

Accounting

Accounting, ACCT = 0310

4100. Accounting Systems. 3 hours. Introduction to technology/accounting information systems and their interface with processes and process re-engineering. Application of systems development life cycle to the engineering of accounting information systems. Emphasis on auditing system security and integrity. Coverage of project management and accounting systems development. Practical experience with a commercial accounting package. Prerequisite(s): ACCT 2020, 2030, 3110 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610 and 3610.

4130. Financial Statement Analysis. 3 hours. Ratio and analysis and interpretation of balance sheet and income statement data. Account classifications and income measurements; company ratios, trends and present position; development of industry standards and status of business indicators as a guide for economic forecasts. Prerequisite(s): ACCT 2020, 2030 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610. Not open to accounting majors. Offered fall semester only.

4140. Advanced Accounting Principles. 3 hours. Problems connected with income determination and equity accounting, and consolidated statements; domestic and foreign branches, and international accounting; statement of affairs; fiduciaries; actuarial science. Prerequisite(s): ACCT 2020, 2030, 3110, 3120 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610. Offered evening in fall; day in spring and summer semesters.

4270. Managerial Accounting. 3 hours. Nature, measurement and analysis of accounting data appropriate to managerial decision making, and comprehensive budgeting; statistical cost estimation; cost-volume-profit analysis; gross profit analysis; application of probability to cost control; capital planning. PERT-cost. Prerequisite(s): ACCT 2020, 2030, 3270 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610. Offered day in fall; evening in spring and summer semesters.

4300. Federal Income Taxation. 3 hours. Introduction, problems of tax bases and rates; history of the federal income tax; determination of federal income tax base and application of rates; economic and social implications of taxation. Prerequisite(s): ACCT 2020, 2030 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610; senior standing.

4400. Auditing — Professional Responsibilities. 3 hours. Introduction to auditing and the professional responsibilities of a career in any specialty of the accounting profession. Topics include the legal and ethical responsibilities of accountants; professional auditing standards; the acquisition, evaluation and documentation of audit evidence; reports on the results of the engagement. Prerequisite(s): ACCT 2020, 2030, 3110, 3120, 4100 with grades of C or better; ECON 1100, 1110; MATH 1100; 1190; BLAW 3430; BCIS 2610.

4405. Professional Development. 1 hour. Enables students to develop knowledge, skill, and attitudes necessary to function effectively and succeed in the business world. Topics covered include how to dress for success, confidence and motivation, self-assessment, handling conflict and stress, personal and business ethics, dining etiquette, resume writing, professional certification opportunities, job search

and interviewing, and the necessity for continuous self-improvement. In addition to faculty instruction, topics are covered by using former students and other guest lecturers from business, industry and government to expose students to career enhancing opportunities and to provide valuable insights from first-hand experiences.

4410. Auditing — Evidence. 3 hours. The investigation all aspects of the investigative process in auditing. Topics include evaluation in internal control, compliance testing, substantive testing, operational audits, statistical sampling and auditing EDP. Prerequisite(s): ACCT 2020, 2030, 3110, 3120, 4100, 4400 with grades of C or better; ECON 1100, 1110; MATH 1100, 1190; BCIS 2610; BLAW 3430; MSCI 3700, 3710.

4420. International Accounting. 3 hours. Integrates the functional areas of accounting and demonstrates how accounting relates to the disciplines in the College of Business Administration core. Cross-functional and global approaches to organizational issues will be emphasized. Enhances the ability of students to think critically, and to develop knowledge, skills, and attitudes necessary to compete effectively in the global business world. Topics covered include: multinational strategy, global perspectives in accounting, environmental, social and political influences on accounting, accounting information systems in a multinational enterprise, performance evaluation in a multinational enterprise, and the exploration of timely topical issues such as NAFTA, the European Union, and the globalization of securities markets. Prerequisite(s): ACCT 3110, 3120, 3270, 4100 and 4400.

4800. Internship. 3 hours. Supervised work in a job relative to student's career objective. Prerequisite(s): student must meet the employer's requirements and have consent of the professional program director. Pass/no pass only. Does not count toward degree requirements.

5020. Accumulation and Analysis of Accounting Data.

1.5 hours. Provides an understanding of accounting procedures and concepts utilized by management in making decisions. Basic concepts and techniques of accounting; the role of an accounting system in business operations and management; preparation and interpretation of financial reports. This course meets the deficiency requirement in accounting for MBA candidates and may be counted as part of a graduate program in a field other than business administration.

5110. Accounting Analysis and Reports I.

3 hours. Measurement and reporting issues as they affect revenue and expense recognition, equity measurements, working capital, plant and equipment, and intangibles. Includes study of managerial accounting issues as they affect both financial statement presentation and enterprise planning and control. Prerequisite(s): ACCT 5020 (2020, 2030), 4100; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610). All prerequisites (other than ACCT 5020) may be taken concurrently. Accounting leveling course.

5120. Accounting Analysis and Reports II.

3 hours. Measurement and reporting issues as they affect revenue and expense recognition, equity measurements, long-term investments, foreign currency translation, business combinations, consolidated financial statements and alternative accounting models. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 (3110, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610). Accounting leveling course.

5130. Accounting for Management. 3 hours. Designed to provide an understanding of managerial accounting data in making business decisions. Cases, readings and projects are used to examine a wide variety of managerial topics. Prerequisite(s): ACCT 5020 (2020, 2030); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710). For students not majoring in accounting.

5140. Advanced Accounting Analysis. 3 hours. Advanced topics in financial accounting and reporting, including business combinations and consolidations, international accounting and monetary translation, governmental accounting and fiduciary accounting. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710).

5150. The Development of Accounting Theory. 3 hours. The theory of accounting as it has developed in the economy of the United States. Particular emphasis on concepts, income measurement, valuation of assets, and valuation and measurement of equities. Application of accounting theory to contemporary problems is analyzed by cases and research papers on selected areas. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610).

5160. Advanced Accounting Theory. 3 hours. Advanced accounting concepts and standards with emphasis on income determination, including legal, economic and accounting views of the income concept. Development of criteria for evaluating and applying theoretical concepts, particularly as they apply to current controversial questions in accounting. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610).

5180. Topics in Financial Accounting. 3 hours. A seminar in new topics and areas of current interest to students of financial accounting. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270) and 5150; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); or consent of department. May be repeated for credit.

5250. Controllership. 3 hours. The analysis and development of a comprehensive budgetary program, including the application of budgetary principles and techniques to all phases of the operations of the business enterprise. The controllership function, with special attention to the relationship of the controller to profit planning, financial control and control of assets. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 3270 or 5110 or 5130; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710); or consent of department.

5270. Managerial Cost Accounting. 3 hours. Accumulation, analysis and interpretation of accounting data relevant to purposes of managerial decision making; profit planning and control, and application of mathematics and statistics to accounting analysis. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 3270 or 5110; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710).

5300. Federal Taxation of Income. 3 hours. Introduction, problems of tax bases and rates; history of federal income tax; determination of federal income tax base and application of rates; the basic compliance requirement. The impact and effect of tax laws on the social and economic environment. Prerequisite(s): ACCT 5020 (2020, 2030), 4100; ECON 5000

(1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430). Accounting leveling course.

5310. Tax Research and Administrative Procedure. 3 hours. Objectives are to develop the technical skill to identify tax situations, isolate the tax issue, and develop the documentary support and arguments for acceptable solutions to complex tax problems. Upon completion of the course, the student will be able to use the major tax services and prepare a tax memorandum that communicates as completely as possible the tax problems of a practical situation. Also included are the procedural processes for representing a taxpayer before the Internal Revenue Service and the requirements for filing a tax return. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430).

5320. Taxation of Corporations, Partnerships and Fiduciaries. 3 hours. An overview of federal tax laws governing C corporations, S corporations, fiduciaries and partnerships. Explanations of how these entities are used in tax planning. A case method course for MS candidates not planning to specialize in taxation. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430).

5330. Taxation of Corporations and Shareholders. 3 hours. A comprehensive study of rules governing the taxation of corporations and the related problems of corporate shareholders. Emphasis is on the use of corporate tax planning. Some important topics covered are formation of corporations; planning the capital structure to minimize taxes; distributions to shareholders, particularly distributions that receive capital-gains treatment; and corporate reorganizations. Numerous cases are used in the course to improve research skills and the preparation of written reports. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300) and 5310; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430). ACCT 5310 may be taken concurrently.

5360. Advanced Topics in Federal Taxation. 3 hours. Topics covered in this course depend on the needs of students enrolled each semester. The range of possible topics includes consolidated tax returns, partnerships, and tax reform proposals. Emphasis on tax planning and on the intricate process by which federal taxes are assessed. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300), 5310 and 5330 (when taught as Advanced Corporate Taxation); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430). ACCT 5310 may be taken concurrently.

5370. Family Tax Planning and Contemporary Topics. 3 hours. Federal estate and gift taxes are analyzed in the first half of the course. Special attention is given to techniques for disposing of wealth to minimize taxes. Estate planning and return preparation cases are assigned. In the second half of the course, international and state and local taxes, compensation planning, exempt organizations, fiduciary income taxation, and passive activity losses are analyzed. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300), 5310, 5330, 5360; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430). ACCT 5310 may be taken concurrently.

5410. Audit — Investigative Process. 3 hours.

The complete cycle of the investigative process known as auditing is covered from evaluation of the business, through study and evaluation of internal control, to corroborative evidence on the details of account balances. Topics include flow-charting, testing planning, use of statistical sampling, computer controls and management audits. Actual experience is gained through an extended case where an audit is performed by student teams. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 4400, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5430. Auditing — Special Problems. 3 hours. A course reserved for in-depth study of particular problems in auditing. The topics change to cope with the dynamic nature of the profession. Specific topics can be offered on a part-semester or semester basis. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 4400, 5110 and 5120 (3110, 3120, 3270), and 5410; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5440. EDP Control and Auditing. 3 hours. The use of the computer to process transactions imposes a new environment and a new set of problems for the auditors, independent and internal. Controls and audit techniques to evaluate these controls are emphasized. The use of the computer as an audit tool is introduced through actual operation of Generalized Audit Software such as is currently used in practice. Additional topics covered include computer fraud, security measures and controls in advanced on-line, teleprocessing systems. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 4400, 5110 and 5120 (3110, 3120, 3270), and 5410; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5450. Seminar in Internal Auditing. 3 hours. A study of the theory and practice of internal auditing. The course examines the difference between internal and external auditing, focusing on such issues as independence, audit scope, reporting and human relations. Specific internal audit topics include operational auditing, audit administration, planning and supervision, and internal audit reporting. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 4400, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5470. Auditing — Advanced Theory. 3 hours. A conceptual approach to the auditing process, stressing the interrelations of objectives, standards, techniques and procedures. Current topics, including significant legal cases, are included. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 4400, 5110 and 5120 (3110, 3120, 3270), and 5410; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5520. Government and Other Non-Profit Accounting.

3 hours. Critically examines current issues in financial accounting, management control and auditing for government and other non-profit organizations. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5630. Accounting Systems and Controls. 3 hours.

A comprehensive study of computerized managerial accounting systems. Major topics include: role of accounting systems in managerial planning and control (decision making), application of computers in accounting systems, role of the managerial accountant in technology management. Prerequisite(s): ACCT 5020 (2020-2030); ACCT 3270, 4100; ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610).

5710. Petroleum Accounting. 3 hours. An introduction to the oil and gas industry and the specialized financial accounting procedures associated with the industry. Areas emphasized include exploration, leasing, drilling, producing, amortization conveyances, joint interests, unitizations, carried interests, and partnerships and special gas contracts. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5760. Oil and Gas Taxation. 3 hours. A survey of federal tax laws affecting the oil and gas industry. Exploration; drilling, development and leasing; conveyances; depletion and amortization; the Windfall Profit Tax. Prerequisite(s): ACCT 5020 (2020, 2030), 4100, 5110 and 5120 (3110, 3120, 3270), 5300 (4300); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); BLAW 5050 (3430); MSCI 5010 (3700, 3710).

5800. Internship. 3 hours each. A supervised productive and educationally meaningful work experience in a job related to the student's career objective. Prerequisite(s): meet employer's requirements and have consent of department chair. May be taken as a free elective. Pass/no pass only.

5890. International Accounting. 3 hours. Integrates the functional areas of accounting and the functional areas of business administration in a global decision making framework. Cross-functional and global approaches to organizational issues will be emphasized. The course is structured to enhance the ability of students to think critically, and to develop knowledge, skills, and attitudes necessary to compete effectively in the global perspectives on accounting, environmental, social, and political influences on accounting, accounting information systems in a multinational enterprise, performance evaluation in a multinational enterprise, comparative international analysis of financial statements, and the exploration of timely topical issues related to international accounting. Prerequisite(s): ACCT 5020 (2020, 2030); ECON 5000 (1100, 1110); BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710); FINA 3770 or equivalent.

5900-5910. Special Problems. 1-3 hours each. Open to students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6010. Seminar on Advanced Topics in Accounting Research.

3 hours. Covers one or more special fields. Topics covered in this course depend on the needs of the students enrolled each semester. Prerequisite(s): consent of department.

6190. Seminar on Theory Development and Theory Formulation. 3 hours. Explores theory formulation and development in disciplines related to accounting; evaluates the ontological, epistemological and methodological structure of contemporary accounting research and critically examines the adequacy of contemporary research from a historical perspective. Prerequisite(s): doctoral status and consent of instructor.

6290. Seminar on Behavioral Research in Accounting. 3 hours. Critically examines behavioral theories as well as methods and their application to accounting research. The course draws on cognitive psychology and accounting literature. Prerequisite(s): doctoral status and consent of instructor.

6900-6910. Special Problems. 1-3 hours each. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in fields involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6940. Individual Research. Variable credit. Individual research for the doctoral candidate. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

Aerospace Studies

see *Undergraduate Catalog*

Anthropology

Anthropology, ANTH = 0480

4010. Language and Culture. 3 hours. Course focuses on language and all other forms of human communication within the context of culture and society, human thought and behavior. Special attention is paid to the relationship between culture and language, the social uses of language, language as a model for interpreting culture, language and all other forms of non-verbal communication within speech interactions. Extralinguistic communication (e.g. proxemics, kinesics), usually meaning out-of-awareness communication for most speakers, will be addressed as cultural communication. Prerequisite(s): ANTH 1010 or consent of department.

4020. Applied Anthropology. 3 hours. Course is concerned with the development, theory, methods and approaches of applied anthropology. Through case materials, the course will examine both the current and historical roles and contributions of the various subfields in the application of anthropology to the problems of culture. Special attention will be

directed at developing some understanding and appreciation of the problems and ethics involved in applied or practical activities and to developing the necessary skills and methods for assuming such a role as an applied anthropologist.

4030. African-American Culture. 3 hours. Socio-cultural evolution of African-American culture in the United States. The concept of adaptation to a given environment provides the basis for understanding the survival techniques used by African-Americans in the United States. Attention is given to the adaptation strategies of the entire group, versus family and individual routine living habits.

4050. Contemporary Ethnic Groups. 3 hours. Course examines the complexities and intricacies involved in the definition of 'ethnic group' in the contemporary world. Different case studies are used to gain understanding and data for the definition of the term. Socioeconomic organization, political systems and ideological creations are taken into account in order to analyze ethnic groups and the role they perform within national and international contexts. The role and performance of the anthropologists in both the analysis and the creation of images regarding the ethnic groups existing today is emphasized.

4250. Development of Anthropological Thought. 3 hours. An overview of the history of anthropological thought from its origins to the contemporary schools of anthropology, with emphasis on the scientific, intellectual and sociopolitical causes and consequences of changes in major conceptual orientations to man and culture. Prerequisite(s): ANTH 1010 or 2250, or consent of department.

4600. Topics in Physical Anthropology. 3 hours. Selected topics of interest and significance in physical anthropology, such as human osteology and primate behavior, are covered during different semesters. Prerequisite(s): ANTH 1010 or BIOL 1110/1115 or equivalent, or consent of department. May be repeated for credit as topics vary. (Same as BIOL 4600 when offered as Forensic Anthropology.)

4610. Topics in Sociocultural Anthropology. 3 hours. Selected topics of interest and significance in sociocultural anthropology, offered at different times, include education and anthropology, urban anthropology, anthropology of art, anthropology of warfare and conflict, and cultural ecology. Prerequisite(s): ANTH 1010 or 2250, or consent of department. May be repeated for credit as topics vary.

4620. Topics in Archaeology. 3 hours. Selected topics of interest and significance in archaeology, such as historic archaeology, Texas archaeology, New World archaeology, Old World archaeology and Meso-American archaeology, are covered during different semesters. Prerequisite(s): ANTH/ARCH 2500 or consent of department. May be repeated for credit as topics vary. (Same as ARCH 4620.)

4700. Magic, Witchcraft and Religion. 3 hours. Anthropological approaches to the study of cultural beliefs in the supernatural, including religions, myth, ritual, totemism, magic and shamanism. Examination of the role of the supernatural in culture. Prerequisite(s): ANTH 1010 or consent of department.

4750. Culture Change. 3 hours. Examines cultural change on the broad level of human evolution and the more specific level of directed change. Emphasis is placed on gaining an understanding of the interactional and multicultural aspects of directed culture change in all human groups. Prerequisite(s): ANTH 1010 or consent of department.

4800. Anthropological Field methods. 3 hours. Course concentrates on the field methods of anthropology, in particular, the various data gathering techniques, methods of analysis and field techniques of “participant observation.” In addition to acquiring the skills of the participant observation method, the student also will gain an increased awareness, understanding and appreciation of the problems associated with conducting research in cultures other than their own. Special attention is devoted to the interactional aspects of dealing with people from a variety of cultural backgrounds. Prerequisite(s): ANTH 1010 or 2250 or consent of department.

4810. Archaeological Field School. 6 hours. Comprehensive training in site survey, excavation techniques, laboratory processing, restoration and analysis of archaeological materials through direct participation in an archaeological field project. Prerequisite(s): ANTH/ARCH 2500 or consent of department. Held off campus; room and board fees may be required. Usually offered only during the summer months and based on the availability of field projects. This course is taught in cooperation with the Institute of Applied Sciences. (Same as ARCH 4810.)

4920. Cooperative Education in Anthropology. 1-3 hours. Supervised work in a job directly related to the student’s major, professional field of study or career objectives. Prerequisite(s): 12 hours credit in anthropology; student must meet the employer’s requirements and have consent of the institute director. May be repeated for credit.

5030. Medical Anthropology. 3 hours. This course presents perspectives in contemporary medical anthropology, with a focus on the biocultural basis of health and sociocultural variations in illness and healing (ethnomedicine). It includes study of comparative health systems, political-economic and ethical issues in health and care, health professions and patients’ views of illness.

5200. Seminar in Cultural Anthropology. 3 hours. A survey of anthropological attempts to understand and explain the similarities and differences in culture and human behavior.

5610. Topics in Sociocultural Anthropology. 3 hours. Cross-cultural and ethnographic investigation, analysis and discussion of a significant, contemporary topic of interest to students in various graduate programs. May be repeated for credit as topics vary.

5900-5910. Special Problems. 1-3 hours each.

Applied Economics

Applied Economics, AECO = 0430

The following courses usually are offered by faculty members in the Institute of Applied Economics. Additional courses in other departments and colleges may be included in a student’s degree plan upon recommendation of the adviser and consent of the dean of the School of Graduate Studies.

4020. Dispute Resolution in the Workplace. 3 hours. Review of alternative dispute resolution (ADR) to address sources of conflict in the workplace. Examines procedures and benefits of arbitration, mediation, ombudspersons,

minitrials, neutral fact-finding and other alternatives to litigation-based conflict resolution. Trends in use and ethical/professional considerations are considered.

4080. Principles of Economic and Community Development. 3 hours. Presents a broad, interdisciplinary perspective on the local and regional economic development process. Topics include economic base analysis, industrial targeting and recruitment, tax incentives and economic impact analysis.

4090. The Political Economy of Texas. 3 hours. Interdisciplinary survey of the demographic, political and economic forces influencing Texas’ emergence as a modern industrial state. Topics include Texas’ fiscal and regulatory environments, human capital needs, and relationship with the federal government.

4120. Negotiation and Dispute Resolution. 3 hours. Introduces the fundamentals of nonlitigation strategies for a variety of business, professional and personal settings. Learning and skills are developed through lecture, role playing, out-of-class assignments, case studies and negotiation simulations.

4420. Practicum in Mediation and Dispute Resolution. 3 hours. Provides opportunity for students to round out their education in dispute resolution through participation in numerous exercises, simulations and actual mediations and/or other forms of alternative dispute resolution. Prerequisite(s): AECO 2120.

4920. Cooperative Education in Economic Development or Regional/Sectoral Analysis. 1-3 hours. Supervised work in a job directly related to the student’s major, professional field of study or career objective. Prerequisite(s): at least 6 hours of credit in economic development or regional/sectoral analysis courses; student must meet employer’s requirements and have consent of the institute director. May be repeated for credit.

5010. Interdisciplinary Seminar. Variable credit.

5050. Seminar in Contemporary Applied Economic Problems. 3 hours. Analysis and discussion of significant contemporary issues in economics and public policy. May be repeated for credit.

5870. Research Methods. 3 hours. Research methodology for business and the social sciences. Topics include research design; techniques of exploratory data analysis; measures of association; a survey of multivariate factor, discriminant and clustering procedures; and an introduction to linear regression analysis. Prerequisite(s): 3 hours of college statistics or consent of instructor. Offered fall semester only. (Same as ECON 5630.)

5880. Multivariate Regression Analysis. 3 hours. Application of multivariate regression analysis to issues in business and the social sciences. Topics include estimation and analysis of linear models under ideal and non-ideal conditions, instrumental variables estimation and estimation of models with limited dependent variables. Emphasis is placed upon the application of computer technology to practical problems in forecasting and policy analysis. Prerequisite(s): 3 hours of college statistics or consent of instructor. (Same as ECON 5640.)

5900-5910. Special Problems. 1-3 hours each. Open to advanced students capable of doing independent research in economic education, and labor and industrial relations under the direction of the instructor.

5920-5930. Research Problems in Lieu of Thesis. 6 hours each. Research methods emphasizing the philosophy of science, basic statistical methods and basic research design; preparation of a number of research proposals reflecting alternative research designs and alternative statistical methodologies, and a minithesis with emphasis on empirical studies. Required of all Master of Science candidates.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Applied General Music

see Music

Applied Gerontology

Applied Gerontology, AGER = 0410

4020. Psychology of Death and Dying. 3 hours. Concepts and attitudes concerning death and dying from a psychological perspective; current research on death and dying; development of insights and understanding to prepare the student to interact effectively with people who are terminally ill and their family members. Prerequisite(s): advanced standing and consent of department. (Same as PSYC 4020.)

4060. Leisure and Aging. 3 hours. Develops an awareness of the physiological, psychological, economic and sociological processes of aging that affect leisure behavior and involvement patterns. Development of activity programs for community-based and institution-bound individuals. Prerequisite(s): SOCI/AGER 4550 recommended. (Same as RECR 4060.)

4250. Topics in Gerontology. 1-3 hours. In-depth analysis and discussion of selected significant subjects in aging. May be repeated for credit as topics vary.

4450. The Family in Later Life. 3 hours. Later stages in the family life cycle are surveyed with emphasis on changing family composition, role transitions and support systems. Prerequisite(s): SOCI 1510 or equivalent. (Same as SOCI 4450.)

4500. Long-Term Care Case Management with Older Adults. 3 hours. This practitioner-oriented course focuses on the foundations of case/care management and the care management process as practiced with impaired elderly clients and their family caregivers. Topics include older client intake and assessment, establishing goals and a plan of care, coordinating and linking services and resources, and managing and monitoring care. Situations commonly encountered with at-risk elders are examined using protocols.

4550. Sociology of Aging. 3 hours. Emergence of aging as a problem in industrial societies; specific problems and programs relating to older people in American society. Prerequisite(s): SOCI 1510 or equivalent. (Same as SOCI 4550.)

4560. Minority Aging. 3 hours. Introduction to the study of minority elderly in the United States, including their physical and mental health, income security, family relations, and service issues. Course content focuses on African-American, Asian/Pacific Islander, Hispanic, and Native American elders.

4700. Women in Later Life. 3 hours. Examination of the social, psychological and economic issues facing older women from historical, current and futuristic viewpoints. The course identifies historical forces that have shaped the status of older women, explores major issues of importance to older women today, and identifies issues and probable responses that will affect older women in the future.

4750. Sexuality and Aging. 3 hours. One of the most pervasive myths of aging is that older people are non-sexual. This course challenges popular stereotypes and examines sexual attitudes, activity and behavior as people age. In addition to common social beliefs and attitudes that may affect the opportunity for sexual expression among older adults, biological changes and sexual response are explored, as are other aspects of intimacy important to aging individuals.

4780. Aging Programs and Services. 3 hours. Introduction to the history of social policy in aging; derivations and directions of public policy, interrelationships of agencies; discussion of selected programs and services for the aged.

4800. The Social Context of Aging: Global Perspectives. 3 hours. Analysis of the aging experience in a global context, historically and currently. Topics include perceptions of aging, definition of need in old age, and models for delivering health and social services to older persons.

4840-4850. Studies in Aging Field Practicum. 3 hours each. Field practicum (12 hours per week) in an agency or institution delivering services to the elderly; 170 clock hours in field. Prerequisite(s): senior standing in the applied gerontology program and completion of AGER 3480, 4550 and 4780.

4960. Studies in Aging Institute. 1-3 hours. Selected topics are developed in an institute format and are regularly scheduled. May be repeated for credit as topics vary.

5200. Seminar on Research Methods and Design. 1-3 hours. Focuses on policy research and its implications for programs in aging, and on techniques of evaluation of programs for the elderly.

5250. Topics in Gerontology. 1-3 hours. In-depth analysis and discussion of significant subjects in aging. May be repeated for credit as topics vary.

5300. Computer Applications in Long-Term Care. 4 hours. Overview of entire subject of small computers, including terminology, how computers work and capabilities of computers; effective application of computers in the health care field, including laboratory experience with hardware and software commonly used by health care professionals.

5350. Basic Mediation Skills in Aging. 3 hours. This course, which utilizes negotiation and mediation principles and techniques, meets the dispute resolution training needs of individuals serving the elderly and their families. Included are such professionals as social workers, counselors, discharge planners, home health administrators, care managers, nursing home staff, adult protective service workers, ombudsmen, health and human services staff, and anyone else contracted to serve the elderly and their family members.

5400. Health Delivery Systems. 1-3 hours. A cross-cultural overview of health delivery systems followed by an extensive consideration of all aspects of the health delivery system in the United States; government and private sector involvement in delivery of health services to the aged is emphasized.

5500. Retirement and Retirement Preparation. 1-3 hours. Investigation of retirement as a social institution with emphasis upon the implications for the individual and society. Includes rationale, content and methods involved in retirement planning programs.

5560. Seminar on Minority Aging. 3 hours. An examination of the current state of gerontological knowledge with regard to each of the federally designated minority groups in the United States: African Americans, Asians/Pacific Islanders, Hispanics, and Native Americans. Each student will have the opportunity to explore the state of knowledge about a particular group or a research issue across populations.

5600. Housing for the Elderly: Planning, Public Policy and Research. 1-3 hours. Theoretical, research and practical literature concerning housing alternatives is considered. Emphasis is on the four housing development stages: need assessment, financing, physical design and management of a housing site; and how theory, research and public policy relate to each of these issues.

5650. Ethnic and Cultural Variations in Service Delivery. 1-3 hours. An examination of ethnic and cultural factors influencing the planning and delivery of health and social services to the aged and handicapped. (Same as RHAB 5650.)

5700. Social Gerontology. 1-3 hours. Demographic, social and cultural aspects of aging, with particular emphasis upon American society and the types of problems encountered by older people. May be repeated for credit as topics vary.

5710. Health Aspects of Human Aging. 1-3 hours. Examination of general and cellular theories of aging and general age-related changes in various body systems. Issues covered include myths and facts about physical health and aging, normal age-related changes and common chronic illnesses associated with old age. Students will become familiar with medical terminology to facilitate effective communication with health care professionals who work with the elderly in both institutional and community settings.

5740. Financial Issues in Aging Administration. 3 hours. Addresses the need of the administrator/manager who is not a financial expert to understand, identify, and experience some applications of practical information related to financial/management issues in residential and community-based programs for the elderly.

5750. Processes of Aging. 1-3 hours. Advanced seminar in social gerontology with emphasis upon psychosocial changes associated with aging.

5770. Program Evaluation in Aging Services. 3 hours. This seminar is designed to provide students with the basic skills and perspectives required to undertake evaluations of health and social programs for the aged, and to assess the merits of program evaluations conducted by others. Emphasis is placed on the unique service needs of older persons; the distinctive character of the facilities, agencies, and programs that serve them; and special challenges faced by those who attempt to assess the benefits of such efforts.

5780. Federal, State and Local Programs in Aging. 1-3 hours. History of social policy in aging; derivations and directions of public policy, interrelationships of agencies; discussion of selected programs and services for the aged.

5790. Needs Assessment and Program Planning for the Elderly. 3 hours. Principles, techniques, and skills used to identify the needs of elders at the community level and to design

programs individually tailored to meet those needs in such areas as access, health, nutrition, housing, income maintenance, employment, personal support, and training and education.

5800. Proseminar on Programs in Aging. 1-3 hours. Investigation of the impact of management processes and organizational structure upon behavior as it relates to the administration of programs in aging. Establishment of organizational goals through the process of grant writing.

5810. Seminar on Administration of Long-Term Care and Retirement Facilities I. 3 hours. The continuum of long-term care; management principles and functions; organization of long-term care facilities; employment issues; government regulations and their enforcement; marketing long-term care; and other topics pertinent to the administration of long-term care and retirement facilities.

5820. Seminar on Administration of Long-Term Care and Retirement Facilities II. 3 hours. Overview of departments within the long-term care facility; the facility's relations with families, volunteers, and the public; safety issues; education and training; history and trends in the long-term care field; and other topics pertinent to the administration of long-term care and retirement facilities.

5830. Seminar on Administration of Community-Based Programs in Aging. 3 hours. Management of community-based programs for the elderly, focusing on personnel issues, including hiring, firing, and supervising; roles, responsibilities, and relations with governing boards; fund-raising with special events, foundations, and grant proposal writing. Topics covered also include mission statements, planning, technology audits, outcome evaluation, marketing, compensation and benefits, and volunteers.

5840. Internship in Administration of Programs in Aging. 3 hours. Five hundred-clock-hour practicum in approved agency serving the aged. Credit awarded only upon completion of internship. Pass/no pass only.

5850. Internship in Administration of Programs in Aging. 3 hours. Five hundred-clock-hour practicum in approved agency serving the aged. Credit awarded only upon completion of internship. Pass/no pass only.

5860. Seminar on the Psychology of Aging. 1-3 hours. Theoretical and research literature concerned with the psychological aspects of aging. Age-related changes in physical, perceptual and cognitive processes are considered with regard to their effects on the occupational, social and personal adjustments and motivations of the aging adult. (Same as PSYC 5860.)

5890. Psychological Counseling for Late Maturity and Old Age. 1-3 hours. Study of the predictable and normal dependencies of aging; techniques of individual, family and group counseling applied to later life with emphasis on problems of retirement, health and bereavement. (Same as PSYC 5890.)

5900-5910. Special Problems. 1-3 hours each. Individual study assigned with consent of major professor and instructor.

5940. Proseminar on Applications in Practice. 3 hours. The focus of this capstone seminar is the application of gerontological theory to practice issues in the field of aging. Students demonstrate their ability to apply theory to practice through class discussion and the submission of a major written project. Continuous enrollment required once work on project has begun.

5960-5970. Studies in Aging Institute. 1-3 hours each. Scheduled regularly for participants in institutes. May be repeated for credit. No more than 6 hours allowed for regular students.

6150. Theories of Aging. 3 hours. An intensive analysis of the theories of aging that have been advanced by researchers in the social and behavioral sciences from 1950 to the present. Prerequisite(s): a minimum of 12 hours in gerontology, including AGER 4550 or 5700, or equivalent.

Applied Gerontology, Related Courses

The following courses are taught in related departments:

ACCT 5130. Accounting for Management. 3 hours. Designed to provide an understanding of managerial accounting data in making business decisions. Cases, readings and projects are used to examine a wide variety of managerial topics. Prerequisite(s): ACCT 5020 (2020, 2030); ECON 5000 (1100, 1110); MATH 1190; BCIS 5090 (2610, 3610); MSCI 5010 (3700, 3710). For students not majoring in accounting.

BLAW 5050. Legal, Regulatory, and Ethical Environment of Business. 1.5 hours. Introduction to the legal environment of business, with particular emphasis on managerial decision-making. Includes a study of the litigation process and constitutional law; selected areas of private and public law, including government regulation; international dimensions of the legal environment of business, business ethics and the social responsibility of business organizations. Business context is emphasized with a focus on individual and managerial decision-making in response to legal and ethical issues.

BLAW 5600. Current Topics in Law. 3 hours. Designed to provide information on the legal environment of specified functional areas as required by needs of functional areas and/or changes in the law. May be repeated for credit as topics vary. Note: This course is taught once a year focusing on legal aspects of retirement facility and long-term care administration.

MGMT 5070. Management Issues. 1.5 hours. The basic concepts in managing the complete flow of materials that represent a supply chain from suppliers to customers. Emphases within the module are placed on production concepts with business wide applications, determining demand, transformation processes used to satisfy demand, and finally managing the supply activity supporting the transformation processes.

Applied Private Music

see Music

Applied Technology, Training and Development

see Technology and Cognition

Archaeology

see Geography

Art

Art, ART = 1210

4070. Topics in Art History. 3 hours. A study of topics in the history of art. Prerequisite(s): ART 2350 and 2360, or consent of instructor. May be repeated for credit as topics vary.

4082. Communication Design: Publication Design.

3 hours. (2;4) Publication design emphasizing layouts, grids and other organizational structures for multi-page design. Prerequisite(s): ART 3080 and 3170.

4084. Professional Practices for Communication Design.

3 hours. Professional, legal and business practices for communication design. Professional ethics, office practices, fees, preparation of estimates, proposals, contracts, taxes and resumes. Prerequisite(s): Passing mid-point portfolio review.

4085. Communication Design: Advanced Graphic Design/Art Direction.

3 hours. (2;4) Advanced development of graphic design/art direction skills. Prerequisite(s): ART 4082.

4086. Communication Design: Final Portfolio Preparation.

3 hours. (2;4) Final graphic design and advertising campaigns, portfolio presentation and retrospective evaluation. Passing senior portfolio review required. Prerequisite(s): ART 3080, 3082, 3170, 4082, and 4805. Graduating senior status suggested.

4088. Communication Design: Illustration.

3 hours. (2;4) Trends and styles of illustration. Emphasis on work with an art director on projects geared to editorial, corporate and agency work. Special attention to specifications, deadlines, reproduction requirements and professional attitudes. Prerequisite(s): ART 2100 and 3 hours of painting or printmaking.

4120. Art in New York. 3 hours. Visits to major museums, galleries, showrooms and design studios. Research on selected art topics or projects. Course includes field trip and classroom lectures. Prerequisite(s): ART 2350 and 2360, or consent of instructor.

4130. Renaissance Art in Italy. 3 hours. Art in Italy from the 13th through 16th centuries. Prerequisite(s): ART 2350 and 2360, or consent of instructor.

4140. Greek and Roman Art. 3 hours. Art between 3000 BC and 500 AD. Prerequisite(s): ART 2350 or consent of instructor.

4170. Computers in Art: Three-Dimensional Modeling and Animation.

3 hours. (2;4) Exploration of three-dimensional modeling and computer animation systems to develop time-based art work, broadcast type graphics and prototypes for three-dimensional art works. Students will develop an understanding of three-dimensional vector space, rendering and imaging techniques, as well as choreography of computer animation. Prerequisite(s): ART 3170.

4172. Photography: Digital Photoimaging.

3 hours. (2;4) A comprehensive exploration of computer technology for use in commercial and fine art studio photography; influence of technology on the aesthetic philosophies and working methods of photographers. Prerequisite(s): CSCI 1100; ART 3170, 2650, 2655, 3600 or consent of instructor.

- 4175. Multi-Media for Artists and Designers.** 3 hours. (2;4) An overview of the use of the computer as a communication medium. Exposure to multi-media authoring, interactivity and internet web design. Prerequisite(s): ART 1440, 1450, 1500, 1510, 3170; CSCI 1100; or consent of instructor.
- 4176. Art and Design of the Computer Game.** 3 hours. (2;4) Design and creation of artwork for use in computer gaming, including portfolio production, presentation, visualization and project planning. Emphasis on drawing, character development, scenic and interface design. Prerequisite(s): ART 3170.
- 4180. Seventeenth-Century Art.** 3 hours. Art in Western Europe. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4190. History of Prints.** 3 hours. Graphic arts since the Renaissance. Prerequisite(s): ART 2360 or consent of instructor.
- 4300. Hybrid Forms.** 3 hours. (2;4) General introduction to the theory and practice of non-traditional art media. Lecture and studio with emphasis in studio. Prerequisite(s): Advanced standing in painting, sculpture, or photography; must have passed mid-point portfolio review.
- 4302. Watercolor Studio.** 3 hours. (2;4) Developing additional competence in watercolor painting. Prerequisite(s): ART 2100, 2300, 2310, 3000, 3100, 4370, or consent of instructor.
- 4310. History of Crafts.** 3 hours. Ceramics, metalwork, weaving and other crafts media from the Paleolithic era to the present. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4320. Asian Art.** 3 hours. A survey of the art of India, China, and Japan from prehistoric to modern times, including architecture, sculpture, painting, ceramics and printmaking. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4330. Northern Renaissance Art.** 3 hours. Art in Europe north of Italy, 14th through 16th centuries. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4340. American Art.** 3 hours. Art from the 15th century to 1945 with an emphasis on new perspectives and current scholarship. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4350. Understanding Art Museums.** 3 hours. European and American art museums; history, organization, functions and collections. Assignments in Dallas/Fort Worth museums. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4360. Nineteenth-Century Art.** 3 hours. Art in Europe and America. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4370. Twentieth-Century Art.** 3 hours. Modern art since post-impressionism, especially recent developments. Prerequisite(s): ART 2360 or consent of instructor.
- 4380. Eighteenth-Century Art.** 3 hours. Art in Western Europe. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4390. Pre-Columbian Mesoamerican and North American Art.** 3 hours. Arts of the Pre-Columbian cultures of Mesoamerica and North America. Prerequisite(s): ART 2350 and 2360, or consent of instructor.
- 4440. Fashion Design V.** 3 hours. (2;4) Design patternwork and construction of garments. Emphasis on fit, professional construction methods, research and appropriateness for target market. Prerequisite(s): ART 3130. Offered fall semester only.
- 4441. Fashion Design VI.** 3 hours. (2;4) Design, patternwork and construction of senior collection in preparation for Artwear fashion show. Critical analysis of garments and final portfolio review by industry professionals. Prerequisite(s): ART 4440. Offered spring semester only.
- 4450. Professional Internship.** 3-6 hours. In-training programs offered in cooperation with approved business and professional houses in communication design, fashion design, interior design and photography. Limited number of approved students. Students wishing credit must have instructor approve plan. Term reports required of students and employers. Prerequisite(s): Interior design students must have completed ART 3310 and 3320; communication design students must have completed ART 3170 and 3080. May be repeated for credit.
- 4520. Interior Design: Historical Styles.** 3 hours. (2;4) Planning and presentation of interiors designed in historic styles. Design presentation and construction detailing with appropriate materials and methods for contemporary practice. Prerequisite(s): GNET 3350, and ART 3310, 3320, 3510 and 3540.
- 4550. Theories of Contemporary Art.** 3 hours. Selected theoretical and critical issues in recent art. Prerequisite(s): ART 4370. Not for art history credit.
- 4600. Alternate Photographic Processes.** 3 hours. (2;4) Alternate processes in photography with emphasis on hand applied, non-silver photographic emulsions. Prerequisite(s): ART 2650 and 2655. Offered spring only.
- 4610. Artist's Bookmaking.** 3 hours. (2;4) Application of the concepts and techniques of bookmaking to create sequential works of art. Emphasis on developing ideas, materials, presentation and basic bookbinding techniques in one-of-a-kind and multiple books. Prerequisite(s): one 3000-level printmaking or photography course, or consent of instructor.
- 4650. Photography: Advanced Lighting Techniques.** 3 hours. (2;4) Photographic lighting procedures and studio techniques. Completion of a portfolio of images is required. Prerequisite(s): ART 2650, 2655, and passing mid-point portfolio review.
- 4710. Medieval Art.** 3 hours. Art from fall of the Roman Empire to late Gothic international style. Prerequisite(s): ART 2350 or consent of instructor.
- 4740. Interior Design: Professional Practice.** 3 hours. Business and office practice, fees and commissions, preparing estimates, contracts, professional ethics and job opportunities. Student must pass senior portfolio review. Prerequisite(s): ART 3310 and 3320. Concurrent enrollment in ART 4840 required.
- 4800. Studio.** 3 hours. (0;6) Developing additional competence in special areas. Prerequisite(s): senior standing and consent of instructor; ART 4802 and 4804 have the additional prerequisite of ART 3000 (6 hours). All may be repeated for credit.
- 4801. Sculpture Studio.**

- 4802. Advanced Painting Studio.**
- 4803. Ceramics Studio.**
- 4804. Advanced Drawing Studio.**
- 4805. Printmaking Studio.**
- 4806. Photography Studio.**
- 4807. Communication Design Studio.**
- 4808. Fashion Design Studio.**
- 4810. Metalsmithing and Jewelry Studio.**
- 4811. Fibers: Weaving Studio.**
- 4812. Fibers: Fabric Design Studio.**
- 4813. Computers in Art Studio.**
- 4840. Interior Design: Space Planning IV.** 3 hours. (2;4) Application of comprehensive problem-solving techniques, including research, programming, concept development, space planning, code review, design, detailing and systems integration for a large commercial space. Prerequisite(s): GNET 3350; ART 3310, 3320, and 3540 or 4520. Concurrent enrollment in ART 4740 required.
- 4890. Visual Arts Studies: Criticism and Aesthetics in the Visual Arts.** 3 hours. An examination of aesthetics in the visual arts through visual discrimination and critical thinking in relationship to historical and socio-political influences. Prerequisite(s): ART 2350, 2360, 3850, 3855, 3860 and 3865. Course must be taken prior to student teaching.
- 5130. Seminar in Renaissance Art.** 3 hours. Selected problems in Renaissance art. Prerequisite(s): ART 4130. May be repeated for credit as topics vary.
- 5180. Seminar in Seventeenth-Century Art.** 3 hours. Selected problems in 17th-century art. Prerequisite(s): ART 4180. May be repeated for credit as topics vary.
- 5190. Seminar in Art History.** 3 hours. Research and study in selected topical areas of art history. May be repeated for credit as topics vary.
- 5200. Contemporary Architecture.** 3 hours. Biological, structural and social problems of human shelter; analysis of achievement in contemporary architecture.
- 5340. Seminar in American Art.** 3 hours. Selected problems in American art. Prerequisite(s): ART 4340. May be repeated for credit as topics vary.
- 5350. Research in Art.** 3 hours. A study of research techniques and their applications in the field of visual arts; preparation of a prospectus.
- 5360. Seminar in Nineteenth-Century Art.** 3 hours. Selected problems in 19th-century art. Prerequisite(s): ART 4360. May be repeated for credit as topics vary.
- 5370. Seminar in Twentieth-Century Art.** 3 hours. Selected problems in 20th-century art. Prerequisite(s): ART 4370. May be repeated for credit as topics vary.
- 5380. Seminar in Eighteenth-Century Art.** 3 hours. Selected problems in 18th-century art. Prerequisite(s): ART 4380. May be repeated for credit as topics vary.
- 5390. Seminar in Art Museum.** 3 hours. Study of the functions of an art museum — collection, preservation, exhibitions, research and interpretation of art objects. Visits to North Texas art museums required.
- 5410. Seminar in Discipline-Based Art Education.** 3 hours. Examination of theory development in disciplined-based art education (DBAE). Emphasis is placed on analyzing the evolving theoretical foundations which inform DBAE practice. Influences from art and aesthetic education, curriculum reform movements, and social issues are identified and considered. Prerequisite(s): graduate art education.
- 5550. Seminar in Art Museum Education I.** 3 hours. Study of the museum's public role, centering on history and theory of art museum education. Audience identification and museum education careers stressed toward aim of understanding, developing, and expanding learning opportunities in museums. Prerequisite(s): art education and art history, graduate level.
- 5560. Seminar in Art Museum Education II.** 3 hours. Emphasis on current practices of art museum education with advanced study in areas of specialization. Prerequisite(s): ART 5550 or consent of instructor.
- 5610. Artist's Bookmaking.** 3 hours. (2;4) Design and creation of books as works of art at the master's level. Utilization of techniques of book design and bookbinding to create personal artistic statements in a sequential format. Prerequisite(s): competency in photography or printmaking or consent of school.
- 5700. Seminar in University Art Teaching.** 3 hours. A study of problems unique to university art faculty; professional practices in various fields of art teaching. May be repeated for credit as topics vary.
- 5800. Graduate Studio.** 3 hours. Courses for students qualified to develop professional competence in special areas of studio work. Prerequisite(s): 12 hours of art in the selected area and consent of school. All may be repeated for credit.
- 5801. Sculpture Studio.**
- 5802. Painting Studio.**
- 5803. Ceramics Studio.**
- 5804. Drawing Studio.**
- 5805. Printmaking Studio.**
- 5806. Photography Studio.**
- 5807. Communication Design Studio.**
- 5809. Interior Design Studio.**
- 5810. Jewelry and Metalworking Studio.**
- 5811. Fibers: Weaving Studio.**
- 5812. Fibers: Fabric Design Studio.**
- 5850. Seminar in Art Education.** 3 hours. Selected problems in art education, theory and practice. Prerequisite(s): consent of school. May be repeated for credit as topics vary.
- 5860. Curriculum Development and Program Assessment in Art.** 3 hours. Processes for developing and sequencing the curriculum and methodologies for the assessment of educational programs and student learning in art for elementary and secondary public schools and higher education.
- 5870. History of Art Education.** 3 hours. Seminar explores the history and philosophy of education in relationship to the teaching of art in public schools and higher education.

5880. Trends and Issues in Art Education. 3 hours. Research into current literature and practical applications in American and international art education.

5900-5910. Special Problems. 1-3 hours each. Conference courses open to advanced students capable of doing independent research under the direction of the instructor. Not to be registered for except when other graduate courses are not available. Registration permitted only with consent of school. A maximum of 3 semester hours of credit for each course.

5920-5930. Research Problems in Lieu of Thesis. 3 hours each. Research dealing with significant problems in the field of art. Courses open to MFA students who are doing a project in lieu of a thesis. Student must mount an MFA exhibition as part of course requirements for 5930.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of school. 6 hours credit required. No credit assigned until thesis has been completed and filed with graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

5960-5970. Art Institute. 1-3 hours each. For students accepted by the university as participants in special institute programs.

6900-6910. Special Problems. 1-3 hours each. Conference courses for doctoral students. Directed reading and research in fields of special interest.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of school. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Astronomy

see *Undergraduate Catalog*

Behavior Analysis

Behavior Analysis, BEHV = 0435

4010. Functional Analysis and Problem Behavior. 4 hours. (2;3) Introduction to function-based treatment approaches for problem behavior. Topics include anecdotal assessment, descriptive assessment, experimental analysis and various courses of treatment derived from functional assessment, with emphasis on the importance of consistency between procedures and the functional properties of problem behavior. Prerequisite(s): BEHV 3440 or consent of instructor.

4310. Behavior Principles and Self-Management. 3 hours. Uses behavior principles to understand and deal with problems in self-management. Self-assessment of goals, options and necessary trade-offs is followed by a behavioral analysis of the nature of the self-management problem. Each student applies behavioral principles to develop and implement an individual self-management plan to reach a particular short-term goal. Prerequisite(s): BEHV 2300 or 3150.

4400. Organizational Behavior Management. 3 hours. Describes theory and techniques of applying behavior analysis principles to solve performance problems and design more effective workplaces. Focuses on pinpointing critical work behaviors, measuring work performance, analyzing the contingencies responsible for the performance, implementing and evaluating intervention programs involving stimulus control, feedback and reinforcement systems to improve employee performance. Discusses organizational behavior management as a philosophy and as a tool for improving job performance in any organization.

4750. Advanced Readings in Behavior Analysis. 3 hours. (2;3) Addresses current theoretical, philosophical and ethical issues that relate to applications. Complex behavior interpreted in terms of complex environmental configurations. Interlocking operant behaviors of individuals in social systems. Ethical and legal responsibilities in applied areas. Prerequisite(s): BEHV 2300 or 3150.

4800. Topics in Behavioral Applications. 3 hours. Focus is on the complex relations between behavior and the environment in specific kinds of settings. Topics include applications in institutional settings and work environments in public and private sectors, business and industry. Prerequisite(s): BEHV 2300 or 3150.

5000. Observation and Measurement of Behavior and Environment. 3 hours. An examination of the factors to be considered in observing and measuring behavior and environment; methods of recording data with emphasis on the conditions under which each method is most appropriate.

5010. Experimental Analysis of Behavior. 3 hours. Reviews classical experimental literature in behavior analysis. Compares methodology to that in natural and social sciences. Special emphasis on experimental analysis of human behavior.

5020. Theory and Philosophy in Behavior Analysis. 3 hours. Study of the conceptual framework of behavioral analysis; studies epistemological issues and nature of scientific explanation; examines common misconceptions and provides theoretical foundations for applications and basic research.

5030. Applied Behavior Analysis and Autism III: Supervision and Training. 3 hours. Describes behavioral intervention literatures as they relate to the change agents responsible for treatment implementation. Students design and implement change agent data collection systems, training packages, and complete extensive practical training. Students also explore issues in the funding and systems involved in the provision of treatment. Prerequisite(s): BEHV 4000.

5140. Research Methods in Behavior Analysis. 3 hours. An overview of strategies and tactics of experimental design in behavior analysis. Includes strengths and weaknesses of single organism methodology in basic and applied research. Topics include issues of experimental logic, experimental control, variability, data analysis and display, and interpretation of experimental findings.

5150. Techniques in Applied Behavior Analysis. 3 hours. Analysis of problems in behavioral terms. Selection of management strategy and behavior change techniques, including behavioral contracting, contingency management, programmed instruction, removal or reduction of environmental stressors. Consideration of ethical issues, including informed consent, need for non-coercive or at least restrictive intervention. Supervised practical experience.

5250. Topics in Behavior Analysis. 3 hours. In-depth analysis and discussion of significant topics in behavior analysis. Topics include but are not limited to the following: philosophy of measurement of behavioral phenomena; rule-governed vs. contingency-governed behavior; the creation of settings and interpersonal dynamics; legal, ethical and professional issues in behavior analysis.

5330. Verbal Behavior and the Analysis of Human Behavior. 3 hours. Use of behavior analysis in understanding the nature and development of human communication. Explores how and why communication fails; develops guidelines for enhancing communication through understanding of the underlying behavioral processes.

5540. Legal/Ethical Issues in Behavior Analysis. 3 hours. Reviews effects of court decisions in development and implementation of behavioral interventions, including issues dealing with accountability, confidentiality, quality of services, place of research in work settings and ethical safeguards that pertain to these issues.

5560. Development of Behavior Intervention Programs. 3 hours. Focus is on the integrated components of behavioral programming. Includes developing behavioral objectives, functional analysis, design of intervention procedures, evaluative criteria and the integration of these components into a readable document.

5570. Training and Supervision of Staff in Human Service Settings. 3 hours. Includes analysis of political and social contingencies existing in most institutional settings. Describes training considerations and ways to establish a positive work environment for staff and clients. Principles underlying effective supervisory practices are described.

5810. Practicum. 2 hours. (0;0;2) Students work in a small group in a field setting under the immediate supervision of a faculty member in the department. The purpose of this practicum is to provide experience in applying behavioral principles in a setting where faculty feedback is continuously available.

5815. Practicum. 1 hour. (0;0;1) Students work individually or in pairs on a project in any of a variety of applied settings. They are supervised by faculty through weekly meetings and occasional on-site observation. Project must be pre-approved, in writing, by faculty supervisor before registration. Practicum projects typically require about 100 clock hours (including time in the field and time meeting with supervisor). The purpose of this practicum is to provide the student with experience in planning and implementing behavior change. This course may be repeated for credit. Prerequisite(s): BEHV 5810.

5820. Internship. 3 hours. (0;0;3) Students work in the field, under the supervision of a qualified behavior analyst, in a setting of their choice for a period of 6 weeks. Internship settings include (but are not limited to) agencies serving persons with developmental disabilities, business and industry, consulting firms, research facilities, schools, and offices of physicians, psychologists and other private practitioners. Prerequisite(s): BEHV 5810 and 5815.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of independent work in a specific area of interest. Outline of problem and proposed activities must be submitted in writing to faculty and approved in advance of registration.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit

given until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

6400. Behavioral Interventions in Health and Medicine. 3 hours. Course is constructed around a series of cases in which behavioral interventions are planned to improve health, prevent disease, or mitigate the effects of chronic health problems of individuals. A behavioral analysis of the problem in the context of individuals' overall repertoire and life circumstances is followed by design of an intervention plan based on behavioral principles. Problems likely to need resolution for successful intervention are identified and addressed.

Biochemistry

see Biological Sciences

Biological Sciences

Biochemistry, BIOC = 0116

4540. Biochemistry I. 3 hours. Chemistry and biochemistry of carbohydrates, lipids, amino acids and proteins, and nucleic acids; biochemical energetics, enzyme catalysis, vitamins and coenzymes, and their interrelationships in energy-producing cycles and pathways. Prerequisite(s): CHEM 2380. May not be repeated at the graduate level as BIOC 5540.

4550. Biochemistry II. 3 hours. Metabolic pathways in biosynthesis and degradation of lipids, nucleic acids, proteins and carbohydrates; photosynthesis, nitrogen cycle, and metabolic regulation. Prerequisite(s): BIOC 4540 or consent of department. May not be repeated at the graduate level as BIOC 5550.

4560. Biochemistry Laboratory. 2 hours. (1;3) Analysis and characterization of amino acids, peptides, enzymes, lipids, nucleic acids, carbohydrates, and metabolic pathways and processes. Techniques include a variety of chromatographic methods, electrophoresis, UV-vis spectroscopy and radiochemistry. Prerequisite(s): BIOC 4540 (may be taken concurrently).

4570. Biochemistry and Molecular Biology of the Gene. 3 hours. Mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems. May not be used to satisfy minor requirements in chemistry. Prerequisite(s): at least one of the following: BIOL 3510/3520, 3450 or BIOC 4540. (Same as BIOL 4570.)

4580. Biochemistry and Molecular Biology of the Gene Laboratory. 2 hours. (0;5;0) Experiments in recombinant DNA techniques, gene regulation and other areas of molecular biology. May not be used to satisfy major or minor requirements in chemistry. Prerequisite(s): credit for or concurrent enrollment in BIOC 4570, or consent of department. (Same as BIOL 4580.)

4940. Honors Research in Biochemistry. 3 hours. Advanced original independent research supervised by a faculty member in the biological sciences. For students interested in pursuing careers in research or medicine. Prerequisite(s): 3.25 GPA or better in the sciences, at least 12 hours of biology and 16 hours of biochemistry/chemistry, junior or senior standing and departmental approval.

4950. Honors Thesis in Biochemistry. 3 hours.

A continuation of BIOC 4940 involving advanced original independent research culminating in a written report supervised by a faculty member in the biological sciences. The results will be written in standard thesis format and presented orally. For students interested in pursuing careers in research or medicine. Prerequisite(s): BIOC 4940 and departmental approval.

5340. Molecular Biology. 3 hours. Mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems. Prerequisite(s): BIOL 4570 and 4580, or BIOC 4570 and 4580, and at least two of the following: BIOC 4540, 4550 or 4560, or BIOL 3450, 3510 or 3520. (Same as BIOL 5340.)

5540. Biochemistry. 3 hours. (3;0;1) Chemistry and biochemistry of carbohydrates, lipids, amino acids and proteins, and nucleic acids; biochemical energetics, enzyme catalysis, vitamins and coenzymes, and their inter-relationships in energy-producing cycles and pathways. A recitation period is scheduled for problem-solving and student reports from the current biochemical literature. Prerequisite(s): CHEM 2380 or consent of department.

5550. Biochemistry. 3 hours. (3;0;1) Continuation of BIOC 5540. Metabolic pathways in biosynthesis and degradation of lipids, nucleic acids, proteins and carbohydrates photosynthesis, nitrogen cycle, biochemical genetics and metabolic regulation. A recitation period is scheduled for problem-solving and student reports from the current biochemical literature. Prerequisite(s): BIOC 5540 or consent of department.

5680. Selected Topics in Biochemistry. 1-3 hours. Current research interests in the field of biochemistry. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5900-5910. Special Problems. 1-3 hours each. For students capable of developing a problem independently through conferences and activities directed by the instructor. Problem chosen by the student with the consent of the instructor.

5940. Seminar in Current Biochemistry. 1 hour. A study of current literature; current research emphasized. May be repeated for credit.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

6010. Seminar for Doctoral Candidates. 3 hours. Demonstration of competence in a specific area of biochemistry and/or molecular biology as evidenced by criteria established by the faculty. May be repeated for credit.

6600. Advanced Molecular Biology. 3 hours. Genetic structure and regulation of gene expression in prokaryotic and eukaryotic organisms; mechanisms of gene action, gene/enzyme relationships and metabolic control; biochemical manipulation and characterization of genetic macromolecules. Prerequisite(s): BIOL 4570 or 5340 or equivalent. (Same as BIOL 6600.)

6610. Advanced Intermediary Metabolism and Its Regulation. 3 hours. Advanced intermediary metabolism of carbohydrates, lipids, nitrogenous compounds and nucleic

acids. Relevant new findings particularly regarding the regulation of these pathways are also covered.

Prerequisite(s): BIOC 4550/5550 or consent of department.

6620. Advanced Cell Biology. 3 hours. Structure and function of animal and plant cells with emphasis on cell membranes, cytoplasmic organelles and the nucleus; readings in current literature. Prerequisite(s): biochemistry, BIOL 3510/3520 or equivalent, or consent of department. (Same as BIOL 6620.)

6630. Protein Structure and Function. 3 hours.

An introduction to protein structure. Coverage of recurring structural motifs and the determination of protein structure as it determines enzyme function. Catalytic reaction mechanisms, protein-substrate interactions, and the kinetics of enzyme catalyzed reactions. Prerequisite(s): BIOC 4550 or 5550.

6640. Biochemical Regulation. 3 hours. A study of regulation in metabolic processes and pathways, emphasizing the theories of metabolic flux and enzyme regulation. Fundamental regulatory mechanisms, such as allosterism, covalent protein modification and induction, are discussed in the context of fundamental cell metabolism and signal transduction. Prerequisite(s): BIOC 4550 or 5550, or consent of department.

6650. Plant Physiology and Biochemistry. 3 hours.

This course emphasizes contemporary aspects of plant biochemistry and physiology using examples from the current research literature. Lectures focus on physiological processes that are specialized and unique to higher plants, including photosynthesis, and dormancy. Biochemical and physiological approaches are integrated as they relate to the overall control of plant growth and development.

Prerequisite(s): one of the following: BIOC 4540 or 4550, or BIOL 3510 or 4570, or plant physiology, or consent of the instructor.

6680. Advanced Techniques in Biochemistry. 1-3 hours.

Methods and instrumentation currently used in biochemical analyses. Presented in four-week minicourses consisting of 8 hours of lecture and 24 hours of laboratory. Topics vary from year to year but include, among others, protein sequencing and amino acid analysis, nucleic acid sequencing, tissue culture, monoclonal antibody production, column chromatography, radioisotopes, peptide synthesis, and gel electrophoresis and electrofocusing. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

6900-6910. Special Problems. 1-3 hours each. For doctoral students capable of developing a problem independently through conferences and activities directed by the instructor. Problem selected by the student with the consent of the major professor.

6940. Individual Research. 1-12 hours. Doctoral research of independent nature. May be repeated for credit.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

6990. Postdoctoral Research. 1-3 hours. For postdoctoral fellows to further training and research experience in developing and solving research problems independently. Prerequisite(s): consent of department. May be repeated for credit.

Biological Sciences, BIOL = 0114

4000. Plant Ecology. 4 hours. (3;4) Role of plants in biological communities. Field and laboratory studies of the major local community types. Prerequisite(s): BIOL 1720/1740 or general biology.

4050. Animal Ecology. 4 hours. (3;4) Role of animals in biological communities. Field and laboratory studies of the ecology of local fauna. Prerequisite(s): 6 hours of biological sciences.

4070. Insect Biology. 4 hours. (3;3) Morphology, physiology, ethology, classification and control of insects and related arthropods. Prerequisite(s): 6 hours of biological sciences. May not be repeated at the graduate level as BIOL 5070.

4080. Radiation Safety. 1 hour. (1;0) Radiation sources, interaction of radiation with matter and human tissues, radiation measurement and dosage, instrumentation, regulations and practical safety procedures. Meets state training requirements for use of radioactive isotopes or radiation producing equipment. Prerequisite(s): 12 hours of biology, chemistry, or physics, or combination of the three. May not be repeated at the graduate level as BIOL 5080. (Same as BIOL 5080.)

4090. Parasitology. 4 hours. (3;3) Biology, ecology and classification of animal parasites; immunology and physiology of host-parasite interaction. Prerequisite(s): 8 hours of biological sciences.

4110. Endocrinology. 3 hours. Regulation of physiological processes in animals by hormones and related chemical agents. Prerequisite(s): BIOL 3800 or equivalent, or consent of department. May not be repeated at the graduate level as BIOL 5110.

4130. Economic Botany. 3 hours. Distribution, production, history and botany of plants of economic importance. Prerequisite(s): BIOL 1720/1740 or equivalent.

4200. Immunology. 4 hours. (3;4) Immune defense mechanisms including immunobiology, immunochemistry, serology, immune responses to infectious agents, allergy and autoimmune diseases. Laboratory studies of antigen-antibody reactions. Prerequisite(s): credit for or concurrent enrollment in organic chemistry. May not be repeated at the graduate level as BIOL 5510.

4250. Pharmacology: Biological Basis of Drug Action. 3 hours. An overview of pharmacology based on principles of drug action; emphasis on drugs by class, and not specific drugs per se. General principles, antibiotics and pharmacology of the autonomic, cardiovascular, central nervous and endocrine systems. Prerequisite(s): BIOL 3800 and credit for or concurrent enrollment in second semester organic chemistry or consent of instructor. May not be repeated at the graduate level as BIOL 5150.

4260. Principles of Evolution. 3 hours. Population genetics; ecological, geographical and historical concepts of evolution. Prerequisite(s): BIOL 3350 or 3450, or equivalent. May not be repeated at the graduate level as BIOL 5260.

4300. Histology. 4 hours. (2;5) Microstructure and ultrastructure of animal cells and tissues; relationship of structure and function in tissues and organs. Laboratory studies of tissue structure using the light microscope. Prerequisite(s): 12 hours of biology.

4360. Bioanalytical Chemistry. 4 hours. (3;3) Principles of chromatographic and detection systems. Recent advances in separation sciences and their applications to the analysis of chiral amino acids, proteins, DNA sequence, vitamins and toxicants in biological and environmental samples. Laboratory experiments illustrate methods used in biochemistry, biotechnology, toxicology and environmental sciences. Prerequisite(s): 16 hours of organic chemistry.

4380. Fundamentals of Aquatic Toxicology. 3 hours. (2;3) Theory and methodologies used by scientists, regulatory agencies and industry to measure the impact of man's activities on freshwater aquatic ecosystems. The course has its foundations in history, but concentrates on current methodologies and theories. Prerequisite(s): 8 hours each of chemistry and biology. May not be repeated at the graduate level as BIOL 5380.

4420. Invertebrate Biology . 4 hours. (3;3) Biology of non-vertebrate animals with emphasis on phylogenetic relationships and anatomical, physiological and behavioral adaptation to varied environments. Prerequisite(s): 12 hours of biological sciences.

4480. Medical Genetics and Genetic Counseling. 3 hours. Human genetics including cytogenetics, immunogenetics, population genetics, molecular genetics, human biochemical genetics and genetic counseling. Prerequisite(s): 12 hours of biology, including BIOL 3350 or 3450 or equivalent, and 8 hours of organic chemistry or equivalent. May not be repeated at the graduate level as BIOL 5840.

4500. Bacterial Physiology. 4 hours. (3;4) Biochemistry, metabolism, energy transformations and synthesis of cell constituents in bacteria; chemical and physical agents affecting bacterial growth and survival. Prerequisite(s): BIOL 3370 and at least one semester of organic chemistry with laboratory.

4530. Virology. 3 hours. Molecular biology of viruses infecting bacteria, plants and animals; interaction of viruses and host cells; viral genetics; replication, pathogenesis, oncology, immunology, chemotherapy and vaccines. Prerequisite(s): BIOL 2040 or 3370.

4540. Virology Laboratory. 1 hour. (0;4;0) Growth and cultivation of bacterial viruses including the production and purification of viral stocks. The use of bacteriophage as model systems to study virus reproduction and cellular metabolism, and as tools in modern molecular biology to study genetic processes. Prerequisite(s): credit for or concurrent enrollment in BIOL 4530, or consent of department.

4570. Biochemistry and Molecular Biology of the Gene. 3 hours. Mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems. May not be used to satisfy minor requirements in chemistry. Prerequisite(s): at least one of the following: BIOL 3450, 3510/3520 or BIOC 4540. (Same as BIOC 4570.)

4580. Biochemistry and Molecular Biology of the Gene Laboratory. 2 hours. (0;5;0) Experiments in recombinant DNA techniques, gene regulation and other areas of molecular biology. Prerequisite(s): credit for or concurrent enrollment in BIOL 4570, or consent of department. (Same as BIOC 4580.)

4600. Forensic Biology. 3 hours. Human identification techniques with emphasis on identification from human skeletal remains. Fundamental biology of osseous and dental tissues; forensic botany and entomology; genetics of human variability; serotyping; HLA typing; analysis of hair and dermatoglyphic lines; DNA fingerprinting. Prerequisite(s): no course prerequisites; however, a background in zoology or general biology is helpful. (Same as ANTH 4600 when offered as Forensic Anthropology.)

4620. Human Development – Conception through Childhood. 3 hours. Basic embryology, human reproduction, child development including both physiological and cognitive from the neonatal period through the teenage years. May not be repeated at the graduate level as BIOL 5620. Prerequisite(s): 8 hours of biological sciences or consent of department.

4630. Human Teratology. 3 hours. Principles of teratology and embryology, including study strategies, reproduction toxicants, drugs and lactation, risk assessment, and known human teratogenic agents. May not be repeated at the graduate level as BIOL 5630. Prerequisite(s): 8 hours of biological sciences or consent of department.

4750. Neurobiology. 3 hours. Brain chemistry, physiology and anatomy; neural basis of memory, perception, rhythms, emotion, cognition; development of the nervous system; neurological disorders. Prerequisite(s): 16 hours of biology or consent of instructor.

4760. Neurobiology Laboratory. 1 hour. (0;3) Vertebrate neuroanatomy and experimental neurobiology using electrophysiological and behavioral methods. Prerequisite(s): credit for or concurrent enrollment in BIOL 4750. May not be repeated at the graduate level as BIOL 5760.

4770. Biotechnology. 3 hours. Applications of biotechnology in today's society. Emphasis on molecular biotechnology and its applications in industry, agriculture, medicine and forensic science. Students may enroll in BIOL 4580 for the companion laboratory component. Prerequisite(s): BIOL 2040 and 3350 or 3450.

4800. Biological Sciences Seminar Series. 1 hour. A weekly seminar series covering a broad range of biological research topics. Invited speakers are prominent local, regional or national researchers. Prerequisite(s): 12 hours of biological sciences or consent of department. Pass/no pass only. May be repeated for credit. May not be applied toward upper-level science electives.

4920. Cooperative Education in Biological Sciences. 1-3 hours. Supervised work in a job directly related to the student's major, professional field of study or career objective. Prerequisite(s): 12 hours of credit in biological sciences; student must meet employer's requirements and have consent of department. May be repeated for credit.

4940. Honors Research in Biology. 3 hours. Advanced original independent research supervised by a faculty member in the biological sciences. For students interested in pursuing careers in research or medicine. Prerequisite(s):

3.25 GPA or better in the sciences, at least 20 hours of biology and 16 hours of chemistry, junior or senior standing and departmental approval.

4950. Honors Thesis in Biology. 3 hours. A continuation of BIOL 4940 involving advanced original independent research culminating in a written report supervised by a faculty member in the biological sciences. The results will be written in standard thesis format and presented orally. For students interested in pursuing careers in research or medicine. Prerequisite(s): BIOL 4940 and departmental approval.

5001. Contemporary Topics in Molecular Biology. 1-3 hours. Contemporary topics in molecular biology and biochemistry. Topics may vary from semester to semester and may include eukaryotic and prokaryotic molecular genetics, DNA profiling, physiology and metabolism and application of recombinant DNA technologies. May be repeated for credit as topics vary.

5002. Contemporary Topics in Microbiology. 1-3 hours. Contemporary topics in microbiology. Topics vary from semester to semester and may include bacterial physiology or metabolism and microbial chemistry. May be repeated for credit as topics vary.

5003. Contemporary Topics in Neuroscience. 1-3 hours. Contemporary topics in neuroscience and physiology. Topics vary from semester to semester and may include neurophysiology, computational neuroscience, neurotransmitters, central nervous system trauma. May be repeated for credit as topics vary.

5005. Contemporary Topics in Biology. 1-3 hours. Contemporary topics in the biological sciences. Topics may vary from semester to semester and may include topics such as human development, epidemiology or plant physiology. May be repeated for credit as topics vary.

5040. Contemporary Topics in Environmental Science and Ecology. 1-3 hours. Contemporary topics and issues in environmental science and ecology. Topical themes include global climate change, biodiversity, wetlands, population and aquatic, terrestrial or plant ecology. May be repeated for credit as topics vary.

5060. Electron Microscopy. 4 hours. (2;6) Theory and application of scanning and transmission electron microscopy, including sample preparation and analytical techniques.

5070. Insect Biology. 4 hours. (3;3) Morphology, physiology, ethology, classification and control of insects and related arthropods. Prerequisite(s): 6 hours of biology.

5080. Radiation Safety. 1 hour. Radiation sources, interaction of radiation with matter and human tissues, radiation measurement and dosage, instrumentation, regulations and practical safety procedures.

5110. Endocrinology. 3 hours. Regulation of physiological processes in animals by hormones and related chemical agents. Prerequisite(s): BIOL 3800 or equivalent, or consent of department.

5120. Environmental Contaminants. 2 hours. Presents a scientific overview of environmental contaminants, their occurrence, sources and impact on humans and the environment.

5150. Pharmacology: The Biological Basis of Drug Action. 3 hours. An overview of pharmacology for graduate students, based on principles of drug action. The course emphasizes drugs by class, and not specific drugs per se. Course covers general principles, antibiotics and pharmacology of the autonomic, cardiovascular, central nervous and endocrine systems.

5160. Advanced Techniques in Microbiology and Molecular Biology. 6 hours. (0;6) Intensive laboratory exercises in cultivation, analysis and gene transfer in bacterial mutants. Further emphasis on techniques for studying macromolecular and enzyme synthesis, preparation and analysis of plasmid DNA, cloning and gene expression. Prerequisite(s): microbiology, biochemistry or BIOL 3510.

5180. Techniques in Molecular Biology. 6 hours. (1;6) Teaches advanced molecular biology laboratory methodology. Techniques include gene cloning, plasmid purification, restriction analysis, DNA fingerprinting and DNA sequencing. Prerequisite(s): BIOL/BIOC 4570, or BIOL 5340, or consent of instructor.

5200. Environmental Health. 3 hours. An introduction to the environmental determinants of health that focuses on health risks of human-mediated changes to the environment, as well as the regulatory framework which directs decision making on environmental issues. Consideration given to health implications of growing populations, available food quantity and quality, loss of habitat and biodiversity, radiation, toxins in the environment, sanitation, solid and hazardous waste disposal, and environmental degradation including noise, air and water pollution.

5250. Advanced Human Physiology. 3 hours. Physiological mechanisms in humans, with emphasis on medical physiology.

5260. Principles of Evolution. 3 hours. Genetic, systematic, ecological, historical and geographical concepts of evolution. Prerequisite(s): consent of department.

5270. Limnology. 4 hours. (2;4;1) Physical, chemical and biological factors that affect productivity in reservoirs, lakes and ponds. Field studies using current limnological methods and instruments. For biologists, chemists, teachers and sanitarians. Prerequisite(s): 12 hours biology or 6 hours biology plus 6 hours of another science.

5300. Physiological Ecology. 3 hours. Physiological, behavioral, and biochemical adaptations of animals to environmental limiting factors, including temperature, oxygen, water, salinity, light and toxic chemicals.

5340. Molecular Biology. 3 hours. Mechanisms and regulation of genetic expression, chromosome replication, mutagenesis and DNA repair, and gene cloning in prokaryotic and eukaryotic systems. Prerequisite(s): BIOL/BIOC 4570/4580 and at least two of the following: BIOC 4540/4550/4560 or BIOL 3450 or 3510/3520. (Same as BIOC 5340.)

5360. Chemistry of Water and Water Pollution. 4 hours. (3;3;0) Chemical and engineering approaches to water and waste water treatment. Laboratory studies for assessing chemicals in water and waste water. Application of standardized analytical methods for evaluating water quality. Prerequisite(s): 6 hours of chemistry.

5380. Fundamentals of Aquatic Toxicology. 3 hours. (2;3) Theory and methodologies used by scientists, regulatory agencies and industry to measure the impact of

man's activities on freshwater aquatic ecosystems. The course has its foundations in history, but concentrates on current methodologies and theories.

5420. Industrial Microbiology. 3 hours. Use of microorganisms and microbial processes in the pharmaceutical, chemical and food industries. Prerequisite(s): biochemistry, BIOL 4500.

5470. Laboratory Techniques in Cytology. 1 hours. (0;3;1) Cytological techniques in plants, animals and humans, including karyotyping, cell and tissue culture, and sex chromatin analysis. Prerequisite(s): consent of department. May be taken with or without BIOL 5490.

5490. Cytology and Cytogenetics. 3 hours. Cell structure and function in plants and animals with emphasis on genetic and chromosomal aberrations. Prerequisite(s): consent of department.

5500. Advanced Bacterial Physiology. 3 hours. Growth, processes of metabolism, genetics, regulatory control, structure, adaptation and differentiation mechanisms in bacteria. Emphasis on comparative analysis and current literature. Prerequisite(s): general microbiology, biochemistry or BIOL 3510/3520.

5510. Advanced Immunology. 3 hours. Immune defense mechanisms, including immunobiology, immunochemistry, serology, immune responses to infectious agents, allergy and autoimmune diseases.

5520. Invertebrate Biology. 4 hours. (3;3) Biology of non-vertebrate animals with emphasis on anatomical, physiological and behavioral adaptations to varied environments and phylogenetic relationship. Prerequisite(s): 6 hours of biology.

5570. Aquatic Insects of North America. 4 hours. (3;4) Ecology, sampling methods, systematics and classification of Nearctic aquatic insects at the family level; use of keys and key terminology in aquatic insect identification. Prerequisite(s): invertebrate zoology or entomology, or consent of instructor.

5620. Human Development. 3 hours. Basic embryology, human reproduction, child development (physiological and cognitive) from the neonatal period through the teenage years.

5630. Human Teratology. 3 hours. Principals of teratology and embryology, including study strategies, reproduction toxicants, drugs and lactation, risk assessment, and known human teratogenic agents.

5650. Environmental Science Field Course. 6 hours. (3;5) Advanced field methods and approaches for analysis of the physical, chemical and ecological aspects of aquatic, terrestrial and estuarine ecosystems are covered. On a rotating basis, the field course focuses on alpine lakes, deserts and estuaries. May be repeated for credit as topics vary. Prerequisite(s): consent of instructor.

5701. Practicum in Genetics Laboratory Techniques. 3 hours. Small group work in cytogenetic, biochemical and DNA laboratories under the supervision of the laboratory directors. Prerequisite(s): acceptance into genetic counseling program.

5702. Internship – Genetic Counseling I. 6 hours. Students spend five-week summer session in a clinical setting in which genetic counseling is performed. Family histories and pedigrees are completed by the student. Prerequisite(s): acceptance into genetic counseling program.

5703. Internship – Genetic Counseling II. 6 hours. Attendance one day in prenatal, pediatric, adult and cancer genetic clinics and one day at the Texas Teratogen Information Service each week. Under the supervision of a clinical geneticist or genetic counselor, the student provides genetic counseling. Prerequisite(s): acceptance into genetic counseling program.

5760. Neurobiology Laboratory. 1 hour. (0;3) Vertebrate neuroanatomy and experimental neurobiology using electrophysiological and behavioral methods. Prerequisite(s): concurrent enrollment in BIOL 6460 or consent of department.

5800. Microbial Genetics. 3 hours. Genetic structure, inheritance and gene expression in microorganisms and their viruses. Prerequisite(s): BIOL 3450 and 4500 or equivalent, and consent of department.

5830. Advanced Genetics. 3 hours. Genetic structure and inheritance in viruses, bacteria and higher organisms, including gene biochemistry, gene expression, population genetics, cytogenetics and organelle genetics. Prerequisite(s): BIOL 3450 or equivalent, and consent of department.

5840. Medical Genetics and Genetic Counseling. 3 hours. Human genetics, including cytogenetics, immunogenetics, population genetics, molecular genetics, human biochemical genetics and genetic counseling. Prerequisite(s): BIOL 3350 or 3450 or equivalent.

5860. Biological Sciences Seminar Series. 1 hour. A weekly seminar series covering a broad range of biological research topics. Invited speakers are prominent local, regional or national researchers. May be repeated for credit. Pass/no pass only.

5880. Environmental Sciences Seminar Series. 1 hour. A weekly seminar series covering a broad range of environmental research topics. Invited speakers are prominent local, regional or national researchers. May be repeated for credit. Pass/no pass only.

5900-5910. Special Problems. 1-3 hours each. Independent study or laboratory research. Problem must be approved by major professor. No more than 6 hours may be counted toward a degree.

5920-5930. Research Problems in Lieu of Thesis. 3 hours each.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

5960. Science Institute. 1-6 hours. For students who assist in instruction or participate in special research workshops. Prerequisite(s): consent of department. No more than 6 hours may be counted toward a degree.

6010. Biology Seminar. 1 hour. Weekly lectures on research in biology and related disciplines. Prerequisite(s): consent of department. May be repeated for credit as topics change.

6070. Ecology of Benthic Organisms. 4 hours. (3;2;1) Adaptations, biotic interrelationships and population characteristics of bottom-dwelling aquatic organisms. Field techniques, population analysis and dynamics in both lentic and lotic habitats. Prerequisite(s): BIOL 2140 or equivalent, and a minimum of 7 hours advanced or graduate ecology.

6080. Current Advances in Pharmacology. 3 hours. Course covers the latest advances in pharmacology on a rotating basis, with emphasis on neuropharmacology, autonomic pharmacology and biochemical/molecular pharmacology. May be repeated up to a total of three times to cover all aspects.

6150. Communication in Scientific Teaching and Research. 3 hours. A seminar and workshop that cover lecture course techniques, laboratory preparation and teaching, seminar techniques, research presentations at scientific meetings, research publications, research proposals, scientific illustration, photography, departmental and university services for teaching and research, and job-seeking techniques in academe, government and industry.

6200. Bioinstrumentation and Analytical Techniques. 4 hours. (3;0;1) Current research instrumentation and techniques in biological sciences. Prerequisite(s): consent of department.

6220. Biostatistics. 6 hours. Statistical methods and experimental design; descriptive statistics; data presentation; parametric and non-parametric methods of hypothesis testing, including two-sample tests, analysis of variance, regression and correlation analyses; introduction to multivariate statistics. Competency with computer statistical packages is developed. Computer fee required.

6300. Hazardous Waste Management. 3 hours. An introduction to the dynamic and rapidly changing field of hazardous waste management. Management issues such as legal, technical and sociological aspects are presented. Types of hazardous waste and numerous treatment/disposal options are reviewed.

6320. Remote Sensing. 4 hours. (3;3) The theoretical bases and practical aspects of digital remote sensing. Remote sensing technology is reviewed and data analysis techniques are presented. Approaches to the development of a remote sensing project are given. Hands-on experience is provided in the laboratory. Prerequisite: GEOG 5170 is recommended.

6340. Environmental Impact Assessment. 4 hours. (3;3) The principles and practices of preparing environmental impact assessments and statements. Procedures for predicting and assessing impacts on the physical, chemical, biological, cultural and socioeconomic environments are given. Techniques for selecting a preferred action from a group of alternatives are presented.

6360. Environmental Engineering. 4 hours. (3;3) Water, land and air pollution control technologies are presented. Engineering approaches to pollution problems are demonstrated by considering technical feasibility and economic constraints. Laboratory exercises provide instruction for quantitative analysis of water and waste water; field trips to various pollution-control facilities. Prerequisite(s): CHEM 1410-1420 and 1430-1440.

6370. Aquatic Chemistry. 3 hours. Quantitative treatment of the variables that determine the composition of natural waters and factors governing natural water cycles.

6380. Environmental Chemistry. 4 hours. (3;1) Thermodynamics and kinetics of physical and chemical reactions under environmental conditions. Transfer of laboratory results to field situations. Offers basic knowledge necessary to understand the fate and transport of chemicals in the atmosphere and hydrosphere. Prerequisite(s): 15 hours of chemistry.

6390. Techniques in Environmental Analysis. 4 hours. (3;3) Theory and application of advanced analytical chemistry techniques for metals and organics in environmental and biological samples. Introduces methods for trace metals analysis and identification, and organics separation and identification techniques. Laboratory teaches state-of-the-art spectroscopic and chromatographic techniques.

6460. Cellular Neuroscience. 3 hours. A detailed examination of the nervous system, specifically neuroanatomy, neurophysiology, neurochemistry and sensory transduction. Prerequisite(s): consent of department.

6480. Systems Neuroscience. 3 hours. A detailed examination of the major brain functions, including sensation, perception, movement, emotions, language, thought and memory. Prerequisite(s): BIOL 6460 or equivalent, or consent of department.

6500. Brain Development and Plasticity. 3 hours. Development of the nervous system from early embryo through adulthood; neurogenesis, cell migration, differentiation, synaptogenesis; similarities among mechanisms of ontogeny, learning and regeneration; emphasis on experimental approaches. Prerequisite(s): BIOL 4750 or 6480 or equivalent is recommended.

6540. Neurochemistry. 3 hours. Chemistry of the nervous system and behavior; pharmacology, anatomy and physiology of neurotransmitter systems; current techniques in neurochemistry and neuropharmacology. Prerequisite(s): BIOL 4750 or 6460 or equivalent, and one semester of undergraduate biochemistry are recommended.

6600. Advanced Molecular Biology. 3 hours. Genetic structure and regulation of gene expression in prokaryotic and eukaryotic organisms; mechanisms of gene action, gene/enzyme relationships and metabolic control; biochemical manipulation and characterization of genetic macromolecules. Prerequisite(s): BIOL 4570 or 5340 or equivalent. (Same as BIOC 6600.)

6620. Advanced Cell Biology. 3 hours. Structure and function of animal and plant cells with emphasis on cell membranes, cytoplasmic organelles and the nucleus; readings in current literature. Prerequisite(s): biochemistry, BIOL 3510/3520 or equivalent, or consent of department. (Same as BIOC 6620.)

6900-6910. Special Problems. 1-3 hours each. Independent study or laboratory research for doctoral students. Problem must be approved by major professor. No more than 6 hours may be counted toward a degree.

6940. Individual Research. 1-12 hours. May be repeated for credit, not to exceed 12 hours. Pass/no pass only.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been

completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Molecular Biology

Related Courses Offered at Texas Woman's University

Students who wish to enroll in the following TWU courses may do so through a cross-registration mechanism administered by the Toulouse School of Graduate Studies at UNT.

BACT 6533. Plasmids as Vectors for Recombinant DNA. 3 hours. Molecular structure and replication of plasmids. Utilization of plasmids for isolation, characterization, and expression of prokaryotic and eukaryotic genes. One lecture, 6 laboratory hours a week.

BACT 6543. Viruses as Vectors for Recombinant DNA. 3 hours. Replicative cycle of viruses utilized in recombinant DNA technology. Viruses used to isolate genetic material from other sources and characterization of the recombinant DNA by size, restriction endonuclease mapping and nucleic acid sequencing. One lecture, 6 laboratory hours a week.

BIOL 5123. Biostatistics. 3 hours. Advanced studies in biometric systems, experimental design and data analysis. 3 lecture hours a week. Prerequisite(s): 12 hours of biology and permission of instructor.

BIOL 5133. Advanced Genetics. 3 hours. Theory, experimental methods, and data analysis of modern advances in genetics. 3 lecture hours a week. Prerequisite(s): permission of instructor.

BIOL 5653. Human Development. 3 hours. Fundamentals of human embryology, the anatomy of human development and pathology of development. Emphasis on normal and pathological aspects of human gestation. Lectures, films, student reports and tests. 3 lecture hours a week.

BIOL 5703. Radiation, Protection and Dosimetry. 3 hours. Interactions of ionizing radiations and matter, radiation instrumentation, determination of radiation, case and principles of radiation protection. 3 lecture hours a week. Prerequisite(s): one year of physics and permission of instructor.

BIOL 6123. Neuroendocrinology. 3 hours. Introduction to neural and physiological mechanisms of endocrine function with emphasis on reproduction and response to stress. Survey of current literature. 3 lecture hours a week.

BIOL 6334. Advanced Cell Biology. 4 hours. Survey of current understanding of biogenesis, architecture and function of cellular organelles. The cell cycle and regulation of cell growth. 4 lecture hours. Prerequisite(s): permission of instructor.

BIOL 6513. Molecular Biology. 3 hours. Survey of current understanding of DNA structure, organization, chromosome replication, gene transcription, ribosome assembly and translation. Emphasis is on molecular processes and their regulation in both prokaryotes and eukaryotes. 3 lecture hours a week. Prerequisite(s): CHEM 5613 and CHEM 5623 or permission of instructor.

BIOL 6653. Developmental Biology. 3 hours. Experimental evidence and molecular analysis of the embryogenesis of animals and mechanisms of cellular differentiation. Reading assignments, lectures and review of recent research publications in the field. 3 lecture hours a week.

ZOOL 5423. Endocrinology. 3 hours. Advanced studies of biology and biochemistry of the glands of internal secretion. 3 lecture hours a week. Prerequisite(s): ZOOL 4243.

Business Administration, College of

Enrollment for graduate credit in courses in the College of Business Administration is open only to students who have completed the admission process and have been formally accepted into an MBA, MS or PhD program in business administration or other University of North Texas graduate degree programs.

Business Administration, Interdepartmental, BUSI = 0370

4660. International Business Operations. 3 hours. Foreign operations of American firms and impact of foreign competition on the domestic market; organization for foreign production, marketing and finance; foreign markets, resources, institutions and managerial problems arising out of governmental relations. Prerequisite(s): MKTG 3650, FINA 3770 and senior standing.

4940. Business Policy. 3 hours. Enterprise management integrating the functional areas of business administration into a realistic approach to business problems; applying principles to complex problems at the executive level. Prerequisite(s): completion of all other business foundation courses and senior standing. To be taken during the last semester of course work.

5190. Administrative Strategy. 3 hours. A capstone course providing the integration of functional areas, requiring students to determine policy at the general- or top-management level. Students address strategic organizational problems and optimization of the total enterprise. Lectures, case analysis and special topics.

5900. Special Problems. 1-3 hours. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

5920-5930. Problems in Lieu of Thesis. 3 hours each.

6100. Seminar in University Teaching for Business Administration. 3 hours. Topics in teaching methodologies. Focus on those topics that provide doctoral students with practical teaching tips to help them become more effective teachers. Different learning styles are addressed and frameworks, theories, and teaching models are presented that help doctoral students continually improve their teaching throughout their career.

6220. Applied Multivariate Statistics I. 3 hours. Applications of multivariate regression analysis, canonical correlation analysis, and nonparametric statistical procedures to issues in business research involving multivariate data. Topics include building, evaluating, and validating a regression model; analyzing models using hierarchical regression, contrast coding, partial correlations and path analysis; and comparing parametric and corresponding nonparametric tests. Prerequisite(s): MSCI 5180 or equivalent and BUSI 6450. May be taken concurrently with BUSI 6220.

6240. Applied Multivariate Statistics II. 3 hours. Applications of multivariate statistical procedures involving data reduction techniques and analyzing multidimensional relationships in business research. Topics include multivariate analysis of variance, discriminant analysis, logistic regression, exploratory factor analysis, cluster analysis, multidimensional scaling and conjoint analysis. Prerequisite(s): BUSI 6220.

6280. Applications in Causal and Covariance Structure Modeling. 3 hours. Application of CSM techniques to the analysis of behavioral data in business research. "Hands-on" practice using LISREL to examine measurement and structural models containing directly observed and latent variables. Provides a solid working knowledge of how to conceptualize measurement and structural models, the standard LISREL and SIMPLIS syntax for estimating these models, and proper interpretation of LISREL output. LISREL assumptions, limitations, tricks, and traps are explored. Specific topics include reviews of causality and path analysis, covariance algebra, creating path diagrams and structural equations, LISREL notation and syntax, considerations in model identification, estimation, evaluation and interpretation. Specific application areas include confirmatory factor analysis and its extensions, causal models with directly observed and latent variables. Course also takes a critical look at the analysis of experimental data, modeling quadratic and interaction terms, analysis of ordinal and other non-normal variables. Prerequisite(s): BUSI 6220, 6240 (may be taken concurrently), and 6450. Students must have a thorough knowledge of multiple regression, factor analysis, ANOVA and ANCOVA. Students are also expected to have a solid grasp of the fundamentals of research design, including how to assess the internal and external validity of research designs, as well as how to assess the validity and reliability of multi-item behavioral measures. Exposure to matrix algebra is encouraged.

6450. Business Research Methods. 3 hours. Designed to introduce PhD students to the methods and measurements of business research, including scientific method, research design and measurement. Prerequisite(s): MSCI 5180 or equivalent.

6460. Foundations of Scientific Inquiry. 3 hours. Seminar in scientific inquiry for doctoral students in business administration. Focus on topics that provide doctoral students with a better understanding of theoretical frameworks used in business research. Form and structure of explanations, laws, and theories used in business research are examined and discussed. The seminar is intended to be a rigorous course that exposes doctoral students to an array of topics for understanding basic business research.

6480. Advanced Issues in Research Design. 3 hours. Experimental and quasi-experimental approaches to solving problems using the scientific method. Observation, generalization, explanation, and prediction using experimentation and statistical inference. Statistical principles in experimental design including ANOVA and MANOVA techniques. After completing the course, students are prepared for conducting experiments. Prerequisite(s): BUSI 6450 or equivalent.

6900. Special Problems. 1-3 hours. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

Business Computer Information Systems

Business Computer Information Systems, BCIS = 0315

4610. Analysis of Business Information Systems. 3 hours. An integrated perspective of the problems in today's information systems environment, concentration on contemporary design methodologies and considerations unique to users of computers and information systems. Topics include current systems analysis, modular design, development and implementation, documentation, project planning and task definition, and other systems analysis topics. Prerequisite(s): BCIS 3610 and 3620; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4620. Introduction to Database Applications. 3 hours. Analysis of file organization techniques and data structures. Consideration of the management of data as a resource. Design of data models and databases in business organizations. Use of database management systems and user-oriented data languages. Prerequisite(s): BCIS 3610 and 3690; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4630. Technical Problems in Information Systems. 3 hours. Business computer information systems advanced technical concepts including OS and on-line COBOL implementation, COBOL data representation, subroutines, COBOL and assembler relationships, loaders, utilities, JCL, ABEND analysis and core dump analysis. Introduces students to advanced software technical concepts that form the foundation of business computer systems. Prerequisite(s): BCIS 3690; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4640. Administrative Problems in Information Systems. 3 hours. Advanced analysis of business information systems. An integrated investigation of business computer information systems programming and systems development concepts. Use of project management methodologies, concentration on tools and techniques, formal presentations and group dynamics. Prerequisite(s): BCIS 4610 and 4620; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4650. Visual Programming for Business Applications. 3 hours. Business application design and development from the perspective of visual programming technologies. Emphasis on performance characteristics and user interface design considerations. Prerequisite(s): BCIS 3690 and 4610 or BCIS 4660 or ACCT 4100; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS and MSCI course, or consent of department.

4660. Decision Systems Design. 3 hours. Survey of special business computer information systems topics such as computer performance evaluation, database design, security and privacy, legal implications, software engineering, telecommunications, operating systems, artificial intelligence applied to business computing systems, and other appropriate BCIS topics. Prerequisite(s): BCIS 3610; ACCT 2020 and 2030 with grades of C or better; CSCI 1110 or equivalent; MSCI 3700; MSCI 3710 or 3870; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS and MSCI course, or consent of department. May be repeated for credit.

4670. Continuing Seminar in Computer-Based Information Systems. 3 hours. A seminar on current topics in business computer information systems. Examines state-of-the-art issues associated with the design, development, implementation, control and management of business computer information systems. Prerequisite(s): BCIS 2610; BCIS 3610; BCIS 3620; BCIS 4610; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department. May be repeated for credit.

4680. Distributed Systems and Teleprocessing. 3 hours. This course develops an understanding of the differences between centralized, decentralized and distributed data processing systems; their relationships with the business enterprise, data communications and the parameters affecting the implementation of the system; provides background for analysis, design, selection and evaluation of hardware, software and support required for a distributed data processing environment. Prerequisite(s): BCIS 3690 and 4610; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4690. Information Technology Management. 3 hours. Overview of the management of an organization's information assets. Emphasizes techniques and issues specific to information systems department management; the development, implementation and operation of computer-based information systems; as well as personnel, career management, assessment, legal, ethical, global and societal issues. Prerequisite(s): BCIS 3690 and 4610; ACCT 2020 and 2030 with grades of C or better; ECON 1100; MGMT 3820; MATH 1100 or 1180; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4700. Problem Solving and Decision Making Process. 3 hours. Study of the process of decision making, and the information requirements of decisions; decision support system tool selection and DSS applications development. Prerequisite(s): BCIS 4610 or BCIS 4660 or ACCT 4100; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4710. Object-Oriented Methodologies. 3 hours. Examination of the techniques of artificial intelligence as applied to solving business problems. The course includes the design and construction of an artificial intelligence application project using an expert system tool. Prerequisite(s): BCIS 3690 and 4610; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4740. Client-Server Systems. 3 hours. Office information and decision support systems are examined as emerging and critical elements in business data and information systems. Emphasis on information processing considerations at the systems level; including analysis and management of support activities such as data and records management, electronic filing and retrieving systems, word processing, micro- and reprographics, and telecommunications; discussion of person/machine interfaces; appraisals of current and future technological trends, and their impact on data processing and office environment. Prerequisite(s): BCIS 3690 and 4610, or ACCT 4100; ACCT 2020 and 2030 with grades of C or better; ECON 1100 and 1110; MATH 1100; MATH 1190 or equivalent; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken BCIS course, or consent of department.

4800. Internship. 1-3 hours. Supervised work in a job related to student's career objective. Prerequisite(s): student must meet the employer's requirements, and have consent of the department chair or BCIS undergraduate coordinator. Pass/no pass only, and cannot be used as a support course.

5090. Introduction to Business Computer Information Systems. 1.5 hours. Examines the interaction between information systems and the organizational context. Specific topics to be covered include the strategic role of information systems (IS), interorganizational systems, the Internet and WWW, electronic commerce, reengineering, the human impacts of IS, the management of change, IS development

and implementation, and emerging types of information technology. Course work includes lectures, readings, case analyses and discussion, electronic meeting technology, hands-on computer assignments, and a team field project.

5110. Structure of Programming Languages. 3 hours. Introduces graduate students to new approaches in programming business applications. Makes use of visual programming tools as well as traditional programming tools such as COBOL. Problem-solving techniques and structured programming are covered early and used throughout the course. Prerequisite(s): BCIS 5090 or equivalent, or consent of department.

5120. Information Systems Development. 3 hours. The foundations of business information systems analysis and design. Concentration on contemporary design methodologies and computer-aided software engineering techniques. Topics include strategic information systems planning, requirements analysis, user interface design, data design, process design, system testing, ethics, and system audit ability, control and security. Prerequisite(s): BCIS 5090 or equivalent, or consent of department.

5130. Operating Environments. 3 hours. Advanced technical concepts including basic operating system resources, command and control languages, and operating system internals and utilities. COBOL and Assembler implementation, capabilities, and resource requirements are covered for IBM MVS/ESA and VM/ESA., UNIX, and Windows NT. Introduces students to advanced software technical concepts that form the foundation of business computer systems. Prerequisite(s): BCIS 5110 or consent of department.

5420. Foundations of Database Management Systems. 3 hours. An introduction to database and database management systems technology within the framework of a business environment. Topics include the study of analysis, design, development and implementation of database-oriented file organizations in business applications. Prerequisite(s): BCIS 5090 or equivalent, or consent of department.

5600. Management Information Systems. 3 hours. The role of information systems in organizations. Alternative taxonomies of information systems such as modes of processing and management levels. Structure of a management information system. Human-machine information systems. Prerequisite(s): BCIS 5090 or equivalent, or consent of department.

5610. Executive Support Systems. 3 hours. An analysis of how computer systems can assist executive decision making and improve productivity. Emphasis is placed on the design, construction, utilization and managerial impacts of executive support systems. Prerequisite(s): BCIS 5120 or consent of department.

5620. Networking and Telecommunications. 3 hours. The purpose of this course is to develop an understanding of the strategic impact on the business organization of the convergence of telecommunications and computer topics. The course includes the design and organizational restructuring issues associated with new technologies in telecommunications. Prerequisite(s): BCIS 5120 or consent of department.

5630. Client/Server Systems. 3 hours. Examines technical and managerial issues associated with the design, development, and deployment of client/server computer systems. Topics include architectures, platform connectivity and project management. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5640. Object Oriented Systems. 3 hours. Examines a variety of managerial issues associated with developing and implementing object-oriented system applications within business. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5650. Emerging Information Technologies. 3 hours. Examines various managerial and technical issues associated with the introduction of new information technologies within the firm. Subjects include environmental scanning for new IT developments, assessment of new IT, and legal/ethical issues. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5660. Data Administration and Project Management. 3 hours. Examines data administration and project management functions including the implementation and acquisition of business computer information systems within the constraints of legal, technological, economic and environmental issues. Topics are analyzed with respect to their impact on the selection, acquisition, utilization and evaluation of business computer information systems. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5670. International Issues in Information Technology. 3 hours. Discussion and in-depth analysis of contemporary information systems topics with emphasis on the economic and technological impact of computer information systems on the business environment. Prerequisite(s): BCIS 5120 and 5420, or consent of department.

5700. Strategic Use of Information Technology. 3 hours. Provides an overview and understanding of the issues involved in the strategic management of the information assets of organizations. Examines a broad range of issues and problems associated with the management of information technology (IT) and information systems (IS) and their alignment with the strategic goals of the organizations. Focuses on the managerial rather than the technical issues and views IS from the perspective of managers at all levels. Prerequisite(s): Completion of Foundation and Technology Sequence course work and within 9 hours of graduation.

5800. Internship. 3 hours. Supervised work in a job related to student's career objective. Prerequisite(s): student must meet employer's requirements and have consent of department chair or BCIS master's coordinator. Pass/no pass only, and cannot be used as a support course.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6010. Seminar in Business Administration. 3 hours. Covers one or more special fields. May be repeated for credit, and two or more sections may be taken concurrently.

6650. Seminar in Man-Machine Studies. 3 hours. The study of computer information systems in the context of their interaction with human users, including an examination of how the human user makes decisions and is supported or inhibited in that task by the orientation and design of information systems.

6660. Comparative Information Systems Theory. 3 hours. Comparative study of present theories with particular attention to the role of computer-based information systems in the organizational policy of business, government and other institutions. Prerequisite(s): consent of department. May be repeated for credit.

6670. Topics in Information Systems. 3 hours. Topics of historical, current and future relevance in the design, development, installation and management of computer-based information systems are examined using readings, case studies and lectures. Prerequisite(s): consent of department. May be repeated for credit.

6900. Special Problems. 1-3 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in fields involved. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6940. Individual Research. Variable credit. Individual research for the doctoral candidate. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

Management Science, MSCI = 0320

4510. Model-Based Decision Support Systems. 3 hours. How model-based decision support systems can be utilized as a key element within a managerial decision process. Attention is paid to how and why such a model is used in a support system environment. Topics include the use of mathematical, statistical and business models that are embedded within a decision support system for dealing with both structured and semi-structured decision problems. Prerequisite(s): MSCI 3700; MSCI 3710 or 3870; BCIS 3610; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken MSCI course, or consent of department.

4520. Data-Based Decision Support Systems. 3 hours. Extracting information from large databases and designing data-based decision support systems; use of extracted knowledge to support human decision-making in the areas of summarization, prediction and explanation of observed phenomena. Prerequisite(s): MSCI 3700; MSCI 3710 or 3870; BCIS 3610; 2.5 UNT GPA (2.5 transfer GPA if no courses taken at UNT); a grade of C or better in each previously taken MSCI course, or consent of department.

5010. Statistical Analysis. 1.5 hours. Basic descriptive and inferential statistics; includes frequency distributions, averages, dispersions, index numbers, time-series analysis, probability, theoretical distributions, sampling distribution, estimation, tests of significance, chi-square, regression and correlation, analysis of variance and sample design. Prerequisite(s): MATH 1190 or equivalent. This course meets the deficiency requirement of statistics (MSCI 3700 and 3710) for MBA candidates, and may be counted as part of a graduate program in a field other than business administration.

5180. Introduction to Decision Making. 3 hours. Emphasis on model assumptions, applying the correct statistical model and interpreting the results. Topics include linear regression, experimental design, time-series decomposition, linear programming and elementary matrix theory. Prerequisite(s): MSCI 5010 or equivalent, or consent of department.

5210. Model-Based Decision Making. 3 hours. A survey of quantitative managerial techniques such as linear programming (including sensitivity analysis and duality), network analysis (including PERT/CPM transportation problem) and inventory models. Decision theory in a business environment is emphasized. Prerequisite(s): MSCI 5010 or equivalent.

5220. Statistical Sampling. 3 hours. Introduction to sampling theory and applications. Attention is focused on major survey sampling techniques, including cluster, ratio, stratified and simple random sampling. Principal concepts and methods of acceptance sampling that are useful in quality control are presented, including operating characteristic curves, and single, double and sequential sampling plans for attributes and variables. Prerequisite(s): MSCI 5180 or consent of department.

5230. Non-Parametric Statistics for Business Research. 3 hours. Analysis of business research data that is categorical or ordinal (ranked or scaled), and is therefore not suitable for computations such as means and standard deviations. Topics include measurements of consumer preferences, market segmentation, labor or job grades, racial and sex classifications, and exempt characteristics and performance ratings. Single and multiple sample techniques are discussed. Prerequisite(s): MSCI 5010 or equivalent, or consent of department.

5240. Data-Based Decision Systems. 3 hours. A survey of time-series analysis techniques is presented. Topics include smoothing techniques and Box-Jenkins methodology. Prerequisite(s): MSCI 5180 or consent of department.

5250. Statistical Techniques in Simulation. 3 hours. An examination of construction and use of simulation models in business. Random number and process generators, construction of simulation models, introduction to special purpose simulation languages and research project. Prerequisite(s): MSCI 5010 or consent of department.

5260. Problem Solving and Decision-Making Process. 3 hours. Development of analytical techniques essential to effective solution of problems involving risk and uncertainty; integrative and unified treatment of classical Bayesian and normative decision theory as conceptual foundations for the development of decision techniques. Prerequisite(s): MSCI 5010.

5310. Reliability and Life-Data Analysis. 3 hours. Principal topics in reliability and life-data analysis are covered, including statistical failure models, probability plotting, hazard plotting, series systems, competing risks, censored data and accelerated life tests. Applications to advanced technology industries and software reliability are included. Prerequisite(s): MSCI 5180 or consent of department.

5320. Quality Control. 3 hours. Broad coverage of managerial and statistical aspects of quality control, including quality assurance and quality management. Attention is especially devoted to pareto analysis, process capability assessment, control charts for attributes, cumulative sum charts and advanced control chart methods. Prerequisite(s): MSCI 5010 or consent of department.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of developing a problem independently. Problem chosen by the student and developed through conferences and activities under the direction of the instructor. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6000. Theory and Application of Nonparametric Statistics. 3 hours. Analysis of business research data that is categorical or ordinal (ranked or scaled). Topics include linear rank statistics, test of location for single and multiple sample problems, goodness-of-fit tests, measures of association, related samples tests and independent samples tests, rank tests for ordered alternatives, and permutation tests. Prerequisite(s): MSCI 5180 or equivalent.

6010. Seminar in Business Administration. 3 hours. Covers one or more special fields. May be repeated for credit, and two or more sections may be taken concurrently.

6710. Theory and Application of Stochastic Modeling. 3 hours. Probabilistic modeling techniques with emphasis on manufacturing and services. Specific topics covered include inventory theory and methods, scheduling, queuing theory, availability, maintainability, reparability, reliability, Markov processes and renewal theory. Prerequisite(s): MSCI 5180.

6720. Experimental Design and Statistical Modeling. 3 hours. Emphasis is focused on both the design and analysis aspects of planned experimentation. Topics include completely randomized designs, block designs, factorial designs, design resolution and fractional factorial designs, response surface analysis, evolutionary operations in process improvement and Taguchi methods. Prerequisite(s): MSCI 5180.

6740. Mathematical Programming. 3 hours. A study of advanced deterministic mathematical programming techniques. Topics include quadratic programming, dynamic programming, integer programming, goal programming, large-scale linear programming and other non-linear techniques. Prerequisite(s): MSCI 5210 or consent of department.

6750. Management Science Seminar. 3 hours. Organizational problems involved in the development and implementation of various management science models, as well as the applicability of the models to different technical problems in varying ecotechnological systems; in-depth study of areas of potential application of the more widely used management science models. Prerequisite(s): consent of department. May be repeated for credit.

6900. Special Problems. 1-3 hours. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs, accompanied by conferences with professors in fields involved.

Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6940. Individual Research. Variable credit. Individual research for the doctoral candidate. May be repeated for credit. Prerequisite(s): approved applications for special problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit. Prerequisite(s): approved applications for specific problems/independent research/dissertation credit must be submitted to the COBA Student Advising Office prior to registration.

Business Law

see Finance, Insurance, Real Estate and Law

Chamber Music

see Music

Chemistry

Chemistry, CHEM = 0118

4530. Materials Chemistry. 3 hours. Application of chemical principles to understanding the general behavior of materials. Course will include semiconductors, metals, catalysts and "nano-designed" materials (e.g. quantum wells). Prerequisite(s): concurrent enrollment in CHEM 3520 or equivalent, or consent of department. May not be repeated at the graduate level as CHEM 5530.

4610. Advanced Inorganic Chemistry. 3 hours. Electronic structure of atoms and molecules; structure and thermodynamic properties of binary compounds; inorganic nomenclature; introductory survey of bonding, stereochemistry and reactivity of inorganic and organometallic complexes. Prerequisite(s): CHEM 3520.

4620. Advanced Inorganic Chemistry Laboratory. 1 hour. (1;3) Inorganic and organometallic preparations; spectroscopic identification of diamagnetic and paramagnetic compounds; basic glassblowing; introduction to library resources. Prerequisite(s): CHEM 4610.

4630. Instrumental Analysis. 4 hours. (3;4) Identification and analysis of compounds through absorption spectroscopy in ultraviolet, visible and infrared regions, nuclear and electron spin resonance, mass spectrometry, chromatography, polarography and other advanced instrumental techniques. Prerequisite(s): CHEM 3450; 3520 (may be taken concurrently).

4660. Introduction to Computational Chemistry. 3 hours. (2;3) Introduction to the use of modern computational methodologies for the study of physical properties and chemical reactions of importance in chemistry, biochemistry, molecular biology and environmental sciences. Prerequisite(s): CHEM 3520 (may be taken concurrently) or consent of department.

4920. Cooperative Education in Chemistry. 1-3 hours. Supervised work in a job directly related to the student's major, professional field of study or career objective. Prerequisite(s): 12 semester hours of credit in chemistry; student must meet employer's requirements and have consent of the department chair. May be repeated for credit.

4930. Selected Topics in Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

4940. Chemistry Seminar. 1 hour. Colloquia covering current topics in chemistry. Prerequisite(s): chemistry major with senior standing. May be repeated for credit. May not be used to meet degree requirements for chemistry major or minor. Pass/no pass only.

4960-4970. Science Institute (Chemistry). 1-6 hours each. For students accepted by the university in special institute courses. May be repeated for credit, not to exceed 6 hours in each course.

5010. Introduction to Graduate Teaching and Research. 2 hours. Topics include university policies, safety in the laboratory, first aid techniques, teaching techniques, audio-visual facilities and operation, use of the university libraries, university/departmental computational facilities, PC facilities and use, and maintaining a research journal. Required for all full-time first-year graduate students. Prerequisite(s): graduate standing in the chemistry department.

5200. Physical Chemistry. 3 hours. A survey of selected topics in physical chemistry, including thermodynamics, mechanics, statistical mechanics, heterogeneous and homogeneous equilibria, and chemical kinetics. Prerequisite(s): CHEM 3520 or consent of department.

5210. Advanced Physical Chemistry. 3 hours. The basic concepts of quantum mechanics are emphasized utilizing several models to aid in the description, such as the square well model, the rigid rotator, the hydrogen atom and the hydrogen molecule ion. The applications of quantum mechanics to chemical systems are considered in terms of resonance, wave mechanics, perturbation and variation methods. Prerequisite(s): pass exemption examination in physical chemistry, or CHEM 5200.

5380. Organic Chemistry. 3 hours. A survey of organic chemistry involving a systematic study of classes of reactions with an integration of fact and theory. Prerequisite(s): CHEM 2380 or consent of department.

5390. Selected Topics in Analytical Chemistry. 3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5450. Advanced Techniques in Analytical Chemistry.

1-3 hours. Methods and instrumentation currently used in the analysis of materials. Presented in modular units of approximately three to four weeks duration. Typical subjects include fundamentals of liquid and gas-liquid chromatography, atomic absorption spectroscopy, polarography and related electroanalytical methods and X-ray fluorescence spectroscopy. Credit: 1 semester hour per module. May be repeated for credit as topics vary. Laboratory fee when laboratory involved.

5460. Surveys of Modern Analytical Chemistry.

3 hours. A survey of modern analytical methods with emphasis on instrumental techniques and data handling, including separation methods, electrochemical methods and spectroscopy. Prerequisite(s): consent of department.

5500. Physical Organic Chemistry. 3 hours. The mechanisms of organic reactions and the effect of reactant structures on reactivity. Prerequisite(s): pass exemption examination in organic chemistry, or CHEM 5380.

5530. Materials Chemistry. 3 hours. Application of quantum chemical principles to understanding the general behavior of materials. Course will include semiconductors, metals, catalysts and "nano-designed" materials (e.g., quantum wells). Prerequisite(s): CHEM 3520 or equivalent, or consent of department.

5560. Inorganic Chemistry. 3 hours. A survey of inorganic chemistry involving a systematic study of atomic structure, structure and bonding in inorganic and organometallic compounds, and representative inorganic reactions. Prerequisite(s): consent of department.

5570. Advanced Analytical Chemistry. 3 hours. This course covers an advanced treatment of analytical chemistry, including the following topics: advanced separation methods, analytical applications of electrochemistry and spectroscopy, experimental design, sampling and data analysis. Prerequisite(s): pass exemption examination in analytical chemistry, or CHEM 5460.

5620. Selected Topics in Inorganic Chemistry. 3 hours. Topics of current interest, which vary from year to year. Topics include ligand field theory, physical methods in inorganic chemistry, group theory and molecular symmetry, and recent advances in transition and non-transition metal chemistry. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5640. Selected Topics in Organic Chemistry.

3 hours. Topics of current interest, which vary from year to year. Prerequisite(s): consent of department. May be repeated for credit as topics vary.

5650. Kinetics of Chemical Reaction. 3 hours. Reactions and reaction rates; determination of rate laws for simple and complex reactions; deduction of reaction mechanisms; reaction energetics; chain reactions; theories of elementary reaction rates; reactions at extreme rates; extra-kinetic probes of mechanism. Prerequisite(s): consent of department.

5660. Computational Chemistry and Biochemistry.

3 hours. (2;3) Introductory course covering the latest techniques for the study of reactions of interest to chemists and biologists via the use of molecular modeling and quantum mechanical simulations. Prerequisite(s): consent of department.

5700. Thermodynamics. 3 hours. Reversible and irreversible thermodynamics of gases, liquids, solids and solutions; free energy relationships of ideal and non-ideal solutions; introduction to statistical calculation of thermodynamic properties. Prerequisite(s): consent of department.

5710. Advanced Inorganic Chemistry.

3 hours. An advanced study of the interrelation of structure, bonding and reactivity of inorganic and organometallic compounds; basic applications of molecular symmetry, and group theory to chemical problems. Prerequisite(s): pass exemption examination in inorganic chemistry, or CHEM 5560.

5900-5910. Special Problems. 1-3 hours each. For students capable of developing a problem independently through conferences and activities directed by the instructor. Problem chosen by the student with the consent of the instructor.

5920-5930. Research Problems in Lieu of Thesis. 3 hours each. An introduction to research; may consist of an experimental, theoretical or review topic. A paper conforming to recommendations outlined in the "Handbook for Authors of Papers in the Journals of the American Chemical Society" must be submitted for credit in each course.

5940. Seminar in Current Chemistry. 1 hour. Colloquia covering current topics in chemistry. Required of all full-time graduate students in each semester of graduate residence. Prerequisite(s): senior standing. May be repeated for credit. Pass/no pass only.

5950. Master's Thesis. 3 or 6 hours. May be repeated for credit. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun.

5960. Science Institute. 1-6 hours. Courses for students accepted by the university for enrollment in special institute courses. May be repeated for credit, not to exceed a total of 6 hours in each course.

6010. Seminar for Doctoral Candidates.

3 hours. Demonstration of competence in a specific area of chemistry (analytical, organic, physical, inorganic) as evidenced by criteria established by the faculty of each discipline. May be repeated for credit. Six credit hours required.

6900-6910. Special Problems. 1-3 hours each. For doctoral students capable of developing a problem independently through conferences and activities directed by the instructor. Problem selected by the student with the consent of the major professor.

6940. Individual Research. 1-12 hours. Doctoral research of independent nature. May be repeated for credit.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

6990-6991. Individual Research. 1-3 hours each. For postdoctoral fellows to further training and research experience in developing and solving research problems independently. Prerequisite(s): consent of department. May be repeated for credit. Pass/no pass only.

Child Development

see Counseling, Development and Higher Education

Civil Engineering Technology

see Engineering Technology

Communication Studies

Communication Studies, COMM = 0119

4020. Communication Theory. 3 hours. Process of theory construction with particular emphasis on human communication, elements and types of theories, theoretical logics, metatheoretical perspectives toward communication, and specific content theories of communication.

4021. Communication Research Methods. 3 hours. Experimental and quantitative techniques usable in research in communication.

4040. Rhetorical Theory. 3 hours. A study of rhetorical traditions that provide useful insights into how individuals engage in rhetorical transactions.

4060. Performance Theory. 3 hours. Examination and comparison of text-centered, performer-centered and audience-centered theories of performance; functions of performance; and methods for evaluating performance. Prerequisite(s): COMM 2060.

4140. Rhetoric and Language. 3 hours. Major approaches to the human creation and transmission of meaning through language. Examines the levels at which and the manner in which spoken language may be persuasive. May include persuasive discourse, language as symbolic action and semiotics.

4220. Gender and Communication. 3 hours. Examination of differences in communication behavior of males and females with particular reference to biological sex and psychological gender. Explores male and female communication in a variety of different contexts. Prerequisite(s): COMM 1010 or 2020, or consent of department.

4240. Rhetoric and Culture. 3 hours. Consequences of discourse on culture. May include communication throughout the life cycle, rhetorical creation and maintenance of social movements, international and intercultural rhetoric, feminist rhetorical criticism, ideological criticism, the rhetorical aspects of popular culture and the grounds for the criticism of culture from a rhetorical perspective.

4260. Performance and Culture. 3 hours. Examination of the role of performance in cultures. Research and analysis of texts and performance practices among various ethnic and cultural groups.

4340. Rhetoric and Politics. 3 hours. Rhetoric of political campaigns, presidential rhetoric, legal communication, and the rhetorical creation, maintenance, use and legitimization of symbolic power. Prerequisite(s): COMM 3340.

4360. Rhetoric of Performance. 3 hours. Contemporary performance as a critical and persuasive tool within social contexts. Research and analysis of performance texts and contexts designed to criticize social or cultural practices. Prerequisite(s): COMM 2060.

4420. Communication and Relational Development. 3 hours. The role of communication processes in initiating, developing, defining, maintaining and dissolving various forms of human relationships. Examines the nature of communication in a variety of relational contexts. Prerequisite(s): COMM 1010 or 2020 or consent of department.

4440. Issues in Freedom of Speech. 3 hours. Theories, doctrines, statutes and cases related to the First Amendment guarantee of freedom of speech.

4800. Communication Internship. 1-4 hours. (0;0;1-4) Supervised work in a job directly related to the student's major, professional field of study or career objective. Prerequisite(s): 12 semester credit hours in communication studies; student must meet employer's requirements and have consent of internship supervisor and department. May be repeated for credit up to 4 semester hours.

4829. Topics in Communication Processes. 3 hours. Rotating topics in interpersonal communication, organizational communication, or communication research methods. Prerequisite(s): 6 hours in communication processes, or consent of department. May be repeated for credit as topics vary.

4849. Topics in Rhetorical Studies. 3 hours. Rotating topics may include Greek rhetoric; Roman rhetoric; medieval rhetoric; values and rhetoric in Weaver, Perelman and Habermas; narrative criticism; Kenneth Burke. May be repeated for credit as topics vary.

4869. Topics in Performance Studies. 3 hours. Rotating topics may include: performance of particular genres, including poetry narrative, drama or non-literary texts; performance methods, including thematic approaches to performance or historical styles of performance; or theoretical issues in performance, including narrative theory, intertextuality or New Historicism. Prerequisite(s): COMM 2060 or consent of department. May be repeated for credit as topics vary.

4950. Senior Honors Thesis. 3 hours. Available to COMM majors having completed at least 90 semester hours with an overall GPA of 3.50 or better. Prerequisite(s): COMM 4020 and 4021, or 3340 and 4040, or 4060.

5080. Introduction to Graduate Study and Research in Communication Studies. 3 hours. Broad perspective on communication studies content areas.

5081. Research Methodologies in Communication. 3 hours. Qualitative and quantitative methodologies for communication studies research.

5220. Organizational Communication. 3 hours. Study of the transmission of information and ideas within an organization with emphasis on the problems encountered in the business world.

5225. Interpersonal Communication. 3 hours. Contemporary research and theory in the study of communication patterns found at various stages of normal interpersonal interactions.

5240. Rhetorical Study of Movements. 3 hours. Investigation of the rhetorical and communicative processes that create, sustain, and transform social movements.

- 5260. Group Performance.** 3 hours. Historical and contemporary theoretical approaches to group performance in performance studies and related disciplines; practical experience in scripting and directing group performance.
- 5280. Communication and Information in the Classroom.** 3 hours. The study of the major variables in the communication process and their impact on student learning and satisfaction. Designed primarily for teachers of all levels and content specialties.
- 5320. Quantitative Research Methods in Communication.** 3 hours. Experimental and quantitative techniques usable in research in communication.
- 5325. Communication Theory.** 3 hours. A survey of scientific and humanistic perspectives on the communication process and social contexts in which it occurs.
- 5340. Rhetorical Methods.** 3 hours. The use of critical and rhetorical theories in the investigation and evaluation of rhetorical acts and artifacts.
- 5345. Rhetorical Theory.** 3 hours. An examination of significant rhetorical theories and theorists.
- 5360. Performance Criticism.** 3 hours. Theories of value and evaluation in performance studies and their influence on the practice of criticism, in general, and performance criticism, in particular. Contexts range from everyday acts of evaluation to formal, public instances of criticism.
- 5365. Performance Theory.** 3 hours. Historical and contemporary theoretical approaches to performance studies, including theories from related disciplines and their impact on theory and practice in performance studies.
- 5380. Theory and Research in Persuasion.** 3 hours. Recent theory and research on the persuasive process. Includes effects of variables in public, interpersonal, organizational, and mass communication contexts.
- 5425. Gender and Communication.** 3 hours. Examination of research and theory in gender and communication, investigating how communication structures gender and how gender affects communication.
- 5440. Public Address Studies.** 3 hours. Research and theory in the critical interpretation and assessment of public discourse.
- 5460. Narrative Theory.** 3 hours. Examination of theories of narrative and narrative structure and their significance. The study of narrative and nonnarrative phenomena, including fiction, drama, film, and politics.
- 5480. Practicum.** 3 hours. Training in the teaching of some aspect of communication. Under the supervision of a faculty member, the student prepares and presents instructional units, conducts class discussions and handles administrative matters peculiar to the type of course involved. No more than 3 hours may apply toward master's degree. Duties performed under teaching fellowships or graduate assistantships do not earn credit in this course.
- 5481. Graduate Internship.** 3 hours. Supervised work in a job related to the student's major, professional field of study or career objective. Prerequisite(s): 9 graduate hours in communication; two letters of recommendation from professors in department; and consent of internship director.
- 5520. Communication and Conflict.** 3 hours. Examines the role of communication used in managing conflict in its most common contexts: intrapersonal, interpersonal, group, organizational, professional, social and international. Theory and research are examined to develop more effective communication in conflict situations.
- 5525. Communication and Change.** 3 hours. A study of the impact of human communication on the process of change in formal and informal organizations with emphasis on understanding and planning change.
- 5540. Freedom of Expression.** 3 hours. Theories, statutes, and cases involving the First Amendment guarantee of freedom of speech.
- 5560. History of Performance Studies.** 3 hours. Philosophies, conventions, and techniques that have contributed to the formation of contemporary performance theory. Examines performance approaches from classical to contemporary eras.
- 5625. Communication Consulting.** 3 hours. Examination of organization communication consulting and of communication theorists and practitioners. Opportunities to develop and/or refine training and facilitating skills and unique models of communication consulting.
- 5720. Communication Style and Competence.** 3 hours. Examination of the major theoretical and empirical approaches to style and competence in communication. Issues of conceptualization, assessment, instruction, and training in communication style and competence are covered.
- 5820. Seminar in Communication Processes.** 3 hours. Contemporary research and theory in communication processes. Rotating topics. May be repeated for credit as topics vary.
- 5840. Seminar in Rhetorical Studies.** 3 hours. Contemporary research and theory in oral rhetorical studies. Rotating topics. May be repeated for credit as topics vary.
- 5860. Seminar in Performance Studies.** 3 hours. Contemporary research and theory in performance studies. Rotating topics. May be repeated for credit as topics vary.
- 5880. Seminar in Communication Studies and Research.** 3 hours. Rotating topics. May be repeated for credit as topics vary.
- 5900-5910. Special Problems.** 1-3 hours each. For students capable of developing a problem independently through conferences and activities directed by the instructor. Problem chosen by the student with the consent of the department director.
- 5920-5930. Research Problems in Lieu of a Thesis.** 3 hours each.
- 5950. Master's Thesis.** 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Community Service

Community Service, COMS = 0445

4100. Social Evolution of Contemporary Volunteerism. 3 hours. Analysis and review of the social evolution of contemporary volunteerism from revolutionary times to the present. Study of the current issues, definitions, and trends in the field of professional management. Introduction to social systems supporting or limiting volunteerism and volunteerism resources on the Internet. May not be repeated at the graduate level as COMS 5100.

5100. Social Evolution of Contemporary Volunteerism. 3 hours. An analysis and review of the social evolution of contemporary volunteerism from revolutionary times to the present. Study of the current issues, definitions, and trends in the field of professional management. Introduction to social systems supporting or limiting volunteerism and volunteerism resources on the Internet. Students who have received credit for COMS 4100 may not take COMS 5100 for credit toward a degree.

5200. Leadership Theory and Practice for Public/Private Sector. 3 hours. Overview of organizational leadership theory and practice for volunteer managers. Students examine and develop a range of skills in a number of interpersonal areas: group dynamics, decision making, managing differences, and leadership and influence.

5500. Community Resource Mapping and Collaboration. 3 hours. Analysis of systems that measure community assets and resources; explore the means of identifying and approaching potential collaborative community partners; focus on the development of joint proposals and/or business plans. An ecological approach is used to analyze the full range of human service agencies: health, social, educational, diagnostic, enrichment, religious, civic and legal. Students have an opportunity to do field work with agency staff on assigned community projects.

5610. Topics in Volunteer Management. 3 hours. A graduate seminar devoted to the investigation, analysis, and discussion of issues in contemporary volunteerism.

Composition, Music

see Music

Computer Education and Cognitive Systems

see Technology and Cognition

Computer Sciences

Computer Science, CSCI = 0123

4010-4020. Software Development. 3 hours each.

4010. The software development process, requirements analysis, software design concepts and methodologies, structured programming and debugging. Prerequisite(s): CSCI 3400.

4020. Software testing methodologies, software reliability, maintenance, project management and configuration management. Prerequisite(s): CSCI 4010.

4050. Computer Game Programming. 3 hours. Programming for modern computer games, including real-time, event-driven, and multimedia programming techniques. Prerequisite(s): CSCI 3400.

4250. Survey of Computer Languages. 3 hours. Formal definition of programming languages including specification of syntax and semantics. Comparison of several existing high-level languages. Prerequisite(s): CSCI 3400.

4300. File Organization and Processing. 3 hours. File design and implementation; operating systems, survey of peripheral device characteristics, sorting, information storage and retrieval, list processing and direct access techniques, job control language, and security and privacy. Prerequisite(s): CSCI 3400.

4330. Topics in Computer Science. 3 hours. Selected topics on computer science. Prerequisite(s): CSCI 3400 and consent of instructor. May be repeated for credit as topics vary.

4350. Introduction to Database Systems Design. 3 hours. Logical and physical database system organization; logical models; design issues; secondary storage considerations. Prerequisite(s): CSCI 3400.

4410. Introduction to Artificial Intelligence. 3 hours. Introduction to concepts and ideas in artificial intelligence. Topics include search techniques, knowledge representation, control strategies and advanced problem-solving architecture. Prerequisite(s): CSCI 3210 or knowledge of LISP or PROLOG.

4420. Introduction to Computer Graphics. 3 hours. Concepts and principles, survey of present display and input technology, systems and applications. Study of basic concepts, and mathematical and geometric principles. Design and use of graphics software packages. Design and implementation of an application using available hardware and software. Prerequisite(s): CSCI 3400.

4450. Algorithm Analysis and Complexity Theory. 3 hours. Algorithm design methodologies, sorting, graph algorithms, dynamic programming, backtracking, string searching and pattern matching. Prerequisite(s): CSCI 3400 and MATH 2770.

4510. Machine Structures. 3 hours. Computer systems organization; micro-, mini- and large-scale machines; multi-processor configurations; processor and peripheral hardware characteristics. Prerequisite(s): CSCI 3100.

4540. Introduction to Operating Systems. 3 hours. Concepts in operating system analysis and design. General topics of process, resource and file management are presented and analyzed in the context of different system architectures and performance constraints. Prerequisite(s): CSCI 3600.

4600. Social Implications of Computer Science. 1 hour. The effect of computer science on the home and the workplace, with emphasis on the role of the computer professional in modern society. Prerequisite(s): junior standing.

4880. Special Computer Application Problem. 1-4 hours. Study defined by the student in applying computer science to another field. Work supervised and work plan approved by one faculty member from computer sciences and one from relevant application area; one to three students may work together if all faculty advisers concerned agree.

Prerequisite(s): prior approval of plan by faculty supervisor. Open to advanced undergraduate students capable of developing problems independently. May be repeated for credit.

4890. Directed Study. 1-4 hours. Study by individuals, or small groups if faculty supervisor agrees. Prerequisite(s): 6 semester hours of computer science with grades of A or B; plan for study and achievements; prior consent of department chair and supervision adviser. Open to advanced undergraduate students capable of developing problems independently. May be repeated for credit.

5010. Introduction to Computer Applications. 3 hours. Use of the computer as a tool in other disciplines. Emphasis is on familiarization with the capabilities of packaged programs such as statistical libraries. Preparation of input for and interpretation of output from these programs. Introduction to programming. May not count toward a major in computer science.

5020. Computer Methods. 3 hours. Use of software tools for the solution of problems in a variety of disciplines. Prerequisite(s): 3 hours of computer science. May not count toward a major in computer science.

5030. Problem-solving in High-Level Languages. 4 hours. Algorithms, pseudocode, flow charts, structured techniques of problem-solving and program design using high-level programming languages. Prerequisite(s): 6 hours of mathematics and/or statistics. Leveling course for computer science majors.

5120. The Design of Computer-Assisted Instruction Systems. 3 hours. Design and development of computer-assisted instruction systems and languages. Topics include design and implementation of test generation systems, authoring tools and intelligent tutoring systems. Prerequisite(s): 3 hours of programming and consent of department.

5170. Teaching and Research in Computer Science. 1 hour. An examination of the philosophies and techniques of teaching and research in computer sciences. Required each semester of all computer science teaching and research assistants. Pass/no pass only. May be repeated for credit.

5200. Automata Theory. 3 hours. Deterministic and non-deterministic finite automata, regular expressions and sets, context-free grammars and pushdown automata, Turing machines as acceptors, enumerators and computers, Church's thesis, universal Turing machines and the halting problem, the Chomsky hierarchy and intractable problems. Prerequisite(s): CSCI 3400 or equivalent.

5210. Non-Numeric Programming. 3 hours. Programming techniques and data structures appropriate to non-numeric programming, including object-oriented programming. Use of languages similar to LISP and PROLOG. Prerequisite(s): CSCI 3400 or equivalent.

5250. Programming Languages. 3 hours. Notations for description of language syntax and semantics. Properties of algorithmic languages: scope of variables, binding time, subroutines and co-routines. Data abstraction, exception handling and concurrent programming. Dialects and standardization. Prerequisite(s): CSCI 3400 or equivalent.

5270. Computer-Human Interfaces. 3 hours. Emphasizes human performance in using computer and information systems. Topics for software psychology include programming languages, operating systems control languages, database query facilities, computer-assisted dialogues, personal computing systems, editors, word processing and terminal usage by non-skilled users. Prerequisite(s): CSCI 3400 or equivalent.

5290. Natural Language Processing. 3 hours. Introduction to natural language processing; modern theories of syntax; context-free parsing; transformational syntax and parsing; augmented transition networks; and survey of natural language processing systems. Prerequisite(s): CSCI 3400 or equivalent.

5300. Information Structures. 3 hours. Advanced topics in data structures, including development and analysis of algorithms for internal sorting, external sorting and searching. Introduction to file structures for single- and multi-key retrieval and range searching. Prerequisite(s): CSCI 3400 or equivalent.

5330. Topics in Computer Science. 3 hours. Advanced study of languages, files and processing techniques with applications selected from reservations systems, inventory systems and other administrative applications, process control, computer-assisted instruction, information storage and retrieval, artificial intelligence, heuristic programming and so forth, depending on class interest. Prerequisite(s): 6 hours advanced courses in computer programming. May be repeated for credit with consent of instructor.

5350. Database Systems Design. 3 hours. Design and implementation issues for large database management systems, security and integrity issues, and physical implementation techniques. Prerequisite(s): CSCI 4350.

5370. Graph Theory for Computer Scientists. 3 hours. Computer science oriented graph theory. Topics include connected and disconnected graphs, Hamiltonian circuits, trees and fundamental circuits, coloring, algorithms and computer programs, switching and coding theory, and electrical network analysis. Prerequisite(s): CSCI 3400 and 4450 or equivalent, or consent of the instructor.

5400. Foundations of Logic Programming. 3 hours. Logic programs, including definite, normal and general types. Inference methods, including forward-chaining, backward-chaining and deduction graphs. Theorem proving and deductive databases. Unification, soundness and completeness of resolution-refutation process and PROLOG. Prerequisite(s): CSCI 4410.

5410. Artificial Intelligence. 3 hours. Advanced study of issues relevant in the design of intelligent computer systems. Topics included in this course are search techniques, knowledge representation, issues in natural language processing and the design of expert systems. Prerequisite(s): CSCI 5210 or consent of department.

5420. Computer Graphics. 3 hours. Basic principles for the design, use and understanding of graphics systems. Design and implementation of graphics software packages, applications and algorithms for creating and manipulating graphics displays. Prerequisite(s): CSCI 3400 and one semester of linear algebra.

5430. Methods of Numerical Computations. 3 hours. Introduction to numerical methods and mathematical software for scientific computation. Floating-point number systems, machine precision, cancellation error, conditioning and stability. Linear systems, Gaussian elimination and matrix decomposition. Polynomial and spline interpolation. Numerical integration. Ordinary differential equations. Non-linear equations. Prerequisite(s): calculus (two semesters), linear algebra (one semester) and CSCI 5030, or equivalent programming experience.

5450. Analysis of Computer Algorithms. 3 hours. The study of efficient algorithms for various computational problems. Topics include advanced techniques of algorithm design: divide-and-conquer, the greedy method, dynamic programming, search and traversal, back-tracking and branch-and-bound. Other topics include NP-Completeness theory, including approximation algorithms and lower bound theory, and probabilistic algorithms. Prerequisite(s): CSCI 4450.

5470. Modeling and Simulation. 3 hours. Modeling of business and scientific discrete-event processes. Directed graphs. Critical path analysis. Queuing theory. Markov processes. Stochastic models. Introductions to systems simulation and industrial dynamics. Programming languages for simulation. Prerequisite(s): 6 hours of programming and 3 hours of statistics. (Same as MSCI 5250).

5520. Software Development. 3 hours. Systems analysis, software requirements analysis and definition, specification techniques, software design methodologies, performance measurement, validation and verification, and quality assurance techniques. Prerequisite(s): CSCI 4010.

5530. Topics in Software Engineering. 3 hours. Case tools, module implementation, testing, system delivery in the work place, scheduling and budgeting, project management, configuration management, software development tasks and ethical issues.

5540. Operating System Design. 3 hours. Advanced topics such as operating system design, job control languages, problems of multiprogramming and multiprocessing, computer networks, interaction, overlays, paging and accounting for resource usage (customer billing and hardware monitoring). System architecture. Interactive computers: time sharing, real-time and process control. Prerequisite(s): CSCI 3600. May be repeated for credit with consent of instructor.

5550. Compiler Design. 3 hours. Formal language specification, lexical analysis, parsing, code generation, error recovery techniques and optimization. Detailed study of two or three compilers. Prerequisite(s): CSCI 5200.

5700. Computer System Architecture. 3 hours. The macro structure and instruction set of computer systems. Survey of characteristic architectures of central processors and systems. Topics selected from mini-, micro-, large-scale and highly parallel computers. I/O control; associative memories; characteristics of storage devices; paging; multiprocessors; terminals. Design of the computer utility and other communications-oriented systems. Prerequisite(s): CSCI 3100 and 3600 or equivalent.

5750. Parallel Processing and Algorithms. 3 hours. Taxonomy of parallel computers; shared-memory vs. message-passing architectures; theoretical models; parallel

algorithm design strategies; parallel data structures; automatic parallelization of sequential programs; communication; synchronization and granularity. Prerequisite(s): CSCI 4450 or 5450.

5780. Computer Networks. 3 hours. Study of problems and limitations associated with interconnecting computers by communication networks. ISO reference model, architecture of circuits, message and packet switching networks, network topology, routing, flow control, capacity assignment, protocols, coding and multiplexing. Prerequisite(s): CSCI 4540 and 5700.

5800. Internship. 1 hour. Supervised work in a job that meets specific educational and career objectives of the student. Requires submission of a final report summarizing industrial experience gained through the internship. Prerequisite(s): consent of department.

5890. Directed Study. 1-4 hours. Study of topics in computer science by individuals or small groups. A student taking CSCI 4890 or 5890 may work with other students taking these courses on the same topic if the faculty supervisor agrees. The student is to prepare a plan for study of a topic and a plan for evaluation of study achievements. Prior approval by the computer sciences department chair and a graduate faculty member who agrees to supervise the work is required for the plan. Prerequisite(s): 6 hours of computer science with a grade of A or B. Open to students with graduate standing who are capable of developing problems independently. May be repeated for credit.

5900-5910. Special Problems. 1-3 hours each. Independent study and research of a specific problem in a field of computer science or its application. A report is required defining the problem and developing a solution. The work may be supervised by any member of the graduate faculty. Prerequisite(s): 8 hours of computer science with grades of A or B; prior approval of written plan by the faculty supervisor and by the computer sciences department chair. May be repeated for credit.

5920-5930. Research Problems in Lieu of Thesis. 2-4 hours each. Independent research of a specific problem in a field of computer science. The work will be supervised by a member of the faculty of the Department of Computer Sciences, and a final written report must be approved by the supervising faculty and the department chair prior to submission to the office of the graduate dean. Prerequisite(s): approval of student's research plan by a computer science faculty member.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

6200. Theory of Computation. 3 hours. Computation by abstract devices, time complexity, inherent complexity of problems, complexity hierarchies, reductions, nondeterminism and NP-completeness, approximation, and intractable problems. Prerequisite(s): consent of department.

6250. Advanced Programming Languages. 3 hours. Current research issues in programming languages. Translation of programming languages, formal semantics and program verification, foundations of structured programming, abstraction, declarative systems and special-purpose languages. Prerequisite(s): consent of department.

6280. Computability. 3 hours. Formal languages, grammars and automata, and their relationship to one another. Operations on languages. Unsolvable problems concerning languages. Prerequisite(s): CSCI 5200 and consent of department.

6330. Advanced Topics in Computer Science. 2-3 hours. Advanced topics and current research issues in computer science. Prerequisite(s): consent of department.

6350. Advanced Database Design. 3 hours. Database theory and application. Data models, distributed databases, spatial databases, statistical databases, database machines, knowledge bases, database design theory and self-documenting databases. Prerequisite(s): consent of department.

6410. Design and Implementation of Expert Systems. 3 hours. Problems in knowledge acquisition, knowledge representation issues, representation of meta-knowledge, use of statistical measures to limit search of the knowledge base and knowledge verification. Prerequisite(s): CSCI 5410.

6420. Advanced Computer Graphics. 3 hours. Research and study of specific problems in the field of computer graphics. The course focuses on topics current to the field and includes, but is not limited to, areas such as design and construction of computer graphics systems, both software and hardware; the theory and use of color and shading; algorithms for solid object modeling; and the use of graphics packages in computer-aided design. Prerequisite(s): CSCI 5420 or consent of department.

6430. Advanced Scientific Computing. 3 hours. Numerical computation, graphics and mathematical software. Prerequisite(s): consent of department.

6460. Advanced Pattern Recognition and Image Processing. 3 hours. Research and study of specific problems and advanced topics, including the principles and pragmatics of pattern recognition, digital image processing and analysis, and computer vision. Prerequisite(s): consent of department.

6470. Advanced Modeling and Simulation. 3 hours. Current research issues in both simulation methodology and applications will be discussed. Distributed simulation, simulation support tools, object-oriented simulation, and artificial intelligence and simulation. Prerequisite(s): CSCI 5470 or consent of department.

6480. Advanced Artificial Intelligence. 3 hours. Current research issues and advanced topics involving both the principles and pragmatics within the area of artificial intelligence. Topics include, but are not limited to, knowledge representation, intelligent tutoring systems and semantic representation in natural language processing. Prerequisite(s): CSCI 5410.

6490. Advanced Man/Machine Intelligence. 3 hours. Robotics-based computer hardware and software; intelligent systems in automation; computer interface and control; computer vision in recognition inspection and 3-D interpretation; robot programming languages, algorithms and computational architectures; expert systems in design, diagnosis and planning; simulation languages and methods; and geometric modeling and graphing animation. Prerequisite(s): consent of department.

6520. Advanced Software Engineering. 3 hours. Research and study of specific problems in the field of software engineering. Software development methodology, verification and reliability; software quality assurance and productivity; software engineering economics; models and metrics for software management and engineering; human performance engineering; and software configuration management and control. Prerequisite(s): CSCI 5520 or consent of department.

6540. Advanced Operating Systems. 3 hours. Current research issues and advanced topics involving both the principles and pragmatics of operating systems specification, design and implementation. Prerequisite(s): CSCI 5540 or consent of department.

6650. Advanced VLSI Systems. 3 hours. Design and implementation of VLSI systems. Properties of MOS devices, implementation of basic functions, design of memory and processor circuits, languages for circuit design, placement and routing algorithms, and area-time complexity. Prerequisite(s): CSCI 5700 or consent of department.

6720. Advanced Computer Architecture. 3 hours. Computer design problems, control structures and microprogramming, microprocessors, large-scale architectures, multiprocessor systems and interconnection networks, fault-tolerance, language-based architectures, special purpose and application-based systems, and performance of systems. Prerequisite(s): CSCI 5700 or consent of department.

6750. Complexity of Parallel Computation. 3 hours. Models of parallel computation — justification and buildability; inherent parallelism and communication costs; techniques for efficient parallelization. Lower and upper complexity bounds; the classes NC and SC; P-complete problems; the parallel computation thesis. Prerequisite(s): CSCI 5450 or 5750.

6780. Advanced Distributed Computing. 3 hours. Selected topics in distributed systems and computer networks. Design of local area networks and multiple network systems; databases, programming languages and operating systems for distributed systems. Prerequisite(s): CSCI 5780 or consent of department.

6900. Special Problems. 1-3 hours. Independent study and research of a specific problem in a field of computer science. A report defining the problem and developing a solution is required. Problem chosen by the student with the approval of the supervising professor. Prerequisite(s): PhD status. May be repeated for credit with consent of department.

6940. Individual Research. 1-6 hours. To be scheduled by the doctoral candidate engaged in research. May be repeated for credit.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Counseling, Development and Higher Education

Child Development, EDCD = 0518

4140. School-Age Child Care Programs. 3 hours. The components in before and after school child care and related programs that are developmentally appropriate and benefit children aged 5 through 12 are explored. These include planning, implementing and evaluating activities, facilities, programs, staff, budgets and other aspects necessary for providing healthy services for children.

4160. Family Life Education. 3 hours. The practice and process of family life education and training of professionals in the child development and family field. Curriculum and program development and evaluation. Teaching strategies and professional responsibilities. Prerequisite(s): EDCD 2010 and 3000.

4500. School-age and Adolescent Development. 3 hours. Theories and characteristics of the development of school-age children and adolescents. Effects of family, school, community and other factors on development. Some observation required.

4510. Guidance of Children and Youth. 3 hours. Focus on guidance and management that is developmentally appropriate for children from birth through adolescence. Research-based, crosscultural, with practical applications and case studies.

4550. Transitions in Family Living and Work. 3 hours. The effects of family living and work performance throughout the life cycle are considered. Selected skills are offered and/or practiced to enhance a better balance between family roles and the job.

4590. Preprimary Curriculum, Organization and Management. 4 hours. (3;3) Developmentally appropriate practice in the education and care of young children, including learning environment, curriculum planning and organization. Practical training in appropriate guidance and teaching techniques during three hours per week in the UNT Child Development Laboratory in addition to three hours per week in class. Prerequisite(s): EDCD 3320, 4510 (CD majors) or EDEC 3350 (Option IV).

4600. Prepracticum. 1 hour. Professional seminar interrelates theoretical concepts with work experience. Professionalism, ethics, and problem solving are emphasized.

4601. Practicum I. 3 hours. The practicum requires a minimum of 150 clock hours of experience with children and/or families, plus one-hour weekly seminars and conference times. Students must have senior status and meet with an adviser the previous semester for approval of practicum site. Prerequisite(s): EDCD 4600.

4602. Practicum II. 3 hours. The practicum requires a minimum of 150 clock hours of experience with children and/or families, plus one-hour weekly seminars and conference times. Students must have senior status and meet with an adviser the previous semester for approval of practicum site. Prerequisite(s): EDCD 4600.

4610. Community Resources Related to Children and Families. 3 hours. Analyzing community resources and needs as related to the family life cycle; ecological approach; home, school and community collaboration; and exploration of careers related to children and families. Fifteen hours a semester in field work arranged. Same as EDEE 5570.

4620. Administration of Programs for Children, Youth and Families. 3 hours. Analysis of programs, personnel policies, facility administration and related topics for teachers and administrators who work with children, youth and families. Prerequisite(s): course in child development.

4800. Studies in Child Development. 1-3 hours. Organized classes for specific program needs and student interests. Prerequisite(s): consent of department. Limited-offering basis. May be repeated for credit.

Counselor Education, EDSS = 0510

5000. Filial Therapy. 3 hours. Training parents to be therapeutic agents in their children's lives through the utilization of play therapy skills in regularly scheduled parent-child structured play sessions in their own homes. How to train parents in the overall principles and methodology of child-centered play therapy is addressed. Prerequisite(s): EDSS 5700 or consent of instructor.

5300. Counseling in the Community Agency. 3 hours. Didactic and experiential training to prepare the community-oriented counselor for work with service, welfare, health and charitable organizations and agencies that require unique counseling expertise. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5400. Planning and Organizing Comprehensive Career Programs. 3 hours. A study of the purposes and functions of a comprehensive career development program; components of a comprehensive career program; techniques for providing comprehensive career programs to junior high, middle school, secondary and adult students. (Same as ATTD 5400.)

5410. History and Current Trends in Comprehensive Career Counseling Programs. 3 hours. This course will provide an overview of the history of career counseling. Special attention will be focused upon current trends in the field of comprehensive career counseling. Prerequisite(s): EDSS 5680 and 5710.

5420. Vocational Student Identification, Placement and Follow-up. 3 hours. A focus on the process of identification and assessment of learner's interests and aptitudes; various instruments, methods and techniques used in assessment are examined. Particular emphasis is given to special needs learners, including at-risk youth and other targeting populations.

5470. Career Development and Information Resources. 3 hours. Survey of career development and counseling with emphasis on the occupational, career and educational information service.

5550. Introduction to Biofeedback in Counseling. 3 hours. Introduction to the use of biofeedback technology for the control of psychophysiological functions. The course will cover basic principles of psychophysiological self-regulation and mind-body interaction, basic biofeedback systems and instrumentation, treatment applications, professional conduct, and personal experience using biofeedback. Prerequisite(s): EDSS 5680 and 5710, or consent of instructor.

5560. Practicum in Biofeedback. 3 hours. Experiential training and practice utilizing biofeedback interventions and instrumentation in counseling. The course will require personal experience in using therapeutic biofeedback methods for self and others. Prerequisite(s): EDSS 5550 or consent of instructor.

5561. Advanced Practicum in Biofeedback. 3 hours.

Experiential training and practice utilizing biofeedback and neurofeedback interventions and instrumentation in counseling settings. The course will require personal experience in using therapeutic biofeedback and neurofeedback methods for self and others. Prerequisite(s): EDSS 5550, 5560 or consent of instructor. Offered once per year.

5570. Teachers as Human Relations Facilitators. 3 hours. Emphasis on methodological approaches and activities designed to develop the ability to facilitate interpersonal relations in the classroom.

5580. Parent and Family Counseling. 3 hours. The application of family systems theory to the study of family dynamics, family development and the resolution of family conflicts. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5590. Couple Counseling. 3 hours. The application of relationship counseling theory to the study of individual development, interpersonal relationships, marital systems and conflict resolution. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5600. Counseling in Secondary Schools. 3 hours. Principles and practices of counseling in the secondary school related to the curriculum, counseling services and the counseling program. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5610. Drug and Addiction Education for Counselors. 3 hours. Principles and practices of drug and addiction education and abuse prevention with special application to the functions of counselors. Prerequisite(s): EDSS 5680 and 5710.

5660. Pre-Practicum in Counseling. 3 hours. A competency-based pre-practicum with experiential emphasis. The student is required to demonstrate proficiency in counseling concepts and techniques before proceeding to EDSS 5690. Prerequisite(s): EDSS 5680 and 5710 and 15 additional hours in counselor education, or consent of department.

5670. Developmental Processes and Strategies. 3 hours. Principles and practices of human development as they relate to counseling processes and strategies. Opportunity for practical application of strategies is provided.

5680. Counseling Theories and Techniques. 3 hours. A study of selected theories and techniques of counseling as they apply to normal and abnormal human behavior. Course should be taken concurrently with EDSS 5710.

5690. Practicum I: Counseling. 3 hours. Provides actual counseling experience with a variety of clients and problems. Prerequisite(s): all required degree courses in counselor education except EDSS 5720 and 5721. Students who take the practicum in counseling during the summer must enroll for both terms. The second-term enrollment will be in EDSS 5900.

5700. Introduction to Play Therapy. 3 hours. Enhancing the counseling relationship with children by utilizing play media to facilitate expression, self-understanding, and personal growth and development. Observation of and supervised experience in play therapy with children are an integral part of the course. Prerequisite(s): EDHD 5230, EDSS 5680 and 5710, or consent of instructor.

5710. Introduction to Counseling Theories and Techniques. 3 hours. Required upon first resident registration in program for master's degree. The course focuses on professional orientation, selected theories and techniques of counseling as they apply to normal and abnormal behavior, and self-awareness through individual and group counseling. Degree plans are developed. Course should be taken concurrently with EDSS 5680.

5720. Practicum II: Field Experience. 3 hours. Supervised experience in counseling in schools, colleges or agencies. Prerequisite(s): EDSS 5690. Students who take Practicum II during the summer must enroll for both terms. The second-term enrollment will be in EDSS 5900.

5721. Practicum III: Field Experience. 3 hours. Supervised experience in counseling in schools, colleges or agencies. Prerequisite(s): EDSS 5720.

5730. Appraisal in Adult Counseling. 3 hours. Study of appraisal concepts and various instruments, methods and techniques that may be used to assess the strengths, limitations and behavioral patterns of individual clients. Prerequisite(s): EDSS 5680 and 5710 and EDER 5210, or consent of department.

5740. Group Counseling Theories and Procedures. 3 hours. Group dynamics and major approaches to group counseling with emphasis on how to start a group counseling program, how to counsel effectively with groups and how to evaluate results. Development of skills of group membership, leadership and working with groups are stressed. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5750. College Student Development Theory. 3 hours. A study of student development theory as it relates to students in higher education and student affairs practice. Prerequisite(s): EDSS 5680 or consent of department.

5760. Appraisal in Child and Adolescent Counseling. 3 hours. Study of appraisal concepts and various instruments, procedures, methods and techniques used to assess learning and behavioral patterns of children. Prerequisite(s): EDSS 5680 and 5710 and EDER 5210, or consent of department.

5770. Counseling in the Elementary School. 3 hours. Basic orientation to the role of elementary school counselor. Focus is on plans for achieving counseling, consulting, and coordinating objectives with emphasis on principles as well as methods. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5780. The Student in Higher Education. 3 hours. A focus on the nature and needs of the college student including older adolescent, young adults, and returning adults. Reviews of demographic data about diversity of college populations, the changing relationship of students to colleges, the nature of student communities and the diverse patterns of structure and function by which colleges individualize education and provide for student affairs practice. Prerequisite(s): EDSS 5680 or consent of department.

5790. Counseling the Culturally and Ethnically Different Client. 3 hours. Development of counseling skills and strategies based upon the special needs and characteristics of the culturally and ethnically different client. Prerequisite(s): EDSS 5680 and 5710, or consent of department.

5800. Studies in Education. 1-3 hours. Organized classes specifically designed to accommodate the needs of students and the demands of program development that are not met by the regular offerings. Short courses and workshops that concern themselves with specified topics, repeated only upon demand. May be repeated for credit.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students who are capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor and department chair.

5930. Research Problems in Lieu of Thesis. 3 hours. Research dealing with significant problems in the field of counseling.

6021. Advanced Practicum, in Counseling I. 3 hours. Supervised individual and family counseling with a wide range of clients and problems. Focus is on consistent implementation of a personal counseling style. Prerequisite(s): EDSS 5690, admission to doctoral program in counselor education and concurrent enrollment in EDSS 6651, or consent of department.

6022. Advanced Practicum in Counseling II. 3 hours. Supervised counseling with a wide range of clients. Focus is on implementation of an internally consistent, personal theory of counseling. Prerequisite(s): EDSS 6021 and concurrent enrollment in EDSS 6652.

6031-6032. Internship. 3 hours each. Supervised professional activities in counseling. Required of all doctoral candidates. Prerequisite(s): EDSS 6022 and 6652; EDSS 6031 is a prerequisite to 6032.

6060. Personal Growth Laboratory. 3 hours. A small group counseling experience designed to facilitate members' realistic assessment of strengths and weaknesses in the emotional, intellectual and physical dimensions. Goal setting and creation of workable courses of action are encouraged. Prerequisite(s): EDSS 5740 and consent of instructor.

6070. Practicum in Group Counseling. 3 hours. Intensive exploration of the dynamics of interpersonal relationships through supervised experience as the facilitator of counseling groups. Students will examine in depth their approach to group leadership in weekly seminar sessions. Prerequisite(s): EDSS 5690 and 5740, and consent of instructor.

6080. Seminar in Group Procedures and Group Counseling. 3 hours. A critical analysis of group counseling and various group approaches, such as interpersonal process and other modalities applicable to working with groups. The seminar group explores the underlying theory of various approaches, participates as a group in the experience and then critiques the experience. Prerequisite(s): EDSS 5740 and consent of instructor.

6090. Counselor Supervision. 3 hours. Critique of the literature in counselor supervision with discussion and didactic emphasis on the role of the counselor supervisor in the dynamics of supervisory relationships. Laboratory supervising a counseling practicum. Prerequisite(s): EDSS 5690, 6021 and 6651, and taken concurrently with EDSS 6022 and 6652.

6110. Seminar in Career Development. 3 hours. Analysis of the major theories of career development; relationship to major counseling movements, the psychology of career

development and human resource development in business and industry are emphasized. Prerequisite(s): EDSS 5470 or consent of instructor.

6130. Research in Counseling. 3 hours. Survey and analysis of existing research and research methodology in counseling. A review of the literature in selected areas is required. Major research reports are evaluated for methodological strengths and weaknesses. Prerequisite(s): EDER 6000 and 6010 and admission to doctoral program in counselor education, or consent of department.

6630. Advanced Play Therapy. 3 hours. Seminar approach to an analysis of the rationale for play therapy in counseling, and an in-depth study of basic theories of play therapy and the variables that affect the helping relationship. Focus also is upon the counselor's own unique contribution to the relationship and the emotional needs of children. Prerequisite(s): EDSS 5690 and 5700, or consent of instructor.

6651-6652. Advanced Theories of Counseling. 3 hours each. Study in depth of the major theories of counseling, including the philosophical and psychological assumptions that underlie them. Prerequisite(s): admission to doctoral program in counselor education or consent of instructor and concurrent enrollment in EDSS 6021-6022 or consent of department; EDSS 6651 is a prerequisite of 6652.

6680. Ethical, Legal and Professional Issues in Counseling. 3 hours. Focus on theoretical and research literature concerned with ethical, legal and professional issues relating to counseling, counselor education and counselor supervision. Prerequisite(s): EDSS 6651-6652.

6900-6910. Special Problems. 1-3 hours each. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs. Conferences with professors in the fields also are included. Problems must be approved in advance by instructor and department chair.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Higher Education, EDHE = 0550

5110. Foundations of Student Development Administration. 3 hours. Principles and techniques of administration applied to the student development subsystem of higher education institutions. Applications to both senior and community college institutions. Prerequisite(s): EDSS 5750 or consent of department.

5120. Student Development Programming Administration. 3 hours. Principles and techniques of creating, analyzing and administering student development programming to meet the needs of heterogeneous college student groups in the areas of academic, social, community and personal development in higher education. Applications to both senior and community college institutions. Prerequisite(s): EDHE 5110 and EDSS 5780, or consent of department.

- 5240. Instruction in the Community College.** 3 hours. Designed to assist faculty members in achieving mastery and competence in management of classroom instructional strategies and techniques in the community college.
- 5250. Programming for Conferences, Seminars, Workshops.** 3 hours. Examination of theory and practice for the development and operation of brief learning activities for education, training and development.
- 5270. The Administrative Structure of the Community College.** 3 hours. This course is designed to achieve mastery and competence regarding the basic concepts of the administrative structures, and their development and implementation in the junior/community colleges of America.
- 5710. Trends and Issues in Adult/Continuing Education.** 3 hours. An introduction to adult/continuing education that includes a review and analysis of its historical development, social context, current practice and problems, and research.
- 5900. Special Problems.** 1-3 hours. Open to graduate students who are capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor. Open only to resident students.
- 6030. Practicum, Field Problem or Internship.** 3-6 hours. Supervised professional activities in college teaching research or administration. Registration is on an individual basis.
- 6050. Teaching and Learning in Higher Education.** 3 hours. A study of major theories of teaching and learning with applications to postsecondary instruction. Includes an examination of the professorate with emphasis on conditions for admission and success.
- 6120. Seminar in Adult and Continuing Education.** 3 hours. A review and critique of research in adult and continuing education. Topics are selected by faculty and vary each semester.
- 6500. Essentials of Academic Publishing in Higher Education.** 3 hours. Deals extensively and intensively with major issues and problems affecting academic publishing. Topics treated include copyrights, book reviews, journal articles, policies and practices of professional journals, researching journals, publishing contacts and contracts, and book publishing.
- 6510. Perspectives on Higher Education.** 3 hours. This course covers historical, philosophical, socio-psychological and futuristic, theoretical methodologies for American higher education using contemporary research modalities.
- 6520. Research on Students in Higher Education.** 3 hours. This course links theories about college student development and research methodology on the study of college student outcomes. Specifically addressed are the conditions and kinds of effects that college attendance has on students. The course considers topics of interest to both practitioners and researchers.
- 6530. Research on Higher Education.** 3 hours. A critical review and analysis of the research literature on higher education and of designs used to conduct research in the field of higher education and on higher education in general.
- 6540. The Dissertation in Higher Education.** 3 hours. Designed to familiarize doctoral students with the various genres of acceptable qualitative and quantitative research in higher education. Emphasis is on research needed in higher education, the psychology and economics of dissertation research and the importance of publishing completed research. Differences between EdD and PhD dissertations are considered.
- 6550. Policy Studies in Higher Education.** 3 hours. Studies in the development, implementation and enforcement of policies by institutions of higher education, state higher education coordinating and governing boards and the federal government. Measurements of the impacts of policies on educational outcomes and institutional management also are examined.
- 6560. Comparative International Higher Education Systems.** 3 hours. Survey of the history and organizational concepts, approaches and educational philosophies utilized by selected nations around the world in the development of higher education systems. Attention also is given to the professional literature and research methods used in comparative higher education studies.
- 6570. The Professorate in Higher Education.** 3 hours. Investigates all aspects of the professorate — teaching, research and service — including promotion/tenure and merit pay. Students participate under supervision in designing, delivering and evaluating instruction via micro-teaching.
- 6640. The Adult Learner and Adult Learning.** 3 hours. A review and analysis with applications to practice of theory and research on adult learners and adult learning.
- 6660. Seminar in College Student Personnel Work.** 3 hours. Intensive study on an individual and group basis of special issues and problems in the organization, practices and administration of college student personnel services.
- 6700. Role of Higher Education in a Democracy.** 3 hours. An examination of the roles, goals, purposes and problems of a diverse pluralistic system of higher education in the unique context of American democracy.
- 6710. General Administration in Higher Education.** 3 hours. An examination of the theoretical principles of organizational behavior, leadership and institutional culture applied to a functional examination of administrative roles in community and senior colleges.
- 6720. Academic Administration in Higher Education.** 3 hours. The functions of administrators of academic programs in institutions of higher education. Emphasis given to philosophy, objectives and curriculum development in academic programs. Both junior and senior college problems are considered.
- 6730. Organization and Administration of Student Development Services.** 3 hours. Principles and techniques of organization and administration applied to the student development subsystem of higher education institutions. Designed to provide knowledge and proficiency in theories of organization and administration applied to the institutional level of the chief student development administrator, the effects of organizations on individual and group behavior, and specific administrative skills applied to the student development subsystem and to the programming needs of the institution. Applications to chief student development officers at both senior and community college institutions.

6740. Planning and Analytical Systems in Higher Education. 3 hours. Systems theory; goals and objectives; management information systems; simulation models and planning, programming, budgeting systems (PPBS); evaluation of educational outcomes; and the institutional research function in higher education.

6750. Personnel Administration in Higher Education. 3 hours. Principles and techniques in the application of personnel administration in higher education.

6760. Higher Education Finance. 3 hours. Examines the sources of revenues, types of expenditures, budgeting and accounting practices, tuition and financial aid policies, cost containment strategies, and the effects of the economy and state and federal funding on the financing of both private and public institutions of higher education.

6780. Educational Resource Development in Higher Education. 3 hours. Designed to provide the administrator in higher education with knowledge and skills in educational resource development. Specific areas to be studied are identification and translation of institutional objectives into support programs and goals, program organization and management, and traditional and non-traditional sources of educational income.

6790. Legal Aspects of Higher Education. 3 hours. Legal aspects and issues affecting institutions of higher learning and their administrations, faculties and students. Analyses of decisions rendered by the federal and state courts concerning procedural and substantive due process, civil rights, and the operation and function of higher education. (Same as BLAW 6790.)

6850. Studies in Higher/Adult Education. 1-3 hours. Short courses and/or workshops organized on a limited-offering basis, to be repeated only upon demand. May be repeated for credit.

6900-6910. Special Problems. 1-3 hours each. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs. Conferences with professors in the fields also are included.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Human Development and Family Studies, EDHD = 0522

5030. Practicum, Field Experience or Internship. 3, 6 or 9 hours each. (0;0;3,6,9) Supervised professional activities in human development and family studies. Registration is on an individual basis and student must have prior consent of professor.

5130. Current Problems in Administration of Programs for Young Children. 3 hours. Identification of problems and issues related to early childhood programs and their administration. Includes evaluation, leadership and advocacy strategies.

5200. Child Development Theory and Research. 3 hours. Findings and implications of current theory and research in emotional, social, cognitive, language, physical and perceptual development from birth through older childhood.

5230. Human Development Across the Life Span. 3 hours. The processes and stages that individuals undergo as they progress from birth through old age and death are studied from a human ecological perspective. Developmental tasks and concepts are explored.

5300. Parent-Child Interaction. 3 hours. Study of parent development and relationships with children throughout the family life cycle. Focus on empirical studies related to dynamics of parent-child interaction. Impact of parenting upon development and socialization of children.

5330. Parent Education. 3 hours. Empirical knowledge and skills required for education and leadership of parents. Overview of major theoretical and programmatic approaches to parent education. Application of models and techniques.

5400. Family Relationships. 3 hours. An analysis of the influences that affect modern family life; consideration of variant family forms.

5430. Cognitive and Language Development. 3 hours. A comprehensive development sequence of cognitive development and language acquisition from birth through adulthood, focusing on theories and research related to cognitive, perceptual, and language development, as well as relationships between language and thought. Prerequisite(s): EDHD 5200 or 5230 or undergraduate child/human development course.

5440. Social-Emotional Development. 3 hours. A comprehensive developmental sequence of social and emotional development from birth through adulthood. Course content focuses on both theory and research pertaining to the development of emotions and temperament as well as intra- and interpersonal issues of social development.

5530. Family Problems in Urban Living. 3 hours. An examination of the implications of urban problems and resources for personal and family life.

5800. Studies in Child Development and Family Relations. 1-3 hours. Organized classes designed to accommodate the needs of students and demands of program development not met by regular offerings. Short courses and workshops on specific topics are offered on a limited basis, to be repeated only upon demand. May be repeated for credit.

5900-5910. Special Problems. 1-3 hours each. Open to graduate students capable of developing a problem independently. Problems chosen by the student and approved in advance by the instructor.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Counselor Education

see Counseling, Development and Higher Education

Criminal Justice

Criminal Justice, CJUS = 0420

4200. Criminal Procedure. 3 hours. An examination of the constitutional and statutory bases and judicial interpretations of the procedures governing the administration of criminal justice. Prerequisite(s): CJUS 2100 and CJUS 3201 or equivalents.

4250. Law and Social Problems. 3 hours. This course examines the role of law in attempts to address and solve social problems. Prerequisite(s): CJUS 2100 and CJUS 3201 or equivalents.

4350. Seminar on Violence. 3 hours. An analysis of the incidence, patterns and causes of criminal violence; the characteristics of particular crimes (e.g., murder, robbery, rape, domestic abuse, terrorism); and society's reaction to such violence. Prerequisite(s): CJUS 2100 or equivalent.

4360. Criminal Investigation. 3 hours. The study of methods of obtaining and reporting information from the crime scene, victims, witnesses and suspects. Specific attention is given to investigation of index crimes (homicide, rape, robbery, assault, burglary, arson, motor vehicle theft and larceny). Prerequisite(s): CJUS 2100, CJUS 3201 and CJUS 3300 or equivalents.

4460. Community Corrections. 3 hours. This course examines the concept of community corrections from various perspectives. It also examines contemporary practices and trends in probation, parole, and other forms of community corrections. Prerequisite(s): CJUS 2100 or equivalent.

4500. Administration of Criminal Justice Agencies. 3 hours. The study of principles and practices of administration and their application to criminal justice agencies. Special focus on the relationship of theoretical administrative concepts and practical criminal justice problems. Prerequisite(s): CJUS 2100 and 9 hours of upper-division criminal justice courses or equivalents.

4650. Victimology. 3 hours. Exploration of the scope of victim issues in American society. Review of the programs and services provided victims of crime. The expanding roles of the courts, police, battered women shelters, victim/witness assistance programs, crisis intervention units and legislation are highlighted. Prerequisite(s): CJUS 2100 or equivalent.

4660. Offender Behavior. 3 hours. This course examines the variables that correlate with or lead to criminal behavior, such as the family, schools, personality, economic forces and cultural values. It uses psycho-social explanations to illuminate the factors that cause crime and criminality and suggests solutions. Prerequisite(s): CJUS 2100 and 3600, SOCI 4870 or equivalents.

4700. Research Methods in Criminal Justice. 3 hours. Examines research methodology in criminal justice. Special emphasis is placed on methods and techniques for conducting research in criminal justice, including the relationship between theory and research, the nature of causation, research designs and techniques, conceptualization and measurement, operationalization, sampling, and ethical issues. Prerequisite(s): minimum of 18 hours in criminal justice, with 12 hours from the criminal justice core.

4850. Internship in Criminal Justice. 1-6 hours. Each student is placed as a participant observer in a criminal justice agency for a minimum of 120 hours to provide an opportunity to apply academic training to practical situations. Prerequisite(s): CJUS 2100 or equivalent and 12 additional hours of criminal justice courses and consent of the director of criminal justice program.

4860. Studies in Criminal Justice. 1-3 hours. Individual investigation of selected issues regarding criminal justice. Prerequisite(s): CJUS 2100 or equivalent and 12 additional hours of criminal justice courses and consent of the director of the criminal justice program. May be repeated for credit as topics vary.

4870. Topics in Criminal Justice. 3 hours. Seminar class devoted to an investigation, analysis and discussion of significant problems in contemporary criminal justice. May be repeated for credit as topics vary. Prerequisite(s): CJUS 2100 or equivalent and 6 additional hours of criminal justice courses.

4901. Senior Seminar: Criminal Justice and Public Policy. 3 hours. The examination of the problems and issues involved in forming and implementing criminal justice policy in the United States. This course represents the final capstone experience for the student. Prerequisite(s): senior standing and at least 18 hours of criminal justice, with 12 hours from the criminal justice core.

5000. Criminal Justice Policy. 3 hours. Methods of policy formulation, implementation, and analysis in the criminal justice setting. Selected topics developed for practical research and evaluation. (Same as PADM 5000.)

5200. Legal Aspects of the Criminal Justice System. 3 hours. An examination of the legal process and procedures of the criminal justice system, including investigation, arrest, prosecution, and sentencing.

5250. Administrative Law for Justice Professionals. 3 hours. Discussion of the legal principles and doctrines applicable to the state and federal criminal justice agencies, including ethical and liability issues confronting justice professionals.

5350. Seminar in Contemporary Policing. 3 hours. Survey of classical and recent literature in policing. Studies of the trends, issues and reform movements currently prominent in the field of policing.

5450. Punishment, Discipline and Social Policy. 3 hours. Theoretical and practical bases of correctional goals and strategies focusing on offenders, the justice system and the public. The impact of various policies on the justice process and society is stressed.

5460. Correctional Programs. 3 hours. Examines the content and purposes of educational, religious, cultural, psychiatric and treatment programming for adult and juvenile offenders in institutions and the community. Methods of handling special needs offenders receive attention, as does the efficacy of such programs in controlling recidivism.

5470. Seminar on Juvenile Delinquency. 3 hours. Problems of definition and measurement, etiological theories, processing of delinquents, and treatment and prevention. (Same as SOCI 5470.)

5500. Seminar in Criminal Justice Administration.

3 hours. Critical application of selected analytical tools in administering justice agencies; studies of the application of human and financial resources, productivity, measurement and enhancement, and organization design, culture and change in the context of criminal justice agencies.

5600. Advanced Criminological Theory. 3 hours.

An examination of the major theoretical explanations of criminality, the distribution of crime, and the behavior of justice agencies. (Same as SOCI 5600.)

5620. Seminar in Victimology. 3 hours. The role of the victim in various types of crime, predators and treatment of trauma, and the treatment of victims by criminal justice agencies. Political impact of the victims' movement on the justice systems and the distribution of victims across demographic and behavioral groups. (Same as SOCI 5620.)

5700. Evaluation and Research Methodologies. 3 hours. Quantitative and qualitative methods of gathering and analyzing data on crime and the justice system, with special attention devoted to evaluation methods. (Same as SOWK 5890 – Topics in Evaluation and Research Methodologies.)

5800. Topics in Criminal Justice. 3 hours. Content varies as course covers specific issues of current interest and concern in criminal justice and criminology.

5850. Directed Studies. 3 hours. Individual research and writing on selected topics under faculty supervision.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Curriculum and Instruction

see Teacher Education and Administration

Dance

see Dance and Theatre Arts

Dance and Theatre Arts

Dance, DANC = 0125

4095. Stage Production II. 1 hour. (1;3) Advanced study of the principles and practices governing the presentation of stage productions. Students manage or serve as crew heads for front-of-house, backstage, and costume and makeup operations for theatrical productions. Opportunity to seek independent solutions to management or technical problems when qualified. One-hour weekly lecture plus at least 45 clock-hours per semester in a production laboratory. Prerequisite(s): 3 hours of DANC 1095, or the equivalent, or permission of the department. May be repeated for credit. (Same as THEA 4095.)

4400. Modern Dance Technique, Level IV. 3 hours. (1;3) A continuation of DANC 3400. For the highly accomplished modern dancer giving emphasis to pre-professional training. Introducing more complex work in contemporary styles. Prerequisite(s): placement through proficiency exam. May be repeated for credit.

4410. Ballet Technique, Level IV. 3 hours. (1;3) A continuation of DANC 3410. For the serious ballet dancer with emphasis on pre-professional preparation. Introducing more complex elements of petit allegro, grande allegro, classical and contemporary ballet repertory. Prerequisite(s): placement through proficiency exam. May be repeated for credit.

4610. Effort/Shape. 3 hours. Study of the expressive relationships of energy exertions and the body as it adapts to space. Exploration of how combinations of motion factors affect the visual, functional and expressive composition of movement. Prerequisite(s): junior standing. One year's previous movement training helpful but not necessary. (Same as THEA 4610.)

4620. Space Harmony. 3 hours. Study of harmonic spatial forms and the manner in which they materialize in movement. Explorations of these forms are developed from geometric shapes creating clarity in postures and gestures. Prerequisite(s): one year of movement study. (Same as THEA 4620.)

4650. Senior Project. 3 hours. (3;4) Individualized dance project with selected faculty member. Includes specialized study in, but not limited to, areas such as choreography, creative research, therapy, dance science, examination of pedagogical or administrative issues. Serves as the capstone course for the BA degree in dance.

4800. Studies in Dance. 1-3 hours.

5110. Critical Analysis of Professional Literature. 3 hours. Analysis and philosophical criticism of the literature in the student's major area and other related fields. Extensive reading assignments and discussion of published and unpublished research.

5200. Improvisation as a Basis for Choreography. 3 hours. A non-technical course dealing with advanced improvisational problems relating to gesture, body exploration, spatial and rhythmic exploration, group interaction and communication of time, space and motion.

5210. Principles of Dance Theatre. 3 hours. (3;2) Theoretical and creative aspects of choreography. Concepts relating to the development of creativity and artistic integrity in dance. The dual emphasis concerns large-group works and experimental forms. Prerequisite(s): DANC 1400, 2400 or 3400. Lecture and movement 3 hours per week plus a minimum of 60 clock hours in a movement laboratory.

5250. Philosophy and Criticism of Dance. 3 hours. In-depth examination and critical analysis of philosophical approaches and resultant aesthetics of performance and choreography through observation of dance performances and study of aesthetic theories and criticism.

5300. Kinesiology and Biomechanics of Dance Injuries. 3 hours. Factors of stress, force, motion, equilibrium and leverage affecting incidence and cause of injuries noted in dancers. Prevention, immediate care and rehabilitation of common injuries seen in the studio. Prerequisite(s): concurrent enrollment in DANC 1400, 1410, 2400 or 2410. Lecture and movement 3 hours weekly plus a minimum of 60 clock hours in a movement laboratory.

5400. Survey of Performing Arts Management. 3 hours. A survey course designed to point out the needs, values and roles of the managerial position in a performing arts organization, with special reference to the administration of professional dance.

5800. Studies in Dance. 1-3 hours. Organized classes specifically designed to accommodate the needs of students and the demands of program development that are not met by regular offerings. Short courses and workshops on specific topics, on a limited-offering basis, to be repeated only upon demand. May be repeated for credit.

5900-5910. Special Problems. 1-3 hours each. Problems must be approved by department chair.

Theatre Arts, THEA = 0126

4000. The Modern American Musical Theatre. 3 hours. (3;2) History and evolution of musical theatre in the 20th century. Practical experience in auditioning, rehearsing and performing. Prerequisite(s): consent of department.

4095. Stage Production II. 1 hour. (1;3) Advanced study of the principles and practices governing the presentation of stage productions. Students manage or serve as crew heads for front-of-house, backstage, and costume and makeup operations for theatrical productions. Opportunity to seek independent solutions to management or technical problems when qualified. One-hour weekly lecture plus at least 45 clock-hours per semester in a production laboratory. Prerequisite(s): 3 hours of THEA 1095, or the equivalent, or permission of department. May be repeated for credit. (Same as DANC 4095.)

4110. Scene Painting for the Theatre. 3 hours. (3;2) Principles and practices of scene painting. Use of the tools, materials and techniques of the modern scenic artist. Prerequisite(s): THEA 3170 or consent of department.

4140. Performance IV. 3 hours. (3;2) Study and performance of dramatic verse in plays, films and television productions. Emphasis on Shakespearean roles. Acting exercises and scene work. Written examination on a selected bibliography about acting. Prerequisite(s): THEA 3140, 3340, 4250, 4300 or consent of department.

4240. Creative Dramatics. 3 hours. (3;2) Use of theatre arts to develop creativity, semiotic exchanges and self-realization. Emphasis on independent theatrical productions and group improvisations. Principles and techniques of theatre arts management.

4250. World Theatre to 1700. 3 hours. Plays, playwrights, actors and other theatre artists in relation to world cultures. Theatre architecture and the use of environmental spaces for theatrical performances. Emphasis on theory and criticism of dramatic art.

4290. Musical Theatre Direction and Management. 3 hours. (3;2) Theories of musical play selection and theatre management. Advanced training in musical play production, directing, theatre organization and creative dramatics as they apply to musical theatre.

4300. World Theatre After 1700. 3 hours. Plays, playwrights, actors and other theatre artists in relation to world cultures. Theatre architecture and the use of environmental spaces for theatrical performances. Emphasis on theory and criticism of dramatic art.

4310. Acting for Film and Television. 3 hours. (3;2) A study of the role of the actor in contemporary film and television productions. Methods and styles of acting in relation to the script, the environment and off-camera personnel. Viewing and discussion of performances in current film/television productions. Prerequisite(s): 75 credit hours of university or college work and 27 credit hours in either THEA or RTVF, including RTVF 2200 or 2350, THEA 2350, or consent of both departments. (Same as RTVF 4310.)

4350. Senior Theatre Arts Colloquium. 3 hours. (3;2) The capstone course in theatre arts. Intensive study of aesthetic principles, history, criticism, terminology and techniques in all areas of theatre. Emphasis on problem-solving, exchange of ideas among various theatre artists and technicians, summary of the students' four-year matriculation, preparation for the senior comprehensive examination in theatre arts and the senior artistic presentation. Class meets regularly as a seminar and also at frequent laboratory events. Prerequisite(s): 90 hours of college-level courses, 30 hours of theatre arts courses or consent of department.

4360. Advanced Repertory Theatre. 3 hours. (2;3) Principles and practices governing the management of a professionally oriented summer repertory theatre program. Prerequisite(s): THEA 2360, upper-division or graduate status, or consent of department. Students may enroll four times for credit, but no more than 6 semester hours may be used toward a major in theatre arts or a teaching field in theatre arts; no more than 3 semester hours may be used toward a minor in theatre arts. May not be substituted for THEA 1043 or 1046.

4460. Play and Film Scriptwriting. 3 hours. Dramatic theory, structure, characterization, dialogue and technical media as used by the playwright or the film scriptwriter in both dramatic and comedic works. Study of the scriptwriting process from proposal to production. Marketing of scripts. Practice in playwrighting and film scriptwriting. Prerequisite(s): consent of department. May be repeated twice for credit, but no more than 3 hours may be counted toward a major in theatre arts. (Same as RTVF 4460.)

4500. Topics in Dance and Theatre Arts. 3 hours. Representative topics include theatrical unions, dance and theatre criticism, music for non-musical productions, dialects for stage and film performances, and playwrighting for non-theatrical media. May be repeated for credit as topics vary.

4610. Effort/Shape. 3 hours. Study of the expressive relationships of energy exertions and the body as it adapts to space. Exploration of how combinations of motion factors affect the visual, functional and expressive composition of movement. Prerequisite(s): junior standing. One year of previous movement training helpful but not necessary. (Same as DANC 4610.)

4620. Space Harmony. 3 hours. Study of harmonic spatial forms and the manner in which they materialize in movement. Explorations of these forms are developed from geometric shapes creating clarity in postures and gestures. Prerequisite(s): one year of movement study. (Same as DANC 4620.)

4920. Cooperative Education in Theatre Arts. 3 hours. Supervised work in a job directly related to the student's major, professional field of study or career objective. Prerequisite(s): 18 advanced hours of theatre arts and consent of department; student must meet the employer's requirements. May be repeated for credit.

5000. Research Methods in Dance and Theatre Arts. 3 hours. Historical, investigative and empirical methods of research for dance and theatre arts scholars or artists. Quantitative analysis. Survey of dramatic and critical literature. Required of all majors in theatre arts the first fall semester of their graduate enrollment.

5260. Asian Theatre. 3 hours. Plays, playwrights, actors and other theatre artists in relation to the cultures of Japan, China, Indonesia, Southeast Asia and India. Theatre architecture and the use of environmental spaces for theatrical performances. Emphasis on theory and criticism of dramatic art.

5300. World Theatre to 1750. 3 hours. Plays, playwrights, actors and other dramatic artists in relation to world cultures. Theatre architecture. Emphasis on the relationship between premodern theories and criticism, and the theories and criticism of the 20th century.

5310. World Theatre After 1750. 3 hours. Plays, playwrights, actors and other dramatic artists in relation to specific cultures. Theatre architecture. Emphasis on 20th-century theories and criticism as they developed from earlier historical periods.

5320. American Theatre. 3 hours. The history and technical development of the theatre in America.

5330. Play Analysis for Design and Production. 3 hours. (3;2) Independent planning and production of plays in various styles and modes. Special problems in directing. Prerequisite(s): 6 advanced undergraduate hours of directing or consent of the department.

5340. Contemporary Theatre Criticism. 3 hours. Experimental and new trends in playwriting, production and criticism.

5350. Theatre Management. 3 hours. Design, organization and administration of commercial, regional, community, educational and touring theatre programs or companies. Management of fine arts centers.

5360. Principles of Stage Design. 3 hours. (3;2) History and theory of stage design with emphasis on problems of period and style. Independent production assignments.

5370. Principles of Stage Lighting. 3 hours. (3;2) History and theory of lighting stage presentations with emphasis on problems of period and style. Independent production assignments.

5380. Principles of Stage and Film Performance. 3 hours. (3;2) History, theory and practice of acting for theatre, film and television. Emphasis on problems of period and style. Independent production assignments.

5390. Theatre for Children, Youth and Teachers. 3 hours. (3;2) Improvisation, play production, playwriting and creative dramatics as tools for teaching a variety of subjects. Emphasis on preparing the classroom or laboratory performance.

5410. Principles of Theatrical Costume Design. 3 hours. (3;2) History, theory and practice of costume design for dance, drama and film. Selected problems in design concept and approach, including modern interpretive development, using written and artistic resources. Practical application with rendering and craft techniques developed.

5460. Studies in Playwriting. 3 hours. (3;2) Principles and practices governing the art of writing for dramatic presentations. The scriptwriting process from proposal to production. Study of historical and contemporary models. Marketing techniques. Prerequisite(s): consent of department. May be repeated twice for credit.

5500. Seminar in Dance and Theatre Arts. 3 hours. Rotating topics. Representative topics include dance and theatre arts criticism, playwriting for non-theatrical media, history of theatrical design and classroom performance for teachers. May be repeated for credit.

5750. Practicum in the Teaching of Theatre Arts. 3 hours. (3;2) Training in the teaching of dance and theatre arts. Under the supervision of a faculty member the student prepares and presents instructional units, conducts class and laboratory activities, practices interscholastic competition and handles administrative matters peculiar to theatre arts. No more than 3 hours may be applied to a master's degree. Duties performed for a teaching or technical fellowship or assistantship may not earn credit for, or be part of, this course.

5900-5910. Special Problems. 1-3 hours each. Problems must be approved by department chair.

5920-5930. Research Problems in Lieu of Thesis. 1-3 hours each.

5950. Master's Thesis. 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

Driver Education

see Kinesiology, Health Promotion and Recreation

Early Childhood

see Teacher Education and Administration

Earth Science

see Geography

Economics

Economics, ECON = 0128

4020. Money and Financial Institutions. 3 hours. Nature and functions of money; modern banking institutions and central banks; credit control and monetary stabilization. Prerequisite(s): ECON 1100-1110.