 INTRODUCTION TO INTERNATIONAL RELATIONS** (3). LEC. 3. Pr., Core Social Science. International relations, including a consideration of the bases of national power and the rudiments of international politics.

**POLI 3100 INTRO TO WORLD AFFAIRS** (3). LEC. 3. Pr., Core Social Science. Contemporary international politics that evaluates foreign policy objectives and strategies of seven major countries and how their stability as sovereign states are affected.

**POLI 3120 INTRODUCTION TO COMPARATIVE POLITICS** (3). LEC. 3. Pr., Core Social Science. Methods of classifying governments by institutional and developmental characteristics.

**POLI 3140 AMERICAN FOREIGN POLICY** (3). LEC. 3. Pr., Core Social Science or POLI 1090. Analysis of the decision making process of American foreign policy and/or of selected current issues of American foreign policy.

**POLI 3150 AMERICAN POLITICAL THOUGHT** (3). LEC. 3. Pr., Core Social Science or POLI 1090. The principal American political philosophers and their influence on political institutions.

**POLI 3160 NATIONAL SECURITY POLICY** (3). LEC. 3. Pr., Core Social Science or POLI 1090. Introduction to national security aspects of United States foreign policy.


**POLI 3180 LATIN AMERICA AND THE UNITED STATES** (3). LEC. 3. Pr., Core Social Science. An analysis of Latin American-United States relations in their political, social and economic aspects.

**POLI 3190 INTERNATIONAL RELATIONS OF THE MIDDLE EAST** (3). LEC. 3. Pr., Core Social Science. A survey of contemporary issues in international relations, focusing on the Middle East.

**POLI 3250 INTRODUCTION TO PUBLIC ADMINISTRATION** (3). LEC. 3. Pr., Core Social Science or POLI 1090 or POLI 2110. Administration in the public sector with particular emphasis on public administration as it exists in modern American government.

**POLI 3260 ORGANIZATION THEORY** (3). LEC. 3. Pr., POLI 3250. Structure and function of governmental organizations with an emphasis on theories of administrative hierarchies and evaluation of bureaucracy.

**POLI 3270 POLICY PROCESS** (3). LEC. 3. Pr., Core Social Science. The formulation and implementation of public policy; the roles of the major governmental institutions in policy making.

**POLI 3290 THE AMERICAN PRESIDENCY** (3). LEC. 3. Pr., Core Social Science or POLI 1090. Introduction to empirical research methods in political science with attention to the ways in which cultural and social diversity in the US has impacted its politics.

**POLI 3300 LAW AND SOCIETY** (3). LEC. 3. Pr., Core Social Science. An analysis of Latin American-United States relations in their political, social and economic aspects.


**POLI 3340 INTRODUCTION TO CONFLICT RESOLUTION** (3). LEC. 3. Pr., Core Social Science. An analysis of Latin American-United States relations in their political, social and economic aspects.

**POLI 3400 POLITICAL PARTIES AND INTEREST GROUPS** (3). LEC. 3. Pr., POLI 1090 or department approval. The nature, organization and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.

**POLI 3410 POLITICAL PARTICIPATION** (3). LEC. 3. Pr., Core Social Science or POLI 1090. Political participation in the traditional and unconventional forms and the developing trends in citizen participation in recent years.

**POLI 3420 POLITICS AND THE MEDIA** (3). LEC. 3. Pr., Core Social Science or POLI 1090. Influences of the media on political action, the electoral process and popular concepts of political institutions, "use" of the media and its regulation by government.

**POLI 3510 GOVERNMENTS AND POLITICS OF WESTERN EUROPE** (3). LEC. 3. Pr., Core Social Science. Political structure, politics and policy in nations of Western Europe and in the European Community.

**POLI 3520 COMPARATIVE POLITICS OF THE MIDDLE EAST** (3). LEC. 3. Pr., Core Social Science. Domestic politics in the nations of the Middle East.


**POLI 3540 EAST EUROPEAN POLITICS** (3). LEC. 3. Pr., Core Social Science. Survey and analysis of political institutions and policies in Eastern and Central Europe under Communism and in the post-Communism period.
POLI 3550 GOVERNMENT AND POLITICS OF LATIN AMERICA (3). LEC. 3. Pr., Core Social Science. Political environment, institutions and processes of Latin America emphasizing factors that influence the degree of democracy and authoritarianism, stability and instability, and political development.

POLI 3610 ASIAN POLITICS (3). LEC. 3. Pr., Core Social Science. The politics of the leading nations in East Asia with major attention being devoted to China and Japan.


POLI 4040 CONTEMPORARY POLITICAL THEORY (3). LEC. 3. Pr., junior standing or department approval. Survey of post-World War II political philosophy, including neoclassicist, postmodernist, communitarian, and critical theories. A previous course in political theory is recommended but not required.

POLI 4050 AMERICAN LOCAL GOVERNMENT (3). LEC. 3. Pr., POLI 1090 or POLI 2100. The structure of local government, the roles and incentives of key elected and appointed officials, and the policy issues faced by those officials. Credit will not be given for both POLI 4050 and POLI 7050.

POLI 4090 URBAN ADMINISTRATION (3). LEC. 3. Pr., POLI 3250 or department approval. Different aspects of urban administration such as decision making, political environment, budgeting, revenue systems and personnel administration.

POLI 4130 POLITICS OF THE ADMINISTRATIVE PROCESS (3). LEC. 3. Pr., POLI 3250 or department approval. How public agencies and their employees at all levels of government survive and sometimes prosper within an intensely political environment. Credit will not be given for both POLI 4130 and POLI 7130.

POLI 4140 PUBLIC FINANCE (3). LEC. 3. Pr., POLI 3250 or department approval. Theory and practice of public finance with an emphasis on applications in state and local government.

POLI 4160 PUBLIC PERSONNEL ADMINISTRATION (3). LEC. 3. Pr., POLI 3250 or department approval. Responsibilities, challenges, and opportunities that confront modern public administration in the management of human resources.

POLI 4220 UNITED STATES POLITICAL ECONOMY (3). LEC. 3. Pr., junior standing. Social, economic and political factors that affect America's national competitiveness and what they portend for political life in the United States.


POLI 4900 INDEPENDENT STUDY (1-3). IND. Pr., departmental approval, 3.25 GPA. Course may be repeated with change in topic.

POLI 4920 INTERNSHIP (1-6). INT., SU. Pr., junior standing and departmental approval. Internship in selected areas of political science. Course may be repeated for a maximum of 6 credit hours.

POLI 4960 DIRECTED READINGS (1-3). IND. Pr., senior standing, departmental approval, 3.00 GPA. Directed readings in Political Science: 1) American Politics; 2) Comparative Politics; 3) International Relations; 4) Political Theory; 5) Public Administration; 6) Public Policy; 7) Public Law; 8) Methodology. Course may be repeated with change in topic.

POLI 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College, departmental approval. Directed readings: 1) American Politics; 2) Comparative Politics; 3) International Relations; 4) Political Theory; 5) Public Administration; 6) Public Policy; 7) Public Law; 8) Methodology. Course may be repeated with change in topic.

POLI 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College, departmental approval. Course may be repeated for a maximum of 6 credit hours.

POLI 5180 ADMINISTRATIVE LAW (3). LEC. 3. General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review.

POLI 5210 VOTING BEHAVIOR AND REPRESENTATION (3). LEC. 3. Pr., junior standing. The causes of voting and vote choice and their consequences for the behavior of representatives. Credit will not be given for both POLI 5210 and POLI 5210.

POLI 5340 THEORY AND PRACTICE OF MEDIATION (3). LEC. 3. Pr., junior standing. Theoretical and comparative perspective on conflict resolution with emphasis on the role of mediation in various societies. Credit will not be given for both POLI 5340 and POLI 6340.

POLI 5370 NON-PROFIT MANAGEMENT (3). LEC. 3. Pr., POLI 3250 or department approval. A comprehensive overview of the complex and diverse non-profit sector in the United States. Focuses on managerial functions such as governance, fundraising, marketing and planning. Credit will not be given for both POLI 5370 and POLI 6370.

POLI 5380 PUBLIC-PRIVATE MANAGEMENT (3). LEC. 3. Pr., junior standing. Theory and practice of the roles of the public and private sectors in the provision, production and delivery of traditional public services. Credit will not be given for both POLI 5380 and POLI 6380.

POLI 5410 SOUTHERN POLITICS (3). LEC. 3. Pr., junior standing. Introduction to the politics and government of the Southern region of the United States. Credit will not be given for both POLI 5410 and POLI 5410.

POLI 5610 WOMEN IN POLITICS (3). LEC. 3. Pr., junior standing. An examination of the political role of women in American society. Credit will not be given for both POLI 5610 and POLI 6610.

POLI 5620 AFRICAN AMERICAN POLITICS (3). LEC. 3. Pr., junior standing. Political values, theories, problems, issues and behavior relating to African-Americans in the United States. Credit will not be given for both POLI 5620 and POLI 6620.

POLI 5970 SPECIAL TOPICS (1-3). IND. Pr., junior standing. Selected topics in political science. 1) American Politics; 2) Comparative Politics; 3) International Relations; 4) Political Theory; 5) Public Administration; 6) Public Policy; 7) Public Law; 8) Methodology. Credit will not be given for both POLI 5970 and POLI 6970. Course may be repeated with change in topic.

POLI 6180 ADMINISTRATIVE LAW (3). LEC. 3. General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review.

POLI 6210 VOTING BEHAVIOR AND REPRESENTATION (3). LEC. 3. The causes of voting and vote choice and their consequences for the behavior of representatives. Credit will not be given for both POLI 6210 and POLI 5210.

POLI 6340 THEORY AND PRACTICE OF MEDIATION (3). LEC. 3. Theoretical and comparative perspective on conflict resolution with emphasis on the role of mediation in various societies. Credit will not be given for both POLI 6340 and POLI 5340.

POLI 6370 NON-PROFIT MANAGEMENT (3). LEC. 3. A comprehensive overview of the complex and diverse non-profit sector in the United States. Focuses on managerial functions such as governance, fundraising, marketing and planning. Credit will not be given for both POLI 6370 and POLI 5370.

POLI 6380 SEMINAR IN PUBLIC-PRIVATE MANAGEMENT (3). LEC. 3. Theory and practice of the roles of the public and private sectors in the provision, production and delivery of traditional public services. Credit will not be given for both POLI 6380 and POLI 5380.

POLI 6410 SOUTHERN POLITICS (3). LEC. 3. Introduction to the politics and to a lesser extent government of the Southern region of the United States. Credit will not be given for POLI 6410 and POLI 5410.

POLI 6610 WOMEN IN POLITICS (3). LEC. 3. A theoretical, historical, social and political examination of the role of women in American society. Credit will not be given for both POLI 6610 and POLI 5610.

POLI 6620 AFRICAN-AMERICAN POLITICS (3). LEC. 3. The political values, structure and behavior of African-Americans in the United States. Emphasis on the theories, problems and issues relating to Black political behavior. Credit will not be given for both POLI 6620 and POLI 5620.

POLI 6670 SPECIAL TOPICS (1-3). IND. Pr., selected topics in Political Science: 1) American Politics; 2) Comparative Politics; 3) International Relations; 4) Political Theory; 5) Public Administration; 6) Public Policy; 7) Public Law; 8) Methodology. Credit will not be given for both POLI 6670 and POLI 5670.

POLI 7000 RESEARCH METHODS (3). LEC. 3. Statistics and other quantitative techniques for the analysis of policy and for administrative decision making.
POUL 4920 Poultry Science (POUL)
Dr. Donald Conner - 844-4133

POUL 1000 INTRODUCTORY POULTRY SCIENCE (3). LEC. 2, LAB. 2.
Introduction to the poultry species and their commercial production, physiology, nutrition, and management. Fall.

POUL 2030 COMMERCIAL POULTRY PRODUCTION (4). LEC. 3, LAB. 3.
The organization and management principles of the commercial poultry meat and egg production industries. Fall.


POUL 3150 Poultry Physiology (4). LEC. 3, LAB. 2. Pr., BIOL 1030. The physiological principles and characteristics of poultry species which directly interact with commercial management systems. Spring.

POUL 4100 SUPERVISED INVESTIGATION (1-4). IND. Pr., senior or graduate standing, departmental approval, cumulative GPA of 2.5 or Pr., higher. Advanced independent investigation in major field of poultry or avian science. Requirements include review of literature, successful and timely completion of research project, and presentation of results in written and/or oral report. Course may be repeated for a maximum of 8 credit hours.

POUL 4920 Poultry Science Internship (1-5). INT. Pr., Departmental approval. Practical on-the-job training in the poultry industry. Course may be repeated for a maximum of 5 credit hours.

POUL 5050 Poultry Feeding (4). LEC. 3. LAB. 2. Pr., BIOL 1030 and BCHE 3200. The application of the principles of nutrition to poultry; the functions of individual nutrients, their deficiency symptoms and their supply in terms of feedstuffs and practical poultry diets. Credit will not be given for both POUL 5050 and POUL 6050. Fall.

POUL 5080 Poultry Health (3). LEC. 3. Pr., BIOL 1030, BIOL 3200, and CHEM 2030 or CHEM 2070. Study of the prevention, diagnosis, control and treatment of economically important diseases of poultry. Credit will not be given for both POUL 5080 and POUL 6080. Spring.

POUL 5110 Poultry Processing (3). LEC. 3. Pr., BIOL 1030 and POUL 3030. Commercial poultry processing and products technology. Credit will not be given for both POUL 5110 and POUL 6110. Fall.

POUL 5140 Poultry Further Processing and Products (4). LEC. 3. LAB. 3. Pr., CHEM 2030 or CHEM 2070. The chemistry and processing techniques used in manufacturing further processed poultry products. Methods used to analyze poultry product safety and quality. "Hands-on" experience with the commercial formulation, processing, and analysis of further processed poultry products. Credit will not be given for both POUL 5140 and POUL 6140.

POUL 5150/5153 Food Laws and Regulations (3). LEC. 3. Federal and state laws and regulations and case history affecting food production, processing, packaging, marketing, and distribution of food and food productions. History of food law, enactment of laws and regulations, legal research and regulatory agencies. Course is taught exclusively online. Credit will not be given for both POUL 5150 and POUL 6150.
POUL 5160 PRINCIPLES OF FOOD SAFETY (3). LEC. 2, LAB. 3. Pr., BIOL 1030, CHEM 2030 or CHEM 2070 and BIOL 3200. Identification and control of foodborne hazards in foods of animal origin. Credit will not be given for both POUL 5160 and POUL 5160. Spring.

POUL 6080 ADVANCED POULTRY FEEDING (4). LEC. 3, LAB. 2. Pr., departmental approval. An advanced study and review of the literature on the application of the principles of nutrition to poultry; the functions of individual nutrients, their deficiency symptoms and their supply in terms of feedstuffs and practical poultry diets. Credit will not be given for both POUL 5050 and POUL 6050. Fall.

POUL 6080 ADVANCED POULTRY HEALTH (3). LEC. 3. Pr., departmental approval. An advanced study of the prevention, diagnosis, control and treatment of economically important diseases of poultry. Credit will not be given for both POUL 5080 and POUL 6080. Spring.

POUL 6110 ADVANCED POULTRY PROCESSING (3). LEC. 3. Pr., departmental approval. An advanced study and review of poultry processing and products technology. Credit will not be given for both POUL 5110 and POUL 6110. Fall.

POUL 6104 POULTRY FURTHER PROCESSING AND PRODUCTS (4). LEC. 3, LAB. 3. Pr., Departmental approval. The chemistry and processing techniques used in manufacturing further processed poultry products. Methods used to analyze poultry product safety and quality. "Hands-on" experience with the commercial formulation, processing, and analysis of further processed poultry products. Credit will not be given for both POUL 5140 and 6140.

POUL 6150/6156 FOOD LAWS AND REGULATIONS (3). LEC. 3. Federal and state laws and regulations and case history affecting food production, packaging, marketing, and distribution of food and food products. History of food law, enactment of laws and regulations, legal research and regulatory agencies. Course is taught exclusively online. Credit will not be given for both POUL 6150 and POUL 6160. Spring.

POUL 6160 ADVANCED PRINCIPLES OF FOOD SAFETY (3). LEC. 2, LAB. 3. Pr., departmental approval. An advanced study and literature review of the identification and control of foodborne hazards in foods of animal origin. Credit will not be given for both POUL 5160 and POUL 6160. Spring.

POUL 7100 SUPERVISED INVESTIGATION (1-4). IND. Pr., senior or graduate standing, departmental approval, cumulative GPA of 2.5 or higher. Advanced independent investigation in major field of poultry or avian science. Requirements include review of literature, successful and timely completion of research project, and presentation of results in written and/or oral report. Course may be repeated for a maximum of 8 credit hours.

POUL 7990 RESEARCH AND THESIS (1-10). MST., TD. Technical laboratory problems related to poultry. Course may be repeated with change in topic.

POUL 8100 NUTRIENT UTILIZATION (3). LEC. 3. Pr., POUL 4050 or equivalent. Structure of feedstuffs and strategy in nutrient recovery from the gastrointestinal systems of fowl, swine, and ruminants.

POUL 8150 AVIAN PHYSIOLOGY (3). LEC. 3. Pr., course in Animal or Human Physiology. Physiology of organ systems of birds with emphasis on domestic fowl. Fall.

POUL 8160 LABORATORY TECHNIQUES IN MOLECULAR VIROLOGY (4). LEC. 1, LAB. 9. Pr., BIOL 4520, BIOL 4530 or departmental approval. Isolation, purification, and identification of viral nucleic acids and proteins. Credit will not be given for both POUL 8160 and CMBL 8160. Summer.


POUL 8950 GRADUATE SEMINAR (1). SEM. 1. SU. Literature in poultry science or related field. Emphasis given to preparation, organization, and presentation of research materials by students and to reporting current literature in the field.


POUL 8990 RESEARCH AND DISSERTATION (1-10). DSR., TD. Technical laboratory problems related to poultry. Course may be repeated with change in topic.

Psychology (PSYC)

PSYC 2010 INTRO TO PSYCHOLOGY (3). LEC. 3. Introduction to the various subfields of psychology.

PSYC 2017 HONORS INTRODUCTION TO PSYCHOLOGY (3). LEC. 3. Pr., Membership in the Honors College. General Introduction to Psychology with consideration of the major areas of the discipline.

PSYC 2120 DEVELOPMENTAL PSYCHOLOGY (3). LEC. 3. Introduction to physical, cognitive, social and emotional development across the lifespan.


PSYC 2520 PSYCHOLOGY OF GENDER (3). LEC. 3. Pr., PSYC 2010 or PSYC 1000. Biological, social and cultural determinants of gender similarities and differences.


PSYC 2970 BASIC TOPICS IN PSYCHOLOGY (3). LEC. 3. Pr., PSYC 2010. Selected introductions to specialty areas in psychology, emphasizing applications to living.

PSYC 3050 HISTORY OF IDEAS IN PSYCHOLOGY (3). LEC. 3. Pr., PSYC 2010. Major events and ideas from ancient to modern times that comprise the history of psychology.


PSYC 3510 BEHAVIORAL NEUROSCIENCE (3). LEC. 3. Pr., PSYC 2010. Exploration of the relationships between the brain and behavior.


PSYC 3570 THEORIES OF PERSONALITY (3). LEC. 3. Pr., PSYC 2010 or PSYC 1000. Survey of selected classical and contemporary theories of personality.


PSYC 3600 TRAINING AND SUPERVISION IN INDUSTRY (3). LEC. 3. Pr., PSYC 2010 and PSYC 3590. The application of behavioral principles to problems common to the training and supervision of people in work organizations.

PSYC 3940 EXPERIENTIAL LEARNING (3-6). PRA. Pr., PSYC 2010. Supplementary instruction concurrent with experience in some field of work involving application of psychological perspectives to community life. Maximum of 3 hours may be used for PSYC major. Course may be repeated for a maximum of 6 credit hours.

PSYC 3950 SPORTS PSYCHOLOGY (3). SEM. 3. An inquiry into how motivation, emotion, personality, and other mind/body variables influence physiology and athletic performance. Seminar class includes applied exer-
cises in emotional expression, stress and pain management, hypnosis, and diet and exercise challenges.

**PSYC 3970 TOPICS IN PSYCHOLOGY** (3). LEC. 3. Pr., PSYC 2010 and departmental approval. Theories, research and issues in contemporary psychology on selected topics. Course may be repeated for a maximum of 6 credit hours.

**PSYC 4010 INTRODUCTION TO CLINICAL PSYCHOLOGY** (3). LEC. 3. Pr., PSYC 2010 and PSYC 3560. General introduction to the profession of clinical psychology focusing on techniques of assessment and intervention.


**PSYC 4240 ADVANCED EXPERIMENTAL PSYCHOLOGY** (3). LEC. 3. Pr., PSYC 2010 and PSYC 2140. In-depth study of one of the traditional areas of experimental psychology such as learning, cognitive or social. Course may be repeated for a maximum of 6 credit hours.

**PSYC 4250 PSYCHOLOGY OF CHOICE AND DECISION** (3). LEC. 3. Pr., PSYC 2010 and PSYC 3520. In-depth treatment of the psychological science of choice (behavioral allocation) and decision-making.

**PSYC 4260 PSYCHOLOGY OF ADDICTIVE BEHAVIORS** (3). LEC. 3. Pr., PSYC 2010. Overview of various psychological features of addictive behaviors including alcohol and drug abuse, eating disorders, gambling and excessive sexual behavior.

**PSYC 4900 INDEPENDENT STUDY** (1-3). IND. Pr., junior standing and departmental approval. Work under the direction of a faculty member on a psychological topic of mutual interest. Maximum of 6 hours may be used for PSYC major. Course may be repeated for a maximum of 9 credit hours.

**PSYC 4910 HUMAN SERVICE PRACTICUM** (3). PRA. 3. SU. Pr., PSYC 2010 and PSYC 3520. Supervised experience in service-delivery settings. May enroll only once.

**PSYC 4967 HONORS READINGS** (1-3). IND. Pr., membership in the Honors College; junior or senior standing. Course may be repeated for a maximum of 3 credit hours.

**PSYC 4970 ADVANCED TOPICS IN PSYCHOLOGY** (3). LEC. 3. Pr., departmental approval. Topics assigned by course instructor.

**PSYC 4997 HONORS RESEARCH AND THESIS** (1-3). IND. Pr., membership in the Honors College; junior or senior standing. Research in specialized topics. Course may be repeated for a maximum of 6 credit hours.


**PSYC 5610 BEHAVIORAL EFFECTS OF ENVIRONMENTAL CONTAMINANTS** (3). LEC. 3. Laboratory, occupational and epidemiological assessment of neurotoxic chemicals; risk analysis; developmental exposures; and policy considerations. Coverage includes heavy metals, pesticides, solvents, and abused drugs.

**PSYC 5620 BEHAVIORAL PHARMACOLOGY** (3). LEC. 3. A review of drugs that affect nervous system function and behavioral or neural mechanisms, that modify these effects. Topics include substance abuse, preclinical and clinical psychopharmacology, learning and memory, behavioral mitigation of drug effects. Meets APA criteria for Level 1 training in psychopharmacology.

**PSYC 5960 SEMINAR IN PSYCHOLOGY** (3). LEC. 3. Pr., departmental approval. Seminar in research and theory on psychological topics.


**PSYC 7100 HISTORY OF IDEAS PSYCHOLOGY** (3). LEC. 3. Historical developments in psychology with emphasis on the major theories and systems that have had an impact on current conceptions in psychology.

**PSYC 7110 ETHICS AND PROBLEMS OF SCIENTIFIC AND PROFESSIONAL PSYCHOLOGY** (1). LEC. 1. Survey of ethical issues and current problems in psychology.

**PSYC 7120 TEACHING OF PSYCHOLOGY** (2). LEC. 2. The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with faculty in appropriate courses. Course may be repeated for a maximum of 6 credit hours.

**PSYC 7130 RESEARCH SEMINAR IN PSYCHOLOGY** (1). SEM. 1. Overview of the research process, including the development of research questions, proposal writing and issues involved in protecting the welfare of research participants.

**PSYC 7140 LEARNING AND CONDITIONING** (3). LEC. 3. Respondent conditioning and operant behavior, including acquisition of language and other forms of individual/ environmental interactions.

**PSYC 7150 BIOLOGICAL PSYCHOLOGY** (3). LEC. 3. Behavior from a biological perspective, including theory and research from the neurosciences and biopsychology.

**PSYC 7160 HUMAN DEVELOPMENT** (3). LEC. 3. Introduction to conceptual and substantive issues of developmental psychology from a life-span developmental perspective.

**PSYC 7170 THEORIES OF PERSONALITY** (3). LEC. 3. Analysis of current issues in personality theory.

**PSYC 7180 SOCIAL PSYCHOLOGY** (3). LEC. 3. Topics and literature on the social foundations of behavior.

**PSYC 7190 COGNITIVE PSYCHOLOGY** (3). LEC. 3. A survey of the nature of human intellectual functioning, including pattern recognition, memory, problem solving, reasoning and language comprehension and generation.

**PSYC 7200 ANIMAL COGNITION** (3). SEM. 3. Experimental analysis of the mechanisms that underlie animal cognition, including attention, concept formation, counting, language, memory, perception, timing, and problem solving.

**PSYC 7210 ANIMAL BEHAVIOR** (3). LEC. 3. Pr., PSYC 7140. Evolution of animal behavior, including mating, parental care, feeding, social, predatory, and defensive behavior.

**PSYC 7230 PSYCHOMETRIC THEORY** (3). LEC. 3. Pr., STAT 7000. Coreq., STAT/PSYC 7270 or STAT 7200. Introduction to basic quantitative theory behind the construction and interpretation of test scores and scales.

**PSYC 7240 METHODS FOR STUDYING INDIVIDUAL BEHAVIOR** (3). LEC. 3. Examination of strategies for measuring individual/environment interaction, using environmental interventions and identifying behavior change and its causes.

**PSYC/STAT 7270 EXPERIMENTAL DESIGN IN PSYCHOLOGY** (4). LEC. 4. Pr., STAT 7000 and STAT 7200. Introduction to the analysis of data collected under different experimental designs. Credit will not be given for both PSYC 7270 and STAT 7270.

**PSYC 7300 ADULT PSYCHOPATHOLOGY** (3). LEC. 3. Current theoretical conceptions and research in adult psychopathology.

**PSYC 7900 INDEPENDENT STUDY** (1-3). IND. Pr., departmental approval. Work under the direction of a faculty member on a psychological
topic of mutual interest. No more than 3 hours count toward major. Course may be repeated for a maximum of 9 credit hours.

**PSYC 7910 PRACTICUM IN APPLIED PSYCHOLOGY** (1-10). PRA. Pr., Departmental approval. Coreq., Graduate standing in Psychology. Supervised practicum in applied psychology. A maximum of 12 hours will apply toward degree. Course may be repeated for a maximum of 30 credit hours.

**PSYC 7970 RESEARCH IN SPECIAL TOPICS** (3). IND. 3. Pr., Departmental approval, graduate standing. Supervised scholarly activity related to student's field of study. Course may be repeated with change in topic.

**PSYC 7980 APPLIED BEHAVIOR ANALYSIS CAPSTONE PROJECT** (1-10). IND. 3. Pr., Departmental approval. Supervised practicum in applied psychology involving a behavior analysis project involving delivery of services to a consumer. Maximum of 6 credit hours will count toward degree. Course may be repeated for a maximum of 30 credit hours.

**PSYC 7990 RESEARCH AND THESIS** (1-10). MST., TD.

**PSYC 8180 ADVANCED SOCIAL PSYCHOLOGY** (3). LEC. 3. Pr., PSYC 7180 or departmental approval. Theories, research and issues in contemporary social psychology.

**PSYC 8250 MULTIVARIATE METHODS** (4). LEC. 3. LAB. 2. Pr., STAT 7000 or 7020. Introduction to the theory behind multivariate analyses and the statistical programs that support them.

**PSYC 8260 ANALYSIS OF TIME-RELATED DATA IN PSYCHOLOGY** (3). LEC. 3. Pr., STAT 7020 or PSYC 8250. Theory and practical applications of statistical approaches for time-related data.

**PSYC 8310 INTRODUCTION TO CLINICAL ETHICS AND METHODS** (3). LEC. 3. Interviewing skills, crisis intervention, professional and ethical issues in providing clinical services.


**PSYC 8350 APPLIED PSYCHOMETRIC PRINCIPLES** (3). LEC. 3. Pr., STAT 7020. Analysis of classical and modern test theory with an emphasis on applied psychometric principles.

**PSYC 8400 ADVANCED CHILD AND ADOLESCENT PSYCHOPATHOLOGY** (3). LEC. 3. Pr., PSYC 7300. Examination of current research and theory of behavioral, cognitive, and emotional disorders in childhood and adolescence.


**PSYC 8420 BEHAVIOR CHANGE IN CHILDREN** (3). LEC. 3. Pr., PSYC 8310 and PSYC 8400 or PSYC 8410. Introduction to methods of prevention and treatment of cognitive, behavioral and emotional disorders of children.

**PSYC 8440 HEALTH PSYCHOLOGY AND BEHAVIORAL MEDICINE** (3). LEC. 3. Pr., departmental approval. Contemporary research in health psychology and behavioral medicine and the empirical foundations of clinical practice.

**PSYC 8450 THEORY AND METHOD IN HUMAN ALCOHOL AND DRUG RESEARCH** (3). LEC. 3. Pr., departmental approval. Theoretical framework and methodological practices in basic research on human alcohol and drug abuse.


**PSYC 8470 BEHAVIORAL ECONOMICS OF SUBSTANCE ABUSE** (3). LEC. 3. Introduction to behavioral theories of choice and behavioral economics, and the application of these basic science areas to the study of substance abuse.

**PSYC 8500 EXPERIMENTAL ANALYSIS OF BEHAVIOR SEMINAR** (1). SEM. 1, SU. Examination of professional preparation issues and recent scientific developments relevant to careers in the experimental analysis of behavior.

**PSYC 8510 CONTEXT AND CONSEQUENCES OF BEHAVIOR** (3). LEC. 3. Pr., PSYC 7140. Advanced survey of the role that consequences play in acquisition, maintenance, and structure of behavior, and the methods by which this role is studied.

**PSYC 8520 CONCEPTUAL AND THEORETICAL ANALYSIS IN PSYCHOLOGY** (3). LEC. 3. Techniques of conceptual analysis relevant to the evaluation of theories and the interpretation and integration of psychological data.

**PSYC 8530 BEHAVIOR ANALYSIS AND HUMAN DEVELOPMENT** (3). LEC. 3. Examination of conceptual, theoretical, and scientific issues relevant to the study of psychological development from a behavior analytic perspective.

**PSYC 8550 APPLIED BEHAVIOR ANALYSIS** (3). LEC. 3. Pr., PSYC 7140 or departmental approval. The scientific and conceptual foundations of applied behavior analysis and its strategies of intervention and evaluation.


**PSYC 8700 ADVANCED INDUSTRIAL PSYCHOLOGY** (3). LEC. 3. Coreq., graduate standing in PSYC or departmental approval. Analysis of methods and content of industrial (Personnel) psychology.

**PSYC 8710 ADVANCED ORGANIZATIONAL PSYCHOLOGY** (3). LEC. 3. Coreq., graduate standing in PSYC or departmental approval. Analysis of major issues in organizational psychology.


**PSYC 8740 LEADERSHIP AND MOTIVATION SEMINAR** (3). SEM. 3. Pr., STAT/PSYC 7270, PSYC 8700. Analysis of historical and contemporary theories of leadership and motivation and related research.

**PSYC 8750 PROFESSIONAL ISSUES IN I/O PSYCHOLOGY** (1). LEC. 1. Pr., departmental approval. Analysis of contemporary professional issues in I/O psychology.

**PSYC 8910 CLINICAL PRACTICUM** (1-4). PRA. Pr., PSYC 8320 or PSYC 8410. Supervised practicum experience in clinical assessment and intervention techniques. Course may be repeated for a maximum of 30 credit hours.

**PSYC 8920 INTERNSHIP** (0). PRA. Pr., doctoral candidacy. Coreq., May not enroll in other coursework. Enrollment in full-time APA-approved 1-year pre-doctoral internship required for the Ph.D. in clinical psychology.

**PSYC 8930 DIRECTED STUDIES IN PSYCHOLOGY** (3). IND. Pr., approved doctoral plan of study. Review of a body of literature leading to the generation and defense of the Major Area Paper (written portion of the general doctoral examination). Course may be repeated for a maximum of 9 credit hours.

**PSYC 8970 SPECIAL TOPICS** (1-3). SEM. Pr., departmental approval. In-depth seminar on issues related to selected specializations in psychology. Course may be repeated for a maximum of 3 credit hours.

**PSYC 8990 RESEARCH AND DISSERTATION** (1-10). DSR., TD. Pr., departmental approval.

**Pharmacy Doctorate (PYDI)**

Dr. Paul Jungnickle - 844-8351

**PYDI 5000 DRUGS AND DISEASES** I (5). LEC. 5. Pr., 1st year PYDI standing. Integrated study of pathophysiology and chemical, pharmacological, biotechnology, and pharmacokinetic principles to explain the action of drugs. Fall.

**PYDI 5080 FOUNDATIONS OF PHARMACY** (1). WSP. 1. Pr., 1st year PYDI standing. One week experience orienting first year PYDI students to the context, concepts, tools, and skills necessary for understanding of, and success in pharmacy education. Fall.

**PYDI 5090 PHARMACY PRACTICE EXPERIENCE** I (2). PRA. 2. Pr., First-year PYDI standing. First of a six-course sequence of introductory practice
experience in which the concept of pharmaceutical care is introduced by the provision of basic care to community based patients. Fall.

**PYDI 5130/5133 DRUG LITERATURE EVALUATION** (2). LEC. 2. Pr., First-year PYDI standing. Development of the ability to effectively and efficiently retrieve drug information and critically evaluate and interpret studies published in the medical and pharmaceutical literature.

**PYDI 5190 PHARMACY PRACTICE EXPERIENCE 2** (1). PRA. 1. SU. Pr., PYDI 5090. Second of a six-course introduction to the practice setting providing experiential activities in the provision of pharmaceutical care.

**PYDI 5230/5233 DRUG LITERATURE 2** (2). LEC. 2. Pr., second-year PYDI standing. Drug literature analysis focusing on clinical trials, biostatistics, design and epidemiology.

**PYDI 5290 PHARMACY PRACTICE EXPERIENCE 3** (1). PRA. 1. SU. Pr., second-year PYDI standing. Third of a six-course introduction to the practice setting providing experiential activities in the provision of Pharmaceutical care.


**PYDI 5390 PHARMACY PRACTICE EXPERIENCE 4** (1). PRA. 1. SU. Pr., PYDI 5290. Fourth of a six-course introduction to the practice setting providing experiential activities in the provision of Pharmaceutical care.


**PYDI 5490 PHARMACY PRACTICE EXPERIENCE 5** (1). PRA. 1. SU. Pr., third-year PYDI standing. Fifth of a six-course introduction to the practice setting providing experiential activities in the provision of Pharmaceutical care.


**PYDI 5510/5513 PHARMACOTHERAPY 8** (3). LEC. 3. Pr., third-year PYDI standing. Application of the basic, clinical and socio-behavioral sciences to dermatological, rheumatological, hemato logical and oncological disorders.


**PYDI 5590 PHARMACY PRACTICE EXPERIENCE 6** (1). PRA. 1. SU. Pr., PYDI 5490. Sixth of a six-course introduction to the practice setting providing experiential activities in the provision of Pharmaceutical care.

Pharmacy Care Systems (PYPC)

Dr. Bruce Beger - 844-8302

**PYPC 5010 PATIENT-CENTERED SKILLS** (2). LEC. 2. Pr., 1st year PYDI standing. Development of positive, therapeutic relationships with patients through the application of communications skills (empathy, assertiveness training, effective listening, etc.) and other behavioral interventions. Fall.

**PYPC 5040 PHARMACY CARE SYSTEMS 1** (3). LEC. 3. Pr., first-year PYDI standing. Introduction to delivery of health care services with emphasis on the role of the profession of Pharmacy (weeks 1-8). Methods of systems and decision analysis applied to problems of optimizing the use of money, equipment, drug products, information and personnel within community and institutional environments (weeks 9-16).


**PYPC 5140 PHARMACY CARE SYSTEMS 2** (3). LEC. 3. Pr., PYPC 5040. Methods of systems and decision analysis (weeks 1-5). The nature, purpose and process of communication for the Health Professional (weeks 5-15).

**PYPC 5240 PHARMACY CARE SYSTEMS 3** (2). LEC. 2. Pr., second-year PYDI standing. The provision of patient care within containment constraints.

**PYPC 5710 INSTITUTIONAL PHARMACY 1** (3). LEC. 3. Pr., first-year PYDI standing. Overview of the nature and scope of institutional pharmacy practice.

**PYPC 5720 ADVANCED PROFESSIONAL COMMUNICATIONS** (2). LEC. 2. Pr., PYPC 5140. Continuation of PYPC 5140.

**PYPC 5900 SPECIAL PROBLEMS IN PHARMACY CARE SYSTEMS 1** (3). LEC. Pr., departmental approval. Selected topics related to socio-behavioral aspects of pharmacy. Course may be repeated for a maximum of 6 credit hours.

**PYPC 7810 HOSPITAL PHARMACY ADMINISTRATION** (2). LEC. 2. Pr., departmental approval. Administrative and policy-making procedures. Provides understanding of socioeconomic aspects of hospital pharmacy practice and competence in selected administrative skills.

**PYPC 7820 RESEARCH METHODS AND DESIGN HEALTH SCIENCE 1** (2). LEC. 2. Pr., STAT 2150 or STAT 7040 or departmental approval. Application of scientific methods in health care.


**PYPC 7840 MEDICATION INFORMATION SYSTEMS** (3). LEC. 3. Health system informatics theories and methodologies. Demonstration of how information reduces uncertainty in health-care decision-making.

**PYPC 7860 THE PHARMACIST’S ROLE IN IMPROVING PATIENT ADHERENCE** (3). LEC. 3. Pr., PYPC 7820. Theories and methodologies involved in adherence to medication regimens.

**PYPC 7900 SPECIAL PROBLEMS IN PHARMACY CARE SYSTEMS 2** (3). LEC. 2. Pr., departmental approval. Special problems. Course may be repeated for a maximum of 6 credit hours.

**PYPC 7950 SEMINAR** (1). LEC. 1. SU. Required of all Pharmacy Care Systems Masters students. Course may be repeated for a maximum of 6 credit hours.

**PYPC 7990 RESEARCH AND THESIS** (1-10). MST., TD. Credit hours to be arranged. Course may be repeated with change in topic.

**PYPC 8900 SPECIAL PROBLEMS IN PHARMACY CARE SYSTEMS 1** (3). LEC. Pr., departmental approval. Credit hours to be arranged. Course may be repeated for a maximum of 6 credit hours.

**PYPC 8950 SEMINAR** (1). SEM. 1. SU. Seminar Course. Required of all Pharmacy Care Systems doctoral students.

**PYPC 8990 RESEARCH AND DISSERTATION** (1-10). DSR., TD. Credit hours to be arranged. Course may be repeated with change in topic.

Pharmacy Practice, Clinical (PYPP)

**PYPP 5020/5023 PATIENT ASSESSMENT 1** (1). LAB. 3. SU. Pr., first-year PYDI standing. Performing a basic physical assessment and obtaining a medical and medication history.

**PYPP 5260 HUMAN PATHOLOGY** (3). LEC. 3. Pr., second-year PYDI standing. General mechanisms and language of disease. Emphasis on pathogenesis of disease to include and understanding of the dynamic nature of disease.
Pharmacal Sciences (PYPS)


PYPP 5600 DRUG INFORMATION (3). PRA. Pr., fourth-year PYDI standing. Advanced practice experience in providing drug information services to health care providers.

PYPP 5610 COMMUNITY PHARMACEUTICAL CARE (3). PRA. Pr., fourth-year PYDI standing. Advanced Practice Experience in a community pharmacy practice setting that provides pharmaceutical care services such as disease management and other advanced patient care activities.

PYPP 5620 INTERNAL MEDICINE (3). PRA. Pr., fourth-year PYDI standing. Advanced practice experience in providing in-patient pharmaceutical care to adult patients with diseases of the major organ systems.

PYPP 5630 MEDICAL SPECIALTY (3). PRA. Pr., fourth-year PYDI standing. Advanced Practice Experience with a focus on the care of patients with chronic disease of a specific major organ system.

PYPP 5640/5643 PRIMARY AND AMBULATORY CARE 1 (3). PRA. Pr., fourth-year PYDI standing. Advanced practice experience in providing pharmaceutical care to patients as they initially access the health care system.

PYPP 5650/5653 PRIMARY AND AMBULATORY CARE 2 (3). PRA. Pr., fourth-year PYDI standing, PYPP 5640. Continuation of PYPP 5640.

PYPP 5660 PRIMARY AND AMBULATORY CARE 3 (3). PRA. Pr., fourth-year PYDI standing. Advanced practice experience in an primary/ambulatory care setting that is innovative and/or the pharmacist has a special role.

PYPP 5670 ELECTIVE ADVANCED PRACTICE EXPERIENCE (3). PRA. Pr., fourth-year PYDI standing. Elective experience at an advanced practice setting in which the student establishes personal learning goals and responsibilities. Must be repeated in 3 different practice settings for a total of 9 hours. Course may be repeated for a maximum of 9 credit hours.

PYPP 5680 CLINICAL SEMINAR (2). LEC. 2. Pr., fourth-year PYDI standing. Coreq., advanced practice sequence. Student seminars on topics of drug therapy.

PYPP 5690 LONGITUDINAL PHARMACY SERVICES (0). PRA. Pr., fourth-year PYDI standing. Coreq., advanced practice experience sequence. Longitudinal experience that develops the ability to adapt to and function within an integrated pharmaceutical services practice.

PYPP 5900/5903 SPECIAL PROBLEMS IN PHARMACY PRACTICE (1-3). LEC. Pr., departmental approval. Selected topics related to pharmacy practice. Course may be repeated for a maximum of 6 credit hours.

PYPP 5200/5203 PRINCIPLES OF PHARMACOKINETICS (3). LEC. 3. Pr., second-year PYDI standing. The time course of drug absorption, distribution, metabolism and excretion and the pharmacodynamic relationships.

PYPP 5220 PRINCIPLES OF DRUG ACTION 2 (4). LEC. 4. Pr., second-year PYDI standing. The chemical and physio-chemical properties of drugs and the biochemical mechanisms of drug action to include neurologic agents, antihypertensives, antibiotics, antimicrobial and antineoplastic agents.

PYPP 5300 PHARMACEUTICAL BIOTECHNOLOGY (2). LEC. 2. Pr., PYPP 5220, BIOL 3200. Coreq., PYDI 5350. Principles of biotechnology as they relate to the pharmaceutical sciences, including recombinant DNA technology, recombinant proteins and oligonucleotides, monoclonal antibodies, and drug delivery systems.

PYPP 5310 PHARMACOLOGY 1 (3). LEC. 3. Pr., BIOL 5600 and CHEM 5190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, therapeutic and other uses of drugs.

PYPP 5320 PHARMACOLOGY 2 (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion and therapeutic and other uses of drugs.

PYPP 5330 PHARMACOLOGY 3 (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion and therapeutic and other uses of drugs.

PYPP 5350 TOXICOLOGY (3). LEC. 3. Pr., BIOL 6600. The basic science of poisons including the acute and chronic toxicology of common environmental, agricultural, industrial, commercial, medicinal and naturally occurring substances.

PYPP 5360 CELLULAR PHARMACOLOGY (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Cytological basis of pharmacodynamics including drug receptor interactions, drug metabolism, and characteristics of adverse drug reactions.

PYPP 5370 FUNDAMENTALS OF BIONUCLEIC ACIDS (3). LEC. 3. Pr., PHYS 1500. Theoretical and practical applications of trace-level radioactivity for research application to pharmacy and allied sciences.

PYPP 5390 NEUROPHARMACOLOGY OF DRUG ABUSE (2). LEC. 2.

PYPP 5500 PHARMACOGNOSY (3). LEC. 3. Pr., CHEM 2080, BIOL 6600. Medicinal plants, folk medicines, herbal drugs and poisonous plants including constituents and uses.

PYPP 5900 SPECIAL PROBLEMS IN PHARMACAL SCIENCES (1-3). LEC. Pr., departmental approval. Selected laboratory research topics in pharmacal sciences. Course may be repeated for a maximum of 9 credit hours.

PYPP 6310 PHARMACOLOGY 1 (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, therapeutic and other uses of drugs.

PYPP 6320 PHARMACOLOGY 2 (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion and therapeutic and other uses of drugs.

PYPP 6330 PHARMACOLOGY 3 (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion and therapeutic and other uses of drugs.

PYPP 6350 TOXICOLOGY (3). LEC. 3. Pr., BIOL 6600. The basic science of poisons including the acute and chronic toxicology of common environmental, agricultural, industrial, commercial, medicinal and naturally occurring substances.

PYPP 6360 CELLULAR PHARMACOLOGY (3). LEC. 3. Pr., BIOL 6600 and CHEM 6190. Cytological basis of pharmacodynamics including drug receptor interactions, drug metabolism, and characteristics of adverse drug reactions.

PYPP 6370 FUNDAMENTALS OF BIONUCLEIC ACIDS (3). LEC. 3. Pr., PHYS 1500. Theoretical and practical applications of trace-level radioactivity for research application to pharmacy and allied sciences.

PYPP 6390 NEUROPHARMACOLOGY OF DRUG ABUSE (2). LEC. 2. Pr., PYPP 5220 or departmental approval. An in-depth study of drugs of abuse, including mechanisms of action, pharmacokinetics, addition, physio-
cal dependence and the effects of drug use during pregnancy. Substance abuse treatment strategies will also be discussed.

**PYPS 6500 PHARMACOGNOSY** (3). LEC. 3. Pr., CHEM 2080, BIOL 6600. Medicinal plants, folk medicines, herbal drugs and poisonous plants including constituents and uses.

**PYPS 7010 PHARMACOKINETICS** (4). LEC. 4. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Pharmacokinetic and pharmacodynamic principles and methods used to study the absorption, distribution, metabolism and excretion of drugs.

**PYPS 7020 TABLET MANUFACTURING** (4). LEC. 4. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Formulation, compression, coating and evaluation of tablets.

**PYPS 7030 DRUG PRODUCT DEVELOPMENT** (4). LEC. 4. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Formulation and evaluation as well as actual manufacture of pharmaceutical products.

**PYPS 7050 NOVEL DOSAGE FORMS** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Theoretical basis and design of controlled release and site specific drug delivery systems.

**PYPS 7060 FORMULATION AND DELIVERY OF PEPTIDE/PROTEIN DRUGS** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Formulation and delivery problems unique to peptide/protein pharmaceuticals and strategies to overcome such problems.


**PYPS 7080 ADVANCED BIOPHARMACEUTICS** (3). LEC. 3. Pr., PYPS 7010. The mathematical and pharmacokinetic relationships between physical and chemical properties of a drug and its dosage form and biological effects.

**PYPS 7110 STABILITY KINETICS OF PHARMACEUTICALS** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Principles of chemical kinetic as applied to the unique stability problems of the various pharmaceutical dosage forms.

**PYPS 7230 CHEMISTRY OF SYNTHETIC DRUGS 1** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Explanation of the principles of Medicinal Chemistry progressing to qualitative and quantitative descriptions of the synthesis, influence of physical and chemical properties of chemical substances on biological activity and biodisposition.

**PYPS 7240 CHEMISTRY OF SYNTHETIC DRUGS 2** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Relationship of physicochemical properties to the pharmacological actions of drugs affecting the central and peripheral nervous systems. Synthetic methodology employed in the design and synthesis of drugs affecting the central and peripheral nervous systems.

**PYPS 7250 CHEMISTRY OF SYNTHETIC DRUGS 3** (3). LEC. 3. Pr., 6 PYPS or 9 PYSC standing or departmental approval. Relationship of physicochemical properties to the pharmacological actions of drugs classified as chemotherapeutic agents. Synthetic methodology employed in the design and synthesis of chemotherapeutic agents.

**PYPS 7260 ANALYTICAL AND CONTROL METHODS 1** (4). LEC. 4. Pr., 6 PYPS or 9 PYSC standing or departmental approval. A survey of the analytical methods used in the analysis and identification of drug substances with emphasis on separation science. The relationships between the chemical and physical properties of the drug molecules and the analytical methods are emphasized.

**PYPS 7270 ANALYTICAL AND CONTROL METHODS 2** (4). LEC. 4. Pr., 6 PYPS or 9 PYSC standing or departmental approval. A survey of the analytical methods used in the analysis and identification of drug substances. The relationships between the chemical and physical properties of the drug molecules and the analytical methods are emphasized.

**PYPS 7300 NEUROPHARMACOLOGY** (3). LEC. 3. Pr., CHEM 6190. PYPS 6310. Neurochemical mechanisms related to the pharmacological actions of medicinal agents affecting the central nervous system.

**PYPS 7310 PSYCHOPHARMACOLOGY 1** (3). LEC. 3. Pr., PYPS 7300. Discussions on anxiety, depression and related disorders.


**PYPS 7330 PHARMACOLOGY RESEARCH METHODS** (3). LEC. 1. LAB. 9. Experimental design, research methods and data analysis in pharmacology.

**PYPS 7360 NEUROPHARMACOLOGY OF DRUG DEPENDENCE** (2). LEC. 2. Pr., PYPS 5220 or departmental approval. An in-depth study of the neurological changes that occur during chronic drug use. Exploration of theories on the causes of drug dependence and current and proposed pharmacological treatments of drug addiction.

**PYPS 7370 PHARMACOLOGY-TOXICOLOGY SEMINAR** (1). SEM. 1. SU. Pharmacology-Toxicology Seminar. Course may be repeated for a maximum of 2 credit hours.

**PYPS 7500 METABOLISM AND DISPOSITION XENOBIOTICS** (2). LEC. 2. Pr., CHEM 6180 and BIOL 6600. Portals of entry, absorption, distribution and elimination of drugs and xenobiotics. Metabolic mechanisms relevant to chemical structure and principles of pharmacokinetics will be emphasized.


**PYPS 7600 HETEROCYCLIC MEDICINAL CHEMISTRY** (3). LEC. 3. Pr., CHEM 7220. A survey of the chemical nature of heterocyclic moieties which are either themselves of medicinal significance or are components of agents possessing therapeutic properties.

**PYPS 7900 SPECIAL PROBLEMS IN PHARMACAL SCIENCES** (1-3). LEC. 1. Pr., 6 PYPS standing or departmental approval. Selected laboratory research topics in the pharmaceutical sciences. Course may be repeated for a maximum of 6 credit hours.

**PYPS 7950 SEMINAR** (1). SEM. 1. SU. Pr., 6 PYPS standing or departmental approval. Required of all 06 PYPS students. Course may be repeated for a maximum of 6 credit hours.

**PYPS 7960 DIRECTED READINGS IN PHARMACAL SCIENCES** (1-3). IND. Pr., 6 PYPS standing or departmental approval and 6 hours of 7000-level courses. Selected study topics in the pharmaceutical sciences. Course may be repeated for a maximum of 6 credit hours.

**PYPS 7999 RESEARCH AND THESIS** (1-10). MST. TD. Research for Masters students. Course may be repeated with change in topic.

**PYPS 8900 SPECIAL PROBLEMS IN PHARMACAL SCIENCES** (1-3). LEC. Pr., 9 PYSC standing or departmental approval. Selected laboratory research topics in the pharmaceutical sciences. Course may be repeated for a maximum of 6 credit hours.

**PYPS 8950 SEMINAR** (1). LEC. 1. SU. Required of all 9 PYSC students. Course may be repeated for a maximum of 6 credit hours.

**PYPS 8960 DIRECTED READINGS IN PHARMACAL SCIENCES** (1-3). IND. Pr., 9 PYSC standing or departmental approval and 6 hours of 7000-level courses. Selected study topics in the pharmaceutical sciences. Course may be repeated for a maximum of 6 credit hours.

**PYPS 8990 RESEARCH AND DISSERTATION** (1-10). DSR., TD. Research for doctoral students. Course may be repeated with change in topic.
RSED 3110/3113 ASSESSMENT IN SPECIAL EDUCATION (3). LEC. 3. Selection, administration, scoring and interpretation of standardized aptitude and educational tests used in the field of special education.

RSED 3120 ASSESSMENT IN REHABILITATION (3). LEC. 3. Selection, administration, scoring and interpretation of work sample systems and standardized tests of intellectual aptitude, achievement, interest and dexterity used in the field of rehabilitation.

RSED 4010 BEHAVIOR MANAGEMENT IN SPECIAL EDUCATION (3). LEC. 3. Skills to manage the behavior of special education students including behavioral assessment, selection criteria for appropriate intervention strategies and evaluation of intervention effectiveness.

RSED 4100 PROFESSIONAL COMMUNICATION IN REHABILITATION (3). LEC. 3. Theoretical and practical aspects of written and oral communication with rehabilitation and other professionals, clients, and family members.

RSED 4110 SUPPORTED EMPLOYMENT IN REHABILITATION (3). LEC. 3. Historical, legislative, theoretical, research and practical foundation of supported employment.

RSED 4120 INDEPENDENT LIVING SERVICES IN REHABILITATION (3). LEC. 3. The history, legislation and philosophy of the independent living movement and its impact on the quality of life for people with severe disabilities.

RSED 4130 ETHICAL PRACTICES IN REHABILITATION (3). LEC. 3. Pr., PHIL 1030. Ethical dilemmas that are routinely faced by practitioners in human service occupations.

RSED 4900/4903 DIRECTED INDEPENDENT STUDY (1-3). IND., SU. Pr., departmental approval. Content focus of study area will be translated into specific objectives with student learning guided by the instructor. Emphasis on exceptional learners. Course may be repeated for a maximum of 3 credit hours.

RSED 4910/4913 PRACTICUM (1-6). PRA., SU. Pr., Departmental approval and junior standing or above. Practice in educational or community service setting aligned with degree program option. Course may be repeated for a maximum of 6 credit hours.

RSED 4920 INTERNSHIP (9). INT., SU. Pr., senior standing. Comprehensive supervised on-the-job experience in a school, college or community-based setting serving individuals with disabilities.

RSED 4970/4973 SPECIAL TOPICS (1-3). IND. Pr., departmental approval. Seminar in which upper-level students and professors engage in critical thinking regarding selected concepts, theories, research and issues germane to the field of disabilities. Course may be repeated for a maximum of 3 credit hours.

RSED 5010 MEDICAL ASPECTS OF DISABILITY (3). LEC. 3. Medical terminology, basic body systems, common malfunctions, therapeutic services, restorative techniques, and disability evaluation for different disability groups and the vocational implications of each.

RSED 5020 PSYCHOSOCIAL ASPECTS OF DISABILITY (3). LEC. 3. Theoretical constructs and practical issues for various types of physical, mental, psychiatric, and social disabilities with implications for personal, vocational, social and community adjustment.

RSED 5030 MENTAL RETARDATION (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition and classification of individuals with mental retardation. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 5040 LEARNING DISABILITIES (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition, and classification of individuals with learning disabilities. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 5050 BEHAVIOR DISORDER (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition, and classification of individuals with behavior disorders. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 5060 SEVERE DISABILITIES (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition and classification of individuals with severe levels of disability. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 5100 INFANTS AND TODDLERS WITH DISABILITIES (3). LEC. 3. Pr., departmental approval. Historical, legislative, and philosophical basis of early intervention for young children, birth through age two, with special needs and their families.

RSED 5110 CURRICULUM IN EARLY CHILDHOOD SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3100. Procedures for developing, implementing, and monitoring individualized educational programs in natural settings.

RSED 5120 CURRICULUM IN ELEMENTARY SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3010. Functional/developmental approach to the selection, development, implementation, and evaluation of curriculum activities for the collaborative instruction of elementary children with disabilities.

RSED 5130 CURRICULUM IN SECONDARY SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3010. Functional/developmental approach to the selection, development, implementation, and evaluation of curriculum materials for the collaborative instruction of secondary students with disabilities.

RSED 5140 CURRICULUM IN SPEECH PATHOLOGY AND SPECIAL EDUCATION (3). LEC. 3. Theoretical and practical foundation in methods, instruments, and procedures used to identify, assess, and instruct pre-school and school-aged children with communication disorders.

RSED 5150 TEACHING METHODS IN SPECIAL EDUCATION (3). LEC. 3. Instructional strategies in reading and math for students who have learning and behavior problems.

RSED 5160 COLLABORATION IN SPECIAL EDUCATION (3). LEC. 3. Collaborative teaching, consultation, and learning as a critical best practice in serving students with disabilities.

RSED 5170 TRANSITION FROM SCHOOL TO COMMUNITY (3). LEC. 3. History, philosophy, models, and definitions of transition with emphasis on best practices, programs, and services.

RSED 5200 VOCATIONAL EVALUATION IN REHABILITATION (3). LEC. 3. Vocational evaluation and work adjustment techniques and strategies used within the rehabilitation process.

RSED 5210 OCCUPATIONAL INFORMATION (3). LEC. 3. Pr., RSED 6200. Identification, location, and use of data resources for job accommodation and modification strategies, labor market surveys, and job placement of persons with disabilities.

RSED 5220 PLACEMENT SERVICES IN REHABILITATION (3). LEC. 3. Theories, strategies, and techniques for job development, accommodation, modification, and placement of people with disabilities with application skills needed to facilitate employment.

RSED 5230 REHABILITATION ASSISTIVE TECHNOLOGY (3). LEC. 3. Basic computer literacy; use of commercially available software, and assistive technology for use by persons with disabilities.

RSED 6010/6016 MEDICAL ASPECTS OF DISABILITY (3). LEC. 3. Medical terminology, basic body systems, common malfunctions, therapeutic services, restorative techniques, and disability evaluation for different disability groups and the vocational implications of each.

RSED 6020/6026 PSYCHOSOCIAL ASPECTS OF DISABILITY (3). LEC. 3. Theoretical constructs and practical issues for various types of physical, mental, psychiatric, and social disabilities with implications for personal, vocational, social and community adjustment.

RSED 6030/6036 MENTAL RETARDATION (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition and classification of individuals with mental retardation. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 6040/6046 LEARNING DISABILITIES (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition, and classification of individuals with learning disabilities. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 6050/6056 BEHAVIOR DISORDERS (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition, and classification of individuals with behavior disorders. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 6060/6066 SEVERE DISABILITIES (3). LEC. 3. Historical perspective, theoretical concepts, etiology, diagnosis, definition and classification of individuals with severe levels of disability. Educational and rehabilitative approaches and contemporary issues are emphasized.

RSED 6100/6106 INFANTS AND TODDLERS WITH DISABILITIES (3). LEC. 3. Pr., departmental approval. Historical, legislative, and philosophical basis of early intervention for young children, birth through age two, with special needs and their families.

RSED 6110/6116 CURRICULUM IN EARLY CHILDHOOD SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3100. Procedures for developing, implementing, and monitoring individualized educational programs in natural settings.
RSED 6120/6126 CURRICULUM IN ELEMENTARY SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3010. Functional/developmental approach to the selection, development, implementation, and evaluation of curriculum activities for the collaborative instruction of elementary children with disabilities.

RSED 6130/6136 CURRICULUM IN SECONDARY SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3010. Functional/developmental approach to the selection, development, implementation, and evaluation of curriculum materials for the collaborative instruction of secondary students with disabilities.

RSED 6140 CURRICULUM IN SPEECH PATHOLOGY AND SPECIAL EDUCATION (3). LEC. 3. Theoretical and practical foundation in methods, instruments, and procedures used to identify, assess, and instruct pre-school and school-aged children with communication disorders.

RSED 6150/6156 TEACHING METHODS IN SPECIAL EDUCATION (3). LEC. 3. Instructional strategies in reading and math for students who have learning and behavior problems.

RSED 6160/6166 COLLABORATION IN SPECIAL EDUCATION (3). LEC. 3. Collaborative teaching, consultation, and learning as a critical best practice in serving students with disabilities.

RSED 6170/6176 TRANSITION FROM SCHOOL TO COMMUNITY (3). LEC. 3. History, philosophy, models, and definitions of transition with emphasis on best practices, programs, and services.

RSED 6200 VOCATIONAL EVALUATION IN REHABILITATION (3). LEC. 3. Vocational evaluation and work adjustment techniques and strategies used within the rehabilitation process.

RSED 6210/6216 OCCUPATIONAL INFORMATION (3). LEC. 3. Pr., RSED 6200. Identification, location, and use of data resources for job accommodation and modification strategies, labor market surveys, and job placement of persons with disabilities.

RSED 6220/6226 PLACEMENT SERVICES IN REHABILITATION (3). LEC. 3. Theories, strategies, and techniques for job development, accommodation, modification, and placement of people with disabilities with application skills needed to facilitate employment.

RSED 6230/6236 REHABILITATION ASSISTIVE TECHNOLOGY (3). LEC. 3. Basic computer literacy; use of commercially available software, and assistive technology for use by persons with disabilities.

RSED 7000/7006 ADVANCED STUDY OF EXCEPTIONALITY (3). LEC. 3. An advanced study of exceptionality with an emphasis upon the educational implications of disability and current issues in special education and rehabilitation.

RSED 7010/7016 REHABILITATION PROFESSIONS, PROGRAMS AND SERVICES (3). LEC. 3. Comprehensive examination of the evolution, nature and contemporary status of state-federal vocational rehabilitation system including roles of the professionals within this system.


RSED 7110/7116 ADVANCED ASSESSMENT IN EARLY CHILDHOOD SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3100, RSED 4010 or departmental approval. Advanced concepts and techniques for developmental screening and assessment for young children (ages 3-8) with developmental delays.

RSED 7120/7126 ADVANCED ASSESSMENT IN SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 3110 or departmental approval. Advanced study of educational tests and procedures for diagnosing special learning problems.

RSED 7130/7136 ADVANCED ASSESSMENT I IN REHABILITATION (3). LEC. 3. Pr., RSED 7010. Principles, process and techniques used to diagnose vocationally-related assets and liabilities of the individual with disabilities.

RSED 7140 ADVANCED ASSESSMENT II IN REHABILITATION (3). LEC. 3. Pr., RSED 7130. Interpretation of vocational evaluation data for prescriptive purposes and communication of that data through report writing and oral communication.

RSED 7150/7156 MULTICULTURAL ASPECTS OF DISABILITIES (3). LEC. 3. Coreq., RSED 7010. Study of three main areas relevant to multicultural competencies and standards for rehabilitation professionals: (a) acquisition of communication skills; (b) attitudes towards ethnic minorities, and (c) knowledge about minority populations. Spring.

RSED 7200/7206 ADVANCED INTERVENTION WITH INFANTS AND TODDLERS WITH DISABILITIES (3). LEC. 3. Pr., RSED 7100 or departmental approval. Administration and on-going management of early intervention programs and service coordination of individualized family service plans and family support.

RSED 7210/7216 ADVANCED INTERVENTION IN EARLY CHILDHOOD SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 7110. Curriculum methods, intervention plans, intervention methods, physical and medical management, environmental and behavioral management, and evaluation of child and family outcomes.

RSED 7220/7226 ADVANCED TEACHING METHODS IN SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 6150. Applied study and practice in analyzing, designing, constructing and evaluating teaching sequences and programs with empirical emphasis for design of instructional principles.

RSED 7230/7236 ADVANCED BEHAVIOR MANAGEMENT IN SPECIAL EDUCATION (3). LEC. 3. Pr., RSED 4010. Provides skills necessary to direct academic and social performance and appropriately manage the behavior of students with special needs.

RSED 7300/7306 REHABILITATION COUNSELING TECHNIQUES (3). LEC. 3. Facilitative communication skills and systematic problem solving skills for effective clinical practice.

RSED 7310/7316 PROPRIETARY REHABILITATION (3). LEC. 3. Pr., RSED 6210, RSED 7130. Vocational rehabilitation in private sector including case management and vocational expert witness for workers compensation, personal injury litigation, and social security.

RSED 7400/7406 CURRICULUM AND TEACHING IN SPECIALIZATION (3). LEC. 3. Pr., Departmental approval. Curriculum design, content, and materials selection related to teaching practices in areas of specialization (mental retardation, learning disabilities, behavioral disorders, etc.). Course may be repeated for a maximum of 6 credit hours.

RSED 7410/7416 PROGRAM IMPLEMENTATION IN SPECIALIZATION (3). LEC. 3. Pr., departmental approval. Program organization and development of materials for curriculum improvement and teaching practices in specialization area (mental retardation, learning disabilities, etc.). Course may be repeated for a maximum of 6 credit hours.

RSED 7420/7426 RESEARCH IN SPECIALIZATION (3). LEC. 3. Pr., departmental approval. Examination and interpretation of applied research in specialization area (mental retardation, learning disabilities, behavioral disorders, etc.).

RSED 7430/7436 RESEARCH INTO PRACTICE (3). LEC. 3. Pr., departmental approval. Applied opportunities for translating instructional and behavioral research into practice by working with students with disabilities who attend RSE's Summer Learning Clinic.

RSED 7440/7446 SEMINAR IN SPECIALIZATION (3). SEM. 3. Pr., departmental approval. Advanced study and professor(s) engage in critical thinking regarding selected concepts, theories, research and issues germane to the field of disabilities. Course may be repeated with change in topic.

RSED 7900/7906 DIRECTED INDEPENDENT STUDY (1-3). IND. SU. Pr., departmental approval. Credit for study limited to specific objectives with advanced student learning guided by the instructor. The department's policy is to restrict independent study only for content not covered in RSED's course listing. Course may be repeated for a maximum of 3 credit hours.

RSED 7910/7916 PRACTICUM (1-6). PRA., SU. Pr., departmental approval. Practice in educational or community service setting aligned with degree program option. Course may be repeated for a maximum of 6 credit hours.

RSED 7920/7926 INTERNSHIP (9). LEC. 9. SU. Pr., departmental approval. Comprehensive supervised on-the-job experience in a school, college or community-based setting serving individuals with disabilities.

RSED 7980/7986 NON-THESIS PROJECT (1-3). LEC., SU. Pr., departmental approval. Course may be repeated for a maximum of 10 credit hours.

RSED 7990 RESEARCH AND THESIS (1-10). MSTR., TD. Pr., departmental approval. The content focus of the study area will be translated into specific objectives with the student learning toward that end, guided by the instructor. In addition to regular meetings with the instructor, the student will be evaluated and graded according to learning performance. The department's policy is to restrict independent study only for content not covered in RSED's course listing.
RSED 8010 DISABILITIES AND RESEARCH METHODS (3). LEC. 3. Pr., departmental approval. History, principles, and methodology of single subject research with emphasis on the various types of research designs applied in rehabilitation and special education.

RSED 8020 DISABILITIES AND APPLIED RESEARCH IN MEASUREMENT (3). LEC. 3. Pr., departmental approval. Classical measurement theory, individual differences determination, constructs related to diagnostic labels, measurement bias and fairness, nature-nurture controversy, and clinical versus statistical inference.

RSED 8030 DISABILITIES AND PROFESSIONAL ISSUES (3). LEC. 3. Pr., departmental approval. Critical and contemporary issues regarding the disability population and their relationship to the roles and leadership of professionals in special education and rehabilitation.


RSED 8050 DISABILITIES AND THE LAW (3). LEC. 3. Pr., departmental approval. Advanced knowledge of legislative and litigation basis for special education and rehabilitation programs and services.

RSED 8060 DISABILITIES AND LIFE SPAN TRANSITIONS (3). LEC. 3. Pr., departmental approval. Advanced study of historical, legal, legislative, philosophical, and service delivery issues and trends with emphasis on research studies and programs.

RSED 8070 PROFESSIONAL SEMINAR (3). LEC. 3. SU. Pr., departmental approval. The first of two consecutive doctoral seminars is devoted to professional technical writing, whereas the second seminar addresses grant writing and management. Course may be repeated with change in topic.

RSED 8900 DIRECTED INDEPENDENT STUDY (1-3). IND. 1-3. IND. 3. Pr., departmental approval. Content focus of study area will be translated into specific objectives with student learning guided by the instructor. Course may be repeated with change in topic.

RSED 8980 NON-THESIS PROJECT (1-10). IND. 1-10. IND. 3. Pr., departmental approval. Course may be repeated with change in topic.

RSED 8990 RESEARCH AND DISSERTATION (1-10). DIR. 1-10. DIR. 3. Pr., departmental approval. Course may be repeated with change in topic.

Science and Mathematics, Interdepartmental (SCMH)

SCMH 1010 CONCEPTS OF SCIENCE (4). LEC. 3. LAB. 1. Science Core. Interdisciplinary course which presents major scientific concepts and stresses the interactions between the sciences and the humanities. Credit will not be given for both SCMH 1010 and either BIOL 1000 or BIOL 1020.

SCMH 1990 PRE-HEALTH PROFESSIONS ORIENTATION (1). LEC. 1. SU. Orientation and guidance for all freshmen planning to seek admission to health professions schools, such as medicine, dentistry, optometry, physical therapy, pharmacy, podiatry and veterinary medicine.

SCMH 3990 PRE-MEDICAL PRECEPTORSHIP (1). LEC. 2. SU. Pr., junior standing and departmental approval. Direct observation and interaction with physicians at East Alabama Medical Center in various medical specialties.

Sociology (SOCY)

ANTH 2300 INTRODUCTION TO PHYSICAL ANTHROPOLOGY (3). LEC. 3. Pr., ANTH 1000. An introduction to human origins and development using a genetic and anthropometric approach.


ANTH 3100 LANGUAGE AND CULTURE (3). LEC. 3. Pr., Social Science Core I and junior standing. The course examines the interplay between language and culture, including socio-linguistics, discourse, mythology and folklore.

ANTH 3200 ANTHROPOLOGY OF GENDER (3). LEC. 3. Pr., ANTH 1000 or UNIV 1010. Gender relations and representations in different cultures, historical periods, and discourses.


ANTH 3450 ARCHAEOLOGICAL FIELD PROBLEMS (1-3). LEC. 1. LAB. 2. Pr., ANTH 1000 or departmental approval and junior standing. A practical investigation of a specific field problem that involves excavation techniques, mapping and data recording. Course may be repeated for a maximum of 3 credit hours.

ANTH 3500 ARCHAEOLOGICAL LABORATORY TECHNIQUES (1-3). LEC. 1. LAB. 2. Pr., ANTH 1000 and junior standing. Analysis, preservation, cataloging and restoration of archaeological materials. Course may be repeated for a maximum of 3 credit hours.

ANTH 3550 ARCHAEOLOGICAL LABORATORY PROBLEMS (1-3). LEC. 1. LAB. 2. Pr., ANTH 1000 or departmental approval and junior standing. Investigates a specific archaeological problem or problems and involves students in laboratory techniques and research. Course may be repeated for a maximum of 3 credit hours.

ANTH 3600 MEDICAL ANTHROPOLOGY (3). LEC. 3. Pr., Social Science Core I and junior standing. How universal experiences of illness and healing are understood by people of different cultures.

ANTH 3700 POLITICAL ECOLOGY (3). LEC. 3. Pr., Social Science Core I and junior standing. Problems in ethnecology, cultural ecology, political ecology and environmentalism.

ANTH 3800 MESOAMERICAN ARCHAEOLOGY (3). LEC. 3. Pr., ANTH 1000 or departmental approval and junior standing. The prehistoric cultures of Mesoamerica, from the Olmecs to the Aztecs.

ANTH 3850 SOUTHEASTERN ARCHAEOLOGY (3). LEC. 3. Pr., ANTH 1000 and junior standing. The diversity and complexity of prehistoric to historic cultures of the southeastern United States.

ANTH 3900 HISTORICAL ARCHAEOLOGY AND ETHNOHISTORY (3). LEC. 3. Pr., ANTH 1000 and junior standing. Historical archaeology and ethnohistory with emphasis on the cultures of peoples who left few written records.

ANTH 4300 THE ANTHROPOLOGY OF LAW (3). LEC. 3. Pr., ANTH 1000 and junior standing. An introduction to the study of law in cultures and societies around the world.

ANTH 4900 ANTHROPOLOGICAL THEORY (3). LEC. 3. Pr., ANTH 1000. Major thinkers in cultural anthropology and their theoretical models considered in historical perspective.

ANTH 4920 INTERNSHIP IN ANTHROPOLOGY (3). INT. 3. Pr., ANTH 1000, junior standing. An internship with a federal/state agency for practical work or research on anthropological problems.

ANTH 4960 DIRECTED READING (3). LEC. 3. Pr., ANTH 1000 and junior standing. An independent reading program to pursue specific interests in anthropology not covered in other courses.

ANTH 4967 HONORS READINGS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

ANTH 4997 HONORS THESIS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

ANTH 5100 NORTH AMERICAN INDIANS (3). LEC. 3. Pr., ANTH 1000 and junior standing. A comparative anthropological, cultural and ethnographic overview of Native American cultures.

ANTH 5200 GENDER, DEVELOPMENT AND CULTURE (3). LEC. 3. Pr., ANTH 1000 or UNIV 1010. The role of gender and culture in Third World development from an anthropological perspective.
ANTH 5600 CULTURE, MEDICINE AND POWER (3). LEC. 3. Pr., ANTH 1000 or UNIV 1010. Power in the context of illness and healing at local, national and international levels.

ANTH 5700 CRITIQUE OF DEVELOPMENT (3). LEC. 3. Pr., ANTH 3700 and junior standing. The meanings and structures of national and international development.

ANTH 5970 SPECIAL TOPICS IN ANTHROPOLOGY (3). LEC. 3. Pr., ANTH 1000 and senior or graduate standing. Examination of a specific problem in ethnographic methods, theory, and cultural analysis.

ANTH 6100 NORTH AMERICAN INDIANS (3). LEC. 3. An advanced comparative cultural and ethnohistorical overview of the Native American cultures of North America, emphasizing change and contact situations.

ANTH 6200 GENDER, DEVELOPMENT AND CULTURE (3). LEC. 3. The role of gender and culture in Third World economic development from an anthropological perspective.

ANTH 6600 CULTURE, MEDICINE AND POWER (3). LEC. 3. Power in the context of illness and healing at local, national and international levels.

ANTH 6700 CRITIQUE OF DEVELOPMENT (3). LEC. 3. The meanings and structures of national and international development in historical perspective to include cultural values, power, inequality and resistance.

ANTH 6970 SPECIAL TOPICS IN ANTHROPOLOGY (3). LEC. 3. Pr., ANTH 1000 and senior or graduate standing. Examination of a specific problem in ethnographic methods, theory, and cultural analysis.

CRIMINOLOGY (CRIM)

CRIM 2000 CRIME AND JUSTICE IN AMERICA (3). LEC. 3. The distribution and measurement of crime, different variations in criminal behavior and the handling of crime in the American criminal justice system.

CRIM 3000 CRIMINOLOGY (3). LEC. 3. Examine etiological issues related to crime. Major theories of crime causation from a wide variety of perspectives are explored in detail.

CRIM 3100 POLICE AND SOCIETY (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. A sociological overview of policing and current issues that relate to the police.

CRIM 3200 SENTENCING AND CORRECTIONS (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. An in-depth analysis of sentencing policy and the corrections system.

CRIM 3400 CRIMINAL JUSTICE ORGANIZATION AND ADMINISTRATION (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. Principles of organization and administration applied to the United States criminal justice process.

CRIM 3500 DELINQUENCY AND JUVENILE JUSTICE (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. The nature and distribution of delinquency in the United States, as well as the various components of the juvenile justice system.

CRIM 4000 CRIMINAL LAW: SUBSTANTIVE AND PROCEDURAL ISSUES (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. Statutory criminal law and its application to law enforcement and the criminal courts in the United States.

CRIM 4100 CONSTITUTIONAL LAW: CRIMINAL JUSTICE (3). LEC. 3. United States Supreme Court opinions defining due process and other issues related to the national and state administration of criminal justice.

CRIM 4300 CRIMINAL EVIDENCE (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. Comprehensive analysis of the rules of evidence used in the U.S. criminal justice process, with particular emphasis on search and seizure and arrests.

CRIM 4350 CRIMINAL INVESTIGATION AND FORENSICS (3). LEC. 3. Pr., CRIM 2000 or CRIM 3000 or departmental approval. Criminal investigation procedures including case preparation, specific techniques for specific offenses and crime science.

CRIM 4400 COMPARATIVE CRIMINAL JUSTICE (3). LEC. 3. Institutional comparison, social control problems and policies and functional analysis of the criminal justice systems in selected countries.

CRIM 4700 THEORIES OF CRIME AND CRIMINALITY (3). LEC. 3. Pr., CRIM 3000. Theories of crime causation with emphasis on theory construction, theory analysis, and differences in theoretical approaches.

CRIM 4920 INTERNSHIP (3-6). INT. Pr., junior standing and departmental approval. Field experience in a work setting under the joint supervision of the agency and the Criminology and Criminal Justice Program. Course may be repeated for a maximum of 6 credit hours.

CRIM 4960 READINGS IN CRIMINOLOGY/CRIMINAL JUSTICE (3). LEC. 3. Pr., junior standing. Independent reading course under the supervision of a faculty member from the Criminology and Criminal Justice Program. Course may be repeated for a maximum of 6 credit hours.

CRIM 4987 HONORS READINGS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

CRIM 4997 HONORS THESIS (1-3). IND. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

CRIM 5200 SOCIOLOGY OF CRIMINAL LAW (3). LEC. 3. Controversial and contemporary issues in the field of criminal law from a sociological perspective.

CRIM 5500 VICTIMOLOGY (3). LEC. 3. Pr., junior standing. The impact of victimization upon the crime victim, offender, and society, as well as the dynamics of the victim-offender relationship.

CRIM 5550 SERIAL AND MASS MURDER (3). LEC. 3. Pr., junior standing. The phenomena of serial homicide and mass murder with emphasis on etiological issues, crime-scene investigation and profiling.

CRIM 5600 SEX CRIMES (3). LEC. 3. Pr., junior standing. Criminal sexual behavior, the social influences on what is defined as sexually deviant, and how the criminal justice system handles sex offenders.


CRIM 5970 SPECIAL TOPICS IN CRIMINOLOGY/CRIMINAL JUSTICE (3). LEC. 3. Pr., junior standing. Selected topics related to Criminology/Criminal Justice.

CRIM 6200 SOCIOLOGY CRIMINAL LAW (3). LEC. 3. Controversial and contemporary issues in the field of criminal law from a sociological perspective.

CRIM 6500 VICTIMOLOGY (3). LEC. 3. The impact of victimization upon the crime victim, offender and society, as well as the dynamics of the victim-offender relationship.

CRIM 6550 SERIAL AND MASS MURDER (3). LEC. 3. The phenomena of serial homicide and mass murder with emphasis on etiological issues, crime-scene investigation and profiling.

CRIM 6600 SEX CRIMES (3). LEC. 3. Criminal sexual behavior, the social influences on what is defined as sexually deviant, and how the criminal justice system handles sex offenders.

CRIM 6650 DRUGS AND SOCIETY (3). LEC. 3. The context and correlates of drug use, relationship with crime and delinquency, and societal reaction to drug abuse.

CRIM 6790 SPECIAL TOPICS IN CRIMINAL JUSTICE (3). LEC. 3. Select topics related to Criminology/Criminal Justice.

CRIM 7300 ADVANCED CRIMINOLOGICAL THEORY (3). LEC. 3. The etiology of crime, including recent advances and issues in criminological theory.

CRIM 7350 VIOLENT CRIME (3). LEC. 3. The social, behavioral, cultural, spatial and situational antecedents of criminal violence.

SOCIOLOGY (SOCY)


SOCY 2000 SOCIAL ISSUES (3). LEC. 3. Pr., SOCY 1000. An exploration of the claims and conflicts of public issues and moral apprehensions; topics may include crime, the environment, gender and racial inequality, various syndromes.

SOCY 2100 POPULATION AND SOCIETY (3). LEC. 3. A survey of theories and research of demographic processes and their interaction with the economy, education, family, medicine, science and technology.

SOCY 2200 SOCIAL PSYCHOLOGY: SOCIOLOGICAL PERSPECTIVES (3). LEC. 3. An examination of collective influences on the person and the role the person plays in sustaining collective conditions.
SOCY 3200 SPORTS IN AMERICA (3). LEC. 3. Sociological perspectives on sports in the social system; organization and culture of sports relationship to social class, race and gender; and the interconnections between sport and the larger society.

SOCY 3300 SOCIOLOGY OF THE FAMILY (3). LEC. 3. The family as a major social institution with emphasis on the American family; cross-cultural comparisons provide perspective.

SOCY 3400 SOCIAL THOUGHT (3). LEC. 3. Pr., SOCY 1000. Examines ancient and contemporary thinking influencing the social and behavioral sciences and public commentaries on social issues and criticisms.

SOCY 3500 MINORITY GROUPS (3). LEC. 3. Pr., SOCY 1000. An exploration of the sources and uses of minority representations in the U.S. addressing inequalities such as race, ethnicity, gender and sexual orientation.

SOCY 3700 METHODS OF SOCIAL RESEARCH (3). LEC. 3. Pr., SOCY 1000. Methodological approaches to data collection used by social scientists including logic of science, hypothesis formation and research design.


SOCY 4100 DEVIANCE (3). LEC. 3. Pr., junior standing. Analysis of creation and reaction to deviance using theoretical approaches including demonic possession, social disorganization, pathological models and labeling examining several deviant groups.

SOCY 4200 MEDICAL SOCIOLOGY (3). LEC. 3. Pr., junior standing. The nature and organization of medical practice and health delivery systems with special attention to the role of physicians, patients, disease and the relationship between culture, politics and health.

SOCY 4300 FIELD INSTRUCTION (3). LEC. 3. Pr., junior standing and departmental approval. Supplementary instruction concurrent with experience in some field of work involving application of sociological perspectives to community life. Course may be repeated for a maximum of 6 credit hours.

SOCY 4400 CONTEMPORARY THEORY (3). LEC. 3. Pr., junior standing. A survey of theorists from Comte to the present, emphasizing theory construction, theoretical analysis and differences in theoretical approaches.

SOCY 4960 DIRECTED READING IN SOCIOLOGY (3). IND. 3. Pr., junior standing and departmental approval. An independent reading program under supervision, to allow pursuit of specific interests in sociology not covered in other course offerings. Course may be repeated for a maximum of 6 credit hours.

SOCY 4967 HONORS READINGS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

SOCY 4997 HONORS THESIS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.

SOCY 5970 SPECIAL TOPICS IN SOCIOLOGY (3). LEC. 3. Pr., junior standing and departmental approval. Study of substantive areas related to the discipline of sociology.

SOCY 6970 SOCIOLOGY SPECIAL TOPICS (3). LEC. 3. Study of substantive areas related to the discipline of sociology. Course may be repeated for a maximum of 6 credit hours.

SOCY 7000 ADVANCED SOCIOLOGICAL THEORY (3). LEC. 3. Pr., SOCY 4400 or departmental approval. Reviews major types of sociological theory within the context of theoretical paradigms, and significant theoretical issues that face the discipline.

SOCY/STAT 7100 STATISTICAL ANALYSIS OF SURVEY, AGGREGATE AND LARGE DATA SOURCES (3). LEC. 3. Pr., STAT 2010 or departmental approval. Techniques commonly used in multivariate statistical analysis of data sources such as surveys, archival records and other large data sets. Credit will not be given for both SOCY 7100 and STAT 7100.

SOCY 7200 SEMINAR IN SOCIAL BEHAVIOR (3). SEM. 3. Research and theory concerning social and group influences on behavior.

SOCY 7800 MENTORING IN THE CLASSROOM (1). LEC., SU. Pr., departmental approval. 125st-hand experience in course building/planning, lecture and test construction, syllabus preparation, presenting and tape a lecture, performance critique, developing discussions, and other techniques.

SOCY 7850 TECHNOLOGY AND TEACHING IN SOCIOLOGY (1). LEC., SU. Pr., Department Approval. The use of technology as a teaching tool as it applies to Sociology.

SOCY 7900 INDEPENDENT STUDY (3). IND. Pr., departmental approval. An independent reading course under the supervision of a department faculty member. Course may be repeated for a maximum of 6 credit hours.

SOCY 7990 RESEARCH AND THESIS (1-10). MST., TD. In conjunction with the preparation of a thesis. Course may be repeated with change in topic.

SOCIAL WORK (SOWO)

SOWO 2000 INTRODUCTION TO SOCIAL WORK (3). LEC. 3. Introduction to Social Work practice, examining career opportunities, history of the profession, practice settings, values, ethics and types of clientele.


SOWO 3400 CHILDREN IN CRISIS AND TRANSITION (3). LEC. 3. Pr., SOWO 3800 or HDFS 2010. The normal childhood transitions and crisis situations and the social work knowledge and skills required for assisting both children and their parents or caregivers.

SOWO 3500 CHILD WELFARE (3). LEC. 3. Pr., SOCY 1000 or SOWO 2000. Social work practice in settings dealing with child abuse and neglect, foster care, child care and adoption. Work with court investigations and procedures, and worker burnout emphasized.

SOWO 3600 AGING ISSUES AND SERVICES (3). LEC. 3. Pr., SOCY 1000. Introduction to social services and social work with the elderly. Various socio-cultural issues and impact on the elderly are covered.


SOWO 3800 HUMAN BEHAVIOR IN SOCIAL ENVIRONMENT I (3). LEC. 3. Pr., SOWO 2000, BIOL 1000. Lifespan approach to biopsychosocial examination of behavior and early development. Special emphasis is given to influences of racism, sexism and ethnocentrism.

SOWO 3850 HUMAN BEHAVIOR IN THE SOCIAL ENVIRONMENT II (3). LEC. 3. Pr., SOWO 3800. Lifespan approach to biopsychosocial examination of behavior from adulthood through old age, emphasizing role of gender, sexism and sexual orientation.

SOWO 3910 FIELD PRACTICUM SEMINAR (3). SEM. Pr., departmental approval. Introduces fields and settings of social work practice via placement in a selected social service agency. Includes a concurrent integrative seminar to analyze their experiences.

SOWO 4060 SOCIAL WORK PRACTICE METHODS I (3). LEC. 3. Pr., SOWO 2000, SOWO 2650, SOWO 3910. Introduces the student to generalist practice methods and skills in engagement, assessment and goal setting with individual clients.

SOWO 4070 SOCIAL WORK METHODS II (3). LEC. 3. Pr., SOWO 4060. The practice skills and perspectives required for work with families and groups.

SOWO 4080 SOCIAL WORK METHODS III (3). LEC. 3. Pr., SOWO 4070. Focuses on generalist practice theory and skills as applied to communities, organizations and oppressed populations. Issues of social justice and social action emphasized.

SOWO 4090 SOCIAL WELFARE POLICY (3). LEC. 3. Pr., SOWO 2650. Critical analysis of policy issues and proposals in selected social welfare programs and their impact upon current social problems and social work values and ethics.

SOWO 4920 SOCIAL WORK FIELD PLACEMENT (9). FLD. 9. Pr., SOWO 4080. 480-hour field experience under joint supervision of agency and university. Application of generalist practice skills and research project required.

SOWO 4950 SENIOR INTEGRATIVE SEMINAR (3). SEM. 3. Pr., SOWO 4080. Coreq., SOWO 4920. Taken concurrently with the senior field placement, seminar serves to guide students in integrating theory with practice through analysis of behavior and evaluation of practice skills.

SOWO 4967 HONORS READINGS (1-3). IND. 3. Pr., membership in the Honors College; departmental approval. Course may be repeated for a maximum of 3 credit hours.
STAT 5680 and MATH 5680. Continuous-time Markov chains, Markov renewal and semi-regenerative theorem, Laplace transforms, convolutions, simulations, renewal processes, brownian motion and diffusion. Credit will not be given for both STAT 6680 and MATH 6680.

STAT/MATH 6670/6676 PROBABILITY AND STOCHASTIC PROCESSES I (3). LEC. 3. Pr., MATH 2630. 125 dom variables, discrete and absolutely continuous distributions. Poisson process, expectation and conditional expectation. Moment generating functions, limit distributions. Emphasis on probabilistic reasoning and problem solving. Credit will not be given for both STAT 6670 and MATH 6670.

STAT/MATH 6680 PROBABILITY AND STOCHASTIC PROCESSES II (3). LEC. 3. Pr., MATH 6670. Multivariate distributions, Central Limit Theorem, Laplace transforms, convolutions, simulations, renewal processes, continuous-time Markov chains, Markov renewal and semi-regenerative processes, brownian motion and diffusion. Credit will not be given for both STAT 6680 and MATH 6680.

STAT/MATH 6690 CHAOTIC AND RANDOM PHENOMENA (3). LEC. 3. Pr., MATH 1620. Statistics and modelling of random phenomena in connection to computational complexity, data analysis, processes of chance and chaotic nonlinear systems. Credit will not be given for both STAT 6690 and MATH 6690.

STAT 7000 EXPERIMENTAL STATISTICS I (4). LEC. 4. Pr., MATH 1120, STAT 2510 or departmental approval. Paired and independent sample t-tests, ANOVA, F-tests, contrasts, tests for trends, multiple comparisons, CR and RCB designs of experiments, regression.

STAT 7010 EXPERIMENTAL STATISTICS II (3). LEC. 3. Pr., STAT 7000. Advanced topics in experimental design: writing linear models for experiment-expected mean squares, variance components, nested designs, Latin Square Designs, split plot designs, ANOVA and multiple regression.

STAT 7020 REGRESSION ANALYSIS (3). LEC. 3. Pr., STAT 7000 or consent of department. Introduction to the method of least squares as it applies to regression and analysis of variance. Simple linear regression, multiple regression, model selection and diagnostics.

STAT 7030 CATEGORICAL DATA ANALYSIS (3). LEC. 3. Pr., STAT/MATH 3600 or STAT 7000 or departmental approval. Methods for analysis or categorical response data. Topics include Chi-square tests, Likelihood Ration tests, Logistic Regression and Loglinear Modeling.

STAT 7040 BIOSTATISTICS (3). LEC. 3. Pr., STAT 7000 or consent of department. Epidemiology, biometry, methods of survival analysis.

STAT/SOCY 7100 STATISTICAL ANALYSIS OF SURVEY, AGGREGATE AND LARGE DATA SOURCES (3). LEC. 3. Pr., STAT 2010 or departmental approval. Techniques commonly used in multivariate statistical analysis of data sources such as surveys, archival records and other large data sets. Credit will not be given for STAT 7100 and SOCY 7100.

STAT/PSYC 7270 EXPERIMENTAL DESIGN IN PSYCHOLOGY (4). LEC. 4. Pr., STAT 7000 and STAT 7270. Introduction to the analysis of data collected under differential experimental designs. Credit will not be given for both STAT 7270 and PSYC 7270.

STAT/INSY 7300/7306 ADVANCED ENGINEERING STATISTICS I (3). LEC. 3. Pr., STAT 3610 or departmental approval. Advanced concepts of experimental design including blocking, regression approach to analysis of variance, fractional factorials in base-2 and base-3 designs. Emphasis is on improving industrial products and processes. Credit will not be given for both STAT 7300 and INSY 7300.

STAT/INSY 7310/7316 ADVANCED ENGINEERING STATISTICS II (3). LEC. 3. Pr., STAT/INSY 7300. Fractional factorial experimentation applied for the purpose of process and quality improvement and optimization, introduction to analysis of covariance, multiple regression analysis, and response surface analysis. Credit will not be given for both STAT 7310 and INSY 7310.

STAT 7600 STATISTICAL THEORY AND METHODS I (3). LEC. 3. Pr., STAT 3600 or departmental approval. Random variables, probability distributions, parametric models, likelihood theory, testing.

STAT 7610 STATISTICAL THEORY AND METHODS II (3). LEC. 3. Pr., STAT 7600. Likelihood ratio, regression, ANOVA, categorical data, non-parametric methods, decision theory.
THEA 1010 INTRODUCTION TO THEATRE (3). LEC. 3. Pr., THEA 2810 and THEA 2820. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.

THEA 1011 INTRODUCTION TO THEATRE FOR MAJORS (4). LEC. 4. Pr., THEA 1010 and THEA 1011. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.

THEA 1010 INTRODUCTION TO THEATRE FOR MAJORS (4). LEC. 4. Pr., THEA 1010 and THEA 1011. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.

THEA 1011 INTRODUCTION TO THEATRE FOR MAJORS (4). LEC. 4. Pr., THEA 1010 and THEA 1011. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.

THEA 1010 INTRODUCTION TO THEATRE FOR MAJORS (4). LEC. 4. Pr., THEA 1010 and THEA 1011. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.

THEA 1011 INTRODUCTION TO THEATRE FOR MAJORS (4). LEC. 4. Pr., THEA 1010 and THEA 1011. Comprehensive introduction to the discipline and to the department. Through lectures, discussions, and special projects, students will develop the broad foundation necessary to successfully pursue a theatre major at Auburn. Spring.
THEA 3100 APPLIED THEATRE II: ACTING (1-2). PRA. Pr., casting in Auburn University theatre productions, junior or senior standing. Performance experience in Auburn University theatre productions. Leading roles are eligible for 2 hours credit, all others for 1 hour credit. Course may be repeated for a maximum of 8 credit hours.


THEA 3200 STAGE MANAGEMENT (3). LEC. 3. Examination of the role and responsibilities of the stage manager in the producing organization: management, organization, auditions, rehearsal and production procedures.

THEA 3210 FUNDAMENTALS OF DIRECTING (3). LEC. 2. STU. 2. Pr., THEA 2000 or departmental approval. Theories and techniques of stage direction including play analysis, production preparation, and production of a one-act play for a public audience.

THEA 3320 THEATRE TECHNOLOGY II (3). LEC. 2. STU. 2. Pr., THEA 2310. Theoretical and practical applications of equipment and techniques in technical theatre. Topics include light, sound mechanics, theatre rigging, equipment, special effects, and computer applications.

THEA 3330 SCENE PAINTING (3). LEC. 1. LAB. 4. Pr., THEA 2400 or departmental approval. Studio-oriented course introducing the principles, techniques, and media of the scenic artist.

THEA 3350 TECHNICAL DIRECTION/PRODUCTION MANAGEMENT (3). LEC. 3. Pr., THEA 2310, THEA 3320 or departmental approval. Exploration of the roles and responsibilities of the Technical Director and the Production Manager in the coordination/execution of technical elements for theatre productions.

THEA 3400 RENDERING FOR THE THEATRE (3). LEC. 1. STU. 4. Pr., THEA 2400 or departmental approval. Traditional drawing and rendering techniques and media that help the designer to communicate scenic, costume, and lighting designs.

THEA 3410 SCENE DESIGN I (3). LEC. 2. STU. 2. Pr., THEA 2400 or departmental approval. Discussion, research, and execution of theory and practices of designing scenery for the stage. Emphasis on traditional style or methods of design and presentation for the proscenium theatre.

THEA 3420 PROPERTY DESIGN AND TECHNOLOGY (3). LEC. 2. STU. 2. Pr., THEA 3320 or departmental approval. History, design, organization, application of materials and techniques used in the design and construction of properties for the theatre, film and television.

THEA 3450 DRAFTING FOR THE THEATRE (3). LEC. 1. STU. 4. Pr., THEA 2310. A comprehensive study of the techniques and methods used in the graphic representation of stage scenery, equipment, and properties design.

THEA 3510 LIGHTING DESIGN (3). LEC. 1. STU. 4. Pr., THEA 2310 or departmental approval. Studio course that explores the theory, research, and practice of stage lighting, practical illumination, and effects lighting.

THEA 3520 SOUND DESIGN (3). LEC. 2. STU. 2. Pr., THEA 3320 or departmental approval. A course to develop an in-depth understanding of the equipment and techniques used in sound design, as both a design and technical medium.

THEA 3610 ADVANCED COSTUME CONSTRUCTION (3). LEC. 1. STU. 4. Pr., THEA 2610. Historical pattern making and draping, millinery skills, and craft techniques, and their practical applications in theatre costumesing.

THEA 3640 COSTUME DESIGN (3). LEC. 2. STU. 2. Pr., THEA 2400. Costume design and rendering as it relates to historical and original design for the theatre. Exploration of design for television, commercials, and rock stars.

THEA 3700 ANALYSIS OF DRAMATIC LITERATURE (3). LEC. 3. Survey of plays from the major periods of theatre history with an emphasis on how to analyze a diversity of dramatic and performative styles.

THEA 3710 THEATRE HISTORY I (3). LEC. 3. Social, religious, political and artistic forces that have contributed to the development of theatre in Western civilization from its origins through 1850.

THEA 3720 THEATRE HISTORY II (3). LEC. 3. Social, religious, political and artistic forces that have contributed to the development of theatre in Western civilization from 1850 to the present.

THEA 3730 TOPICS IN HISTORY AND CRITICISM (3). LEC. 3. Advanced study of specific areas of theatre history and dramatic criticism. Individual topics announced prior to offering of the course. Course may be repeated for a maximum of 6 credit hours.

THEA 3740 COSTUME HISTORY (3). LEC. 3. History of Western costume and its uses in the theatre from ancient times to the present.

THEA 3840 ADVANCED DANCE TECHNIQUES (3). LEC. 1. STU. 4. Pr., THEA 2850 or departmental approval. Intensive exploration of advanced dance techniques in theory and practice. Course often serves as a training and preparation ground for public production and execution. Course may be repeated for a maximum of 12 credit hours.

THEA 4050 THEATRE OPERATIONS AND MANAGEMENT (3). LEC. 3. A comprehensive study of the economic and administrative aspects of theatrical producing: business management, promotion and marketing, and audience development.


THEA 4180 MOVEMENT: SPECIAL PROJECTS (1-3). LEC. Pr., THEA 2840 or departmental approval. Intensive exploration of movement theory and practice with emphasis on circus skills, stage combat, mask work, and period dance. Course may be repeated for a maximum of 6 credit hours.

THEA 4190 ACTING: SPECIAL PROJECTS (1-3). LEC. Pr., departmental approval. Selected advanced projects in performance. Course may be repeated for a maximum of 6 credit hours.

THEA 4290 DIRECTING: SPECIAL PROJECTS (3). LEC. 1. STU. 4. Pr., THEA 3210. Direction of a long one-act or full-length play for public performance. Course may be repeated for a maximum of 9 credit hours.

THEA 4420 SCENE DESIGN II (3). LEC. 2. STU. 2. Pr., THEA 3410 or departmental approval. Advanced course in theory and practice of scenic and lighting design for theatre. Emphasis on experimental and non-traditional staging in a variety of space.

THEA 4490 SCENE DESIGN: SPECIAL PROJECTS (1-3). LEC. Pr., departmental approval. Selected projects in scenic design executed for a public production. Course may be repeated for a maximum of 6 credit hours.

THEA 4590 LIGHTING DESIGN: SPECIAL PROJECTS (1-3). LEC. Pr., departmental approval. Selected projects in lighting design executed for a public production. Course may be repeated for a maximum of 6 credit hours.

THEA 4650 ADVANCED STAGE MAKEUP (3). LEC. 1. STU. 4. Pr., THEA 2850 or departmental approval. Comprehensive study of specialized makeup: film, television, mask making, prosthesis, facial hair design, and wig making.

THEA 4660 THEATRE TECHNOLOGY: SPECIAL PROJECTS (1-3). LEC. Pr., departmental approval. Selected projects in theatre technology and/or technical direction for a public production. Course may be repeated for a maximum of 8 credit hours.

THEA 4690 COSTUME DESIGN: SPECIAL PROJECTS (1-3). LEC. Pr., departmental approval. Selected projects in costume and/or makeup design executed for a public production. Course may be repeated for a maximum of 4 credit hours.

THEA 4750 PLAYWRITING (3). LEC. 3. Cover the principles of play construction, assignment of playwriting exercises, and the completion of a one-act play.

THEA 4810 THEATRE PRODUCTION II (3-6). LEC. Pr., departmental approval. A concentrated workshop experience in all aspects of theatre pro-
duction through participation in rehearsal and performance. Summer. Course may be repeated for a maximum of 12 credit hours.

THEA 4820 SUMMER REPERTORY THEATRE COMPANY II (3-6). LEC. Pr., departmental approval. Intensive and concentrated study of production skills and techniques and studio/laboratory experiences. Summer. Course may be repeated for a maximum of 12 credit hours.

THEA 4890 DANCE: SPECIAL PROJECTS (1-3). LEC. Pr., THEA 2850 or departmental approval. Selected advanced projects in dance. Course may be repeated for a maximum of 6 credit hours.

THEA 4900 INDEPENDENT STUDY (1-3). IND. Pr., departmental approval. Directed readings, creative and tutorial projects of interest to the advanced student. Course may be repeated for a maximum of 6 credit hours.

THEA 4920 PROFESSIONAL INTERNSHIP (1-8). INT. Pr., junior or senior standing, departmental approval. Internship with professional or community theatre in the student’s field of specialization. Each 10-hour work week equals one hour of credit. Course may be repeated for a maximum of 8 credit hours.

THEA 4967 HONORS READINGS (1-3). IND. Pr., membership in the Honors College, junior or senior standing. Subject areas to be determined between student and Theatre instructor. Course may be repeated for a maximum of 6 credit hours.

THEA 4980 SENIOR PROJECT (3). LEC. 3. Pr., admission to Bachelor of Fine Arts program in Production/Design and Management. Research and production of a senior project in the student’s area of emphasis executed for a public audience. Required of all candidates in the BFA in Production/Design and Management program.

THEA 4997 HONORS THESIS (1-6). IND. Pr., Honors College enrollment. Final projects of varying natures and in the theatre program. Course may be repeated for a maximum of 6 credit hours.

Textile Engineering (TXEN)

Dr. Peter Schwartz · 844-4123

TEXTILE CHEMISTRY (TXCH)


TXCH 4410 ADVANCED DYEING THEORY (4). LEC. 3, LAB. 3. Pr., TXEN 3400. Dye fiber bonding; thermodynamics and kinetics of dyeing; colorimetry and color systems.

TXCH 4900 SENIOR PROJECT I (1). IND. Pr., senior standing and departmental approval. Senior design project in the area of textile chemistry.

TXCH 4910 SENIOR PROJECT II (1). IND. Pr., TXCH 4900. Senior design project in the area of textile chemistry.

TXCH 4970 SPECIAL TOPICS (1-3). LEC. 1. Pr., departmental approval. Reading course with varying emphases to give opportunity for overview in textile chemistry. Course may be repeated for a maximum of 3 credit hours. Course may be repeated for a maximum of 10 credit hours.

FIBER ENGINEERING (FBEN)

FBEN 2100 FIBER-TO-YARN ENGINEERING (3). LEC. 2, LAB. 3. Pr., ENGR 1110, MATH 1720 or MATH 1620. Engineering aspects required to design and modify textile yarns in relation to textile end products.


FBEN 2500 BIOMEDICAL TEXTILES (3). LEC. 3. Coreq., CHEM 1010 or CHEM 1030 or CHEM 1110. Structure and properties of textile materials used in health-related applications including wound closings and dressings, arterial grafts, surgical nets, bone and dental cements, synthetic tendons, ligaments, and skin, super-absorbant materials, and prosthetic devices. Fall.


FBEN 3600 MECHANICS OF FLEXIBLE STRUCTURES (3). LEC. 3. Pr., FBEN 2250, FBEN 3310. Coresq., ENGR 2050. Analysis of mechanical behavior and physical properties of flexible structures such as fibers, yarns and fabrics. The influence of geometric characteristics and physical properties on mechanical behavior. Fall.

FBEN 4250 ENGINEERED TEXTILE STRUCTURES (3). LEC. 3. Coreq., ENGR 2250. Design and applications of high performance industrial textiles for civil engineering, architecture and construction, filtration, transportation, military/defense, safety/protective, medicine and composites.

FBEN 4500 TEXTILE REINFORCED MATERIALS (3). LEC. 3. Pr., TXEN 3600. Coreq., ENGR 2050. Material properties and manufacturing of textile reinforced materials; preform structures such as weaves and braids; analysis, design methodology and applications. Spring.

FBEN 4910 FIBER ENGINEERING DESIGN I (3). IND. 3. Pr., Senior standing. Undergraduate design project, first semester.

FBEN 4920 FIBER ENGINEERING DESIGN II (3). IND. 3. Pr., FBEN 4910. Undergraduate design project, second semester.

FBEN 4970 SPECIAL TOPICS (1-3). IND. Pr., Departmental approval. Reading course with varying emphasis to give opportunity for overview in specific areas of textile engineering and technology. Course may be repeated with change in topic.


FBEN 5510 POLYMER CHEMISTRY (3). LEC. 3. Pr., CHEM 290, ENGR 2050, and PHYS 2200. Polymer chemistry including polymer synthesis, polymer characterizations, polymer classes, solubility and swelling, and structure/property relationships. Fall.


FBEN 6250 ADVANCED ENGINEERING FIBROUS STRUCTURES (3). LEC. 3. Pr., FBEN 4250 or departmental approval. Application of advanced technology to the design, development and analysis of high performance industrial textiles. Fall.

FBEN 6310 STRUCTURE AND PROPERTIES OF POLYMERS (4). LEC. 3. LAB. 3. Pr., CHEM 2080 or departmental approval. The inter-relationships between chemical structure of a polymer, polymer properties and uses. Plastics, elastomers and fibers-synthesis and property requirements.

FBEN 6410 PHYSICAL CHEMISTRY OF DYEING (4). LEC. 3, LAB. 3. Pr., FBEN 3400 or departmental approval. Thermodynamics and kinetics of dyeing systems; the laws of physical chemistry applied to dye/fiber interactions; color systems.

FBEN 6510 POLYMER CHEMISTRY (3). LEC. 3. Pr., CHEM 290, ENGR 2050, and PHYS 2200. Polymer chemistry including polymer synthesis, polymer characterizations, polymer classes, solubility and swelling, and structure/property relationships. Fall.


FBEN 7100 INTEGR FIBER-TO-APPAREL QUAL CTRL (3). LEC. 3. Pr., TXTM 3520 or departmental approval. Quality-related topics for integrated textile and apparel operations. Spring.

TEXTILE TECHNOLOGY (TXTN)

TXTN 2120 YARN FORMATION II (3). LEC. 2, LAB. 3. Pr., TXTN 2110. An extension of TXTN 2110 with emphasis on the technology aspects of yarn forming and finishing technologies, fiber and yarn manufacturing, and fiber/machine interaction.


TXTN 3220 NON-CONVENTIONAL FABRICS (2). LEC. 2. Pr., TXTN 2210, TXTN 3310. The manufacturing technology of non-woven and tufted textiles along with the properties and uses of those fabrics.

TXTN 3520 TEXTILE QUALITY CONTROL (2). LEC. 2. Pr., TXTN 2700, TXTN 3500. SPC and quality engineering aspects required for textile applications.

TXTN 4800 PLANT OPERATIONS AND COST CONTROL (3). LEC. 3. Pr., TXTN 2210. The principles of textile operations cost analysis based on labor cost, raw material cost, technological requirements and customer requirements. Strategies for improving competitive advantages.

TXTN 4900 SENIOR RESEARCH I (1). IND. Pr., senior standing. Undergraduate research sequence, initial semester.

TXTN 4910 SENIOR RESEARCH II (1). IND. Pr., TXTN 4900. Conclusion of an undergraduate research sequence.

TXTN 4970 SPECIAL TOPICS (1-10). IND. Pr., departmental approval. Reading and special projects course for overview in specific areas of textile technology and management. Course may be repeated for a maximum of 10 credit hours.

University Courses (UNIV)

UNIV 1000 THE AUBURN EXPERIENCE (1). LEC. 1. Pr., first-year Auburn students only. Surveys the history of the University, current student resources, and academic programs.

UNIV 1050 SUCCESS STRATEGIES (1). LEC. 1. Pr., first-term student, 2.20 or below, or departmental approval. An introduction to essential academic and personal skills. Designed to familiarize students with university life and academic improvement skills. Fall, Spring.

UNIV 2710 THE HUMAN ODYSSEY I (3). LEC. 3. History Core. Examines the human endeavor from pre-history through the 17th century by exploring connections between the sciences and humanities.

UNIV 2717 HONORS HUMAN ODYSSEY I (3). LEC. 3. Pr., membership in the Honors College. History Core. Examines the human endeavor from pre-history through the 17th century by exploring connections between the sciences and humanities.

UNIV 2720 THE HUMAN ODYSSEY II (3). LEC. 3. History Core. Examines the human endeavor from the 18th century through the present by exploring connections between the sciences and humanities.

UNIV 2727 HONORS HUMAN ODYSSEY II (3). LEC. 3. Pr., membership in the Honors College. History Core. Examines the human endeavor from the 18th century through the present by exploring connections between the sciences and humanities.

UNIV 2777 HONORS LYCEUM (1). LEC. 1. Pr., University Honors College. Weekly academic lectures followed by a discussion and interaction. Course may be repeated for a maximum of 2 credit hours.

UNIV 2940 AUBURN ABROAD (0). FLD. Pr., Auburn Abroad Office approval. Student must meet individual program requirements and complete a study abroad course approval form prior to departure.

UNIV 2945 AUBURN ABROAD (0). FLD. Pr., Auburn Abroad Office approval. Student must meet individual program requirements and complete a study abroad course approval form prior to departure.

UNIV 4@@0 UNDERGRADUATE GRADUATION (0). LEC., NG.
Faculty of Veterinary Medicine (VMED)

Dr. Donna W. Angarano - 844-2685

BIOMEDICAL SCIENCES (VBMS)

VBMS 7000 NEUROANATOMY (5). LEC. 3, LAB. 4, Pr., departmental approval. Functional morphology of nervous system from input/output through the long systems; limbic relations to endocrine and autonomic nervous system. Comparative among primates and domestic animals.

VBMS 7020 MICROSCOPIC ANATOMY I (3). LEC. 1, LAB. 4, Pr., departmental approval. A detailed study of subcellular organization and preparation of the basic tissues. Light microscopy and electron microscope preparation are used to describe and interpret morphology.

VBMS 7030 MICROSCOPIC ANATOMY II (3). LEC. 1, LAB. 4, Pr., Departmental approval. Light microscopy and electron microscopy detailed study of the cardiovascular, hemopoietic, digestive, urinary and respiratory systems of domestic animals.

VBMS 7050 DEVELOPMENTAL NEUROBIOLOGY (3). LEC. 3, Pr., departmental approval. Overview of the development of the nervous system. Emphasis will be directed towards understanding sensory systems, development, plasticity and function. Fall.


VBMS 7070 ENDOCRINOLOGY (4). LEC. 4, Pr., BCHE 7200, BCHE 7260; BIOL 6600, or departmental approval. Molecular and cellular endocrinology and physiological regulation of hormone synthesis, secretion and action in mammalian species. Emphasis will be placed on metabolic regulatory hormones.

VBMS 7080 MOLECULAR ENDOCRINOLOGY (2). LEC. 2, Pr., VBMS 7070 or departmental approval. Examination of the literature of hormonal synthesis, secretion and mechanism of action with emphasis on receptors, second messenger systems and gene regulation.

VBMS 7090 CLINICAL PHARMACOLOGY (3). LEC. 3, Pr., acceptable courses in biochemistry and physiology; departmental approval. The actions and effects of drugs on human beings. Spring.

VBMS 7110 ADVANCED CARDIOVASCULAR PHYSIOLOGY (5). LEC. 5, Pr., departmental approval. Cellular and molecular regulation of cardiovascular function.

VBMS 7120 MEMBRANE PHYSIOLOGY (3). LEC. 2, LAB. 3, Pr., departmental approval. The classic and modern aspects of biological membranes. Labs include patch clamp, reconstruction of ion channels in bilayers, Langmuir-Blodgett techniques, and other methods. Summer.

VBMS 7130 VETERINARY MEDICINE DIAGNOSTIC ULTRASONOGRAPHY (3). LEC. 3, Pr., veterinary anatomy and/or D.V.M. degree. The principles and practice of veterinary medical diagnostic ultrasonography as they are utilized in evaluating normal and abnormal anatomy. All animals are used in this course.

VBMS 7140 PHYSIOLOGY I (5). LEC. 5, Pr., departmental approval. Cellular, Cardiovascular, Renal and Respiratory Physiology.

VBMS 7150 PHYSIOLOGY 2 (4). LEC. 4, Pr., VBMS 7140 or departmental approval. Gastrointestinal Physiology, Metabolism, Endocrinology and Reproductive Physiology.

VBMS 7160 NEUROSCIENCE (3). LEC. 3, Pr., departmental approval. An overview of neuroscience on the subcellular, cellular and system levels.

VBMS 7170 ANAT, PHYSIO & PHARM SEMINAR (1). SEM. 1. Required of all graduate students in Anatomy, Physiology and Pharmacology. Fall, Spring.

VBMS 7210 RADIATION BIOLOGY (4). LEC. 4, Pr., D.V.M. degree. Coreq., Residency in Radiation Oncology or Radiology or Small Animal Oncology and registered in the Graduate School. Exploration of biological, physical, and chemical basis of radiotherapy with emphasis on the biological effects of ionizing radiation at the cellular and molecular level. Effects of irradiation on the tumor, normal tissues, and the patient will be addressed.

VBMS 7250 NORMAL RADIOLOGICAL ANATOMY (3). LEC. 3, Pr., D.V.M. Degree, acceptance in an established residency program. A detailed study of the normal structure, size and position of the various organs of the cat, dog, horse and other veterinary species as they appear on plain and contrast radiographs.

VBMS 7260 ADVANCED RADIOLOGY (3-5). LEC. 5, Pr., For graduate students and residents in DCS program or D.V.M. or equivalent. Detailed study of concepts and techniques of all imaging procedures.

VBMS 7270 RADIOLOGICAL INTERPRETATIONS (3-5). LEC. 5, Pr., D.V.M. Degree. Acceptance in established residency program at AU College of Veterinary Medicine. The interpretation of various diagnostic imaging modalities used in veterinary medicine and their applications in the diagnostic work-up of clinical cases presenting to the College of Veterinary Medicine.

VBMS 7280 PHYSICS OF DIAGNOSTIC IMAGING (3). LEC. 3, Pr., D.V.M. Degree. Acceptance in established residency program at AU College of Veterinary Medicine. Principles of physics related to the imaging modalities of diagnostic radiology, ultrasonography, magnetic resonance imaging, scintigraphy, computed tomography, and radiation therapy. Students will study physics at the atomic level but must also develop an understanding of construction, function, and hazards of modern imaging equipment.

VBMS 7290 GRADUATE SEMINAR (1). SEM. 1, Pr., departmental approval. A mandatory graded seminar presentation, held in conjunction with the VBMS seminar series, presenting the resident student’s individual Master of Science degree research topic including pertinent review, hypothesis, materials, results and discussion of findings.

VBMS 7340 LARGE ANIMAL SURGERY AND MEDICINE SEMINAR (1). SEM. 1, Pr., departmental approval. Seminar required of all graduate students in large animal surgery and medicine. Meets at scheduled intervals each year.


VBMS 7360 ADVANCED LARGE ANIMAL SOFT TISSUE SURGERY (5). LEC. 4, LAB. 2, Pr., departmental approval. Research in surgery. Advanced techniques for soft tissue surgical procedures in large domestic animals.

VBMS 7380 ADVANCED FOOD ANIMAL MEDICINE (3). LEC. 3, Pr., departmental approval; D.V.M. degree. In-depth study of food animal medical diseases of all body systems with emphasis on pathophysiologic mechanisms. Summer.

VBMS 7390 ADVANCED EQUINE MEDICINE (3). LEC. 3, Pr., departmental approval. Detailed etiology, symptoms, pathogenesis, treatment and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.

VBMS 7400 GYNECOLOGY OF LARGE DOMESTIC ANIMALS (3). LEC. 3, Pr., departmental approval, D.V.M. degree. Diseases and problems of the reproductive system in the female domestic animals. Normal and abnormal conditions of various species are covered. Winter.

VBMS 7410 ANDROLOGY OF LARGE DOMESTIC ANIMALS (3). LEC. 3, Pr., departmental approval, D.V.M. degree. Diseases and problems of the reproductive system in male domestic animals. Winter.

VBMS 7420 ADVANCED VETERINARY ANESTHESIOLOGY (4). LEC. 4, Pr., departmental approval.

VBMS 7430 HEALTH MAINTENANCE OF FOOD ANIMALS (3). LEC. 3, Pr., departmental approval. Research in nutrition. Principles of production medicine to enhance animal health and productivity.
VBMS 7440 ADVANCED EQUINE ARTHROSCOPIC SURGERY (5). LEC. 3. Pr. Departmental approval; D.V.M. degree Research in surgery. Advanced techniques for arthroscopic surgical procedures in the horse.

VBMS 7450 SELECTED TOPICS IN GRADUATE EDUCATION RESEARCH (1). LEC. 1. SU. Pr, departmental approval. Overview of research funding strategies, grant preparation, transfer of research technology and patents, research ethics, etc. Fall.

VBMS 7460 BACTERIAL PATHOGENESIS (3). LEC. 3. Pr. VBMS 7510 or BIOL 4520, and departmental approval. Molecular and cellular basis of virulence of bacterial pathogens of animals. Spring.

VBMS 7470 ADVANCED EPIDEMIOLOGY (3). LEC. 3. Pr., introductory statistics course or departmental approval. Advanced epidemiological techniques and their application to disease research, clinical retrospective and prospective studies, and disease outbreak investigation. Spring.

VBMS 7480 METHODS IN IMMUNOLOGY (5). LEC. 1. LAB. 8. Pr., departmental approval. Theoretical concepts underlying immunological methods combined with practical hands-on immunological experimentation focused on application to research in the biological sciences. Fall.


VBMS 7510 MOLECULAR GENETICS I (5). LEC. 5. Pr., CHEM 7200. Bacterial, bacteriophage, and eukaryotic genetics, with a focus on gene structure, and molecular mechanisms regulating expression. Critical review of current literature will be emphasized. Fall.

VBMS 7520 MOLECULAR GENETICS II (5). LEC. 5. Pr., VBMS 7510. Genetic mechanisms by which eukaryotic cells replicate, communicate and differentiate. Current literature will be used extensively. Spring.


VBMS 7540 CURRENT TOPICS IN MOLECULAR ViroLOGY (3). LEC. 3. Pr., VBMS 7510, VBMS 7520, or departmental approval. Viral gene expression and evasion of host defense mechanisms. Fall.

VBMS 7550 PATHOLOGY (1-3). LEC., SU. Pr., D.V.M. degree or equivalent and departmental approval. Diagnostic interpretation of lesions and test results. Special topics or current issues in pathology to meet the particular needs of students. Course may be repeated for a maximum of 3 credit hours.


VBMS 7570 DIAGNOSTIC PATHOLOGY (1-3). LEC., SU. Pr., D.V.M. degree. For graduate students and residents in pathology. Diagnosis of animal diseases using necropsy procedures and histopathology. Required every semester of all graduate students and residents in pathology. Course may be repeated for a maximum of 3 credit hours.

VBMS 7580 SURGICAL PATHOLOGY (1-3). LEC., SU. Pr., D.V.M. degree. For graduate students and residents in pathology. Histopathologic diagnosis of surgical biopsy specimens. Required every semester for all graduate students and residents in pathology. Course may be repeated for a maximum of 3 credit hours.


VBMS 7610 ADVANCED CLINICAL PATHOLOGY II (3). LEC. 3. Pr., VMED 5230 or departmental approval. Laboratory evaluation of organ function; disease pattern recognition. Spring.

VBMS 7620 DIAGNOSTIC ONCOLOGY (3). LEC. 3. Pr., VMED 5220 or departmental approval. Principles of gross and microscopic interpretation of animal neoplasms using basic and specialized techniques.


VBMS 7640 MECHANISMS OF DISEASE (3). LEC. 3. Pr., VMED 5220 or equivalent, departmental approval. Disease lesions, processes, disorders; morphologic, molecular, microbiologic, molecular aspects of disease processes.

VBMS 7650 VETERINARY PROTOZOOLOGY AND ENTOMOLOGY (3). LEC. 3. Pr., departmental approval. Current topics in immunology, physiology, molecular biology, pathogenicity, etc. of selected protozoal and arthropod parasites. Spring.


VBMS 7680 PATHOLOGY SEMINAR (1). LEC. 1. Pr., departmental approval or VMED 5220. Weekly conference to discuss gross and histologic pathology in animal tissues.

VBMS 7700 COMBINATORIAL BIOCHEMISTRY & PHAGE DISPLAY (4). LEC. 1. LAB. 6. In-depth study of combinatorial biochemistry and phage display as a tool for development of new drugs, vaccines and diagnostics for veterinary medicine. Spring.

VBMS 7750 GRADUATE COLLOQUIUM IN VETERINARY CLINICAL SCIENCE (1). CLN. 1. Pr., D.V.M. degree or departmental approval, enrollment in graduate school. Forum to present topics relevant to the students clinical and research interests. This a mandatory seminar for graduate students in the Department of Clinical Science. Course may be repeated for a maximum of 5 credit hours.

VBMS 7760 ADVANCED NEUROSURGERY (4). LEC. 2. LAB. 6. Applied anatomy, physiology, physical and radiographic diagnosis and surgical correction of lesions affecting the nervous system of small pet animals.

VBMS 7770 ADVANCED SMALL ANIMAL GENERAL SURGERY (3). LEC. 2. LAB. 3. Pr., D.V.M. or V.M.D. degree, or equivalent. Application of critical thinking skills to perioperative plans and tasks.

VBMS 7790 SMALL ANIMAL ORTHOPEDICS (3). LEC. 3. Pr., D.V.M. or equivalent degree. Review of orthopedic diseases in small animals, interactive review of recent literature and advanced laboratory sessions intended for residents in small animal surgery.

VBMS 7800 ADVANCED SMALL ANIMAL NEUROLOGY (3). LEC. 3. Advanced study of neurodiagnostics and non-surgical therapy of neurological disorders in small domestic animals.

VBMS 7810 ADVANCED SMALL ANIMAL MEDICINE I (3-5). LEC. Pr., D.V.M. degree and currently enrolled in a residency program at the AU College of Veterinary Medicine and departmental approval. Special study of the causes, methods of diagnosis, treatment and control of non-surgical gastrointestinal diseases of small animals. Course may be repeated for a maximum of 5 credit hours.

VBMS 7820 ADVANCED SMALL ANIMAL MEDICINE II (3-5). LEC. Pr., D.V.M. degree and currently enrolled in a residency program at the AU College of Veterinary Medicine and departmental approval. Special study of the causes, methods of diagnosis, treatment and control of nonsurgical gastrointestinal diseases of small animals. Course may be repeated for a maximum of 5 credit hours.

VBMS 7830 ADVANCED SMALL ANIMAL MEDICINE III (3-5). LEC. Pr., D.V.M. degree and currently enrolled in a residency program at the AU College of Veterinary Medicine and departmental approval. Special study of the causes, methods of diagnosis, treatment and control of non-surgical cardiovascular and respiratory diseases of small animals. Course may be repeated for a maximum of 5 credit hours.

VBMS 7840 ADVANCED SMALL ANIMAL MEDICINE IV (3-5). LEC. Pr., D.V.M. degree and currently enrolled in a residency program at the AU College of Veterinary Medicine and departmental approval. Molecular biology lectures and techniques related to diagnostic and research application to clinical problems in small animal veterinary medicine. Course may be repeated for a maximum of 5 credit hours.

VBMS 7870 ADVANCED VETERINARY OPHTHALMOLGY: OPHTHALMIC MEDICINE (3). LEC. 3. Pr., D.V.M. or equivalent degree. Advanced ophthalmology with emphasis on diagnosis, pathophysiology and treatment of ocular diseases of domestic animals.
VBM 7880 ADVANCED VETERINARY OPHTHALMOLOGY: OPHTHALMIC SURGERY (3). LEC. 1, LAB. 6. Pr., VBM 7870. Advanced ophthalmology with emphasis on ophthalmic surgery.

VBM 7890 ADVANCED VETERINARY OPHTHALMOLOGY: OPHTHALMIC BASIC SCIENCES (3). LEC. 3. Pr., D.V.M. or equivalent degree. Advanced ophthalmology with emphasis on diagnosis, pathophysiology and treatment of ocular diseases of domestic animals.

VBM 7950 GRADUATE SEMINARS IN VETERINARY CLINICAL SCIENCES (1). SEM. 1. SU. Pr., D.V.M. degree or departmental approval, enrollment in graduate school. Presentation of thesis research. Fall, Spring.

VBM 7970 RESEARCH PROBLEMS IN BIOMEDICAL SCIENCES (1-5). RES. Pr., Faculty approval. Research problems for graduate students, under supervision of faculty, in variety of specialized disciplines related to the biomedical sciences. Course may be repeated for a maximum of 15 credit hours.

VBM 7980 NON-THESIS PROJECT (1-3). LEC. 3. SU. Pr., D.V.M. degree or departmental approval, enrollment in VBMS program. Non-thesis project, to be determined by faculty advisor and student's graduate advisory committee.

VBM 7990 RESEARCH AND THESIS IN BIOMEDICAL SCIENCES (1-10). MST., TD. Credit to be arranged. Course may be repeated with change in topic.

VBM 8850 BIOMEDICAL SCIENCES SEMINAR (1). SEM. 1. SU. Recent advances in biochemistry, cell biology and molecular biology will be critically presented and discussed by graduate faculty and students.

VBM 8890 RESEARCH AND DISSERTATION (1-10). DSR., TD. Course may be repeated with change in topic.

VETERINARY MEDICINE (VMED)

VMED 5000 ORIENTATION TO VETERINARY MED (0). SEM. 1. SU. Pr., enrollment in the AU College of Veterinary Medicine (AUCVM). Overview of organized veterinary medicine, history of the profession, professional responsibilities and privileges, and career opportunities within the profession.

VMED 5010 VETERINARY MEDICAL ETHICS (1). LEC. 1. SU. Pr., enrollment in AUCVM. Ethical issues confronting veterinarians in every phase of the profession.

VMED 5012 PROBLEM-SOLVING IN VETERINARY MEDICINE I (1). LEC. 1. SU. Pr., enrollment in AUCVM. Moderator-guided, student-directed solving of problems selected by faculty to reflect integration of course material presently and previously covered in the CVM curriculum.

VMED 5020 VETERINARY MEDICINE AND THE LAW (1). LEC. 1. SU. Pr., enrollment in AUCVM. Laws relating to the veterinary profession, public policies and government regulations.

VMED 5022 PROBLEM-SOLVING IN VETERINARY MEDICINE II (1). LEC. 1. SU. Pr., enrollment in AUCVM. Moderator-guided, student-directed solving of problems selected by faculty to reflect integration of course material presently and previously covered in the CVM curriculum.


VMED 5032 PROBLEM SOLVING IN VETERINARY MEDICINE III (1). LEC. 1. SU. Pr., enrollment in AUCVM. Moderator-guided, student-directed solving of problems selected by faculty to reflect integration of course material presently and previously covered in the CVM curriculum.

VMED 5042 PROBLEM SOLVING IN VETERINARY MEDICINE IV (1). LEC. 1. SU. Pr., enrollment in AUCVM. Moderator-guided, student-directed solving of problems selected by faculty to reflect integration of course material presently and previously covered in the CVM curriculum.

VMED 5052 PROBLEM SOLVING IN VETERINARY MEDICINE V (1). LEC. 1. SU. Pr., enrollment in AUCVM. Moderator-guided, student-directed solving of problems selected by faculty to reflect integration of course material presently and previously covered in the CVM curriculum.

VMED 5110 PHYSIOLOGY I (5). LEC. 5. Pr., enrollment in AUCVM. Cellular, Cardiovascular, Renal and Respiratory Physiology.

VMED 5111 VETERINARY ANATOMY I (SMALL ANIMAL) (4). LAB. 12. Pr., enrollment in AUCVM. Basic concepts of body structure and small animal gross anatomy with veterinary medical applications. Fall.


VMED 5121 VETERINARY ANATOMY II (3). LAB. 9. Pr., enrollment in AUCVM. In-depth study of the gross anatomy of the ox, horse and minor species with inclusion of clinical relevance.

VMED 5130 CELL PHYSIO & MOLECULAR GENETICS (2). LEC. 2. Pr., enrollment in AUCVM. Introduction to advanced concepts in the mechanisms regulating cell function and molecular biology and genetics.

VMED 5131 BASIC MICROANATOMY/DOMESTIC ANIM (3). LEC. 1. LAB. 4. Pr., enrollment in AUCVM. Functional comparative microstructure of cells, basic tissues, cardiovascular system, urinary system, skeleton and osteogenesis, respiratory system, and blood of domestic animals.

VMED 5141 ORGANOLOGY OF DOMESTIC ANIMALS (2). LAB. 4. Pr., enrollment in AUCVM. Comparative microstructure of the digestive system, lymphoid system, endocrine system, integumentary systems, reproductive system, and placentation of domestic animals.

VMED 5150 DIAGNOSTIC IMAGING (2). LEC. Pr., enrollment in AUCVM. Basic radiographic and ultrasonographic physics; introduction to computed tomography, magnetic resonance imaging, and nuclear imaging.

VMED 5151 VETERINARY NEUROSCIENCES (5). LEC. 4. LAB. 2. Pr., enrollment in AUCVM. Gross and microscopic morphology and physiology of the peripheral and central nervous systems.

VMED 5180 VETERINARY ETHOLOGY (1). LEC. 1. Pr., enrollment in AUCVM. Basic concepts of ethology and other approaches to animal behavior, introduce diagnostic and treatment methods, discuss relevant cases.

VMED 5200 VETERINARY PARASITOLOGY I (3). LEC. 2. LAB. 2. Pr., enrollment in AUCVM. Platyhelminthes, trematodes, and nematodes of domestic animals.

VMED 5210 VETERINARY PARASITOLOGY II (2). LEC. 2. LAB. 2. Pr., enrollment in AUCVM. Arthropods, protozoa, helminths, and acanthocephalans of domestic animals. Parasiticides.

VMED 5220 PRINCIPLES OF VETERINARY PATHOLOGY (3). LEC. 2. LAB. 2. Pr., enrollment in AUCVM. General principles of pathology and mechanisms of disease processes affecting animals.

VMED 5230 VETERINARY CLINICAL PATHOLOGY (3). LEC. 3. Pr., enrollment in AUCVM. Laboratory test principles and results interpretations in evaluation of hematopoietic, coagulation, hepatic, renal, gastrointestinal, acid/base and fluid status of animals.

VMED 5240 PRINCIPLES OF VET IMMUNOLOGY (3). LEC. 3. Pr., enrollment in AUCVM. Principles underlying the immune system’s ability to protect animals from disease and mechanisms by which immune responses contribute to disease.


VMED 5260 VETERINARY PHARMACOLOGY (3). LEC. 3. Pr., enrollment in AUCVM. Overview of drugs relevant to veterinary practice; pharmacodynamics, pharmacokinetics, clinical application.

VMED 5301 PHYSICAL DIAGNOSES OF LARGE AND SMALL ANIMALS (2). LEC. 1. LAB. 2. Pr., enrollment in AUCVM. Basic approach to physical examination of large and small animals.

VMED 5310 INTRODUCTION TO SURGERY (1). LEC. 1. Pr., enrollment in AUCVM. Basics of surgical instruments, aseptic technique, wound healing, approaches and management of surgery of abdomen and thorax, fluid and nutritional needs of perioperative patients.

VMED 5311 SURGICAL PRACTICUM (2). PRA. 4. Pr., enrollment in AUCVM. Aseptic technique, instrument handling, suture patterns, surgical ties, anesthetic administration/monitoring, surgical incision/tissue handling, wound closure, postoperative patient management.

VMED 5320 CLINICAL VETERINARY NUTRITION (2). LEC. 2. Pr., enrollment in AUCVM. Nutritional requirements and feeding programs of cats, dogs, horses, cows, sheep, goats, llamas and some exotic pets.

VMED 5330 MULTISPECIES MEDICINE (3). LEC. 3. Pr., enrollment in AUCVM. Cause, pathology, diagnosis, and control of common diseases of poultry, companion birds, small mammal, fish, amphibian and reptile pets.
VMED 5340 EMERGENCY MEDICINE AND CRITICAL CARE (2). LEC. 2. Pr., Enrollment in AUCVM. Emergency presentations, critical care manage-
m ent. Spring.

VMED 5350 VETERINARY TOXICOLOGY (3). LEC. 2, LAB. 2. Pr., enroll-
ment in AUCVM. Poisons and poisonous plants affecting large and small
animals, chemical properties, signs, lesions, diagnosis, treatment.

VMED 5360 PRODUCTION/PREVENTATIVE MEDICINE (3). LEC. 3. Pr.
enrollment in AUCVM. Principles of disease prevention and maximization
of production application of food safety principles.

VMED 5370 ONCOLOGY (1). LEC. 1. Pr. Enrollment in AUCVM. Diagnostic and therapeutic measures used to manage animals with onco-
logic diseases. Spring.

VMED 5502 CURRENT TOPICS IN VETERINARY MEDICINE (1). LEC. 1, SU. Pr., enrollment in AUCVM. Emerging topics in veterinary medicine, cur-
rent literature. Fall, Spring. Course may be repeated for a maximum of 15
credit hours.

VMED 5510 HEMOLYMPHATIC/INTEGUMENTARY SYSTEM (4). LEC. 4.
Pr., enrollment in AUCVM. Diagnosis, treatment and prevention of diseases
affecting the integumentary and hemolymphatic systems.

VMED 5512 COMPUTER APPLICATION IN VETERINARY MEDICINE (1). 
LAB. 1, SU. Pr., enrollment in AUCVM. Presentation software, Internet applica-
tions, library searching, databases, continuing education, specialized
veterinary medical networks, Web page design, practice management
software.

VMED 5520 CARDIOVASCULAR SYSTEM (2). LEC. 2. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment and prevention of diseases affecting
the cardiovascular system.

VMED 5530 RESPIRATORY SYSTEM (3). LEC. 6. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment and prevention of diseases affecting
the respiratory system.

VMED 5540 ALIMENTARY SYSTEM (5). LEC. 5. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment and prevention of diseases affecting
the alimentary system.

VMED 5550 UROINARY SYSTEM (2). LEC. 2. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment, and prevention of disease affecting the
urinary system.

VMED 5560 ENDOCRINE SYSTEM (2). LEC. 3. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, diagnosis, treatment and prevention of diseases of the endocrine system. Fall.

VMED 5570 REPRODUCTIVE SYSTEM (5). LEC. 5. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment; and prevention of diseases of the repro-
suctive system.

VMED 5580 NERVOUS SYSTEM (2). LEC. 2. Pr., enrollment in
AUCVM. Pathophysiology, pathologic lesions, radiographic and ultrasono-
graphic lesions, diagnosis, treatment, and prevention of diseases affecting the
nervous system.

VMED 5590 MUSCULOSKELETAL SYSTEM (3). LEC. 3. Pr., enrollment in
AUCVM. Pathophysiology; pathologic, radiographic and ultrasonographic
lesions; diagnosis; treatment; and prevention of diseases affecting the
musculoskeletal system.

VMED 5601 VETERINARY CLINICAL ROTATIONS (3). CLN. Clinical ex-
cperiences through various specialty services in the Veterinary Medical
Teaching Hospital. Course may be repeated with change in topic.

VMED 5602 RESEARCH PROBLEMS IN BIOMEDICAL SCIENCE. (1-10).
RES., SU. Pr., departmental approval. Research problems in a variety of
specialized disciplines for veterinary students and advanced undergradu-
ates. Course may be repeated for a maximum of 10 credit hours.

VMED 5611 VETERINARY CLINICAL ROTATIONS-ELECTIVES (3).
CLN. SU. Clinical experiences through various specialty services in the
Veterinary Medical Teaching Hospital. Course may be repeated for a maxi-
mum of 9 credit hours.

VMED 5650 CANINE SPORTS MEDICINE AND REHABILITATION (1). 
LEC. 1. SU. Pr., enrollment in AUCVM. Activities, requirements, and disor-
ders encountered in canine athletes; role of veterinarian in care and reha-
bilitation; current research.

VMED 5660 LABORATORY ANIMAL MEDICINE (1). LEC. 1. Pr., enroll-
ment in AUCVM. Husbandry, nutrition, handling, and diseases of common
laboratory animals.

VMED 5670 RATITE PRODUCTION AND MEDICINE (1). LEC. 1, SU. Pr.,
enrollment in AUCVM. Diseases, treatment, husbandry, handling, and role
of the veterinarian in ratite production.

VMED 5680 POCKET PET MEDICINE (1). LEC. 1. SU. Pr., enrollment in
AUCVM. Diseases, treatment, restraint, examination, sample collection in
rabbits, Guinea pigs, hamsters, rats, mice, and ferrets.

VMED 5690 REPTILE AND AMPHIBIAN MEDICINE (1). LEC. 1, SU. Pr.,
enrollment in AUCVM. Diseases, treatment, husbandry, handling, restraint,
examination, sample collection in reptiles and amphibians.

VMED 5700 MEDICAL VOCABULARY (2). LEC. 2. Pr., enrollment in
AUCVM. Greek and Latin roots, prefixes and suffixes and their use to define
medical words, terms or phrases.

VMED 5702 WRITING REINFORCEMENT FOR THE HEALTH PROFESSION-
SIAL (1). LEC. 3, SU. Pr., enrollment in AUCVM, departmental approval.
Written and oral presentation of project emphasizing health promotion and
disease prevention in the 21st century.

VMED 5710 PRACTICE MANAGEMENT (1). LEC. 1, SU. Pr., enrollment
in AUCVM. Fundamental principles of effective client, personnel, practice
and business management for the veterinarian.

VMED 5712 WRITING REINFORCEMENT FOR THE SENIOR VETERI-
NARY STUDENT (1). LEC. 1. SU. Pr., enrollment in AUCVM, fourth-year
student. Written and oral presentation of interesting clinical case, contest
with monetary reward.

VMED 5720 BASIC SCIENCE OF NEUROLOGY (1). LEC. 1. Pr., VMED
5511, enrollment in AUCVM. Interactive case-based review of functional
neuroanatomy using clinical neurological cases.

VMED 5721 APPLIED ANATOMY I (1). LAB. 3. Pr., VMED 5111. Detailed
anatomical basis for small animal surgical approaches.

VMED 5730 AVIAN AND EXOTIC ANIMAL PHYSIOLOGY (1). LEC. 1. Pr.,
enrollment in AUCVM, VMED 5110, VMED 5120. Homeostatic physiologic
mechanisms of birds, reptiles, fish, and other species, differences from
mammals emphasized.

VMED 5731 APPLIED ANATOMY II (1). LAB. 3. Pr., VMED 5111. Detailed
anatomical basis for small animal diagnostics and therapeutics.

VMED 5740 APPLIED COMPANION ANIMAL BEHAVIOR (2). LEC. 1, 
LAB. 1. Pr., enrollment in AUCVM, VMED 5300. Diagnosis, treatment and
client education on selected behavior problems in companion animals.

VMED 5741 EQUINE LIMB JOINTS AND FOOT (1). LAB. 3. SU. Pr., VMED
5121. A study of the functional anatomy of the joints and foot of the
horse fore and hind limbs.

VMED 5750 DIAGNOSTIC VETERINARY ULTRASONOGRAPHY (2). 
LEC. 1, LAB. 2. Pr., enrollment in AUCVM, VMED 5121. Basic physics,
instrumentation, and scanning techniques of ultrasonography. Normal
sonographic anatomy correlated with the cross-sectional anatomy of body
structures and organs.

VMED 5751 ELECTROPHYSIOLOGIC DIAGNOSTIC TECHNIQUES (1). 
LAB. 3, SU. Pr., VMED 5111, VMED 5151, enrollment in AUCVM. Practical
study of clinical electrodiagnostic regimes, theory, practice and diagnostic
use of BAER, ERG, VER, SER, EMG, NCV.

VMED 5760 ADVANCED CLINICAL OPHTHALMOLOGY (1). LEC. 1, SU. 
Pr., enrollment in AUCVM, VMED 5590, VMED 5311. Strategies and meth-
ods of diagnosis, treatment and prevention of diseases of the eye in large
and small animals.

VMED 5761 RATIONAL ANTIMICROBIAL THERAPY (1). LEC. 2, SU. Pr.,
enrollment in AUCVM, VMED 5140. Pharmacology of antimicrobial drugs,
case based format, emphasis on drug selection.

VMED 5770 ADVANCED VETERINARY DERMATOLOGY (1). LEC. 1, SU. 
Pr., enrollment in AUCVM, VMED 5510. Clinical dermatology in a case-
based format.

VMED 5780 ADVANCED SMALL ANIMAL ONCOLOGY (1). LEC. 2, SU. Pr., VMED 5340. Enrollment in the AUCVM. Current diagnostic and thera-
peutic methods used in small animal oncology.

VMED 5790 SMALL ANIMAL WOUND MANAGEMENT AND SURGERY
(1). LEC. 1, SU. Pr., Enrollment in AUCVM, VMED 5510, VMED 5310. Wound management, reconstructive/salvage surgery.
VMED 5800 APPLIED SMALL ANIMAL NEUROLOGY (1). LEC. 1, SU. Pr., enrollment in AUCVM. Clinical management of commonly occurring neurologic disease of small domestic animals.

VMED 5801 PRECEPTORSHIP (3). LAB. 20, SU. Pr., approval of Preceptorship Committee, enrollment in AUCVM. Training in a practice situation under the direct supervision of a veterinarian or, under certain conditions, in specialized programs.

VMED 5810 FOREIGN ANIMAL PARASITES (1). LEC. 1, SU. Pr., enrollment in AUCVM, VMED 5200, VMED 5210. Foreign parasites of domesticated and wild animals from continents other than North America.

VMED 5820 ADVANCED REPRODUCTIVE TECHNIQUES (2). LEC. 2, Pr., VMED 5120 or departmental approval. Techniques associated with embryo transfer, fetal sexing, in-vitro fertilization, applied and experimental techniques in cattle emphasized.

VMED 5830 VETERINARY MEDICINE AND THE PUBLIC (1). LEC. 1, SU. Pr., enrollment in AUCVM. News events related to veterinary medicine and the role of the veterinarian in public education and public policy.

VMED 5840 WILDLIFE DISEASES (2). LEC. 2, SU. Pr., enrollment in AUCVM. Control and role of veterinarian in prevention of disease in wild animals, specifically wildlife indigenous to U.S.

VMED 5850 CAGE BIRD PRACTICE (1). LEC. 1, SU. Pr., enrollment in AUCVM. Techniques for handling, examination, sample collection, diseases and nutrition of cage birds.

VMED 5860 ADVANCED TECHNIQUES IN POPULATION MEDICINE (1). LEC. 1, SU. Pr., enrollment in AUCVM. Techniques for investigation of disease problems in populations with emphasis on computer software specialized for outbreak investigation and disease mapping.

VMED 5870 AQUARIUM FISH MEDICINE (1). LEC. 2, SU. Pr., Enrollment in AUCVM. Prevention, diagnosis, and treatment of freshwater and marine aquarium fish diseases.

VMED 5880 EQUINE REPRODUCTION (1). LEC. 1, Pr., enrollment in AUCVM, third or fourth year student. Reproductive physiology, endocrinology, breeding soundness evaluation, breeding management and advanced technologies.

VMED 5890 BEEF PRODUCTION/COMPUTER RECORD SYSTEM (1). LAB. 1, Pr., VMED 5243. Hands-on experience with computerized record systems for beef cattle operations.

VMED 5900 SPECIAL SENSES (1). LEC. 1, Pr., enrollment in AUCVM. Pathophysiology, pathologic lesions, diagnosis, treatment and prevention of diseases affecting eyes, ears and nose.

VMED 5910 INTRODUCTION TO ANESTHESIA (3). LEC. 2, LAB. 2, Pr., enrollment in AUCVM. Principles and practices of veterinary anesthesia in large and small animals.

VMED 5950 CLINICOPATHOLOGIC CONFERENCE (0). SEM. 1, SU. Pr., enrollment in AUCVM. Oral presentation of veterinary clinical case or case material.

VMED 5960 READINGS IN CURRENT VETERINARY LITERATURE (1). LEC. 1, SU. Pr., enrollment in AUCVM. Introduction to veterinary literature, evaluation of recent articles, references, reports on veterinary medicine.

VMED 5995 VETERINARY CLINICAL ROTATIONS - EXTERNSHIPS (0). LEC., SU. Pr., Successful completion of didactic veterinary curriculum. Students will participate in clinical rotations including specialty rotations.

Women’s Studies (WMST)

Dr. Mary E. Kuntz - 844-6363

WMST 2100 INTRODUCTION TO WOMEN’S STUDIES (3). LEC. 3. Interdisciplinary examination of the definitions of gender and impact of culture on the construction of gender. Diversity of representation, reflecting upon the histories of women from a local and global perspective will be the keynote of the course.

WMST 3900 DIRECTED READINGS IN WOMEN STUDIES (1-3). LEC. Pr., Departmental approval. Directed study in an area of special interest. Course may be repeated for a maximum of 3 credit hours.