Course Descriptions Index

Accounting (ACCT)

See School of Accountancy, pages 143-146

ACCT 1050 Accounting Essentials 3
Overview of accounting concepts, with special emphasis on practical applications. Taught only as a special extension course as requested. DE

ACCT 1550 Accounting Software for Small Business Applications 3
Instruction in the use of small business accounting software. Prerequisite: ACCT 1050 or equivalent. DE

ACCT 2010 Survey of Accounting I 3
Survey of uses of accounting information by investors and creditors for decision making. Emphasis on basic accounting principles used to prepare, analyze, and interpret financial statements. Prerequisites: STAT 1040 or MATH 1030 or 1050 (MATH 1050 or equivalent is required for Huntsman School of Business majors); and GPA of 2.5 or higher. (F,Sp,Su) DE

ACCT 2020 Survey of Accounting II 3
Survey of uses of accounting information by managers for decision making, including planning, budgeting, and controlling operations. Emphasizes accumulation, analysis, and control of product and service costs. Prerequisite: ACCT 2010. (F,Sp,Su) DE

ACCT 3110 Intermediate Financial Accounting and Reporting I 3
Study of accounting principles, theory, and practice relating to financial reporting of assets. Prerequisites: Cumulative GPA of 3.0 or higher; grade of *B* or better in ACCT 2010; ACCT 2020; admittance to a USU major; and completion of at least 40 credits. (F,Sp,Su)

ACCT 3120 Intermediate Financial Accounting and Reporting II 3
Study of accounting principles, theory, and practice relating to liabilities, equities, and other contemporary issues. Prerequisite: ACCT 3110; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp,Su)

ACCT 3310 Strategic Cost Management 3
Contemporary theory and applications in the accumulation, analysis, and interpretation of accounting information for internal decision-making and control. Prerequisites: Cumulative GPA of 3.0 or higher; grade of *B* or better in ACCT 2010; ACCT 2020; admittance to a USU major; and completion of at least 40 credits. (F,Sp,Su) DE

ACCT 3410 Income Taxation I 3
Emphasis on Federal income taxation of individiuals. Introduction to tax research methods and taxation of corporations and partnerships. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp,Su) DE

ACCT 4200 Advanced Accounting 3
Study of accounting principles and theory relating to business combinations, nonprofit organizations, and governmental accounting. Prerequisites: ACCT 3120; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

ACCT 4410 Income Taxation II 3
Federal income taxation of partnerships, corporations, S-corporations, estates and trusts, and gifts. Prerequisites: ACCT 3410; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

ACCT 4500 Accounting Information Systems 3
Theoretical concepts underlying the accounting system's computerized support of business processes. Topics include accounting systems development, controls, security, and audit. Prerequisites: ACCT 3110; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

ACCT 4510 Auditing Principles and Techniques 3
Fundamental principles and techniques of auditing and reporting of audits presented in the context of the audit logic sequence. Integrative applications emphasizing audits of organizational resources, processes, and systems. Also addresses ethics, legal environment, auditing standards, and fraud. Prerequisites: ACCT 3110; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits (F,Sp)

ACCT 4900 Independent Research and Readings 1-3®
Selected reading and research individually assigned, handled, and directed. Problems of mutual interest to students and the instructor are investigated and reported. Prerequisite: Departmental permission. (F,Sp,Su)

ACCT 4950 Senior Honors Thesis/Project 3
Creative project that will then be written up, and presented, as a Senior Thesis as required for an Honors Plan. (Sp)

ACCT 5480 Case Studies in Taxation 3
(dual listing 6480)
Contemporary case studies in taxation researched, analyzed, documented, and communicated in a team setting. Prerequisite: Permission of instructor. (F)

ACCT 6010 Financial and Managerial Accounting 3
Introduction to financial and managerial accounting at the graduate level. Prerequisite: Admission to a Huntsman School of Business graduate program. (Su)

ACCT 6200 Advanced Topics in Financial Reporting 3
Study of accounting principles and theory related to advanced consolidations, multinational accounting, segment reporting, SEC reporting, partnerships, and financial distress. Prerequisites: ACCT 3120, 4200. (F,Su)

ACCT 6250 International Accounting and Financial Reporting 3
Explores international accounting issues, including the standard-setting process, the conceptual framework, the regulatory interface, international auditing standards, and a comparison of U.S. and international accounting standards. Prerequisite: ACCT 4200. (Sp)

ACCT 6310 Cost Management Systems to Support World-Class Operations 3
Examination of appropriate cost management systems and performance measures to support decision making in world-class business operations. Cases, projects, simulations, and field studies to reinforce concepts. Prerequisite: ACCT 3310. (Sp)

ACCT 6350 Accounting Strategies for Achieving Profit Goals 3
Action-oriented case studies to demonstrate management accounting techniques to achieve profit goals and business strategies in a variety of organizations. International accounting and ethical issues are addressed. Prerequisites: ACCT 2010 and 2020, or ACCT 6010. (F) DE

ACCT 6410 Tax Research and Procedures 3
Methods of researching tax problems, case studies in tax administration, civil procedures and penalties, professional responsibility, and tax ethics for the tax practitioner. Prerequisites: ACCT 3410 and 4410. (F,Su)

ACCT 6420 Taxation of Corporations and Shareholders 3
Concepts and principles governing the taxation of corporations and shareholders. Effect of taxes on corporation formation, capital structure, distributions, liquidations, and reorganizations. Prerequisites: ACCT 3410 and 4410. (Su)

ACCT 6440 Taxation of Partnerships, Estates, and Trusts 3
Concepts and principles governing the taxation of partnerships and partners and estates, trusts, and beneficiaries. Uses of partnerships and trusts in tax planning. Prerequisites: ACCT 3410 and 4410. (F)

ACCT 6460 Tax Topics 3
Topics of current interest to tax professionals. Prerequisites: ACCT 3410 and 4410. (Su)

ACCT 6480 Case Studies in Taxation 3
(dual listing 5480)
Contemporary case studies in taxation researched, analyzed, documented, and communicated in a team setting. Prerequisite: Permission of instructor. (F)

ACCT 6500 Advanced Accounting Information Systems 3
Study of contemporary issues in accounting information systems, including emerging information technologies for supporting enterprise decision making. Prerequisite: ACCT 4500. (Sp) [DE]

ACCT 6510 Financial Auditing 3
Application of generally accepted auditing standards to accounting systems. Some study of auditing theory and current issues, and an introduction to statistical auditing. Prerequisite: ACCT 4510. (F,Sp)

ACCT 6540 Forensic Accounting 3
Study of forensic accounting. Topics covered include types of fraud, recognition of red flags, and fraud investigation techniques. Also includes practice with computer-aided fraud detection, interrogation techniques, and case studies. (F)

ACCT 6600 Information Systems Auditing and Control 3
Study of information systems auditing methodologies, including risk assessment, systems controls, and the use of computer-assisted audit techniques. (F)

ACCT 6610 Accounting Theory and Research 3
Analytical approach to understanding the financial reporting environment. Integration of accounting theory and practical research methodology in the resolution of financial reporting problems. Prerequisite: ACCT 3120 (may be taken concurrently). (Sp,Su) [DE]

ACCT 6800 Accounting Communications and Professional Conduct 3
Study of written and oral communication skills appropriate for the accounting profession. Covers interpersonal skills and professional conduct, including ethical conduct, in various business settings. (Sp)

ACCT 6900 Independent Reading and Research 1-3®
Independent work in accounting areas: theory, auditing, taxation, and other related areas. Prerequisite: Departmental permission. (F,Sp,Su)

ACCT 6960 Professional Paper 1-3
A paper of professional quality prepared by the student. Designed to demonstrate the ability to complete a major business-related project and to effectively present the results. Prerequisite: Departmental permission. (F,Sp,Su)

ACCT 6990 Continuing Graduate Advisement 1-3®
Continuing enrollment at the University required after completing coursework. Graded Pass/Fail *only*. Prerequisite: Departmental permission. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Animal, Dairy and Veterinary Sciences (ADVS)

See Department of Animal, Dairy and Veterinary Sciences, pages 156-165

ADVS 1010 Artificial Insemination and Reproduction 2
Principles of reproduction, artificial insemination, and handling of semen. Anatomy and physiology of the bovine reproductive tract and reproductive management of the dairy farm. (F) [DE]

ADVS 1020 Dairy Cattle Nutrition and Feeding 3
Applied approach to nutrients, feeds, digestion, and nutrient utilization by dairy cattle. Dietary requirements and feeding practices. (F) [DE]

ADVS 1030 Lactation and Milking Systems 3
The mammary gland, udder health, and mastitis and its control. Milk quality and marketing. Principles involved in the function, design, and maintenance of dairy equipment. (Sp) [DE]

ADVS 1040 Records and Financial Aspects of Dairy Herd Operations 3
Record keeping systems, tax records, estate planning, DHI records, and computer record systems. Principles of credit and finance. Accessing loan sources. (Sp) [DE]

ADVS 1050 Dairy Genetics 3
Principles of dairy genetics, mating, pedigrees, and breeding. Purebred cattle type traits and classification. (F) [DE]

ADVS 1060 Applied Feeding and Management of Dairy Calves and Basic Construction of Facilities 3
Practical experience in feeding and management of dairy calves from birth to weaning. Students participate in actual calf-raising programs. Development of basic skills required for planning and building agricultural structures. (Sp) [DE]

ADVS 1100 Small Scale Animal Production 3
Fundamentals of raising domestic farm animals in a semi-rural, noncommercial setting. Considerations of feeding, breeding, housing, marketing, sanitation, general health care, and community zoning factors. For nonmajors. (Su)

ADVS 1110 Introduction to Animal Science 4
Influence and contributions of animal production and its commodities to society. Introductory scientific principles of animal science, livestock production systems, and contemporary issues. Introduction to professions and careers in animal agriculture and veterinary sciences. (F,Sp)

ADVS 1250 QI Applied Agricultural Computations 2
Development of understanding and proficiency in the application of basic mathematical skills, including algebra and geometry, to practical computational situations encountered in the agricultural sciences. (F,Sp) [DE]

ADVS 1500 Fundamentals of Equine Science and Management 2
Application of basic horse terminology, including parts of the horse, hoof, tack, and gaits. Examines evolution and history of the equine species, including explanation of breed types, colors, markings, and health issues. (F,Sp,Su)

ADVS 1600 Riding Fundamentals I 2
Lectures explore the theory necessary to be a successful rider. Includes information on use of natural and artificial aids with hunt seat and western-style riding. In riding labs, students develop their riding skills and understanding of riding theory. (F,Sp)

ADVS 1720 Dairy Cattle Evaluation and Judging 1
Evaluation of cattle based on exterior anatomical traits functional for improving longevity and milk production. Explanation of classification systems used by breed associations and the artificial insemination industry. Development of basic skills for preparing dairy cattle for show. (Sp) [DE]

ADVS 1910 Orientation to Animal and Dairy Science 0.5
Introduction to the Animal Science and Dairy Science programs, and to the opportunities in animal agriculture and related fields. (F)

ADVS 1920 Orientation to Bioveterinary Science 1
Introduction to the profession of veterinary medicine and related fields, and to the preparation required for veterinary medical careers. (F)

ADVS 2040 Introduction to Biotechnology 1
Introduces students to the emerging field of biotechnology and the impact this technology has on society. Also taught as BIOL 2040, NFS 2040, and PSC 2040. (Sp)

ADVS 2080 Beef Production Practices 2
Production practices in the handling, selection, and care of beef cattle. Demonstrations of equipment, facilities, and skills relevant to beef cattle production. Prerequisite: ADVS 1110 (may be taken concurrently) or permission of instructor. (Sp)

ADVS 2090 Sheep Production Practices 2
Production practices in the handling, selection, and care of sheep. Demonstrations of equipment, facilities, and skills relevant to sheep and wool production. Prerequisite: ADVS 1110 (may be taken concurrently) or permission of instructor. (Sp)

Course Descriptions

ADVS 2120 Swine Production Practices 2
Production practices in the selection, handling, and care of swine. Demonstrations of equipment, facilities, and skills relevant to swine industry. Prerequisite: ADVS 1110 (may be taken concurrently) or permission of instructor. (F)

ADVS 2130 Dairy Production Practices 3
Basic husbandry skills needed to carry out day-to-day operations on a dairy farm. Principles of dairy herd health, disease prevention, and treatment. Prerequisite: ADVS 1020 or 1110 (may be taken concurrently) or permission of instructor. (F) DE

ADVS 2190 Horse Production Practices 2
Production practices in the selection, care, and evaluation of horses. Survey of breeds of horses, their characteristics, and their uses, as well as equine behavior, health care, nutrition, reproduction, anatomy, and physiology. Prerequisite: ADVS 1110 (may be taken concurrently) or permission of instructor. (F)

ADVS 2200 Anatomy and Physiology of Animals 4
Normal structure and function studied systematically. Comparative livestock, poultry, pleasure and companion animals, laboratory animals, and humans. (Sp)

ADVS 2250 Cooperative Work Experience 1-12®
For students who require animal industry experience to prepare them for advanced curriculum in Animal, Dairy, or Bioveterinary Science. (F,Sp,Su) DE

ADVS 2300 Stable Management I 3
Students work at Equine Educational Center to gain valuable skills in management and further develop skills introduced in other equine courses. Students assist with feeding, care of sick or lame horses, horse handling, and facility upkeep. (F,Sp)

ADVS 2310 Stable Management II 3
Students work at Equine Educational Center to gain valuable skills in management and further develop skills introduced in other equine courses. Students assist with feeding, care of sick or lame horses, horse handling, and facility upkeep. Prerequisite: ADVS 2300. (F,Sp)

ADVS 2600 Riding Fundamentals II—Western 2
Lecture includes detailed discussion of upper-level riding skills necessary for western-style riding. Riding labs provide students with opportunity to develop more advanced riding skills. Prerequisite: ADVS 1600. (Sp)

ADVS 2650 Riding Fundamentals II—Hunter 2
Lecture includes detailed discussion of upper-level riding skills necessary for hunter-style riding. Riding labs provide students with opportunity to develop more advanced riding skills. Prerequisite: ADVS 1600. (F)

ADVS 2920 Orientation to Veterinary Medicine 0.5
Preparation of preveterinary students for successful application and admission to professional veterinary schools. Taught first half of spring semester. (Sp)

ADVS 3000 Animal Health and Hygiene 3
Introduction to basic principles of disease. Agents, mechanisms, and preventive measures for common diseases of farm animals will be emphasized. Prerequisite: ADVS 2200. (Sp)

ADVS 3020 Biotechnology in Agriculture 3
Broad view of biotechnology in agriculture. Contributions of advances in recombinant DNA technology, molecular genetics, and genetic engineering toward animal breeding and development of new medicines. Prerequisites: BIOL 1620, CHEM 2310. (F)

ADVS 3100 Equine Evaluation I 2**
Study of equine conformation, using multiple breeds. Development of skills in evaluating balance, leg structure, and muscling. Students organize and present oral reasons. (F)

ADVS 3150 Equine Evaluation II 2**
Study of equine performance horses, including western pleasure, hunter under saddle, reining, western riding, and jumping. Discussion of multiple breeds. Presentation of oral reasons. Prerequisite: ADVS 3100. (Sp)

ADVS 3200 DSC Ethical Issues in Genetic Engineering and Biotechnology 3
Critical evaluation of ethical issues of genetic engineering in biotechnology, including biological engineering and cloning of plants, animals, and humans. Presents basic science of genetic engineering and biotechnology. (Sp)

ADVS 3500 Principles of Animal Nutrition 3
Biochemical characterization and chemical analysis of feedstuffs for farm animals, with regard to carbohydrates, proteins, lipids, minerals, and vitamins. Catabolic/anabolic pathways associated with utilization of these nutrients with respect to production, general health, and nutritional disorders. Prerequisites: ADVS 2200; CHEM 1120, 1220, or 2320. (F)

ADVS 3510 QI Applied Animal Nutrition 3
Categorization of farm animal feeds into energy feeds, protein feeds, dry forages, silages and haylages, pasture and range plants, and vitamin-mineral supplements. Emphasis placed on practical diet formulation, including computerization and aspects of feed delivery and nutritional management. Prerequisite: ADVS 3500 or CHEM 3700. (Sp)

ADVS 3520 Equine Nutrition 1
Covers digestive tract, design, function, and associated problems, as well as nutrient requirements. Prerequisite: ADVS 3500. (Sp)

ADVS 3600 Equine Behavior and Training I 2
Students work with a young horse on ground manners and training. These skills include: haltering, leading, tying, round penning, sacking out, trailer loading, and introduction to saddling. Prerequisite: ADVS 2600. (F)

ADVS 3650 Live Animal and Carcass Evaluation 3
Judging, grading, and pricing of market animals and carcasses, with emphasis on comparative evaluation of live animals and carcasses. (F)

ADVS 3690 Equine Behavior and Training II 2
Students work with a young horse on ground manners and under saddle. Includes work on suppleness at the walk, jog (trot), lope (canter), and backing. Students learn to use soft cues in teaching the horse all aspects. Prerequisite: ADVS 3600. (Sp)

ADVS 3710 Advanced Livestock Judging 2
Advanced methods of selection and identification of superior animals for breeding stock. Emphasis on performance records, judging, grading, and oral reasons. (F,Sp)

ADVS 3900 Special Problems and Readings 1-3®
Students conduct short-term studies and/or literature review with critical analysis of individualized subject matter. Formal written reports required. Prerequisite: Permission of instructor. (F,Sp,Su)

ADVS 3910 Special Topics 1-5®
Topics of special interest to those who have needs not satisfied by courses currently offered. (F,Sp,Su) DE

ADVS 3920 Internship in Veterinary Medicine 1-3®
A directed and evaluated work experience with a veterinarian. For each credit, student must document at least 54 hours of work time. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

ADVS 4200 CI Physiology of Reproduction and Lactation 4
Introduction to principles of physiology as they relate to the reproductive and lactation processes in domestic mammals. Factors affecting reproductive and lactation performance and their applications in animal management. Prerequisites: ADVS 2200; CHEM 1120, 1220, or 2310. (Sp)

ADVS 4250 Internship in Animal Industry 1-12®
Directed and evaluated educational work experience with an animal production unit, related business, or government facility in cooperation with the Livestock Education Foundation. Prerequisite: Permission of instructor. (F,Sp,Su)

ADVS 4260 Internship in Animal Biotechnology Industry 2-12®
Directed and evaluated educational work experience with an animal biotechnology unit, or with a related business or government facility. Prerequisite: ADVS 5160 or 5240 or 5260 and permission of instructor. (F,Sp,Su)

ADVS 4270 Internship in Equine Industry 1-12®
Directed and evaluated work experience with an equine facility. Prerequisite: Permission of instructor. (F,Sp,Su)

ADVS 4300 Stable Management III 3
Students work at Equine Educational Center in a leadership role. Senior-level students work as mentors in all aspects of management. Allows students to develop leadership qualities and further develop their management skills. Graded Pass/Fail *only*. Prerequisite: ADVS 2310. (F,Sp)

ADVS 4310 Stable Management IV 3
Students work at Equine Educational Center in a leadership role. Senior-level students work as mentors in all aspects of management. Allows students to develop leadership qualities and further develop their management skills. Graded Pass/Fail *only*. Prerequisite: ADVS 4300. (F,Sp)

ADVS 4560 QI Principles of Animal Breeding 3
Genetic influences affecting animal performance and the application of selection principles, breeding systems, and methods of improvement to farm animals, including beef and dairy cattle, sheep, swine, and horses. Prerequisite: BIOL 1010 or 1620. (F)

ADVS 4800 Undergraduate Research or Creative Opportunity 1-6®
Research or creative activity pertaining to animals. May include management, production, medical, or basic science, with consideration of biological, chemical, or physical aspects, or instrument design. Prerequisite: Permission of instructor. (F,Sp,Su)

ADVS 4810 Thesis/Project Seminar 1
Oral presentation and discussion of Honors senior thesis/projects. Guest presentations focus on essential contrasts and similarities in "ways of knowing" among various academic specialties. (F,Sp)

ADVS 4900 Senior Thesis/Project 1-3
All Honors students are required to submit a senior thesis/project for graduation with an Honors degree. Thesis/project may be in any area of student's choice, prepared in cooperation with an advisor drawn from the faculty at large. (F,Sp,Su)

ADVS 4910 Preprofessional Orientation 0.5
Survey of the professional opportunities in the animal industries to enable graduating students to make the transition to careers and/or postgraduate study. Prerequisite: Junior standing. (F)

ADVS 4920 CI Undergraduate Seminar 2
Current developments in agricultural field selected by student. Each student is responsible for the research and oral presentation of a topic in the animal industries. Group investigations, preparations, and deliberations on issues in animal agriculture. Prerequisite: Senior standing. (F)

ADVS 4930 Undergraduate Seminar in Veterinary Medicine 2
Prepares preveterinary students for successful application and admission to professional veterinary school. Also includes discussion of current developments in the field of veterinary medicine. Students conduct research and give oral presentations on current topics in the field of professional veterinary medicine. Prerequisite: Junior standing. (F)

ADVS 5030 Sustainable Agricultural Production Systems with Animals 3
Study of various domestic animal production systems in relation to sustainable agriculture and integrated ranch and farm management strategies. Consideration of environmental factors and overall profitablity. Prerequisite: ADVS 1110. (F)

ADVS 5080 Beef Cattle Management 3
(dual listing 6080)
Managing the beef enterprise to yield optimum returns through integrating resource use and applying breeding, nutrition, reproduction, and animal health practices. Prerequisites: ADVS 2080; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 5090 Sheep Management and Wool Technology 4
(dual listing 6090)
Detailed study of the managerial considerations for range and farm flock operations. Examinations of wool, and review of wool clip handling and merchandising. Prerequisites: ADVS 2090; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 5120 Swine Management 3
(dual listing 6120)
Management decisions based on nutrition, breeding programs, herd health practices, herd records, and marketing opportunities. Prerequisites: ADVS 2120; ADVS 3510, 4200, 4560 (may be taken concurrently). (F)

ADVS 5130 Dairy Cattle Management 3
(dual listing 6130)
Capstone course drawing together concepts and applying them to a total dairy farm management program. Prerequisites: ADVS 2130; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 5160 Methods in Biotechnology: Cell Culture 3
Techniques and fundamental knowledge for culturing mammalian and insect cells. Students will learn maintenance, growing, genetic engineering of cells, cytotoxicity, hybridoma creation, cloning, etc. Extensive laboratory experience is provided. Also taught as BIOL 5160, NFS 5160, and PSC 5160. (Sp)

ADVS 5190 Horse Management 3
(dual listing 6190)
Management decisions in horse enterprises emphasizing business procedures, including merchandising, records, selection, uses, housing, facilities, nutrition, feeding, health care, and breeding. Emphasizes total management of horse enterprise, rather than husbandry. Prerequsites: ADVS 2190; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 5220 Endocrine Aspects of Nutrition 2
(dual listing 6220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as BIOL 5220/6220 and NFS 5220/6220. (Sp)

ADVS 5240 Methods in Biotechnology: Protein Purification Techniques 3
Reviews basic methods of protein purification, including scaled-up use of 100L fermenter, large-scale centrifugation, diafiltration, chromotography, and use of BioCAD. Prerequisite: CHEM 3700. Also taught as BIOL 5240, NFS 5240, and PSC 5240. (Sp)

ADVS 5260 Methods in Biotechnology: Molecular Cloning 3
Laboratory-oriented course designed to teach molecular biology techniques such as DNA cloning, genetic probes, polymerase chain reaction, and DNA sequencing. Prerequisite: CHEM 3700 or 5710; or BIOL 3060; or permission of instructor. Also taught as BIOL 5260, NFS 5260, and PSC 5260. (F)

ADVS 5280 Animal Molecular Biology 3
(dual listing 6280)
Laboratory-based course designed to present the theory and provide an in-depth laboratory experience in RNA detection, differential gene expression analysis, real-time RT-PCR, protein detection and purification, 2-D gel electrophoresis, and microarrays. Prerequisite: ADVS 5260 or permission of instructor. (Sp)

ADVS 5350 Introductory Pharmacology and
(dual listing 6350) Pharmacokinetics 3
Basic principles of pharmacology and pharmacokinetics providing basis for extrapolation of biological kinetics of foreign compounds to a wide variety of xenobiotics encountered in toxicology, biology, and research. Prerequisites: BIOL 5600, CHEM 3700. (Sp)

ADVS 5400 Environmental Toxicology 3
(dual listing 6400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as BIOL 5400/6400 and PUBH 5400/6400. (Sp)

Course Descriptions

ADVS 5500 Animal Nutrition Research Techniques 2
(dual listing 6500)
Laboratory intensive course in routine feedstuff evaluation and research techniques to evaluate nutritional and metabolic responses under in vivo, in situ, and in vitro conditions using feed, digesta, feces, urine, tissue, metabolites, and products. Students enrolled in ADVS 6500 will be required to conduct an animal study. Prerequisite: ADVS 3510. (F)

ADVS 5520 Grazing Livestock Nutrition
(dual listing 6520) and Management 2**
Principles of livestock nutrition and production applied to the grazing environment and the relationships of livestock and range management for optimizing values from both. Prerequisites: ADVS 3510; WILD 4000 (recommended). (Sp)

ADVS 5530 Nutritional Management of Farm Animals* 3
(dual listing 6530)
Nutritional management, problem solving, and feeding strategies as they influence performance of farm animals. Optimization of nutrition for various species and classes of domestic livestock. Prerequisite: ADVS 3510. (Sp)

ADVS 5690 Animal Histology 3
(dual listing 6690)
Microscopic anatomy and physiology of normal domestic animal's cells, tissues, organs, and system. Prerequisite: ADVS 2200 or permission of instructor. (F)

ADVS 5700 CI General Animal Pathobiology 3
(dual listing 6700)
Introduction to the principles of gross, microscopic, and physiological changes associated with diseases of domestic animals. Prerequisite: ADVS 5690/6690 or permission of instructor. (Sp)

ADVS 5750 Parasitology 4
Introduction to biology of parasitism. Discussion of representative examples of human and animal parasites. Emphasizes classification, life cycles, and clinical significance of medically important parasites. Laboratories concentrate on taxonomy and morphology of parasites. Prerequisite: BIOL 1620. This course is not currently being offered. For information about when it may be offered, contact the department.

ADVS 5820 Animal Cytogenetics and Gene Mapping 3**
(dual listing 6820)
Structure and properties of chromosomes, chromosome behavior during cell division, chromosomal influence on phenotype, and factors causing changes in chromosome structure and number. Gene markers and gene mapping, with emphasis on applications for livestock. Prerequisite: ADVS 4560 or BIOL 3060. (F)

ADVS 5860 Poisonous Range Plants
Affecting Livestock 3**
Poisonous plants of rangelands and their effects on grazing animals, especially livestock. Management practices to reduce or prevent poisoning. Also taught as WILD 5860. (Sp)

ADVS 6010 Animal Research Orientation 1
Orientation to graduate study and to research procedures and methods in the animal sciences, with introduction to the design and analysis of experiments, research ethics, and accessing research databases. For beginning graduate students. This course is not currently being offered. For information about when it may be offered, contact the department.

ADVS 6080 Beef Cattle Management 3
(dual listing 5080)
Managing the beef enterprise to yield optimum returns through integrating resource use and applying breeding, nutrition, reproduction, and animal health practices. Prerequisites: ADVS 2080; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 6090 Sheep Management and Wool Technology 4
(dual listing 5090)
Detailed study of the managerial considerations for range and farm flock operations. Examinations of wool, and review of wool clip handling and merchandising. Prerequisites: ADVS 2090; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 6120 Swine Management 3
(dual listing 5120)
Management decisions based on nutrition, breeding programs, herd health practices, herd records, and marketing opportunities. Prerequisites: ADVS 2120; ADVS 3510, 4200, 4560 (may be taken concurrently). (F)

ADVS 6130 Dairy Cattle Management 3
(dual listing 5130)
Capstone course drawing together concepts and applying them to a total dairy farm management program. Prerequisites: ADVS 2130; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 6190 Horse Management 3
(dual listing 5190)
Management decisions in horse enterprises emphasizing business procedures, including merchandising, records, selection, uses, housing, facilities, nutrition, feeding, health care, and breeding. Emphasizes total management of horse enterprise, rather than husbandry. Prerequsites: ADVS 2190; ADVS 3510, 4200, 4560 (may be taken concurrently). (Sp)

ADVS 6200 Physiology of Reproduction 3**
Study of processes of reproduction in mammals, including fertilization, embryonic development, reproductive endocrinology, and mechanisms of control. Prerequisites: ADVS 4200, CHEM 3700. (Sp)

ADVS 6210 Molecular Reproduction and
(dual listing 7210) Development* 3
Lecture-based course focusing on current knowledge of genes associated with gametogenesis, fertilization, nuclear reprogramming, and embryonic and fetal development. Prerequisite: ADVS 6200 or permission of instructor. (Sp)

ADVS 6220 Endocrine Aspects of Nutrition 2
(dual listing 5220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as BIOL 6220/5220 and NFS 6220/5220. (Sp)

ADVS 6280 Animal Molecular Biology 3
(dual listing 5280)
Laboratory-based course designed to present the theory and provide an in-depth laboratory experience in RNA detection, differential gene expression analysis, real-time RT-PCR, protein detection and purification, 2-D gel electrophoresis, and microarrays. Prerequisite: ADVS 5260 or permission of instructor. (Sp)

ADVS 6320 Animal Genomics and Proteomics* 3
(dual listing 7320)
Presents in-depth study of current animal genomic and proteomic technologies. Investigates the genetics of animal development, physiology, and disease through the application of techniques used to study genes and the modification of the animal genome. (F)

ADVS 6350 Introductory Pharmacology
(dual listing 5350) and Pharmacokinetics 3
Basic principles of pharmacology and pharmacokinetics providing basis for extrapolation of biological kinetics of foreign compounds to a wide variety of xenobiotics encountered in toxicology, biology, and research. Prerequisites: BIOL 5600, CHEM 3700. (Sp)

ADVS 6400 Environmental Toxicology 3
(dual listing 5400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as BIOL 6400/5400 and PUBH 6400/5400. (Sp)

ADVS 6500 Animal Nutrition Research Techniques 2
(dual listing 5500)
Laboratory intensive course in routine feedstuff evaluation and research techniques to evaluate nutritional and metabolic responses under in vivo, in situ, and in vitro conditions using feed, digesta, feces, urine, tissue, metabolites, and products. Students enrolled in ADVS 6500 will be required to conduct an animal study. Prerequisite: ADVS 3510. (F)

ADVS 6510 Rumen Physiology and Metabolism* 2
(dual listing 7510)
Discussion of some key aspects of physiology and metabolism of the ruminant digestive tract, with emphasis on the rumen. Topics include anatomy and function; motility; metabolism of protein, carbohydrates, and lipids; rumen microbiology; and common digestive disorders. Prerequisite: ADVS 3510. (Sp)

ADVS 6520 Grazing Livestock Nutrition
(dual listing 5520) and Management 2**
Principles of livestock nutrition and production applied to the grazing environment and the relationships of livestock and range management for optimizing values from both. Prerequisites: ADVS 3510; WILD 4000 (recommended). (Sp)

ADVS 6530 Nutritional Management of Farm Animals* 3
(dual listing 5530)
Nutritional management, problem solving, and feeding strategies as they influence performance of farm animals. Optimization of nutrition for various species and classes of domestic livestock. Prerequisite: ADVS 3510. (Sp)

ADVS 6540 Animal Energetics and Nutrient
(dual listing 7540) Metabolism 3**
Techniques and procedures in measurement of heat production; factors affecting heat production; efficiency of energy utilization in body processes such as work, growth, and synthesis of fats, proteins, and carbohydrates; and the energetic costs of nutrient interconversion and turnover. Prerequisites: ADVS 6510/7510; CHEM 5700, 5710. (Sp)

ADVS 6550 Protein Metabolism and Utilization 3**
(dual listing 7550)
Processes involved in the digestion, synthesis, and degradation of protein in the rumen, with special emphasis on protein-energy relationships in the rumen and whole animal. Discussion of protein requirements and efficiency of protein utilization. Prerequisite: ADVS 6510/7510. (F)

ADVS 6560 Mineral and Vitamin Metabolism* 3
(dual listing 7560)
Principal roles of minerals and vitamins in nutrient metabolism as they apply to animal nutrition. Prerequisite: ADVS 6510/7510. (F)

ADVS 6600 Principles of Toxicology 3**
(dual listing 7600)
Mechanisms of action and effects of toxicants on living organisms. Prerequisite: ADVS 5350/6350. (F)

ADVS 6690 Animal Histology 3
(dual listing 5690)
Microscopic anatomy and physiology of normal domestic animal's cells, tissues, organs, and system. Prerequisite: ADVS 2200 or permission of instructor. (F)

ADVS 6700 General Animal Pathobiology 3
(dual listing 5700)
Introduction to the principles of gross, microscopic, and physiological changes associated with diseases of domestic animals. Prerequisite: ADVS 6690/5690 or permission of instructor. (Sp)

ADVS 6800 Graduate Student Seminar 1
Seminars on topics of interest in Animal, Dairy and Veterinary Sciences. (F,Sp)

ADVS 6810 Seminar in Toxicology 1®
Graduate seminar in toxicology and related topics. (Sp)

ADVS 6820 Animal Cytogenetics and Gene Mapping 3**
(dual listing 5820)
Structure and properties of chromosomes, chromosome behavior during cell division, chromosomal influence on phenotype, and factors causing changes in chromosome structure and number. Gene markers and gene mapping, with emphasis on applications for livestock. Prerequisite: ADVS 4560 or BIOL 3060. (F)

ADVS 6890 Mechanisms of Animal Disease 3
(dual listing 7890)
Discussion course dealing with biochemical and microbial mechanisms in disease processes, including cellular reaction to injury, host-viral interactions, and host-toxin interactions. Students enrolled in ADVS 7890 will be required to prepare a USDA/NIH grant application. This course is not currently being offered. For information about when it may be offered, contact the department.

ADVS 6900 Special Problems 1-3®
Readings, discussions, lectures, literature reviews, and research problems in animal, dairy, and bioveterinary sciences. Prerequisite: Consent of instructor and department. (F,Sp,Su) DE

ADVS 6910 Readings and Conference in
Pharmacology and Toxicology 1-3®
Independent readings and conferences in the area of pharmacology and toxicology with particular emphasis on current literature. Prerequisite: ADVS 6350/5350. (F)

ADVS 6970 Research and Thesis 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ADVS 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

ADVS 7210 Molecular Reproduction and
(dual listing 6210) Development * 3
Lecture-based course focusing on current knowledge of genes associated with gametogenesis, fertilization, nuclear reprogramming, and embryonic and fetal development. Prerequisite: ADVS 6200 or permission of instructor. (Sp)

ADVS 7320 Animal Genomics and Proteomics* 3
(dual listing 6320)
Presents in-depth study of current animal genomic and proteomic technologies. Investigates the genetics of animal development, physiology, and disease through the application of techniques used to study genes and the modification of the animal genome. (F)

ADVS 7510 Rumen Physiology and Metabolism* 2
(dual listing 6510)
Discussion of some key aspects of physiology and metabolism of the ruminant digestive tract, with emphasis on the rumen. Topics include anatomy and function; motility; metabolism of protein, carbohydrates, and lipids; rumen microbiology; and common digestive disorders. Prerequisite: ADVS 3510. (Sp)

ADVS 7540 Animal Energetics and
(dual listing 6540) Nutrient Metabolism 3**
Techniques and procedures in measurement of heat production; factors affecting heat production; efficiency of energy utilization in body processes such as work, growth, and synthesis of fats, proteins, and carbohydrates; and the energetic costs of nutrient interconversion and turnover. Prerequisites: ADVS 7510/6510; CHEM 5700, 5710. (Sp)

ADVS 7550 Protein Metabolism and Utilization 3**
(dual listing 6550)
Processes involved in the digestion, synthesis, and degradation of protein in the rumen, with special emphasis on protein-energy relationships in the rumen and whole animal. Discussion of protein requirements and efficiency of protein utilization. Prerequisite: ADVS 7510/6510. (F)

ADVS 7560 Mineral and Vitamin Metabolism* 3
(dual listing 6560)
Principal roles of minerals and vitamins in nutrient metabolism as they apply to animal nutrition. Prerequisite: ADVS 7510/6510. (F)

ADVS 7600 Principles of Toxicology* 3
(dual listing 6600)
Mechanisms of action and effects of toxicants on living organisms. Prerequisite: ADVS 5350/6350. (F)

ADVS 7890 Mechanisms of Animal Disease 3
(dual listing 6890)
Discussion course dealing with biochemical and microbial mechanisms in disease processes, including cellular reaction to injury, host-viral interactions, and host-toxin interactions. Students enrolled in ADVS 7890 will be required to prepare a USDA/NIH grant application. This course is not currently being offered. For information about when it may be offered, contact the department.

ADVS 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ADVS 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Agriculture (AG)

See College of Agriculture, pages 121-122

AG 4250 Advanced Internship and Cooperative Experience 1-9
Advanced or middle-level internship or cooperative experience to be approved by the Dean's Office. Intended for nonformal students interested in a broad agricultural experience. (F,Sp,Su)

Anthropology (ANTH)

See Department of Sociology, Social Work and Anthropology, pages 448-462

ANTH 1010 BSS Cultural Anthropology 3
Role of cultural concepts within discipline of anthropology. Relationship of cultural concepts to survival and adaptation, society and social life, ideology and symbolism, and cultural change and diversity. Applications to contemporary world problems. (F [F,Sp,Su online]) DE

ANTH 1020 BLS Biological Anthropology 3
Survey of multidisciplinary field of biological anthropology. Includes study of fossil and living primates, fossil evidence for human evolution, bioarchaeology, contemporary human variation and adaptation, principles of evolutionary theory, and introductory population genetics. (F) DE

ANTH 1030 BSS World Archaeology 3
Surveys archaeology and the means by which inferences about the past are made. Examines major processes shaping humans, including world colonization, our foraging legacy, origins of agriculture and civilization, and implications of our past for the present and future. (F [Sp online]) DE

ANTH 1099 Resources in Anthropology at USU 1
Familiarizes incoming freshmen, new majors, and transfer students with the academic resources available to Anthropology students at USU. Covers program, department, library, college, campus, intercampus, and internet resources. (F)

ANTH 2010 BSS Peoples of the Contemporary World 3
Introduces different ways of life, rural and urban, from the world's major culture areas. Focuses on how contemporary societies have evolved in ecological, historical, and political context. Introduces problems arising from third world social change. (Sp) DE

ANTH 2210 BHU Introduction to Folklore 3
Introduction to major genres of folklore (folk narrative, custom, folk music and song, vernacular architecture and arts), folk groups (regional, ethnic, occupational, familial), and basic folklore research method (collecting and archiving). Also taught as ENGL 2210 and HIST 2210. (F,Sp) DE

ANTH 2330 Principles of Archaeology 3
Addresses different ways of interpreting the past by exploring archaeology's historical, theoretical, and methodological development. Provides students with the basic tools for conducting archaeological research and with an understanding of the background of the discipline. (Sp)

ANTH 2720 Survey of American Folklore 3
Principal ethnic, regional, and occupational folk groups in America. Relations between folklore and American history, literature, and society. Key genres in American folklore (narrative, art, song, etc.) and their role in American culture. Also taught as ENGL 2720 and HIST 2720. (Sp)

ANTH 3110 North American Indian Cultures 3
Introduces ethnography of native cultures found within the USA and Canada, documenting their pre-contact adaptations and their interactions with changing national policies leading to today's resurgence of native peoples. (F) DE

ANTH 3130 CI Peoples of Latin America 3
Survey of Latin American cultures, past and present. Emphasis on culture as a dynamic, adaptive system and on contemporary issues in rural and urban Andean South America, Amazonia, and Mesoamerica. Appropriate for both majors and nonmajors. (F)

ANTH 3150 Applied Anthropology Survey: History, Uses, Methods, and Careers 3
Surveys the field of applied anthropology, including discussions of emergence, application, and usefulness. Introduces students to methods and skills used by practitioners, as well as to those used to prepare for careers in applied anthropology. (Sp)[1,2]

ANTH 3160 DSS Anthropology of Religion 3
Cross-cultural description and theoretical analysis of religion and its functional relationships to human psychology, society, and the natural environment. (F)[1]

ANTH 3200 DSS/CI Perspectives on Race 3
Study of the processes of racial differentiation, the basis of biological differences found among existing human groups, the influence of biology and culture on human variation, and the influence of social context on perceptions of race. (Sp)[1]

ANTH 3250 Osteology 3
Detailed hands-on study of human skeleton, including component of comparative vertebrate skeletal anatomy. Applications to fields of archaeology, forensic science, paleopathology, and zoology. Includes methods component. (F)[2]

ANTH 3300 DSS Archaeology in North America 3
Prehistoric and historic archaeology of the North American continent. Explores initial colonization and Native American origins; variability among foraging adaptations; spread of farming; cultural complexity in Midwest, Southwest, and West Coast; Indian-environment relationships; European contact; depopulation; and historic archaeology of Euro-Americans. (Sp)[1]

ANTH 3310 CI Introduction to Museum Studies 3
Explores all aspects of museum work, from the acquisition and storage of collections to fundraising and educational programs. As part of course requirements, students tour area museums and get first-hand perspectives on the challenges and rewards of museum work from professionals in the field. Course fee for field trip(s) required. (Sp)[1,2]

ANTH 3320 DSS Ancient Humans and the Environment 3
Explores human-environment relationships during the past 40,000-plus years, from small-scale societies to ancient civilizations. In this problem-oriented, topical course, emphasis placed on small group projects, discussion, writing, and oral presentation. This course is not currently being taught. For information about when it may be taught, contact the department.

ANTH 3350 DSS Archaeology of Ancient Civilizations 3
Surveys primary states in antiquity, including Mesopotamia, China, Egypt, South America, and Mesoamerica. In-depth study of the process of their formation and theories of their origins. Emphasis is anthropological and scientific to complement the classical and humanistic. (Sp)[1]

ANTH 3360 Utah Archaeology 3
Popular introduction to the archaeology and prehistory of Utah and surrounding regions. Employs approachable texts with some supplementary readings. Features liberal use of photographs and maps to illustrate lectures. Class website provides context, discussion forums, and study aids. (F)[1]

ANTH 3370 Archaeology of Prehistoric Europe 3
Explores major issues in European prehistory, from the arrival of the first hominids through the establishment of settled farming and pastoral communities just before the rise of the state societies. (F)[1] DE

ANTH 3550 DHA Culture of East Asia 3
Helps students explore and appreciate the culture of three East Asian countries: China, Japan and Korea. Students gain sincere view and understanding of these East Asian cultures through readings, hands-on cultural activities, viewing video materials, writing, and discussions. Topics include: major historical and social

events, customs and traditions, thoughts and beliefs, people, food, contemporary issues, art, literature, and film. Also taught as HIST 3550 and LANG 3550. DE

ANTH 4100 The Study of Language 3
Investigates ways in which human languages are structured, how they change, how they reflect the cultures in which they are used, and how they are learned. Also taught as LING 4100. (F,Sp)

ANTH 4110 DSS Southwest Indian Cultures, (dual listing 6110) Past and Present 3
Reviews past and present Indian cultures of greater southwest region. Examines the prehistoric Anasazi, the Pueblos, the canyon and desert peoples, the Utes, and the Navajos. Interprets these cultures in ecological, historic, and political contexts. (Sp) DE

ANTH 4120 CI/DSS Anthropology of Childhood 3
Focuses on the anthropological study of childhood. Students design and carry out an ethnology (using library and archival sources) on an issue in the study of children. Readings of ethnograpic studies of childhood from the U.S. and abroad. Includes methods component. (Sp)[1,2]

ANTH 4230 DSS Medical Anthropology: Matter, Culture, Spirit, and Health 3
Examines the bio-ecological (matter) and socio-cultural aspects of disease/illness in human populations and examines "spiritual" dimensions of health in cross-cultural context. Includes methods component for anthropology majors and serves as a Liberal Arts cluster capstone course. (Sp)[1,2]

ANTH 4370 Archaeology and Paleoenvironments Field Trip 2
Two-hour class session and assigned readings prepare students for a three-day field trip to explore the archaeology and paleoenvironments of the northern Bonneville Basin. Post-field writing assignment integrates the field experience with readings and discussion. Prerequisite: Instructor permission. (F)[1]

ANTH 4800 Topics in Anthropology 1-3®
Focuses on special topics in anthropology. Topics and course format vary. DE

ANTH 4980 History and Theories of Anthropology 3
Explores the epistemological foundations of anthropology. Traces the history of anthropology, including the main currents of theoretical thought, the paradigm shifts that revitalize the discipline, and the major scholars that illustrate each period. This is an advanced course that benefits from some anthropology and familiarity with the intellectual traditions of the Western World. Prerequisite: ANTH 1010 and at least one other upper-division course in cultural anthropology. (Sp)[3]

ANTH 4990 Contemporary Issues in Anthropology 3
Capstone course in anthropological theory and method, required for all majors. Prerequisite: ANTH 1010. Recommended Prerequisite: ANTH 4980. (Sp)[1,3]

ANTH 5100 DSS Anthropology of Sex and Gender 3 (dual listing 6100)
Increases awareness of sexuality and gender, and of feminist perspectives about social problems related to gender and sexuality that cross-cut cultural boundaries. Emphasizes gender-related social problems in contemporary world societies. (F)

ANTH 5120 Applied Rural Development 3 (dual listing 6120)
Reviews development anthropology for practitioners. Examines human dimensions of planned policy, program, and project interventions. Examines how rural development occurs and how it is analyzed and managed in selected real-world cases. Includes methods component. This course is not currently being taught. For information about when it may be taught, contact the department.

ANTH 5130 Ethnographic Field School 3-6 (dual listing 6130)
Provides practical training in use of ethnographic field methods, qualitative data analysis, and ethnographic report-writing. Combines classroom instruction with supervised off-campus field research, while living in a cross-cultural setting. Fulfills program methods requirement. Application and additional fee required. Also taught as SOC 5130/6130. (Su)

ANTH 5160 DSS Cities and Development 3 (dual listing 6160)
Examines role of emergent urban areas in national development. Employs ethnographic case studies of selected cities, coupled with a policy perspective on problems of hyperurbanization in both poor and more advanced societies. Includes methods component. This course is not currently being taught. For information about when it may be taught, contact the department.

ANTH 5190 Applied Anthropology Practicum 1-5® (dual listing 6190)
Seminar with supervised projects in applied anthropology for advanced students. Integrates academic knowledge and field technique. Includes methods component. Prerequisite: Instructor approval.[1,2,3]

ANTH 5210 Physical Anthropology Lab 1-3
Laboratory experience enabling participation in analysis/reporting stages of physical anthropology projects. Includes methods component. Prerequisite: Permission of instructor.[2,3]

ANTH 5250 QI Problems in Bioarchaeology 3® (dual listing 6250)
Examines various approaches to the study of human biocultural adaptation through the analysis of human remains from archaeological sites. Includes methods component. Graduate students complete a more substantial research project than undergraduates, which must include a quantitative component. Prerequisite: STAT 1040 or ANTH 3250 or permission of instructor. (Sp)[1,2,3]

ANTH 5300 Archaeology Field School 3-5® (dual listing 6300)
Internship on archaeological field project, including survey, excavation, recording, mapping, and scientific conduct of archaeological problem solving. Application process may begin as early as December. Additional field support fee required. Prerequisites: ANTH 1030 and instructor's permission. (Su)[2,3]

ANTH 5310 Archaeology Lab 1-3® (dual listing 6310)
Laboratory experience enabling participation in analysis/reporting stages of archaeology projects. Includes methods component. Prerequisite: Graduate standing or permission of instructor. (F,Sp,Su)[2,3]

ANTH 5320 Zooarchaeology 3 (dual listing 6320)
Advanced undergraduate and graduate course on laboratory methods in zooarchaeology. Structured to address anthropologically significant questions that can be investigated through zooarchaeological analysis, and to provide students with the basic analytical skills to address these questions. Graduate students will be required to conduct a more extensive research project and write-up. Taught on the Brigham City campus. (Sp)[1,2] DE

ANTH 5330 Geoarchaeology 3 (dual listing 6330)
Explores the ways that the earth sciences are employed in archaeological analysis. Topics include: sedimentology, pedology, geomorphology, paleoclimatology, geophysical methods of dating archaeological materials, artifact and materials sourcing, and modeling environment-human interaction. Prerequisites: Graduate standing; or ANTH 1020 and 1030; or GEO 1110 and 3200 and upper-division standing. (Sp)[1,2]

ANTH 5380 Peopling of the New World 3 (dual listing 6380)
Explores how, when, and why humans first populated the Americas. Through emphasis on critical thinking and hypothesis testing, students scientifically evaluate evidence for initial colonization drawn from the fields of archaeology, biological anthropology, genetics, and linguistics. (Sp)[1]

ANTH 5650 DSS Developing Societies 3 (dual listing 6650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as GEOG 5650/6650 and SOC 5650/6650. (Sp) DE

Course Descriptions

ANTH 5700 Folk Narrative 3
Forms and functions of folk narrative genres: myth, legend, folktale, memorate, and ballad. Also taught as ENGL 5700 and HIST 5700. (Sp)

ANTH 5800 Museum Development 1-3®
Apprenticeship in the USU Museum of Anthropology to learn the operation of a small museum. Entails close ongoing consultation with museum director and other staff members. Possible projects include artifact curation, exhibit development, public outreach, and others. Prerequisite: Instructor's permission. (F,Sp,Su)[2,3]

ANTH 5900 Independent Studies 1-3®
Customized study or readings for upper-division or graduate students on topics not covered in regular courses. Prerequisite: Approval, prior to registration, of proposal written by student in consultation with instructor.

ANTH 5980 Senior Project 1
Develops advanced research and writing skills in a specialty area, and results in a research project/report. Completed in consultation with faculty instructor and subject to approval.

ANTH 6100 Anthropology of Sex and Gender 3
(dual listing 5100)
Increases awareness of sexuality and gender, and of feminist perspectives about social problems related to gender and sexuality that cross-cut cultural boundaries. Emphasizes gender-related social problems in contemporary world societies. (F)

ANTH 6110 Southwest Indian Cultures,
(dual listing 4110) Past and Present 3
Reviews past and present Indian cultures of greater southwest region. Examines the prehistoric Anasazi, the Pueblos, the canyon and desert peoples, the Utes, and the Navajos. Interprets these cultures in ecological, historic, and political contexts. (Sp) **DE**

ANTH 6120 Applied Rural Development 3
(dual listing 5120)
Reviews development anthropology for practitioners. Examines human dimensions of planned policy, program, and project interventions. Examines how rural development occurs and how it is analyzed and managed in selected real-world cases. Includes methods component. This course is not currently being taught. For information about when it may be taught, contact the department.

ANTH 6130 Ethnographic Field School 3-6
(dual listing 5130)
Provides practical training in use of ethnographic field methods, qualitative data analysis, and ethnographic report-writing. Combines classroom instruction with supervised off-campus field research, while living in a cross-cultural setting. Fulfills program methods requirement. Application and additional fee required. Also taught as SOC 6130/5130. (Su)

ANTH 6160 Cities and Development 3
(dual listing 5160)
Examines role of emergent urban areas in national development. Employs ethnographic case studies of selected cities, coupled with a policy perspective on problems of hyperurbanization in both poor and more advanced societies. Includes methods component. This course is not currently being taught. For information about when it may be taught, contact the department.

ANTH 6190 Applied Anthropology Practicum 1-5®
(dual listing 5190)
Seminar with supervised projects in applied anthropology for advanced students. Integrates academic knowledge and field technique. Includes methods component. Prerequisite: Instructor approval.[1,2,3]

ANTH 6250 Problems in Bioarchaeology 3®
(dual listing 5250)
Examines various approaches to the study of human biocultural adaptation through the analysis of human remains from archaeological sites. Includes methods component. Graduate students complete a more substantial research project than undergraduates, which must include a quantitative component. Prerequisite: STAT 1040 or ANTH 3250 or permission of instructor. (Sp)[1,2,3]

ANTH 6300 Archaeology Field School 3-5®
(dual listing 5300)
Internship on archaeological field project, including survey, excavation, recording, mapping, and scientific conduct of archaeological problem solving. Application process may begin as early as December. Additional field support fee required. Prerequisites: ANTH 1030 and instructor's permission. (Su)[2,3]

ANTH 6310 Archaeology Lab 1-3®
(dual listing 5310)
Laboratory experience enabling participation in analysis/reporting stages of archaeology projects. Includes methods component. Prerequisite: Graduate standing or permission of instructor. (F,Sp,Su)[2,3]

ANTH 6320 Zooarchaeology 3
(dual listing 5320)
Advanced undergraduate and graduate course on laboratory methods in zooarchaeology. Structured to address anthropologically significant questions that can be investigated through zooarchaeological analysis, and to provide students with the basic analytical skills to address these questions. Graduate students will be required to conduct a more extensive research project and write-up. Taught on the Brigham City campus. (Sp)[1,2] **DE**

ANTH 6330 Geoarchaeology 3
(dual listing 5330)
Explores the ways that the earth sciences are employed in archaeological analysis. Topics include: sedimentology, pedology, geomorphology, paleoclimatology, geophysical methods of dating archaeological materials, artifact and materials sourcing, and modeling environment-human interaction. Prerequisites: Graduate standing; or ANTH 1020 and 1030; or GEO 1110 and 3200 and upper-division standing. (Sp)[1,2]

ANTH 6340 Archaeology of the
Western United States 3
Examines human adaptive variability in Western North America, focusing on prehistoric Great Basin, Colorado Plateau, and California cultures. Includes in-depth examination of regional archaeological sequences and applications of evolutionary ecology to understanding regional lifeway variation over time. Prerequisite: Graduate standing. (F)[1]

ANTH 6350 Archaeological Theory 3
Survey and critique of archaeological theory from the 19th century to current issues in the 21st century. Emphasizes shifting paradigms and research strategies. As a seminar course, includes reading, discussion, and critical writing. (F)[1]

ANTH 6360 Research Design and Quantitative
Methods in Archaeology 3
Develops skills required for conducting original research at the professional level. Focuses on linking research with relevant theoretical, empirical, and methodological questions; developing statistically sound sampling strategies; using statistics to interpret data; and deriving conclusions from data. Prerequisite: Graduate standing. (F)[1]

ANTH 6370 GIS in Archaeology 3
Presents background and develops skills necessary to use geographic information systems (GIS) for recording and maintaining archaeological data. Provides overview on how to use GIS to analyze and interpret these types of data. Prerequisite: Graduate standing. (Sp)[1]

ANTH 6380 Peopling of the New World 3
(dual listing 5380)
Explores how, when, and why humans first populated the Americas. Through emphasis on critical thinking and hypothesis testing, students scientifically evaluate evidence for initial colonization drawn from the fields of archaeology, biological anthropology, genetics, and linguistics. (Sp)[1]

ANTH 6390 Cultural Resources Management Policy 3
Reviews the history of Cultural Resource Management (CRM) legislation, addressing how laws are interpreted and implemented by contract archaeologists working mainly in the United States. Focuses on how to run modern CRM projects within this legislative framework. Prerequisite: Graduate standing. (F)[1]

ANTH 6410 Writing for Archaeologists 3
Teaches future archaeologists to communicate effectively in the various genres of the discipline demanding writing proficiency. Emphasizes professional writing, including research papers, grant proposals, bids for archaeological work, curriculum vitae, and cover letters. (F)[1]

ANTH 6420 Lithic Analysis 1
Laboratory course emphasizing techniques used to study stone tools and other lithic technologies. Focuses on morphological analysis and how to generate data from laboratory measurements. Includes applications of lithic analyses to empirical and theoretical research questions. Prerequisite: Graduate standing. (F)[1]

ANTH 6650 Developing Societies 3
(dual listing 5650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as GEOG 6650/5650 and SOC 6650/5650. (Sp) [DE]

ANTH 6700 Archaeology Internship 3-6®
Internship placement in governmental agency or department, museum, or private archaeology firm. Arranged and overseen by the Anthropology graduate director, in conjunction with the committee chair and professional supervisor. Prerequisite: Graduate standing (F,Sp,Su)

ANTH 6900 Independent Studies 1-3®
Customized study or readings for graduate students on topics not covered in regular courses. Prerequisite: Approval of proposal written by student in consultation with instructor.

ANTH 6970 Thesis Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

[1]This course is taught alternating years. Check with department for information about when course will be taught.
[2]This course may be used to satisfy the methods component requirement for the anthropology major.
[3]This course has one or more prerequisites. Check with the department for details.
[4]This course is offered infrequently. Check with department for information about when course will be taught.
[®]Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Applied Economics (APEC)

See Department of Applied Economics, pages 166-170

Note: Effective Fall Semester 2009, courses previously listed under the ECON prefix will be taught under *either* the APEC prefix *or* the ECN prefix. (ECN courses are shown on pages 545-546.) Students registering for Summer Semester 2009 Economics courses can find them under the ECON prefix by logging into Access at: **http://www.usu.edu/myusu/**

APEC 2010 BSS Introduction to Microeconomics 3
Designed to build an understanding of the economics of the marketplace from the perspectives of individual consumer and producer or business. Development and application of microeconomic principles to demonstrate the role and limitations of competitive markets in motivating socially efficient consumer, business, and public sector choices. Prerequisite: ECN 1500. Also taught as ECN 2010. (F,Sp,Su) [DE]

APEC 3010 Introduction to Agricultural Economics and Agribusiness 3
Introduction to economic principles as they apply to the food and agricultural industry. Emphasizes production and consumption of food and fiber products, the structure of the agricultural/agribusiness industry, major farm problems, and public policy issues impacting agribusiness firms. (Sp)

APEC 3012 Introduction to Natural Resource and Regional Economics 3
Introduction to economic principles as they apply to the use of natural resources and as they affect environmental quality. Analysis of changes in natural resource use and environmental quality, in order to determine the economic impact upon rural communities and regions. (F)

APEC 3020 Firm Finance and Records Analysis 3
Construction, analysis, and comparison of key financial statements using cash and accrual systems of accounting. Introduction to computerized financial and management record-keeping systems to meet tax and management purposes. Prerequisites: ACCT 2010 and APEC 3010 (APEC 3010 may be taken concurrently). (Sp)

APEC 3310 Mathematics in Agricultural and Resource Economics 3
Explores application of mathematics to agricultural, resource, environmental, and regional economics. Reviews algebraic, single-variable calculus (differentiation and integration); multivariate calculus optimization; and linear algebra and applications to economics. Prerequisites: MATH 1100 and APEC/ECN 2010; or instructor's approval. (F)

APEC 4010 Intermediate Microeconomics 3
Analysis of behavior of consumers and business firms. Application of theory to the solution of real world problems. Credit will not be given for both ECN 3010 and APEC/ECN 4010. Prerequisites: APEC/ECN 2010, MATH 1100, and STAT 2300. Also taught as ECN 4010. (Sp)

APEC 4020 Macroeconomics and Trade 3
Explores the business cycle, monetary policy, interest rates, inflation, employment, and production as they apply to agribusiness and related industries. Includes discussion of exchange rates, balance of trade, comparative advantage, and various policy tools used to influence trade. Prerequisite: ECN 1500. (Sp)

APEC 5010 QI Firm Marketing and Price Analysis 3
Students learn strategies for product and commodity marketing. Explores risk management, including futures and options, as well as price analysis and forecasting techniques. Prerequisites: APEC 3310 and APEC/ECN 4010. (F)

APEC 5015 Firm Management, Planning, and Optimization 3
Application of principles and practices used by managers of agribusiness firms. Evaluation of alternative actions using budgeting (enterprise, cash flow, partial, whole firm, and capital) and optimization programs. Prerequisites: APEC 3020, 3310, APEC/ECN 4010, and ACCT 2020. (F)

APEC 5020 Strategic Firm Management 3
Explores principles and concepts needed to evaluate the impact of industry structure, policies, and international forces on the management of agribusiness firms. Emphasizes the evaluation of producing and marketing new or differentiated products or services. Prerequisites: APEC 3310 and APEC/ECN 4010. (Sp)

APEC 5330 QI Applied Econometrics 3
Introduction to basic statistics, simple linear regression, multiple regression, and simultaneous equation models for economics. Prerequisites: STAT 2000 or 2300 or 3000. Also taught as ECN 5330. (Sp)

APEC 5560 Natural Resource and Environmental Economics 3
Economics of developing, managing, and conserving natural resources and the environment. Topics include resource use and conservation, environmental quality, public and private resource management, and valuation of nonmarket goods. Prerequisite: APEC/ECN 2010 or APEC 3012. (Sp)

APEC 5850 Regional and Community Economic Development 3
Building on microeconomic theory, models for regional and urban structure and change are explored. Policy decision models are also developed. Prerequisite: APEC 3012 or ECN 3010 or APEC/ECN 4010. (F)

APEC 5950 Senior Project 3
Identification and analysis of a current economic problem. Throughout this process, other agricultural economics course concepts and methods are brought together. (F,Sp)

APEC 6000 Macroeconomic Theory I 3
(dual listing 7230)
Lays a foundation of advanced macroeconomic analysis, integrating theory, data, and computational methods. Special attention given to real-world issues, with an emphasis on how economists use macro models and data to improve business and public policy decisions. Topics covered include neoclassical and endogenous growth theories, real business cycle and new Keynesian theories of economic fluctuations, monetary theory, macroeconomic policy, and open-economy macroeconomics. Also taught as ECN 6000/7230. (F)

APEC 6030 Agricultural Marketing 3
Covers a variety of topics relating to price analysis for agricultural commodities. Explores econometric and time series modeling and forecasting of agricultural prices. Includes a section on futures and options on futures contracts, focusing on fundamental and technical analysis. Prerequisite: APEC/ECN 6330. (F)

APEC 6040 Agribusiness Production and Supply Chain Management 3
Uses economics to explain resource allocations within agribusiness production units and supply chains. This includes, but is not limited to, development of understanding of supply chains and how to use supply chains to effectively address markets for food and fiber. Prerequisite: APEC 6030. (F)

APEC 6100 Microeconomic Theory I 3
Provides a rigorous introduction to graduate-level microeconomic theory. While the specific focus is on the theoretical construct of graduate-level microeconomic models, the broad objective of the class is to lay the foundation for empirical applications in microeconomics. To meet this broad objective, the course covers theory of the firm, consumer theory, market structure, theory of public goods and externalities, and welfare economics. (F)

APEC 6250 Graduate Internship 1-3®
(F,Sp,Su)

APEC 6300 Quantitative Analysis for Business and Policy Decisions 3
Provides an introduction to applied mathematical programming, operations research, simulation, risk analysis, adaptive management, and other decision theoretic tools used by government policy makers and managers of firms. (Sp)

APEC 6330 Applied Econometrics 3
Provides graduate-level introduction to applied regression tools, including: simple and multivariate regression analysis; linear, nonlinear, and qualitative dependent variable models; distributed lags; seemingly unrelated regression; and model specification and validation tests. Prerequisite: Background in statistics and calculus. Also taught as ECN 6330. (F) DE

APEC 6500 Introduction to Natural Resource Economics 3
Introduction to the legal and regulatory foundations of natural resource policy, with specific attention to water, minerals, rangelands, forests, fish, and off-site impacts of agricultural and industrial production. Topics include externalities, property rights, public goods, public choice, and public trust. Prerequisite: ECN 3010 or APEC/ECN 4010 or APEC 5560. (Sp)

APEC 6510 Introduction to Environmental Economics 3
Introduction to the foundations of environmental economics. Adaptation of market mechanisms to ameliorate pollution problems and provide amenity services. Methods for determining the value of nonmarketed goods and services. Topics include economic principles regarding social choice and market exchange, as well as current and historical issues involving pollution, environmental regulation, and the effects of environmental regulation on the profitability of private and public entities. Prerequisite: ECN 3010 or APEC/ECN 4010 or APEC 5560 or APEC 6500. (F)

APEC 6700 Regional and Community Economic Development 3
Extension of microeconomic foundations of regional and urban economics to recent advances in economic growth and development, economic structure, land-use, public finance, housing, social welfare, environmental quality, and transportation. Prerequisite: APEC 6100. (Sp)

APEC 6710 Community Planning and Impact Analysis 3
Focuses on tools used by local and regional economic development specialists as they relate to planning and impact assessment. Specific topics will include I/O models, IMPLAN models, and computable CGE modeling approaches as they are used in a planning environment. Prerequisite: APEC 6700. (F)

APEC 6910 Independent Research 1-3®
Directed readings. Credits from this course toward any economics graduate degree require approval of the student's advisory committee, the department graduate committee, and the department head. Prerequisites: APEC/ECN 4010 and ECN 5000. (F,Sp,Su)

APEC 6970 Thesis Research 1-9®
Master's level research. Graded Pass/Fail *only*. (F,Sp,Su)

APEC 6990 Continuing Graduate Advisement 1-9®
Master's level advisement. Graded Pass/Fail *only*. (F,Sp,Su)

APEC 7130 Microeconomic Theory I 3
Provides a rigorous introduction to graduate-level microeconomic theory. While the specific focus is on the theoretical construct of graduate-level microeconomic models, the broad objective of the class is to lay the foundation for empirical applications in microeconomics. To meet this broad objective, the course covers theory of the firm, consumer theory, market structure, theory of public goods and externalities, and welfare economics. Also taught as ECN 7130. (F)

APEC 7140 Microeconomic Theory II 3
Extends the theoretical foundations of microeconomics with an emphasis on model building in economics. Topics include static games of complete and incomplete information, dynamic games of complete and incomplete information, imperfectly competitive markets, risk and uncertainty, public goods, general equilibrium, and information economics. Prerequisites: APEC/ECN 7130 and APEC/ECN 7360. Also taught as ECN 7140. (Sp)

APEC 7150 Microeconomic Theory III 3
Explores the uses of microeconomic theory in fields such as Game Theory, Industrial Organization, and Labor Economics. Study of topics such as multi-stage and repeated games, bargaining, principal-agent models of economic behavior, auctions and bidding, labor market discrimination, price discrimination and two-part tariffs, and the labor-leisure choice. Course is based on both classic and contemporary papers in each of these fields. Prerequisite: APEC/ECN 7140. (F)

APEC 7230 Macroeconomic Theory I 3
(dual listing 6000)
Lays a foundation of advanced macroeconomic analysis, integrating theory, data, and computational methods. Special attention given to real-world issues, with an emphasis on how economists use macro models and data to improve business and public policy decisions. Topics covered include neoclassical and endogenous growth theories, real business cycle and new Keynesian theories of economic fluctuations, monetary theory, macroeconomic policy, and open-economy macroeconomics. Also taught as ECN 7230/6000. (F)

APEC 7240 Macroeconomic Theory II 3
Extends the foundations of APEC 7230/6000 with a more in-depth look at the theory and computational aspects of various models of economic growth and business cycles. Prerequisites: APEC/ECN 7230/6000 and APEC/ECN 7360. Also taught as ECN 7240. (Sp)

APEC 7310 Econometrics I 3
Begins with a review of probability and statistics. Remainder of course is spent discussing the Classical linear regression model, least squares and maximum likelihood estimation, finite and asymptotic sample properties, inference, prediction, and nonlinear optimization. Prerequisite: APEC/ECN 7360. Also taught as ECN 7310. (F)

APEC 7320 Econometrics II 3
Extension of APEC 7310, covering topics such as nonspherical disturbances, panel data, simultaneous equations, time series and distributed lag models, and limited and qualitative dependent variable models. Prerequisite: APEC/ECN 7310. Also taught as ECN 7320. (Sp)

APEC 7330 Econometrics III 3
Provides in-depth coverage of current topics/techniques in applied econometric time series analysis, with an emphasis on econometric model development, estimation, and interpretation. Topics include difference equations, lag operators, stationary ARMA processes, modeling economic time series including trends and volatility, testing for trends and unit roots, vector autoregressions, the Kalman

filter including the state space representation of a dynamic system, cointegration, and error-correction models. Prerequisite: APEC/ECN 7320. (F)

APEC 7350 Mathematical Economics I 3
Includes linear equations, matrix algebra, multivariate calculus, static optimization, comparative static analysis, constrained optimization, and Kuhn-Tucker conditions. Also taught as ECN 7350. (F)

APEC 7360 Mathematical Economics II 3
Extends the presentation of APEC 7350 by covering applications of constrained optimization, the envelope theorem and applications, differential equations, dynamic economics, and optimal control. Prerequisite: APEC/ECN 7350. (Sp)

APEC 7400 International Trade and the Environment 3
Focuses on recent developments in the theory of trade and trade policy, including: (1) imperfect competition, (2) factor movements, (3) trade flows, and (4) the effect of trade policies on environmental quality. Prerequisites: APEC/ECN 7140 and APEC/ECN 7240. (Sp)

APEC 7500 Resource Economics 3
Focuses on formal economic models associated with optimal exploitation of renewable and nonrenewable resources. Applications to minerals, groundwater, energy resources, soil, forests, fisheries, rangelands, watersheds, wildlife, etc. Prerequisites: APEC/ECN 7140 and APEC/ECN 7240. (F)

APEC 7510 Environmental Economics 3
Covers the theory of environmental policy. Topics include, but are not limited to, externalities, uncertainty and the choice of policy instruments, market imperfections and the number of participants, nonconvexities in the production set, the charges and standards approach, marketable emission permits, the environment and development, international environmental issues, and ecological economics. Prerequisite: APEC 7500. (Sp)

APEC 7950 Department of Economics Graduate Seminar 1®
Exposes students to new developments in research and management in the field of economics. Features participation by students, faculty, and guest lecturers. Graded Pass/Fail *only*. (F,Sp)

APEC 7970 Dissertation Research 1-9®
PhD dissertation research. Graded Pass/Fail *only*. (F,Sp,Su)

APEC 7990 Continuing Graduate Advisement 1-9®
PhD-level advisement. Graded Pass/Fail *only*. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Art (ART)

See Department of Art, pages 171-176

ART 1010 BCA Exploring Art 3
Introduction to the visual arts, including the language, elements, and history of art. (F) DE

ART 1020 Drawing I 3
Introduction to the visual language of drawing, the graphic elements, various drawing media, and the creative problems involved. (F,Sp) DE

ART 1050 Introduction to Photography 3
Overview of photography. Operation of camera and related equipment, exposure and development of black and white and color positive film materials, and enlarging and printing of black and white negatives, with a strong emphasis on composition and photographic aesthetics. (F) DE

ART 1110 Drawing I (Art Majors Only) 3
Development of foundation drawing skills for art majors. Introduction to fundamental drawing principles and various drawing media through creative applications. Required for art majors. Enrollment limited to art majors having freshman standing (30 or less earned credits) *only*. (F,Sp)

ART 1120 Two-dimensional Design 3
Study and problem solving of form, space, texture, value, and color theory. (F,Sp)

ART 1130 Three-dimensional Design 3
Fosters development of basic understanding of three-dimensional form and space relationships. Includes three-dimensional problem solving, as well as use of a range of materials. (F,Sp)

ART 1150 Two-dimensional Design (Art Majors Only) 3
Foundation design course for art majors. Exploration of the elements and principles of two-dimensional design. Extensive use of a variety of media in creative problem solving. Required for art majors. Enrollment limited to art majors having freshman standing (30 or less earned credits) *only*. (F,Sp)

ART 1160 Three-dimensional Design (Art Majors Only) 3
Foundation design course for art majors. Exploration into the principles and vocabulary of visual organization in three dimensions. Through the manipulation of a variety of materials, students gain understanding of form and space. Required for art majors. Enrollment limited to art majors having freshman standing (30 or less earned credits) *only*. (F,Sp)

ART 2110 Drawing II 3
A continuation of ART 1020 or 1110, with an emphasis on more complex problems and techniques. Prerequisite: ART 1020 or 1110 or permission of instructor. Enrollment limited to art majors having freshman standing (30 or less earned credits) *only*. (F,Sp) DE

ART 2200 Painting I 3
Introduction to visual language of painting. Focuses on organization of visual ideas and basic oil painting techniques. Provides experience in both direct and indirect painting methods, as well as introducing applied color concepts. Prerequisites: ART 1020 or 1110; and ART 1120 or 1150. (F) DE

ART 2220 Watercolor Painting 3
Exploration of formal, technical, and conceptual problems in water media, for students with basic painting experience. Emphasis on gaining proficiency in both transparent and opaque watercolor techniques. Prerequisite: ART 2200. (F,Sp)

ART 2230 Basic Printmaking 3
Introductory course to acquaint students with the broader aspects of relief, intaglio, and planographic processes. Prerequisites: ART 1020 or 1110; and ART 1120 or 1150. (F)

ART 2400 Computers and Art 3
Basic course dealing with the study and use of the personal computer as a creative medium. Emphasizes hands-on software training directed toward the art of visual design and aesthetic expression. Several projects created using the computer and related peripherals. Discusses various forms of digital output and communications. Critical reviews of art projects focus on the elements and principles of visual design, as well as basic graphic design concepts. Enrollment limited to Art majors *only*. (F)

ART 2600 Basic Sculpture 3
Introduction to additive and subtractive processes in the realization of sculptural ideas. Student involvement in carving, clay modeling, and construction projects. Prerequisite: ART 1130 or 1160. (F,Sp)

ART 2650 Introduction to Ceramics 3
Introduction to basic processes of ceramics and the operation of the USU ceramics lab. Includes handbuilding, throwing, and firing. (F,Sp,Su) DE

ART 2810 Photography I 3
Black and white photography, including camera operation, exposure and development, and enlarging and printing of black and white negatives, with a concern for advancing technical controls, aesthetics, and darkroom experimentation. Introduction to electronic imaging. (F,Sp) DE

ART 2900 Introductory Internship/Coop 3®
Introductory level educational work experience in an internship/cooperative education position approved by the Department of Art. (F,Sp)

Course Descriptions

ART 3000 Secondary Art Methods I 3®
Focuses on developing art curricula by formulating objectives for teaching art history, art appreciation, and the making of art in the secondary schools. Required for art education majors. (F,Sp)

ART 3050 Japanese Calligraphy 1®
Study of Japanese writing system through practicing the art of calligraphy. No prerequisites. Also taught as JAPN 3050. (Sp)

ART 3200 Painting II 3
Continuation of concepts and techniques covered in ART 2200, emphasizing more complex formal and conceptual problems. Prerequisite: ART 2200. (Sp)

ART 3210 Classical Mythology* 3
Introduces major myths of the Classical world. Explores how these myths serve as keys to understanding the documents and arts of Classical civilization. Also taught as CLAS 3210. (F,Sp)

ART 3220 Screen Printing 3
Investigation of the basic processes employed in screen printing. Includes surface preparation, image preparation, drawing techniques, registration, and printing of the screen. Prerequisite: ART 2230. (Sp)

ART 3230 Lithography 3
Investigation of the basic processes employed in lithography, including surface preparation, basic drawing techniques, registration, processing, and printing of the stone or plate, as well as photo, transfer, and color methods. Prerequisite: ART 2230. (F,Sp)

ART 3240 Intaglio 3
Investigation of the basic processes employed in intaglio, including acid (line etch, aquatint, lift grounds, soft ground) and nonacid (dry point, mezzotint, engraving) techniques, as well as transfer and color methods. Prerequisite: ART 2230. (Sp)

ART 3250 Relief Prints 3®
Introduction to relief printing, including woodcut, linoleum cut, and wood engraving. Prerequisite: ART 2230. (F,Sp)

ART 3260 Anatomy for Artists 3
Study of principles of anatomical structure of the figure as it applies to two-dimensional and three-dimensional art media. Prerequisites: ART 1020 or 1110; and ART 2110. This course is not currently being offered. For information about when it may be offered, contact the department.

ART 3270 Color: Theory and Practice 3
Explores both the theory and application of color in the visual arts. Special emphasis placed on the development of applied color skills. (Su)

ART 3300 Clinical Experience I 1®
First clinical practicum (30 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. Required at level I. Graded Pass/Fail *only*. (Sp)

ART 3350 Drawing for Illustration 3®
Encourages drawing with a variety of media. Students will draw from the model in class. Homework consists of filling two 100-page sketchbooks with drawings from life, memory, or photographs.

ART 3370 Illustration Concepts* 3®
Students learn to develop visual ideas for illustrations and carry an idea through the stage of roughs to a comprehensive and finished image, using both digital and traditional media. Prerequisites: ART 1020 or 1110; ART 1120 or 1150; and ART 2400. (F)

ART 3400 Typography 3®
Introductory graphic design course, dealing with concepts and principles related to the exploration of typography as an art and design element. Series of exercises designed to give students professional and philosophical look at aesthetic and functional use of type and related visual elements. Prerequisites: ART 1120 or 1150; and ART 2400. (Sp)

ART 3420 Communication Arts Seminar 1®
Lecture seminars by professional guest artists in illustration and graphic design. (F,Sp)

ART 3610 Intermediate Sculpture 3
Further development in the materials, techniques, and traditions of sculpture. Expands on specific explorations, such as modeling, construction, and carving. Emphasizes strong relationship between concept and the technical execution of a sculptural form. Prerequisite: ART 2600. (F)

ART 3650 Intermediate Ceramics: Handbuilding 3®
Application of traditional ceramic construction techniques to vessel and sculptural subjects. Prerequisite: ART 2650. (F)

ART 3660 Intermediate Ceramics: Throwing on the Potter's Wheel 3®
Focuses on throwing and trimming techniques using the potter's wheel. Emphasizes production of multiples. Prerequisite: ART 2650. (Sp)

ART 3700 Elementary Art Methods 3®
Focuses on developing art curricula by formulating objectives for teaching art processes, art history, and art appreciation in the elementary schools. Required preparation for a grade school teacher. (F,Sp) DE

ART 3710 Fine Art Seminar 1®
Lecture seminars given by professionals as part of the Art Department visiting artist program. (F,Sp)

ART 3810 Photography II 3
Advanced black and white photography emphasizing technical controls, including the zone system and introduction to the 4x5 camera. Application of technical skills to enhance creative photographic expression. Continuation of digital imaging and use of computer for sensitometry graphing. Prerequisite: ART 2810 or equivalent experience. (Sp)

ART 4000 Secondary Art Methods II 3®
Focuses on developing methodologies for presenting art concepts and techniques in the secondary schools. Prerequisite: ART 3000. (F)

ART 4200 Advanced Drawing and Painting Studio 3-6®
Advanced individual painting and drawing projects. Students may use a variety of painting and drawing methods to execute a series of closely related paintings and drawings that are intended to develop a focused and personal portfolio. Prerequisite: ART 2200. (F,Sp,Su)

ART 4210 Figure Painting 3®
Painting from the model, with emphasis on solving problems of the planar structure of the human form. Prerequisite: ART 4260. (Sp)

ART 4250 Advanced Printmaking Studio 1-9®
In-depth investigation of one printmaking process with emphasis placed on both technical and aesthetic considerations. Prerequisites: ART 2230 and consent of instructor. (F,Sp)

ART 4260 Life Drawing 3®
Drawing from live models with emphasis on exploring interpretation, techniques, and compositional approach. Prerequisites: ART 1110 and 2110. (F)

ART 4270 Special Topics: Drawing and Painting 3®
Focuses on various issues in the field of drawing and painting. Allows students to pursue production of their own creative endeavors related to the topic of the course. Course content varies from semester to semester. (F,Sp,Su)

ART 4300 Clinical Experience II 1®
Second clinical practicum (30 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. Required at level II. Graded Pass/Fail *only*. Prerequisite: ART 3300. (F)

ART 4370 Illustration Studio 3®
Students build and enhance their portfolios through solving a series of advanced illustration problems. Emhasizes development of personal style through an examination of content, materials, and techniques. Explores both digital and traditional media. Prerequisite: ART 3370. (Sp)

ART 4410 Graphic Interface Design I 3®
Concentrates on development of graphic design techniques and theories necessary to create successful graphical user interfaces. Students explore aesthetic and functional uses of motion, sound, interactivity, information architecture, branding, and typography as they relate to graphic interface design. Prerequisites: ART 4420, 4440. (F)

ART 4420 Brand Identity Design 3
Advanced studio course focusing on the visual expression of a brand. Students study the design and application of trademarks/logos, related brand strategies, positioning, and processes of research and analysis. Students complete a series of symbol design and application projects. Prerequisite: ART 3400. (F)

ART 4430 Graphic Interface Design II 3®
Advanced graphic design course exploring dynamic interactivity. Students take a professional and philosophical look at the use of multimedia as it relates to business and society. Emphasizes research and the exploration of innovative ideas using interactive interface as a vehicle for communicating information. Prerequisite: ART 4410. (Sp)

ART 4440 Type, Image, and Visual Continuity 3®
Examines the application of design theory and process to complex information organization systems. Focuses on relationships between typography, imagery, and visual continuity. Students design varied text-intensive publications and image-intensive poster projects. Prerequisite: ART 3400. (Sp)

ART 4450 Portfolio Preparation 1-9®
Builds students' job-seeking portfolios through lectures, critiques, and studio work. Existing projects are refined and gaps are filled in with new projects. All work must meet professional standards, with focus on quality and job-related subject matter. Prerequisites: ART 4410, 4420, 4440. (F)

ART 4460 Advanced Computer Graphics Studio 1-9®
Independent research and development of advanced projects in the field of digital graphics. Prerequisiste: ART 4440. (F,Sp,Su)

ART 4470 Special Topics in Graphic Design and Illustration 1-9®
Focuses on various issues in the field of visual communications design. Allows students to pursue production of digital and traditional projects related to the topic of the course. Content of this studio course varies from semester to semester. Prerequisite: Permission of instructor. (F,Sp,Su)

ART 4610 Sculpture Projects 3®
Develops skills in a particular sculptural methodology. Investigates genres of public sculpture, installation, and advanced modeling, from traditional to contemporary. Stresses ideas based in a broader context of social and cultural issues. Prerequisite: ART 3610. (Sp)

ART 4620 Sculpture Seminar 3
Designed to focus on and challenge current assumptions in regard to contemporary issues in sculpture. Prerequisite: ART 4660. (F)

ART 4640 Technology of Ceramic Art 3®
Selected topics in aesthetics and technology of ceramic art, including ceramic history, glaze chemistry and calculation, firing techniques, kiln design and construction, etc. Students enrolling for more than 3 credits arrange credit for directed studies in specific topics. Prerequisites: ART 3650, 3660. (F,Sp,Su)

ART 4650 Advanced Ceramic Studio 3-6®
Provides time, equipment, and facilities for advanced students to pursue directed studies leading to personal expression through ceramic media. To be repeated during at least four semesters by art majors with ceramics emphasis. Prerequisites: ART 3650, 3660. (F,Sp,Su)

ART 4660 Advanced Sculpture Studio 1-9®
Advanced directed study in specific technical, aesthetic, and/or conceptual issues in sculpture. Prerequisite: ART 4610. (Sp)

ART 4810 Digital Photography 3®**
Continued exploration of digital photography, from computer to studio, with strong ties to traditional image making. Digital image processing and use of both software and hardware of digital photography. Study of ethical, artistic, and personal issues. Prerequisite: ART 3810. (F)

ART 4820 Nineteenth Century Photography Printing Processes* 3
Introduction to hand-made photographic emulsions invented and used in the nineteenth century. Production of gum prints, cyanotypes, photogravures, carbon prints, and platinum prints. Explores unique visual characteristics of each process. Includes basic bookbinding. Prerequisite: ART 3810. (F)

ART 4830 Independent Projects in Photography 1-9®
Student-initiated, independent projects in photography. Provides opportunity for students to gain technical proficiency and aesthetic creativity. Major emphasis on critiques and group discussions. Prerequisite: ART 3810 or permission of instructor. (F,Sp,Su)

ART 4840 Color Photography I* 3
Introduction to technical, conceptual, aesthetic, and digital explorations available with exposure and development of color positive and negative films. Investigation of color theory accompanied by production of correctly balanced color prints. Prerequisite: ART 3810. (F)

ART 4850 Color Photography II* 3
Continuation of study with color materials including digital investigations. Explores alternative techniques and manipulative capabilities with color processes. Stresses individual pursuit of color print portfolio. Prerequisite: ART 4840. (Sp)

ART 4860 Photographic Studio 3**
Exploration of the photographic studio, 4x5 view camera, the principles of applied lighting, and the communication of an idea through photography. Commercial, editorial, portrait, and digital photography directed toward professional portfolio preparation. All students required to have 4x5 camera. Enrollment limited to BFA students *only*. Prerequisite: ART 3810. (F)

ART 4870 Photographic Portfolio 3**
Advanced photography class in preparation for life after graduation. Strong emphasis on work toward a personal professional portfolio (fine art and commercial) and written support documentation (resumes, cover letters, artist statement, etc.). Enrollment limited to BFA students *only*. Prerequisite: ART 4860. (Sp)

ART 4880 Imaging Services 3
Internship situation at a commercial photographic studio and lab facility. Prerequisites: ART 4810, 4840. Enrollment limited to BFA candidates *only*. (F,Sp,Su)

ART 4900 Advanced Internship/Coop 1-9®
Internship/cooperative education work experience in art. For those students needing complexity and a more professional level of experience in the workplace. (F,Sp)

ART 4910 Senior BFA Exhibition 2
Professional presentation and exhibition procedures. Enrollment limited to senior standing and BFA candidates *only*. Required for all BFA candidates. Prerequisite: Approval of advisor. (Sp)

ART 4920 Independent Projects 1-9®
Student-planned projects, executed through individual initiative and scheduled consultation with instructor. Prerequisites: ART 1020 or 1110; ART 1120 or 1150; and ART 1130 or 1160. (F,Sp,Su)

ART 4930 Student Teaching at University Level 3
Teaching methods and procedures for university-level classes, working directly with faculty in lower-division classes. Prerequisite: Approval of instructor. (F,Sp,Su)

ART 5500 Student Teaching Seminar 2
Capstone seminar focused upon student teaching issues, professional development, and principles of effective instruction, emphasizing a reflective methodology. Graded Pass/Fail *only*. Prerequisites: Level 1 and Level 2 completion, and student teaching placement. (F,Sp)

ART 5630 Student Teaching in Secondary Schools 10
Thirteen-week culminating practicum in which students assume full-time teaching responsibilities under direction of cooperating teachers in major and minor fields. Graded Pass/Fail *only*. Prerequisites: Level 1 and Level 2 completion, and student teaching placement. (F,Sp)

ART 6200 Graduate Drawing and Painting Studio 1-9®
Emphasizes individual attainment of personal conviction or direction in painting. Prerequisite: Graduate status. (F,Sp,Su)

ART 6250 Graduate Printmaking Studio 1-9®
Intensive individual production in advanced printmaking techniques. Prerequisite: Graduate status. (F,Sp,Su)

ART 6370 Graduate Illustration Studio 3-9®
(Advertising, Editorial, Fashion.) Techniques in advertising illustration meeting the needs of client and his or her audience. Prerequisite: Graduate status. (F,Sp,Su)

ART 6400 Graduate Graphic Design Studio 3-9®
Graphic design problems leading to understanding of major concepts in this area. Prerequisite: Graduate status. (F,Sp,Su)

ART 6640 Technology of Ceramic Art 3®
Selected topics in aesthetics and technology of ceramic art, including ceramic history, glaze chemistry and calculation, firing techniques, kiln design and construction, etc. Prerequisite: Graduate status. (F,Sp,Su)

ART 6650 Graduate Ceramic Studio 3-9®
Arranged to provide time, equipment, and facilities for graduate students to pursue directed studies. Tutorial format with group critiques. Prerequisite: Graduate status. (F,Sp,Su)

ART 6660 Graduate Sculpture Studio 3-9®
Advanced individual problems in various media and technique. Prerequisite: Graduate status. (F,Sp,Su)

ART 6710 Graduate Greek and Roman Art 3
Origin and development of the art and architecture of Crete, Mycenae, Greece, and the Roman world. Prerequisite: Graduate status. (Sp)

ART 6800 Graduate Photography Studio 3-9®
Designed to cover several phases of photography, with emphasis on composing what we see in an artistic manner. Allows graduate students to further emphasize their thesis project area of study. Prerequisite: Graduate status. (F,Sp,Su)

ART 6900 Graduate Seminar 3®
Deals with general topic of professional practice, including art criticism and how contemporary work relates to current social issues. Prerequisite: Graduate status. (F,Sp)

ART 6910 Graduate Interdisciplinary Critique 1®
Focuses on current work of critique participants. Brings disciplinary analysis to specific problem. Prerequisite: Graduate status. (F,Sp)

ART 6920 Graduate Independent Projects in Art 1-9®
Advanced problems in emphasis, medium, and idiom of student's choice. Student plans project and executes it through individual initiative and scheduled consultation with the instructor. Prerequisites: Consent of instructor, graduate status. (F,Sp,Su)

ART 6940 Graduate Internship/Coop 1-9®
Internship/cooperative education work experience in art. Designed to allow graduate students to receive more complex and professional workplace experience. Prerequisite: Graduate status. (F,Sp,Su)

ART 6970 Research and Thesis 3®
Graded Pass/Fail *only*. Prerequisite: Candidacy status. (F,Sp,Su)

ART 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Art History (ARTH)

See Department of Art, pages 171-176

ARTH 2710 BHU Survey of Western Art: Prehistoric to Medieval 3
Prehistoric art through the end of the Gothic era. (F)

ARTH 2720 BHU Survey of Western Art: Renaissance to Post-Modern 3
Renaissance through modern. (Sp)

ARTH 3110 DHA/CI Ancient Near East* 3
Survey of history and civilization of ancient Mesopotamia, Egypt, and Israel, from prehistory to 500 B.C. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. Also taught as HIST 3110. (Sp)

ARTH 3820 History of Early Photography* 3
Reviews early history of photography, beginning before the 1839 public announcement by Daguerre and continuing through the early twentieth century. Explores social change, invention, and the fulfillment of the artist's desire to represent reality. (Sp)

ARTH 3830 History of Contemporary Photography* 3
Reviews history of contemporary photography, beginning with the modernist movements of the 1920s and progressing through the aesthetic, technical, and communicative changes, up to today's contemporary uses of the medium. Examines photography's relationship to the historical changes in society, through its evolution as an art form, a commercial venue, and a visual record. (Sp)

ARTH 4210 Celtic Europe* 3
History of Celtic peoples in British Isles, Scandinavia, and continental Europe, from Neolithic times to the Norman Conquest in 1066. Computer intensive. Also taught as HIST 4210. (F)

ARTH 4510 DHA Islamic Visual Cultures* 3 (dual listing 6510)
Explores the emergence and development of Islamic visual cultures in Asia and around the Mediterranean between 622 and 1250. Recommended prerequisite: ARTH 2710. (Sp)

ARTH 4610 CI Greek and Roman Art* 3 (dual listing 6610)
Origin and development of art and architecture of Crete, Mycenae, Greece, and the Roman world.

ARTH 4620 DHA Byzantine Art* 3 (dual listing 6620)
Focuses on the art and architecture of the Byzantine empire from late antiquity to the fifteenth century. In addition to including study of the visual arts, course incorporates readings in the history of religion and gender studies. Recommended prerequisite: ARTH 2710. (F)

ARTH 4630 DHA Medieval Art* 3 (dual listing 6630)
Covers art and architecture in Europe between 450 and 1450, with an emphasis on cultural diversity and artistic variety. Study of the visual arts is complemented by readings in history and literature. Recommended prerequisite: ARTH 2710. (Sp)

ARTH 4720 CI Renaissance Art 3
Development of European art and architecture from the thirteenth to the sixteenth century.

ARTH 4730 Baroque and Rococo Art 3
Development of painting, sculpture, and architecture in Europe from the late sixteenth through the eighteenth centuries.

ARTH 4740 Nineteenth Century Art 3
Painting and sculpture from Neoclassicism to Symbolism. Prerequisite: ARTH 2720.

ARTH 4750 Twentieth Century Art* 3
History of painting, sculpture, and architecture from post-impressionists to the present. Prerequisite: ARTH 4610.

ARTH 4760 American Art 3
History of painting, sculpture, and architecture in America from colonial times to the present. Prerequisite: ARTH 2720. (Sp)

ARTH 4790 Art History Seminar and Special Problems 1-6®
Capstone course for art history emphasis area. Focuses on special topics in the discipline of art history. Allows students to develop advanced research projects related to the topic of the course. Covers critical theory and methods of art history research and writing. Prerequisite: Completion of at least one art history course at the 3000 level or above; or permission of instructor. (Sp)

ARTH 4800 Directed Reading and Research in Art History 1-3
Directed reading, writing, and research in art history. Prerequisite: Permission of instructor. (F,Sp)

ARTH 4810 Museum Internship 1-3
Through this course, advanced art history students may arrange for credit in conjunction with a local museum. Supervisor at museum oversees student's work. A faculty member in Art History oversees the written component, including portfolio, documentation, and research paper, depending on number of credits student is enrolled for. Prerequisite: Permission of instructor. (F,Sp)

ARTH 5710 Gender Issues in Art* 3
Discussion of major issues and debates regarding gender in the visual arts. Topics include: revising the canon, representing gender, and theories of gender and spectatorship. Readings are discussed and applied to visual works of art. (Sp)

ARTH 5720 Central European Art* 3
Discussion-based seminar covering the traditionally neglected theme of art in Central Europe. Emphasizes modern art, with the theme of national identity as a constant concern. (F)

ARTH 5730 The Art Museum* 3
The history of museums and display practice has become a significant field in studies of contemporary art and art history. Topics covered include: cabinets of curiosity and historical origins, art museums and their publics, blockbusters, revisionism, architecture, museums, and memory.

ARTH 5740 Art and Religion: Topics in Sacred Art 3
Discussion-based course investigating relationships between religion and the arts. May focus on any period of history or region of the world, depending on scholarly interests of instructor. Also taught as RELS 5740. (Alt Sp)

ARTH 6510 DHA Islamic Visual Cultures* 3
(dual listing 4510)
Explores the emergence and development of Islamic visual cultures in Asia and around the Mediterranean between 622 and 1250. Recommended prerequisite: ARTH 2710. (Sp)

ARTH 6610 Greek and Roman Art* 3
(dual listing 4610)
Origin and development of art and architecture of Crete, Mycenae, Greece, and the Roman world.

ARTH 6620 Byzantine Art* 3
(dual listing 4620)
Focuses on the art and architecture of the Byzantine empire from late antiquity to the fifteenth century. In addition to including study of the visual arts, course incorporates readings in the history of religion and gender studies. Recommended prerequisite: ARTH 2710. (F)

ARTH 6630 DHA Medieval Art* 3
(dual listing 4630)
Covers art and architecture in Europe between 450 and 1450, with an emphasis on cultural diversity and artistic variety. Study of the visual arts is complemented by readings in history and literature. Recommended prerequisite: ARTH 2710. (Sp)

ARTH 6720 Graduate Renaissance Art 3
Development of European art and architecture from the thirteenth to the sixteenth centuries. Prerequisite: Graduate status. (F)

ARTH 6730 Graduate Baroque and Rococo Art 3
Development of art and architecture in Europe from the sixteenth to the eighteenth centuries. Prerequisite: Graduate status. (Sp)

ARTH 6740 Graduate Nineteenth Century Art 3
Painting and sculpture from Neoclassicism to Symbolism. Prerequisites: ARTH 2720 or consent of instructor, graduate status. (F)

ARTH 6750 Graduate Twentieth Century Art 3
History of painting, sculpture, and architecture from the post-impressionists to the present. Prerequisite: Graduate status. (Sp)

ARTH 6760 Graduate American Art 3
History of painting, sculpture, and architecture from the post-impressionists to the present. Prerequisite: Graduate status. (F)

ARTH 6770 Graduate Gender Issues in Art 3
Discussion of major issues and debates regarding gender in the visual arts. Topics include: revising the canon, representing gender, and theories of gender and spectatorship. Readings are discussed and applied to visual works of art. (Sp)

ARTH 6790 Art History Seminar and Special Problems 1-6®
Focuses on special topics in the discipline of art history. Allows students to develop advanced research projects related to the topic of the course. Covers critical theory and methods of art history research and writing. Prerequisite: Graduate status and consent of instructor. (Sp)

ARTH 6900 Graduate Seminar: Issues in Contemporary Art 3
Sessions devoted to select issues prevalent in contemporary art, including the body, the real, text, gender, display, and conceptualism. Requires intensive verbal and written participation. (Sp)

*Taught alternate years. For further information, consult department.

Aerospace Studies (AS)

See Department of Aerospace Studies, pages 147-148

AS 1010 Introduction to the Air Force Today 1
AS 1020 Introduction to the Air Force Today 1
Introduces the United States Air Force and Air Force Reserve Officer Training Corps. Air Force mission and organization, officership and professionalism, military customs and courtesies, officer opportunities, group leadership problems, and communication skills. Leadership Laboratory is mandatory for cadets. (F) (Sp)

AS 1110 Leadership Laboratory I 1
AS 1120 Leadership Laboratory I 1
Air Force customs and courtesies, drill and ceremonies, military commands, environment of the Air Force officer, and officer opportunities. Graded Pass/Fail *only*. AS 1110 must be taken concurrently with AS 1010; AS 1120 must be taken concurrently with AS 1020. (F) (Sp)

AS 2010 The Evolution of U.S. Aerospace Power 1
AS 2020 The Evolution of U.S. Aerospace Power 1
Examines general aspects of air and space power through a historical perspective. Illustrates Air Force Core Values with historical examples and continues development of communications skills. Leadership Laboratory is mandatory for cadets. (F) (Sp)

AS 2110 Leadership Laboratory II 1
AS 2120 Leadership Laboratory II 1
Air Force customs and courtesies, drill and ceremonies, military commands, environment of the Air Force officer, and officer opportunities. Graded Pass/Fail *only*. AS 2110 must be taken concurrently with AS 2010; AS 2120 must be taken concurrently with AS 2020. (F) (Sp)

AS 3010 Air Force Leadership and Management 3
AS 3020 Air Force Leadership and Management 3
Presents advanced leadership and management skills. Cadets given opportunity to practice these leadership skills and management techniques in a supervised environment. Leadership Laboratory is mandatory for cadets. (F) (Sp)

AS 3060 Physical Fitness Training 1-2®
Early morning workout to build stamina. Organized to keep cadets in shape to pass the Physical Fitness Test (PFT). Team instructed. (F, Sp)

AS 3110 Leadership Laboratory III 1
AS 3120 Leadership Laboratory III 1
Advanced leadership experiences to include the planning and controlling of cadet corps activities, and the preparation and presentation of briefings and other oral and written communications. Graded Pass/Fail *only*. AS 3110 must be taken concurrently with AS 3010; AS 3120 must be taken concurrently with AS 3020. (F) (Sp)

AS 3400 Field Training (4 Weeks) 1-4
Students in the four-year program participate in four weeks of Field Training. Major areas of study include junior officer training, career orientation, survival training, base functions, Air Force environment, and physical training. Graded Pass/Fail *only*. (Su)

AS 3500 Field Training (6 Weeks) 1-6
Students in the two-year program participate in six weeks of Field Training. Major areas of study include junior officer training, career orientation, survival training, base functions, Air Force environment, and physical training. Graded Pass/Fail *only*. (Su)

AS 4010 National Security Affairs/Preparation for Active Duty 3
AS 4020 National Security Affairs/Preparation for Active Duty 3
Designed to give college seniors the foundation to understand military officer's role in American society. Overviews complex social and political issues facing the military profession. Leadership Laboratory is mandatory for cadets. (F) (Sp)

AS 4110 Leadership Laboratory IV 1
AS 4120 Leadership Laboratory IV 1
Advanced leadership experiences to include the planning and controlling of cadet corps activities, and the preparation and presentation of briefings and other oral and written communications. Graded Pass/Fail *only*. AS 4110 must be taken concurrently with AS 4010; AS 4120 must be taken concurrently with AS 4020. (F) (Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Agricultural Systems Technology and Education (ASTE)

See Department of Agricultural Systems Technology and Education, pages 149-155

ASTE 1010 Introduction to Agricultural Systems Technology 3
Introduction to problem solving related to the areas of agricultural power and machinery, soil and water conservation, structures and animal environments, electrical circuits, and emerging technologies. (F)

ASTE 1120 Forage and Harvest Equipment 3
Fundamentals and principles in operations, adjustments, and maintenance of technologies utilized in agricultural forage and combine harvesting. (F)

ASTE 1130 Planting and Tillage Equipment 3
Fundamentals and principles in operation, maintenance, and repair of planting and tillage equipment. Exploration of different systems and their applications. (Sp)

ASTE 1610 Agricultural Machinery Engines 3
Fundamental principles and components utilized in the power production for agricultural machinery. Diesel engines, as power plants, will be overhauled using a systems approach. (F)

ASTE 1615 Agricultural Machinery Engine Laboratory 3
Gives students practical hands-on experience in engine diagnostics and repairs. Prerequisite: ASTE 1610 (may be taken concurrently). (F)

ASTE 1620 Agricultural Machinery Power Trains 3
Fundamental principles and components utilized in agricultural machinery transmittal of power through drive trains. A systems approach to overhauling these components will be developed. (Sp)

ASTE 1625 Agricultural Machinery Power Trains Laboratory 3
Gives students practical hands-on experience in power trains diagnostics and repairs. Prerequisite: ASTE 1620 (may be taken concurrently). (Sp)

ASTE 1710 Introduction to Agricultural Communication 3
Overview of the history, importance to society, and role of mass communication in agriculture. Introduces students to the use of mass media in the agricultural industry. (F)

ASTE 2200 Electricity in Agricultural Systems 3
Fundamentals of electricity (AC) as used on farms and ranches. Residential and commercial agricultural applications of the National Electric code. Electrical supply and service, distribution, proper grounding, and installation of components. (Sp)

ASTE 2250 Occupational Experience in Agriculture 1-6
Supervised occupational experiences for technical vocational preparation. Graded Pass/Fail *only*. (F,Sp)

ASTE 2710 Orientation to Agricultural Education 2®
Students examine the framework of agricultural education, with a special emphasis on the nature of the programs, career opportunities, and the qualifications and preparation requirements of future agricultural educators. (F)

ASTE 2830 Agribusiness Sales and Marketing 3
Basic principles of agribusiness sales and marketing. After completing a series of self-assessments relating to sales, learning, and personality preferences, students learn to complete each major step of the sales process. (F)

ASTE 2900 BSS Humanity in the Food Web 3
Provides broad overview of food systems in conjunction with detailed analysis of particular issues, such as different theories and supporting data on the domestication of plants and animals, the use of human labor, the development and operation of complex technologies, and the analysis of socioeconomic data on human population growth and well-being. (F,Sp) DE

ASTE 2930 Individualized Projects in Agricultural Mechanics 1-3®
Basic skill preparation for employment in agricultural industry. (F,Sp)

ASTE 3030 Metal Welding Processes and Technology in Agriculture 3
Selection of ferrous and nonferrous welding techniques in agricultural applications. Welding, cold- and hot-working metal in agricultural construction and maintenance. (F) DE

ASTE 3040 QI Fabrication Practices in Agricultural Buildings 2
Selection and use of agricultural building materials, including concrete and masonry, lumber, plywood, finishes, and fasteners. Application of hand and power tools and procedures in agricultural construction. (Sp)

ASTE 3050 CI Technical and Professional Communication Principles in Agriculture 3
Technical communication principles and practices used in the agricultural industry. Emphasizes technical writing of reports and correspondence using electronic information retrieval and presentation. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (F,Sp)

ASTE 3080 Compact Power Units for Agricultural and Turfgrass Applications 3
Operation and application of agricultural and turfgrass equipment powered by internal combustion engines having less than 40 horsepower. (Sp) DE

ASTE 3090 Computer Applications in Agriculture 3
Overview of computer systems and software currently used in agriculture. Emphasis placed on spreadsheet development, file management, computer ethics, and design of materials for print, presentation, and web media. Prerequisite: Satisfactory completion of University computer and information literacy exam. (F)

ASTE 3100 Leadership Applications in Agricultural Science, Management, and Development 2
Study of leadership styles and their applications in development of agricultural programs for youth and adults. Emphasizes leadership and communication principles for effective community resource management in rural environments. Experiences provided in leadership styles, program planning, and meeting organization. (Sp)

ASTE 3200 Irrigation Principles and Practices 3
Introduction to planning principles for irrigation systems and farm water resource development. Layout of system components and coverage of practices common to the Intermountain West. (Sp)

ASTE 3240 CI Teaching in Laboratory Settings 3®
Basic principles of teaching students in laboratory settings. Overview of major concepts, considerations, and practices used for developing and evaluating agriscience curricula. Students should be admitted into the Secondary Teacher Education Program (STEP) prior to enrollment in this course. Prerequisite: ASTE 2710. (Sp)

ASTE 3300 Clinical Experience I in Agricultural Education 1
In-school clinical observation experience. Students involved in observing management and assisting in teaching. Designed to provide familiarity with agricultural education classroom. Graded Pass/Fail *only*. (Sp)

ASTE 3440 DSC Science, Technology, and Modern Society 3
Designed to challenge students from all academic majors to develop an understanding of the dynamic interaction between science, technology, and society. Explores responsibility of humans for directing the utilization of technology as a creative enterprise. Also taught as ETE 3440. (F,Sp)

ASTE 3500 Teaching Apprenticeship in Agricultural Education 2
Each student serves as an apprentice to professional agricultural educator. Students complete competencies leading to early preparation for student teaching. (F,Sp,Su)

ASTE 3600 QI Management of Agricultural Machinery Systems 3
Management principles for evaluation and selection of agricultural implements for performance, optimization, economics, environmental impact, and long-term sustainable agricultural practices. Prerequisite: MATH 1050 or STAT 1040. (Sp)

ASTE 3620 Managing the FFA and SAE Programs 2
Introduction to basic concerns, understandings, and practices needed to effectively advise an FFA chapter. Students learn appropriate philosophies and skills for operation of a comprehensive supervised agricultural experience program. Prerequisite: Admission to Secondary Teacher Education Program. (Sp)

ASTE 3670 Agricultural Equipment Business Management, Marketing, and Communications 3
Introduction to principles and operation of computer software systems related to marketing and management within the agricultural machinery business industry. Emphasis on business communication principles for effective transfer of information and problem resolution. Prerequisites: MATH 1050; fulfillment of Communications Literacy CL1 requirement or instructor's permission. (Sp)

ASTE 3710 Agricultural Machinery Hydraulic Systems and Diagnosis 3
Fundamental principles and components overhaul of hydraulic systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. (F)

ASTE 3720 Agricultural DC Electrical Systems and Diagnosis 3
Fundamental principles and components overhaul of DC electrical systems as applied in agricultural machinery. Exploration of techniques for diagnosing malfunctions and related failures with a systems approach. Prerequisite: ASTE 1620 or approval of instructor. (F)

ASTE 3730 Agricultural Machinery Auxiliary Systems and Diagnosis 3
Application of theory, testing, diagnosis, and repairs of auxiliary systems, including air conditioning, fuel injection, analog, electronic monitoring, and GPS as utilized in agricultural equipment. Prerequisite: ASTE 3720 or approval of instructor. This course is currently inactive. Contact department for information about when this course may be taught.

ASTE 3900 Special Problems in Agricultural Systems Technology and Education 1-6
Students conduct short-term investigation and/or literature analysis with critical review of contemporary issues in Agricultural Systems Technology. Formal contract with approved faculty. Activities culminate with a written report. (F,Sp,Su)

ASTE 4100 Agricultural Structures and Environment 3**
Overview of agricultural structures and environmental considerations related to livestock, livestock waste management, and commodity storage. Planning, layout, construction materials, concrete masonry, ventilation, insulation, and energy. (Sp)

ASTE 4150 CI Methods of Teaching Agriculture 3®
Introduction to basic practices of classroom teaching and program planning. Through participation in discussions, activities, and assignments, students refine their abilities to develop programs, diagnose the learner, prepare the instruction, and guide student learning. Prerequisites: ASTE 2710, 3240. (F)

ASTE 4250 Occupational Experiences in Agriculture 1-6
Supervised occupational experience for technical and professional preparation in teacher education and/or agricultural business. Graded Pass/Fail *only*. (F,Sp,Su)

ASTE 4300 Clinical Experience II in Agricultural Education 1
Continued in-school observation of agricultural education teaching. Requires student participation in teaching, management, and program development in agricultural education. Graded Pass/Fail *only*. (F)

ASTE 4400 Advising Applied Technology Education Student Organizations 1
Principles and practices for advising applied technology student organizations in secondary education. Examination of leadership organizations supporting applied technology education. Emphasis on program planning, leadership development, and evaluation. This course is currently inactive. Contact department for information about when this course may be taught.

ASTE 4900 Senior Project Research and Creative Opportunity 1-6
Returning student teachers work to strengthen their weaknesses in areas such as scaled drawing, cost estimating, machine shop practices, construction, and small engines. (Sp)

ASTE 5100 (dual listed 6100) Electrical Controls and Motors for Agri-Industrial Applications 3
Operation and application of electrical motors, electrical and electronic controls, and circuit and overload protection utilized in agricultural and industrial installations. This course is currently inactive. Contact department for information about when this course may be taught.

ASTE 5200 Assessment in Applied Technology Education 3
Principles and practices in assessing performance and development of applied technology students. Emphasizes testing and evaluation techniques used in applied technology education. (Sp,Su)

Course Descriptions

ASTE 5260 CI (dual listed 6260) Environmental Impacts of Agricultural Systems 3
Investigation of relationship between agricultural practices and environmental quality, including control of agricultural nonpoint-source pollution. (F)

ASTE 5400 (dual listed 6400) Food, Land, and People 1-3®
Designed for pre-service (undergraduate, elementary education) or practicing, in-service (graduate) teachers. Offers development for infusing agriculture and the concepts of food, land, and people into existing curriculum standards and objectives. Presentation of agricultural-related instructional units, as well as research-based teaching strategies will be demonstrated. (F,Sp,Su) DE

ASTE 5500 Agricultural Education Secondary Curriculum Seminar 2®
Cooperative examination of considerations and processes for teaching secondary students. Reflection on the practice of teaching. Preparation for entry into the teaching profession. Graded Pass/Fail *only*. (Sp)

ASTE 5630 Agricultural Education Student Teaching in Secondary Schools 10
Students teach agriscience and technology courses in secondary and middle school settings under the guidance of clinical and Utah State University supervisors. Graded Pass/Fail *only*. (Sp)

ASTE 6000 Methods of Equipment Testing, Diagnosis, and Repair 3
Investigation and demonstration of methods and procedures for testing, troubleshooting, and diagnosis of tractors, power units, and all types of agricultural equipment. This course is currently inactive. Contact department for information about when this course may be taught.

ASTE 6070 Program and Curriculum Development in Career and Technical Education 3®
Program planning for locally applied curriculum design to meet student interests and community needs for career and technical educators. (F,Sp,Su)

ASTE 6100 (dual listing 5100) Electrical Controls and Motors for Agri-Industrial Applications 3
Operation and application of electrical motors, electrical and electronic controls, and circuit and overload protection utilized in agricultural and industrial installations. This course is currently inactive. Contact department for information about when this course may be taught.

ASTE 6110 Applied Technology Education Program Planning and Evaluation 3
Program planning and evaluation. Study of strategies used in applied technology. Demonstration of manpower surveys and job analysis for curriculum development. (F)

ASTE 6130 Electrical and Hydraulic Component Testing, Diagnosis, and Repair 3
Involves supervision and demonstration of procedures for testing, diagnosis, and repair of all types of electrical and hydraulic components on modern agricultural equipment. (F)

ASTE 6140 Agricultural Development and Evaluation 3
Principles and strategies for developing, implementing, and evaluating agricultural technology and educational programs for U.S. and international organizations. (Sp)

ASTE 6170 Supervision and Administration of International Extension Programs 3
Investigation and analysis of theories and practices of supervision and administration as applied to international extension-education programs and rural development/agricultural extension operations. (F)

ASTE 6240 Strategies for Teaching Adults 3
Features contemporary strategies and guided practice for teaching adults in group and individualized learning settings. (F,Sp,Su)

ASTE 6250 Special Problems in Agricultural Systems Technology 1-5®
A consideration of needs and special types of service in FFA, young farmers, and adult programs for applied technology teachers. (F,Sp,Su) DE

ASTE 6260 (dual listing 5260) Environmental Impacts of Agricultural Systems 3
Investigation of relationship between agricultural practices and environmental quality, including control of agricultural nonpoint-source pollution. (F)

ASTE 6300 Foundations of Adult Education and Program Evaluation 3
Addresses the context and providers of adult education. In addition, adult learning theories and participation models are examined. (F)

ASTE 6400 (dual listed 5400) Food, Land, and People 1-3®
Designed for pre-service (undergraduate, elementary education) or practicing, in-service (graduate) teachers. Offers development for infusing agriculture and the concepts of food, land, and people into existing curriculum standards and objectives. Presentation of agricultural-related instructional units, as well as research-based teaching strategies will be demonstrated. (F,Sp,Su) DE

ASTE 6510 Principles and Practices of Extension Education 3
History, philosophy, and organizational structure of U.S. and international extension organizations, including programming models, teaching strategies, and accountability. (F) DE

ASTE 6700 Research Methods 3
Introduction to techniques used in applied agricultural research and career and technical education research. Includes research design, data gathering, and statistical analysis and interpretation. (Sp) DE

ASTE 6750 Agricultural Safety and Health: Issues and Decisions 3
Review of agricultural safety and health issues. Public and private concerns addressed through problem identification, data gathering, resolution, and evaluation. (Sp)

ASTE 6970 Research and Thesis 1-9®
Graded Pass/Fail *only*. (F,Sp,Su) DE

ASTE 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su) DE

ASTE 7000 Principles and Practices of Community College Education 3
Examines the American two-year college, including historical and philosophical development, curricula, students and the learning process, faculty and instruction, administration and governance, support, and control. Focuses upon principles, practices, and problems of community colleges in America. (Su)

ASTE 7400 Community and Interagency Partnerships 3
Explores relationship between education and the community, with special emphasis on community needs and interagency relationships needed for the development of a total community education program. Furthers understanding of leadership and agency, through exploring and examining contemporary and perennial issues from multiple perspectives in a diverse higher-educational context. (Su)

ASTE 7500 Diffusion of Innovations 3
Explores processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. Course content is applicable to persons who work closely with people in formal and informal educational settings. (Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
**Taught 2009-2010.

Aviation Technology (AV)

See Department of Engineering and Technology Education, pages 253-258

AV 1100 The Aviation Profession 1
Covers attributes of aviation professional, career planning, and certification process. (F,Sp)

AV 1130 Flight Principles 2
Basic flight theory and physics of flight. Aircraft control systems related to flight. Ground handling and servicing of aircraft. Special lab fee. (F) DE

AV 1140 Aircraft Components and Principles 2
Materials and hardware, as well as nondestructive inspection applicable to aircraft. Plumbing methods, maintenance publications, and aircraft weight and balance control. (F)

AV 1170 Aircraft Structures 3
Accepted methods and repair for metal structures. Organic finishes and application techniques with laboratory applications and practical experience. (F)

AV 1240 Aircraft Maintenance 3
Maintenance, repair, alteration, and inspection of aircraft. Assembly and rigging of control systems with laboratory application of maintenance assembly and rigging procedures. Prerequisites: AV 1130, 1140. (Sp)

AV 2100 Aircraft Reciprocating Powerplants and Accessories 3
Theory of operation, maintenance, and repair of reciprocating engines, propellers, exhaust systems, ignition systems, and fuel systems with laboratory applications of principles and components studied. Prerequisite: AV 2110 (must be taken concurrently). (F)

AV 2110 Aircraft Reciprocating Powerplants and Accessories Lab 3
Laboratory application of principles studied in AV 2100. Prerequisite: AV 2100 (must be taken concurrently). (F)

AV 2140 Aircraft Turbine Powerplants and Maintenance Operations 3
Theory of turbine powerplants, including turbine engine and components operation, hot section inspection, and servicing. Aircraft engine 100-hour inspections and maintenance, with laboratory applications of principles and components studied. Prerequisite: AV 2150 (must be taken concurrently). (Sp)

AV 2150 Aircraft Turbine Powerplant Maintenance Operations Lab 3
Theory of turbine powerplants, including turbine engine and components operation, hot section inspection, and servicing. Aircraft engine 100-hour inspections and maintenance, with laboratory applications of principles and components studied. Prerequisite: AV 2140 (must be taken concurrently). (Sp)

AV 2170 Aircraft Systems 2
Theory and operation of aerospace environmental systems, communication, navigation and guidance systems, fuel and propellant systems, fire detection, and warning. (Sp)

AV 2180 Aircraft Hydraulic and Pneumatic Systems 2
Theory and operation of aircraft hydraulic, landing gear, and brake systems. (F)

AV 2190 Aircraft Systems Lab 1
Laboratory application of principles and components studied in AV 2170. Prerequisite: AV 2170 (must be taken concurrently). (Sp)

AV 2200 Aircraft Hydraulics and Pneumatics Systems Lab 1
Laboratory application of principles and components studied in AV 2180. Prerequisite: AV 2180 (must be taken concurrently). (F)

AV 2250 Internship 1-4®
Planned supervised work experience in industry. Must have departmental approval. (F,Sp,Su)

AV 2330 Private Pilot Ground School 4
Instructions in principles of flight, aircraft and engine operation, weather, navigation, radio aids to navigation, radio communications, and federal air regulations. Preparation for FAA Private Pilot written exam. (F,Sp,Su)

AV 2350 Private Pilot Certification 1
FAA approved flight training program meeting all requirements for, and in the issuance of, the Private Pilot Airplane License. Prerequisite: AV 2330 (may be taken concurrently). (F,Sp,Su)

AV 2420 FAA Regulations, Records, and Certification 2
Maintenance forms, records, and regulations releasing aircraft to airworthy status. Certification of maintenance technicians is also included. (Sp)

AV 2430 Aircraft Electrical Systems and Components 2
Aircraft electrical power generating systems. Theory of generation, alternators, regulation, and control systems with laboratory application of principles and systems studied. Prerequisite: ETE 2300. (Sp)

AV 2440 Aircraft Electrical Systems Laboratory 2
Laboratory application of principles and systems studied in AV 2430. Prerequisites: ETE 2300; AV 2430 (must be taken concurrently). (Sp)

AV 2510 Intermediate Flight 1
FAA approved flight training program that fulfills the cross country requirements for commercial and instrument ratings. Prerequisite: AV 2350. (F,Sp,Su)

AV 2520 Instrument Pilot Ground School 4
Ground school approved by FAA under Part 141 of the Federal Aviation Regulations. Designed to prepare students to pass the FAA oral and written examinations required for becoming instrument rated pilots. Prerequisite: AV 2330. (F,Sp)

AV 2540 Instrument Pilot Certification I 1
FAA approved flight training program introducing requirements for issuance of the Instrument Pilot Airplane Rating. Prerequisites: AV 2350, 2510; and AV 2520 (may be taken concurrently). (F,Sp,Su)

AV 2550 Instrument Pilot Certification II 1
Continuation of AV 2540. Completes all requirements for issuance of the instrument pilot airplane rating. Prerequisite: AV 2540. (F,Sp,Su)

AV 2620 Commercial Pilot Ground School 2
Commercial flight operations including performance, cross country planning, advanced systems operations, complex airplanes, and flight maneuvers. Prerequisites: AV 2350, 2520, 2540, and 2550. (F,Sp)

AV 2660 Commercial Pilot Certification 1
Flight instruction to meet FAA requirements and completion of tests for certification. Prerequisites: AV 2540, 2550; and AV 2620 (may be taken concurrently). (F,Sp,Su)

AV 2720 CFI and CFII Ground School 3
Designed to prepare students to pass the FAA oral and written examinations required for becoming certified flight and instrument instructors. Combines Certified Flight Instructor and Certified Flight Instructor-Instrument into one course. Prerequisites: AV 2620, 2660. (F,Sp)

AV 2740 CFI Certification 1
FAA-approved flight training program meeting all requirements for the issuance of the Certified Flight Instructor Airplane Rating. Prerequisites: AV 2620, 2660; and AV 2720 (may be taken concurrently). (F,Sp,Su)

AV 2860 CFII Certification 1
FAA approved flight training program meeting all the requirements for, and issuance of, the Certified Flight Instructor, Airplane Instrument Rating. Prerequisites: AV 2620, 2660, 2720, and 2740. (F,Sp,Su)

AV 2880 Multi-Engine Certification 1
Flight training program designed to satisfy all requirements necessary to qualify a student for the FAA Multi-Engine Airplane Rating practical test. Prerequisite: AV 2660. (F,Sp,Su)

AV 3010 National Airspace, Air Traffic Control, and Airport Administration 3
Study of air traffic control system, airspace usage, and facilities. Airport planning, development, and management and their importance to the achievement of a successful airport operation. Management of publicly owned and operated airports, ranging in size from general aviation to the large air carrier hubs. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 3120 Aviation Law 3
Law as it affects aviation industry. Rights and responsibilities of individual organizations and the aviation community. Regulation and liability pertaining to design, manufacturing, operation, and maintenance of aircraft. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 3140 Advanced Avionics Systems and Flight Simulation 3
Advanced instrument simulation training. Prerequisites: AV 1100, 2540, and passing scores on the Computer and Information Literacy (CIL) exams. (F,Sp,Su)

AV 3280 Advanced Turbine Engines 2
Advanced study of turbo-jet propulsion. Comparative examination of jet, fan, turbo-prop, and turbo-shaft engines. Prerequisites: AV 1100, 2150, and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 3410 FCC License 1
Prepares students to obtain the FCC General Radio Telephone Operator's License. Covers electronic fundamentals through microwave radar and FCC rules and regulations. Prerequisite: ETE 3400. (Sp)

AV 3610 AeroTechnology Design I 1
Students select and plan a senior project. Requires written proposal, including technical description of the project and management plans. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (Sp)

AV 4200 (dual listing 6200) Composite Manufacturing Processes and Repair 3
Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting and storage, and composite materials testing. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (Sp)

AV 4250 Internship 1-6®
Planned supervised work experience in industry. Prerequisite: Departmental approval. (F,Sp,Su)

AV 4280 Airline Management 3
Study of airline operations and their organizational structure. Examines functions of airline dispatcher, operations specialists, managers, and cockpit flight crew. Discussion of advanced flight planning, aircraft performance and loading considerations, and impact of weather on flight operations and routing priorities. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 4300 Airline Marketing 3
Introduces marketing thought, basic marketing principles and their application to airline business and operations, strategic planning, and decision-making. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. AV 4280 is *highly recommended.* (Sp)

AV 4480 Certified Flight Instructor Practicum 2
Under supervision of ground school instructor, students gain practical experience teaching ground school subjects. Prerequisite: AV 2740.

AV 4490 Human Factors in Aviation Safety 3
Examines major causative agent in aircraft accidents: the human being. Emphasizes psychological and physiological factors enhancing accident probability. Includes detailed analysis of ergonomics (human engineering) and its influence on safety. Prerequisites: AV 1100 and passing scores on the Computer and Information Literacy (CIL) exams. (Sp)

AV 4610 CI AeroTechnology Design II 3
Execution and completion of a team or individual project. Requires design reviews and written reports. Prerequisites: AV 1100, 3610, and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 4620 CI AeroTechnology Design III 3
Preparation and presentation of a team or individual project. Writing and speaking skills emphasized through technical reports and presentations. Prerequisites: AV 1100, 4610, and passing scores on the Computer and Information Literacy (CIL) exams. (Sp)

AV 4660 CI Flight Senior Project 3
Students select, plan, and execute an approved senior project. Writing and speaking skills emphasized through technical reports and presentations. Prerequisites: AV 1100, 5400, and passing scores on the Computer and Information Literacy (CIL) exams. (F,Sp)

AV 5400 Regional Jet Ground School I 4
Introduction to a typical commercial jet aircraft in use by Regional Airlines. Course includes the following: Aircraft Systems, Standard Operating Procedures, and Flight Planning and Performance. Introduction to Airline Flight Operations in preparation for entry-level pilot positions with a regional airline. Prerequisites: AV 1100, 2550, and passing scores on the Computer and Information Literacy (CIL) exams. (Sp)

AV 5410 Regional Jet Ground School II 4
Continuation of AV 5400. Prerequisites: AV 1100, 5400, and passing scores on the Computer and Information Literacy (CIL) exams. (F)

AV 5420 Advanced Regional Jet Simulation 3
Flight training introduction to a typical commercial jet aircraft simulator in use by regional airlines. Intended for Professional Pilot aviation students actively pursuing a career in the airline industry. Prerequisites: AV 1100, 5410, and passing scores on the Computer and Information Literacy (CIL) exams. (F,Sp)

AV 6200 (dual listing 4200) Composite Manufacturing Processes and Repair 3
Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting and storage, and composite materials testing. (Sp)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Business Administration (BA)

See Department of Economics and Finance, pages 230-233
Also see Department of Management, pages 349-355

Note: Effective Fall Semester 2009, the courses previously listed under the Business Administration (BA) prefix will be listed under *either* the Finance (FIN) prefix *or* the Management (MGT) prefix. (FIN courses are shown on pages 565-566, and MGT courses are shown on pages 603-607.) Students registering for Summer Semester 2009 Business Administration courses can find them under the BA prefix by logging into Access at: **http://www.usu.edu/myusu/**

Biological and Irrigation Engineering (BIE)

See Department of Biological and Irrigation Engineering, pages 179-184

BIE 1880 Engineering Quantification of Biological Processes 3
Introduction to engineering practice of biological modeling and quantification of biological processes. Introduction to transport of heat and mass; bioenergetics, thermodynamics, and enzyme kinetics; metabolism; mechanical work processes; and modeling of biological systems. Recommended that students take BIE 1880 *after* taking calculus and biology. (Sp)

BIE 1890 Introduction to Undergraduate Research Methods 1
Introduction to research in biological engineering. Provides preview of research facilities and faculty programs within the Biological and Irrigation Engineering Department at USU. Teaches specific skills for searching scientific literature, database compilation, design of controlled experiments, lab tours, data analysis, and data presentation. (Sp)

BIE 2330 Engineering Properties of Biological Materials 3
Relationships between composition, structure, and properties of biological materials. Definition, measurement, and use of mechanical, thermal, electromagnetic, chemical, and biological properties in computation and design. Prerequisites: BIOL 1610, BIE 1880, CHEM 1210, 1215. (F)

BIE 2400 Biological and Environmental Thermodynamics 3
Introductory thermodynamics for biological and environmental engineering. First and second laws of thermodynamics. Entropy, thermodynamics of processes, and equations of state. Phase equililbria, Gibbs free energy, and Raoult's law. Prerequisite: MATH 1220. (Sp)

BIE 3000 Instrumentation for Biological Systems 3
Fundamentals of measurement systems used in bioprocess, biomedical, agricultural, biological, and environmental applications. Selection and use of sensors, data acquisition systems, and elementary controls. Prerequisite: ETE 2210 or 2300. (Sp)

BIE 3200 Introduction to Unit Operations in Biological Engineering 3
Introduction to the fundamental unit operations required to process biological materials in bioprocessing, biomedical, and food engineering applications. Integration of biology and chemistry into biological engineering using basic concepts in heat, mass, and energy conservation and transport. Prerequisites: BIE 2330, CHEM 2300. (F)

BIE 3670 Transport Phenomena in Bio-Environmental Systems 3
Core course in both biological and environmental engineering. Students develop a detailed understanding of the principles, concepts, modes, and methods of calculating heat and mass transfer. Emphasis given to contaminant and nutrient flux, along with their state transformations, in order for the biological or environmental engineer to evaluate options for production, clean-up, and control of bio-environmental systems. Prerequisite: Minimum grade of *C-* in BIE 2400 or MAE 2300. Also taught as CEE 3670. (Sp)

BIE 3870 Biological Engineering Design I 1
Students select and plan a senior design project. A project proposal, including a technical description of the project and management plans, is required. (F,Sp,Su)

BIE 4250 Cooperative Practice 3
Planned work experience in industry or government. Detailed program must be approved prior to registration. Written report required. (F,Sp,Su)

BIE 4880 CI Biological Engineering Design II 3
Execution and completion of a comprehensive senior design project. Design reviews and written reports are required. Prerequisite: BIE 3870. (F,Sp,Su)

BIE 4890 CI Biological Engineering Design III 3
Preparation and presentation of the senior design project. The presentation will involve a professional standard report and an evaluation and critique by Biological Engineering students and faculty. Prerequisite: BIE 4880. (F,Sp,Su)

BIE 4930 Special Studies 1-4®
Independent or group study of biological and irrigation engineering subjects not covered in regular course offerings. (F,Sp,Su)

BIE 5010 Principles of Irrigation Engineering 3
(dual listing 6010)
Soil-water-plant relationships; evapotranspiration and water requirements; effective water use; irrigation scheduling; infiltration; irrigation systems planning. Prerequisites: CEE 3430, 3500. (F, Sp online, Su)

BIE 5020 Biological Systems Modeling and Controls 3
Development of mathematical models to describe biological systems. Emphasizes use of analogic techniques for development and numerical methods for solution. Systems to be considered include biotransport, population biology, and cellular engineering. Prerequisite: MATH 2250. (F)

BIE 5110 Sprinkle and Trickle Irrigation 4
(dual listing 6110)
Sprinkle and trickle irrigation system demand, system selection and configuration, emitter and sprinkler characteristics and sizing, uniformity and efficiency, pipe network layout and sizing, and system operation, management, and maintenance. Prerequisite: BIE 5010/6010. (F)

BIE 5150 Surface Irrigation Design 3
(dual listing 6150)
Design and evaluation of surface irrigation systems. Field measurements for evaluating and improving uniformity and efficiency. Simulation of surface systems. Land leveling computation and equipment. Prerequisite: BIE 5010/6010. (F, Sp online, Su)

BIE 5250 Remote Sensing of Land Surfaces 4
(dual listing 6250)
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as CLIM 5250/6250 and WATS 5250/6250. (Sp)

BIE 5300 Irrigation Conveyance
(dual listing 6300) and Control Systems 3
Design, evaluation, and operation of irrigation distribution systems. Measurement and monitoring of flows and water levels, and canal and pipeline automation. Simulation of system hydraulics. (F)

BIE 5350 Drainage and Water Quality Engineering 3
(dual listing 6350)
Introduction to principles and practices of drainage. Engineering investigation and design of drains. Formation and function of wetlands caused by irrigation and drainage systems. Prerequisite: BIE 5010/6010. (Sp)

BIE 5450 Field Evaluation of Agricultural
(dual listing 6450) Irrigation Systems 2
Field measurements in pressurized and surface irrigation systems for performance evaluation and determination of water application uniformity and efficiency. (Su)

BIE 5520 Irrigation Project Operation
(dual listing 6520) and Maintenance 3
Organizing, administering, and financing irrigation and drainage projects. Operation and maintenance of irrigation distribution systems. Simulation of command area water demands. Prerequisite: BIE 5010/6010. (Sp)

BIE 5550 Groundwater Systems Engineering I 3
(dual listing 6550)
Groundwater exploration; well drilling and testing; pumping plant design, operation, and testing; aquifer evaluations; siting of multiple well systems. Development of pumping strategies for water supply and environmental control systems. Introduction to conjunctive use. Prerequisite: BIE 5010/6010. (F)

BIE 5600 (dual listing 6600) Downstream Processes in Biological Engineering 3
Purification of proteins and other soluble/insoluble products from biochemical and/or chemical process streams. Emphasizes physical-chemical separation processes based on density, size, solubility, molecular interactions, etc. (Sp)

BIE 5610 (dual listing 6610) Food and Bioprocess Engineering 3
Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Prerequisite: BIE 3200. Also taught as NFS 5610/6610. (F)

BIE 5620 (dual listing 6620) Metabolic Engineering I 4
Presents fundamental knowledge of cellular metabolic pathways, basic principles of metabolic engineering, metabolic flux analysis, regulation of metabolic pathways, metabolic engineering applications, and biosynthesis of primary/secondary metabolites. Students given opportunities to conduct experiments, as well as opportunities for hands-on gene cloning and work with genetic engineering techniques. (Sp)

BIE 5630 (dual listing 6630) Synthetic Biological Engineering 3
Covers aspects of synthetic biological engineering, including overview of molecular biology and molecular cloning techniques, including PCR and analysis of nucleic acids and proteins. Introduces bioinformatics and practical use of these programs for biological design. Emphasizes principles of genetic engineering and use of standard biological parts and cellular engineering applications. (Sp)

BIE 5680 (dual listing 6680) Soil-based Waste Management 2
Engineering management of wastes present in the vadose zone, including extraction, containment, and biological, chemical, and physical destruction technologies for sustainable agriculture and environmental quality. Aspects include engineering characterization, problem definition, treatment, and monitoring. Analysis and design emphasized through problems, examinations, and report writing. Prerequisites: CEE/PUBH 3610, CEE 3640, 3870, CEE/BIE 3670. Also taught as CEE 5680/6680. (Sp)

BIE 5810 (dual listing 6810) Biochemical Engineering 3
Fundamentals of bioreactor design and bioengineering to produce biological commodities. Emphasizes mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: BIE 3200 and BIE/CEE 3670; *or* BIE/CEE 3670, CEE/PUBH 3610, and CEE 3640. Also taught as CEE 5810/6810. (F)

BIE 5830 (dual listing 6830) Management and Utilization of Biological Solids and Wastewater 3
Focuses on production, management, and disposal of biosolids and wastewater generated in food processing and wastewater treatment. Emphasizes beneficial use of biosolids and wastewater for agricultural production, forest enhancement, and land reclamation. Prerequisites: BIE 3200, BIE/CEE 3670, CEE/PUBH 3610, CEE 3640. Also taught as CEE 5830/6830. (F)

BIE 5840 (dual listing 6840) Introduction to Biophotonics 3
Engineering aspects of interactions of light with living systems. Design, testing, construction, and simulation for medical, bioprocess communication, data storage, and instrumentation applications. To receive graduate-level credit, students must complete a 10-page extra paper project addressing state-of-the-art research being conducted on a new biophotonics instrument, component, or device. Engineering aspects of the research development must be addressed (i.e., design; cost, including capital and O&M; reliability; and performance). Use and referencing of the current research literature is required. (F)

BIE 5850 (dual listing 6850) Biomaterials Engineering 3
Explores identification and modification of properties of natural and artificial biomaterials. Design of applications for by-product recovery and recycling, environmental, food processing, and biomedical industries. Commercialization of biomaterial feed stocks, biotechnology output, and bioprocessing by-products into traditional and alternative products. Prerequisite: BIE 2330. (F)

BIE 5890 (dual listing 6890) Tissue Engineering 3
Introduction to fundamentals of tissue engineering. Investigation of engineering design strategies for artificial organs, as well as treatments for disease disorders of nerves, blood vessels, bones, cartilage, skin, and liver. Exploration of the use of stem cell gene therapy in tissue engineering. Prerequisite: BIE 2330 or permission of instructor. (Sp)

BIE 5910 (dual listing 6910) Introduction to Biosensors 3
Principles of biologically based sensing elements and interfacing techniques. Design and analysis methods of biosensing and transducing components in bio-interface. Applications of biosensors and bioelectronics in biomedical, bioprocessing, and biomechanical engineering. Prerequisite: BIE 2330 or permission of instructor. (F)

BIE 5930 Special Studies 1-4®
Independent or group study of biological and irrigation engineering subjects not covered in regular course offerings. (F,Sp,Su)

BIE 6010 (dual listing 5010) Principles of Irrigation Engineering 3
Soil-water-plant relationships; evapotranspiration and water requirements; effective water use; irrigation scheduling; infiltration; irrigation systems planning. Prerequisites: CEE 3430, 3500. (F, Sp online, Su)

BIE 6110 (dual listing 5110) Sprinkle and Trickle Irrigation 4
Sprinkle and trickle irrigation system demand, system selection and configuration, emitter and sprinkler characteristics and sizing, uniformity and efficiency, pipe network layout and sizing, and system operation, management, and maintenance. Prerequisite: BIE 6010/5010. (F)

BIE 6150 (dual listing 5150) Surface Irrigation Design 3
Design and evaluation of surface irrigation systems. Field measurements for evaluating and improving uniformity and efficiency. Simulation of surface systems. Land leveling computation and equipment. Prerequisite: BIE 6010/5010. (F, Sp online, Su)

BIE 6250 (dual listing 5250) Remote Sensing of Land Surfaces 4
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as CLIM 6250/5250 and WATS 6250/5250. (Sp)

BIE 6260 Hydrology of Irrigation Agriculture 3
Impacts of irrigation activities on local and regional hydrology, wetlands, and natural systems. Determination of components of field and project water balances, including evapotranspiration. Effects of water conservation practices and changes in efficiency on timing and disposition of water resources and return flows. Irrigation scheduling and use of computer models. Prerequisite: BIE 6010/5010.

BIE 6300 (dual listing 5300) Irrigation Conveyance and Control Systems 3
Design, evaluation, and operation of irrigation distribution systems. Measurement and monitoring of flows and water levels, and canal and pipeline automation. Simulation of system hydraulics. (F)

BIE 6350 (dual listing 5350) Drainage and Water Quality Engineering 3
Introduction to principles and practices of drainage. Engineering investigation and design of drains. Formation and function of wetlands caused by irrigation and drainage systems. Prerequisite: BIE 6010/5010. (Sp)

BIE 6450 (dual listing 5450) Field Evaluation of Agricultural Irrigation Systems 2
Field measurements in pressurized and surface irrigation systems for performance evaluation and determination of water application uniformity and efficiency. (Su)

BIE 6520 (dual listing 5520) Irrigation Project Operation and Maintenance 3
Organizing, administering, and financing irrigation and drainage projects. Operation and maintenance of irrigation distribution systems. Simulation of command area water demands. Prerequisite: BIE 6010/5010. (Sp)

BIE 6550 (dual listing 5550) Groundwater Systems Engineering I 3
Groundwater exploration; well drilling and testing; pumping plant design, operation, and testing; aquifer evaluations; siting of multiple well systems. Development of pumping strategies for water supply and environmental control systems. Introduction to conjunctive use. Prerequisite: BIE 6010/5010. (F)

BIE 6600 (dual listing 5600) Downstream Processes in Biological Engineering 3
Purification of proteins and other soluble/insoluble products from biochemical and/or chemical process streams. Emphasizes physical-chemical separation processes based on density, size, solubility, molecular interactions, etc. (Sp)

BIE 6610 (dual listing 5610) Food and Bioprocess Engineering 3
Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Prerequisite: BIE 3200. Also taught as NFS 6610/5610. (F)

BIE 6620 (dual listing 5620) Metabolic Engineering I 4
Presents fundamental knowledge of cellular metabolic pathways, basic principles of metabolic engineering, metabolic flux analysis, regulation of metabolic pathways, metabolic engineering applications, and biosynthesis of primary/secondary metabolites. Students given opportunities to conduct experiments, as well as opportunities for hands-on gene cloning and work with genetic engineering techniques. (Sp)

BIE 6630 (dual listing 5630) Synthetic Biological Engineering 3
Covers aspects of synthetic biological engineering, including overview of molecular biology and molecular cloning techniques, including PCR and analysis of nucleic acids and proteins. Introduces bioinformatics and practical use of these programs for biological design. Emphasizes principles of genetic engineering and use of standard biological parts and cellular engineering applications. (Sp)

BIE 6680 (dual listing 5680) Soil-based Waste Management 2
Engineering management of wastes present in the vadose zone, including extraction, containment, and biological, chemical, and physical destruction technologies for sustainable agriculture and environmental quality. Aspects include engineering characterization, problem definition, treatment, and monitoring. Analysis and design emphasized through problems, examinations, and report writing. Prerequisites: CEE/PUBH 3610, CEE 3640, 3870, CEE/BIE 3670. Also taught as CEE 6680/5680. (Sp)

BIE 6810 (dual listing 5810) Biochemical Engineering 3
Fundamentals of bioreactor design and bioengineering to produce biological commodities. Emphasizes mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: BIE 3200 and BIE/CEE 3670; *or* BIE/CEE 3670, CEE/PUBH 3610, and CEE 3640. Also taught as CEE 6810/5810. (F)

BIE 6830 (dual listing 5830) Management and Utilization of Biological Solids and Wastewater 3
Focuses on production, management, and disposal of biosolids and wastewater generated in food processing and wastewater treatment. Emphasizes beneficial use of biosolids and wastewater for agricultural production, forest enhancement, and land reclamation. Prerequisites: BIE 3200, BIE/CEE 3670, CEE/PUBH 3610, CEE 3640. Also taught as CEE 6830/5830. (F)

BIE 6840 (dual listing 5840) Introduction to Biophotonics 3
Engineering aspects of interactions of light with living systems. Design, testing, construction, and simulation for medical, bioprocess communication, data storage, and instrumentation applications. To receive graduate-level credit, students must complete a 10-page extra paper project addressing state-of-the-art research being conducted on a new biophotonics instrument, component, or device. Engineering aspects of the research development must be addressed (i.e., design; cost, including capital and O&M; reliability; and performance). Use and referencing of the current research literature is required. (F)

BIE 6850 (dual listing 5850) Biomaterials Engineering 3
Explores identification and modification of properties of natural and artificial biomaterials. Design of applications for by-product recovery and recycling, environmental, food processing, and biomedical industries. Commercialization of biomaterial feed stocks, biotechnology output, and bioprocessing by-products into traditional and alternative products. Prerequisite: BIE 2330. (F)

BIE 6860 (dual listing 7860) Research Orientation 1
Promotes familiarization with departmental and graduate school rules, procedures, and research. (F)

BIE 6870 (dual listing 7870) Research Planning 1
Tools and techniques for writing research proposals and giving presentations. (Sp)

BIE 6890 (dual listing 5890) Tissue Engineering 3
Introduction to fundamentals of tissue engineering. Investigation of engineering design strategies for artificial organs, as well as treatments for disease disorders of nerves, blood vessels, bones, cartilage, skin, and liver. Exploration of the use of stem cell gene therapy in tissue engineering. Prerequisite: BIE 2330 or permission of instructor. (Sp)

BIE 6910 (dual listing 5910) Introduction to Biosensors 3
Principles of biologically based sensing elements and interfacing techniques. Design and analysis methods of biosensing and transducing components in bio-interface. Applications of biosensors and bioelectronics in biomedical, bioprocessing, and biomechanical engineering. Prerequisite: BIE 2330 or permission of instructor. (F)

BIE 6930 Special Problems 1-4®
Independent study of problems in biological and agricultural engineering. (F,Sp,Su)

BIE 6970 Thesis Research 1-10®
Credit for MS research and report requirements. Graded Pass/Fail *only*. (F,Sp,Su)

BIE 6990 Continuing Graduate Advisement for MS Students 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

BIE 7350 Groundwater Systems Engineering II 4
System analysis techniques applied to aquifer and stream/aquifer management. Development of economically, quantitatively, and environmentally optimal strategies for alternative water policies. Modeling techniques for managing aquifer systems under volumetric, economic, and environmental management goals. Prerequisites: CEE 5470/6470 or 6500. (Sp)

BIE 7600 Advanced Research Topics 3
Study of advanced biological and engineering topics. Analysis of project scale water management issues, software development, crop modeling, advanced drainage systems, remote sensing, groundwater systems, and other topics taken from the research interests of the faculty. Prerequisite: PhD enrollment. (Sp)

BIE 7860 (dual listing 6860) Research Orientation 1
Promotes familiarization with departmental and graduate school rules, procedures, and research. (F)

BIE 7870 Research Planning 1
(dual listing 6870)
Tools and techniques for writing research proposals and giving presentations. (Sp)

BIE 7960 Supervised Teaching 1-3
Faculty members mentor PhD students in teaching and in understanding principles of pedagogy, including: (1) planning/organizing lectures and other teaching activities, (2) conducting teaching/instruction activities, (3) involvement in grading student work, and (4) assessment of activities by faculty mentor. (F,Sp)

BIE 7970 Dissertation Research 1-10®
Graded Pass/Fail *only*. (F,Sp,Su)

BIE 7990 Continuing Graduate Advisement for PhD Students 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Biology (BIOL)

See Department of Biology, pages 185-193

BIOL 1010 BLS Biology and the Citizen 3
Principles and methods of biology and how they impact the daily life and environment of the individual. (F,Sp,Su) DE

BIOL 1020 Biological Discovery: A Lab Course 1
Field and laboratory investigative exercises. Emphasizes observation, hypothesis formulation and testing, data analysis, and writing. (F,Sp)

BIOL 1030 Medical College Admissions Test (MCAT) Preparation 1
Classroom instruction, tutorials, and readings to review material expected to be covered on the MCAT. Several Saturday practice exams are scheduled. Graded Pass/Fail *only*. (Sp)

BIOL 1040 Dental Admissions Test (DAT) Preparation 1
Classroom instruction, tutorials, and readings to review material expected to be covered on the DAT. Several Saturday practice exams are scheduled. Graded Pass/Fail *only*. (Sp)

BIOL 1100 Introduction to Microbiology 3
Biology and the role of microorganisms in the world around us, with emphasis on their contributions to human disease. Offered only through Independent Study. No laboratory component. Students who require a laboratory must take BIOL 2060. Not open to students with credit in BIOL 2060. (F,Sp,Su) DE

BIOL 1300 BLS Of Maggots, Mites, and Men 3
Examines the natural history, evolution, and behavior of insects and spiders, as well as their impact on human individuals and societies. (F)

BIOL 1610 Biology I 4
Principles of cell biology, energetics, and genetics; plant structure, function, and development. Three lectures and one lab. To receive University Studies Breadth Life Sciences (BLS) credit, students must complete *both* BIOL 1610 *and* either BIOL 1620 or 3300. The BIOL 1610 and 3300 option for BLS credit is available *only* to students majoring in Biological Engineering *or* Environmental Engineering. The BIOL 1610 and 3060 option for BLS credit is available *only* to students in the Bioinformatics Emphasis of the Computer Science Major. (F) DE

BIOL 1620 BLS Biology II 4
Animal structure, function, and development; principles of evolution, ecology, and behavior. Three lectures and one lab. Prerequisite: BIOL 1610. (Sp)

BIOL 1750 Topics in Biology (Topic) 1-3®
(F,Sp)

BIOL 1800 Herbarium Studies 1-2
Provides classroom and practical experience in developing and maintaining an herbarium and extending its reach to the community. Students taking this course for one credit will complete classroom and laboratory work, while those earning two credits will in addition complete an herbarium research or service project. (F)

BIOL 2040 Introduction to Biotechnology 1
Introduces freshmen to the emerging field of biotechnology and the impact this technology has on society. Also taught as ADVS 2040, NFS 2040, and PSC 2040. (Sp)

BIOL 2060 Elementary Microbiology 4
Biology and role of microorganisms in the world around us, with emphasis on their contributions to human disease. Not intended for biology majors. (F) DE

BIOL 2220 General Ecology 3
Study of the interrelationships among organisms and their environments, addressing where and how organisms live. Adaptation, population growth, species interactions, biodiversity, and ecosystem function are explored for a wide variety of organisms and ecosystems. Prerequisites: BIOL 1610 and 1620. Also taught as NR 2220. (F,Sp)

BIOL 2300 Mushroom Identification 1
Lecture course covering taxonomy, ecology, and importance of macro and micro fungi. Also taught as WILD 2300. (F)

BIOL 2310 Mushroom Identification Lab 1-2®
Lab course acquainting students with basic fungal taxonomic groups. Students collect, preserve, and identify fungi they collect. Edible fungi prepared and eaten. Also taught as WILD 2310. (F)

BIOL 2320 Human Anatomy 4
Study of the human body, with emphasis on the structure of each of the body's essential organ systems. Three lectures, one lab. (Sp,Su) DE

BIOL 2410 Plants and Fungi in the Field 2
Introduction to identification of green plants and macrofungi. Quantitative methods for field studies. Prerequisite: BIOL 1610. (Su)

BIOL 2420 Human Physiology 4
Functioning of the human body, with emphasis upon major organ systems. Medical and athletic examples used to illustrate important concepts. (F,Sp,Su) DE

BIOL 2520 Pathophysiology 3
Promotes an understanding of disease and dysfunctional variations of normal health across the body. Prerequisites: BIOL 2320 and 2420, each with a minimum grade of *C*. Course offered *only* at select branch campuses, not at the Logan campus. (F,Sp) DE

BIOL 2700 Predental Orientation and Observation 3
Introduces predental students to the dental curriculum and characteristics of the dental profession. Each student assigned to a practicing dentist for part of the course. Prerequisite: Permission of advisor. (Sp)

BIOL 3000 DSC Discovering Utah's Biodiversity 3
Lecture and field course designed to identify and study local organisms and their role in ecosystems. Topics include ecology, local geology, adaptations to the local environment, and human impacts. Major components include writing, as well as the collection and presentation of data. Prerequisite: Completion of a University Studies Breadth Life Sciences (BLS) course. (F,Sp) DE

BIOL 3010 DSC/CI Evolution 3
Origins and evidence for the theory of biological evolution, and its significance for society and science. Prerequisite: University Studies Breadth Life Sciences (BLS) course. (Sp) DE

BIOL 3030 DSC Genetics and Society 3
Course for nonscience majors. Addresses ethical, political, and social implications of advances in genetics and basic genetic principles, as well as contemporary issues in human genetics. Prerequisite: University Studies Breadth Life Sciences (BLS) course. Not open to biology majors or to those with credit in BIOL 3060. (Sp)

BIOL 3040 DSC Plants and Civilization 3
Examines the importance of plants as food, shelter, clothing, medicine, and drugs. Social and historical role of plants in aesthetics, religion, energy, biotechnology, human exploration, and migration. Prerequisite: University Studies Breadth Life Sciences (BLS) course. (F) DE

BIOL 3060 QI Principles of Genetics 4
Introduction to transmission, population, and molecular aspects of modern genetics. Prerequisites: BIOL 1610; CHEM 1110 or 1210. The BIOL 1610 and 3060 option for BLS credit is available *only* to students in the Bioinformatics Emphasis of the Computer Science Major. (F,Sp,Su)

BIOL 3065 Genetics Laboratory 2**
Experimental approach to genetics using bacteria, fungi, plants, insects, and humans. Students will be introduced to several computer and laboratory techniques, and will design many of the experiments. Prerequisite: BIOL 3060 (may be taken concurrently). (F)

BIOL 3100 CI Bioethics 3
Discussion of current controversial ethical issues in medicine, animal rights, and environmental conservation. (Sp)

BIOL 3220 QI Field Ecology 2
Field trips and exercises to study ecological patterns and processes in terrestrial and aquatic habitats. Emphasis on hypothesis testing and collection and analysis of data from the field. Prerequisite: BIOL 2220 (may be taken concurrently); MATH 1100 or 1210. Recommended: Course in statistics. (F)

BIOL 3300 General Microbiology 4
Biology, ecology, and diversity of microorganisms. Emphasis placed on bacteria, viruses, fungi, and protists, and their role in the environment. Two lectures, two labs. Prerequisites: BIOL 1610 (with a grade of *C-* or better); CHEM 1120 or 2300 or 2310 (may be taken concurrently). To receive University Studies Breadth Life Sciences (BLS) credit, students must complete *both* BIOL 1610 *and* 3300. The BIOL 1610 and 3300 option for BLS credit is available *only* to students majoring in Biological Engineering *or* Environmental Engineering. (F,Sp)

BIOL 3500 DSC Plagues, Pests, and People 3
Examines the biology and diversity of medically important insects and their associated diseases. Emphasizes the basic principles and concepts in medical, veterinary, and forensic entomology, as well as the historical impact of insect-borne diseases. Prerequisite: University Studies Breadth Life Sciences (BLS) course. (Sp)

BIOL 3760 Independent Study 1-3®
Directed individual or group study. Prerequisite: BIOL 1620. Not counted as Biology degree elective or toward the Biology, Biomath, or Public Health minors. (F,Sp,Su) DE

BIOL 4000 Human Dissection 1
Exposure and dissection of the human body, with an emphasis on bones, joints, muscles, and internal organs. One evening lab per week. Prerequisite: BIOL 2320. (F)

BIOL 4060 CI Exploring Animal Behavior 3
In-depth investigation into current topics. Students will generate hypotheses; design and complete experiments in field and lab; and prepare a written lab report, book review, and poster for public presentation. Two lectures, one lab. Prerequisite: BIOL 1620, 2220. (Sp)

BIOL 4230 QI Applied Mathematics in Biology 3**
Formulation, analysis, and experimental tests of mathematical models in biology. Combines mathematics, computing, experimental design, and statistical analysis while applying the scientific method to biological systems. Lectures, recitations, and a laboratory. Prerequisites: *C-* or better in BIOL 1620 and MATH 2250; or permission of instructor. Programming recommended. Also taught as MATH 4230. (Sp)

BIOL 4250 Internship/Co-op 1-2
Internship/cooperative work experience in biology or prehealth biology to allow student to gain a professional level of experience. Advisor's signature required. (F,Sp,Su)

BIOL 4400 QI Plant Physiology 4
Introduction to plant metabolism, water relations, and growth. Prerequisites: BIOL 1620; MATH 1050 or higher. (F)

BIOL 4410 Plant Structure 3
Morphology, anatomy, and development of seed plants, with an emphasis on angiosperms. Two lectures and one lab. Prerequisite: BIOL 1610. (Sp)

BIOL 4420 Plant Taxonomy 3
Identification of vascular plant species and recognition of families common in northern Utah. Introduction to principles and practices of plant taxonomy. Prerequisite: BIOL 1610. (Sp,Su)

BIOL 4430 Introduction to Plant Pathology 4
Combined lecture-lab course emphasizing concepts in plant pathology. Symptoms and disease-causing organisms are described. Methods of control, the nature of epidemics, and disease prediction. Prerequisite: BIOL 1610. (Sp)

BIOL 4500 Applied Entomology 3
Fundamentals of insect biology, emphasizing species of economic importance. Principles and tactics of pest management. Laboratory includes survey of beneficial and harmful insects affecting humans and agriculture. Prerequisites: BIOL 1610 and 1620. (Sp)

BIOL 4710 Teaching Internship 1®
Advanced undergraduates function as teaching interns under supervision of a faculty member. Only 1 credit may be counted toward Biology degree electives. Prerequisite: Consent of instructor. (F,Sp,Su) DE

BIOL 4750 Topics in Biology (Topic) 1-3®
(F,Sp,Su) DE

BIOL 5010 Biogeography 3
(dual listing 6010)
Distributions of plants and animals, including invertebrates, from terrestrial, freshwater, and marine systems, discussed from historical and ecological perspectives. Explores ecological patterns of body size, color, species density, home range, etc., as well as their causes. Prerequisite: BIOL 1620. (Sp)

BIOL 5020 QI Modeling Biological Systems 3**
(dual listing 6020)
Basic techniques of mathematical and computer simulation applied to a wide variety of biological systems: ecology, physiology, agroecosystems, and cell biology. Model formulation, validation, sensitivity and stability analysis, stochastic systems. Prerequisites: MATH 1220, STAT 3000, programming experience. (F)

BIOL 5030 Individual-Based Models in
(dual listing 6030) Ecology and Evolution 3**
Examines the nature, application, and student development of computer simulation models that follow the demographic fates and spatial movement of individual organisms in the context of ecological and evolutionary questions. Recommended prior to enrollment: Programming experience (preferably in C), upper-division courses in statistics and ecology or evolution, and BIOL 5020/6020. (Sp)

BIOL 5100 Neurobiology 3**
(dual listing 6100)
Physiology, organization, and development of nervous systems. Examples taken from vertebrate and invertebrate systems. Special emphasis placed on cellular and molecular substrates of electrical excitability. Prerequisites: BIOL 1620; BIOL 2420, 5600, or 5620; CHEM 1220; and PHYS 2120 or 2220. (F)

BIOL 5150 Immunology 3
Immune response in health and disease. Experimental approach to investigating immune function and abnormalities. Prerequisites: CHEM 1220; BIOL 3060; and BIOL 3300 or 5210. (Sp)

BIOL 5160 Methods in Biotechnology: Cell Culture 3
Techniques and fundamental knowledge for culturing mammalian and insect cells. Students will learn maintenance, growing, genetic engineering of cells, cytotoxicity, hybridoma creation, cloning, etc. Extensive laboratory experience is provided. Also taught as ADVS 5160, NFS 5160, and PSC 5160. (Sp)

BIOL 5190 Molecular Genetics 3
(dual listing 6190)
Molecular aspects of genetics, including DNA replication, structure, rearrangement, transposition, recombination, repair, genetic engineering, and gene expression. For 6000-level (graduate) credit, additional reading, recitation, and/or writing is required. Prerequisites: BIOL 3060; and CHEM 3700 or 5700. (Sp)

BIOL 5210 Cell Biology 3
Examines the mechanisms of cell structure and function at the molecular level. Prerequisites: BIOL 1620, 3060; CHEM 2300 or 2320; CHEM 3700 or 5700 highly recommended. (F)

BIOL 5220 Endocrine Aspects of Nutrition 2
(dual listing 6220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as ADVS 5220/6220 and NFS 5220/6220. (Sp)

BIOL 5230 Developmental Biology 3
Examines the mechanisms of biological development using classical embryological and modern molecular and cellular approaches. Prerequisites: BIOL 3060 and 5210; CHEM 3700 and 5700 strongly recommended. (Sp)

BIOL 5240 Methods in Biotechnology: Protein Purification Techniques 3
Reviews basic methods of protein purification, including scaled-up use of 100L fermenter, large-scale centrifugation, diafiltration, chromatography, and use of BioCAD. Prerequisite: CHEM 3700. Also taught as ADVS 5240, NFS 5240, and PSC 5240. (Sp)

BIOL 5250 CI Evolutionary Biology 3
Current topics in organic evolution from molecular to macroevolutionary scales. Prerequisite: BIOL 3060 or WILD 4880 or permission of instructor; BIOL/NR 2220 recommended. (F,Sp) DE

BIOL 5260 Methods in Biotechnology: Molecular Cloning 3
Laboratory-oriented course designed to teach molecular biology techniques such as DNA cloning, genetic probes, polymerase chain reaction, and DNA sequencing. Prerequisite: CHEM 3700 or 5710; or BIOL 3060; or permission of instructor. Also taught as ADVS 5260, NFS 5260, and PSC 5260. (F)

BIOL 5300 QI Microbial Physiology 4
Lectures, discussions, and laboratory investigations concerning the physiology, structure, and metabolism of prokaryotic and eukaryotic microbes. Prerequisites: BIOL 3300, MATH 1210. (Sp)

BIOL 5310 Soil Microbiology* 3
Ecology and diversity of microorganisms in soils. Emphasis on factors controlling microbial activity and the role of microorganisms in organic matter decomposition and nutrient cycling. Prerequisites: BIOL 1610, 1620; CHEM 2300 or 2310; SOIL 3000. Also taught as SOIL 5310. (F)

BIOL 5320 Soil Microbiology Laboratory* 2
Techniques for measuring microbial activity and diversity in soils. Includes use of molecular and isotope methods. Prerequisite: Concurrent or prior enrollment in BIOL/SOIL 5310. Also taught as SOIL 5320. (F)

BIOL 5330 Virology 3
Structure, replication, genetics, and molecular biology of viruses. Virus-host interactions. Viral diseases and antiviral agents. Prerequisites: BIOL 3060 and 3300. (Sp)

BIOL 5380 Evolutionary Genetics 4
(dual listing 6380)
Examines theoretical and applied aspects of genes in natural and artificial populations. Topics include molecular evolution, population, and quantitative genetics, with emphasis on the intersection of genetics with evolution, ecology, and conservation biology. Prerequisite: BIOL 3060 or permission of instructor. (F)

BIOL 5400 Environmental Toxicology 3
(dual listing 6400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as ADVS 5400/6400 and PUBH 5400/6400. (Sp)

BIOL 5420 CI Forest and Shade Tree Pathology 3
Nature, cause, and management of forest diseases. Also taught as PLSC 5420 and WILD 5420. (Sp)

BIOL 5440 Plant Molecular, Cellular,
(dual listing 6440) and Developmental Biology I* 3**
Examines background and recent advances. Students analyze and discuss structure, genome, molecular, development, and photosynthesis topics from a research perspective. Prerequisites: BIOL 3060, 5210; CHEM 3700 or 5710. Also taught as PLSC 5440/6440. (Sp)

BIOL 5450 Plant Molecular, Cellular,
(dual listing 6450) and Developmental Biology II* 3**
Examines background and recent advances. Students analyze and discuss cell wall, growth regulator, and environmental response topics from a research perspective. Prerequisites: BIOL 3060, 5210; CHEM 3700 or 5710. Also taught as PLSC 5450/6450. (Sp)

BIOL 5530 Insect Systematics and Evolution 3
Evolution, biology, and classification of insects, including basic external morphology. Emphasizes role of phylogeny in systematics and importance of systematics in comparative biology. Prerequisite: BIOL 1620. (F)

BIOL 5550 Freshwater Invertebrates 3
Ecology, collection, and systematics of freshwater aquatic invertebrates. Focuses on insects, but also covers crustaceans, molluscs, and annelids. Several weekend field trips and a collection are required. Prerequisite: One year of general biology or zoology, or permission of instructor. Also taught as WATS 5550. (Sp)

BIOL 5560 Ornithology 3
Surveys evolution, systematics, physiology, anatomy, ecology, behavior, and identification of birds. Includes lectures, laboratory and field exercises, field trips, and an independent project. Attendance required at one Saturday and one Friday-Sunday field trip. Prerequisites: BIOL 1620; MATH 1050 or higher. (Sp)

BIOL 5570 Herpetology 3
Evolution, adaptations, distribution, natural history, behavior, and identification of amphibians and reptiles of the world, with special emphasis on North American species. Two lectures and one lab. Prerequisite: BIOL 1620. (Sp)

BIOL 5580 Mammalogy 3
Evolution, adaptations, distribution, natural history, behavior, and identification of mammals of the world, with special emphasis on North American species. Two lectures and one lab. Prerequisite: BIOL 1620. (F) DE

BIOL 5590 Animal Community Ecology 4**
(dual listing 6590)
Concepts and controversies in modern community ecology emphasizing aquatic and terrestrial animals. Covers the community concept, diversity and stability, null models, relative importance of competition and predation, food webs, disturbance, metapopulations, biogeography, and new directions. Prerequisites: BIOL 2220, STAT 3000. (Sp)

BIOL 5600 Comparative Animal Physiology 3
(dual listing 6600)
Principles and mechanisms of physiology in vertebrate and invertebrate animals. For graduate (6000-level) credit, additional reading, recitation, and/or writing will be required. Prerequisites: BIOL 1620 and one of CHEM 1110, 1120, and 1220; or permission of instructor. (Sp) DE

BIOL 5610 QI Animal Physiology Laboratory 2
Laboratory exercises designed to explore principles of animal physiology, using computer simulations, tissue models, and animal preparations. Emphasis placed on hypothesis design and data interpretation. Prerequisite: BIOL 2420, 5600, or 5620 (any prerequisite may be taken concurrently). (F,Sp) DE

BIOL 5620 Medical Physiology* 3
Cardiovascular, respiratory, endocrine, gastrointestinal, excretory, and nervous system function in the mammalian body. Emphasis on molecular mechanisms. Examples from mammalian diseases used to illustrate key concepts. Prerequisites: BIOL 1620; BIOL 2420 or 5600; CHEM 1120 or 3700 (may be taken concurrently) or 5710. (F)

BIOL 5730 Genomic Technologies 4
Provides theoretical background in genomics/proteomics technologies and laboratory training in advanced techniques. Topics include: whole genome sequencing, transcriptome and proteome characterization, DNA and expressed gene libraries, and operation of modern genomics laboratory equipment. Prerequisites: BIOL 1620, 3060; CHEM 3700 or 5710; CS 2200; STAT 3000. Also taught as CHEM 5730. (Sp)

BIOL 5800 Undergraduate Research 1-3®
Faculty-directed research in biology. Prerequisites: BIOL 1620 and consent of instructor. Maximum of 3 credits of BIOL 5800 are acceptable toward Biology degree elective requirements. (F,Sp,Su) DE

BIOL 5810 Bachelor's Thesis 3
Preparation of a written thesis, based upon individual investigation, under the supervision of faculty. Prerequisites: 3 credits of BIOL 5800 (or concurrent enrollment) and consent of instructor. (F,Sp,Su)

BIOL 5850 Microbiology Seminar 1®
(dual listing 6850)
Graded Pass/Fail *only*. (F,Sp,Su)

BIOL 6010 Biogeography 3
(dual listing 5010)
Distributions of plants and animals, including invertebrates, from terrestrial, freshwater, and marine systems, discussed from historical and ecological perspectives. Explores ecological patterns of body size, color, species density, home range, etc., as well as their causes. Prerequisite: BIOL 1620. (Sp)

BIOL 6020 QI Modeling Biological Systems* 3
(dual listing 5020)
Basic techniques of mathematical and computer simulation applied to a wide variety of biological systems: ecology, physiology, agroecosystems, and cell biology. Model formulation, validation, sensitivity and stability analysis, stochastic systems. Prerequisites: MATH 1220, STAT 3000, programming experience. (F)

BIOL 6030 Individual-Based Models in
(dual listing 5030) Ecology and Evolution* 3
Examines the nature, application, and student development of computer simulation models that follow the demographic fates and spatial movement of individual organisms in the context of ecological and evolutionary questions. Recommended prior to enrollment: Programming experience (preferably in C), upper-division courses in statistics and ecology or evolution, and BIOL 6020/5020. (Sp)

BIOL 6100 Neurobiology 3**
(dual listing 5100)
Physiology, organization, and development of nervous systems. Examples taken from vertebrate and invertebrate systems. Special emphasis placed on cellular and molecular substrates of electrical excitability. For graduate (6000-level) credit, additional reading, recitation, and/or writing will be required. Prerequisites: BIOL 1620; BIOL 2420, 5600, or 5620; CHEM 1220; and PHYS 2120 or 2220. (F)

BIOL 6190 Molecular Genetics 3
(dual listing 5190)
Molecular aspects of genetics, including DNA replication, structure, rearrangement, transposition, recombination, repair, genetic engineering, and gene expression. For 6000-level (graduate) credit, additional reading, recitation, and/or writing is required. Prerequisites: BIOL 3060; and CHEM 3700 or 5700. (Sp)

BIOL 6200 Biogeochemistry of Terrestrial
Ecosystems 3**
Inputs, outputs, and cycling patterns of major nutrients. Emphasizes mechanisms for transformations, factors influencing process rates, and the impacts of management and global change on nutrient cycles and air and water quality. Prerequisites: BIOL 1620, SOIL 3000, CHEM 2300 or 2310, or permission of instructor. Also taught as SOIL 6200 and WILD 6200. (F)

BIOL 6210 Advanced Cell Biology 3**
Presents most recent advances in cell biology research. Prerequisites: BIOL 3060 and 5210. (Sp)

BIOL 6220 Endocrine Aspects of Nutrition 2
(dual listing 5220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as ADVS 6220/5220 and NFS 6220/5220. (Sp)

BIOL 6250 Graduate Internship 1-6
Work experience, for which the student is paid, tied to academics in a graduate student's field of study. Graded Pass/Fail *only*. Prerequisite: Permission of department head prior to enrollment. (F,Sp,Su)

BIOL 6260 Behavioral Ecology* 3**
Focuses on current topics, emphasizing critical reading and thinking skills. Includes lectures, student presentations, and discussions of primary literature. (Sp)

BIOL 6380 Evolutionary Genetics 4
(dual listing 5380)
Examines theoretical and applied aspects of genes in natural and artificial populations. Topics include molecular evolution, population, and quantitative genetics, with emphasis on the intersection of genetics with evolution, ecology, and conservation biology. Prerequisite: BIOL 3060 or permission of instructor. (F)

BIOL 6400 Environmental Toxicology 3
(dual listing 5400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as ADVS 6400/5400 and PUBH 6400/5400. (Sp)

BIOL 6440 Plant Molecular, Cellular,
(dual listing 5440) and Developmental Biology I* 3**
Examines background and recent advances. Students analyze and discuss structure, genome, molecular, development, and photosynthesis topics from a research perspective. For graduate (6000-level) credit, additional reading, recitation, and/or writing will be required. Prerequisites: BIOL 3060, 5210; CHEM 3700 or 5710. Also taught as PLSC 6440/5440. (Sp)

BIOL 6450 Plant Molecular, Cellular,
(dual listing 5450) and Developmental Biology II* 3**
Examines background and recent advances. Students analyze and discuss cell wall, growth regulator, and environmental response topics from research perspective. For graduate (6000-level) credit, additional reading, recitation, and/ or writing will be required. Prerequisites: BIOL 3060, 5210, CHEM 3700 or 5710. Also taught as PLSC 6450/5450. (Sp)

BIOL 6510 Insect-Plant Interactions 2**
Ecology, evolution, and physiology of the interactions between insects and plants, including herbivory, defenses/compensations of plants to insect attack, pollination, and other mutualisms. (F)

BIOL 6520 Ecological Vertebrate Physiology* 3**
Physiological responses and adaptations of vertebrates to physical, chemical, and biological environments. Bioenergetics at the species level. Three lectures. Prerequisites: One course in physiology and one course in ecology. (F)

BIOL 6590 Animal Community Ecology 4**
(dual listing 5590)
Concepts and controversies in modern community ecology emphasizing aquatic and terrestrial animals. Covers the community concept, diversity and stability, null models, relative importance of competition and predation, food webs, disturbance, metapopulations, biogeography, and new directions. For graduate (6000-level) credit, additional reading, recitation, and/or writing will be required. Prerequisites: BIOL 2220, STAT 3000. (Sp)

BIOL 6600 Comparative Animal Physiology 3
(dual listing 5600)
Principles and mechanisms of physiology in vertebrate and invertebrate animals. For graduate (6000-level) credit, additional reading, recitation, and/or writing will be required. Prerequisites: BIOL 1620 and one of CHEM 1110, 1120, and 1220; or permission of instructor. (Sp)

BIOL 6740 Cellular Communication by Small Molecules and Proteins ** 3**
Using post-translational modifications, small molecules, and protein motifs in cellular communication. Variances in the communication systems related to disease state and/or cell stress and therapeutic strategies to manipulate the communication systems. Prerequisite: CHEM 5700 or 6700 or permission of instructor. Also taught as CHEM 6740. (Sp)

BIOL 6750 Topics in Biology (Topic) 1-3®
(F,Sp,Su)

BIOL 6800 Biology Seminar 1®
Format for general graduate-level seminar topics. Graded Pass/Fail *only*. (F,Sp)

BIOL 6820 Plant Biology/Pathology Seminar 1®
Graded Pass/Fail *only*. (F,Sp)

BIOL 6830 Entomology Seminar 1®
Graded Pass/Fail *only*. (F,Sp)

BIOL 6840 Zoology Seminar 1®
Graded Pass/Fail *only*. (F,Sp)

BIOL 6850 Microbiology Seminar 1®
(dual listing 5850)
Graded Pass/Fail *only*. (F,Sp,Su)

BIOL 6870 Ecology Seminar 1®
The Ecology Center schedules regular seminars throughout the school year with ecological scientists from other institutions participating. Ecology majors are required to attend a minimum of 10 such lectures. Graded Pass/Fail *only*. Students should register for fall semester, but attend through spring semester. Also taught as ENVS 6870, PSC 6870, WATS 6870, and WILD 6870. (F)

BIOL 6910 Special Problems 1-3®
Individual or group study under faculty guidance. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

BIOL 6960 Graduate General Ecology 4
General concepts, history, and issues in all major areas of the science of ecology including: environmental biophysics; and physiological, behavioral, evolutionary, community, ecosystem, and applied ecology in both terrestrial and aquatic environments. Also taught as ENVS 6960, PSC 6960, WATS 6960, and WILD 6960. (F)

BIOL 6970 Thesis Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

BIOL 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

BIOL 7750 Topics in Biology 1-3
(F,Sp,Su)

BIOL 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

BIOL 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
***This course is taught alternating years. Check with department for information about when course will be taught.

Business (BUS)

See Jon M. Huntsman School of Business, pages 123-127

BUS 1000 Business Orientation 0.5
Orients freshmen and transfer students to Huntsman School of Business programs, academic and student services, professional organizations, and career possibilities. This course is not currently being offered. For information about when it may be offered, contact the Huntsman School of Business.

BUS 2000 Orientation for International Summer Program 1®
Introduction to culture, history, and business environments, as well as travel orientation, to prepare students for participation in one of the summer programs in either South America or Asia. (Sp)

BUS 2250 Introductory Internship 1-9®
Introductory-level experience in a career-related position approved by the Cooperative Education Office. One credit for every 75 hours of internship experience, with a maximum of 9 credits. A maximum of 12 credits of 2250 and 4250 combined can be counted toward the minimum degree requirements for the Huntsman School of Business. Prerequisite: Permission of instructor. (F,Sp,Su) DE

BUS 3010 Intermediate Accounting I 3
Study at the intermediate level in accounting theory and practice relating to financial reporting of assets. Prerequisites: Cumulative GPA of 2.5 or higher; grade of *B-* or better in ACCT 2010.

BUS 3020 Intermediate Accounting II 3
Study at the intermediate level in accounting theory and practice relating to financial reporting of liabilities and equities. Prerequisites: Cumulative GPA of 2.5 or higher; BUS 3010.

BUS 3100 DSS Survey of Management Information Systems 3
Survey of business uses of information technology, emphasizing vocabulary, concepts, career emphases, and systems components. Includes general systems theory and business functional information subsystems (e.g., accounting, management, finance, and marketing). Prerequisites: Cumulative GPA of 2.5 or higher; and Computer and Information Literacy (CIL) Exam, OSS 1400, or equivalent. (F,Sp,Su)

BUS 3110 DSS Management Fundamentals 3
Study of the role of management, leadership theory, defining goals, organizing work, and managing performance. Prerequisite: Cumulative GPA of 2.5 or higher. DE

BUS 3250 Discussions With Business Leaders 1®
Introduces current business trends, issues, and problems. This is accomplished through readings and discussions, as well as by required attendance at Dean's Convocation, Partner's in Business, and other appropriate business seminars. Graded Pass/Fail *only*. (F,Sp)

BUS 3310 Managerial Cost Accounting 3
Intermediate level of accounting and interpretation of accounting information for internal decision-making and control. Prerequisites: Cumulative GPA of 2.5 or higher; ACCT 2020.

BUS 3330 Essentials of Database Systems 3
Includes essential theory of database systems in areas such as E/R design, relational design, the SQL language, and distributed databases. Prerequisites: MIS 2100, completion of at least 40 credits, and cumulative GPA of 2.5 or higher. DE

BUS 3400 QI Finance Fundamentals 3
Study of basic financial management principles, methods, and policies for business. Prerequisites: Cumulative GPA of 2.5 or higher; ACCT 2010; MATH 1050; choose one statistics course from STAT 1040, 2300, 3000, or PSY 2800. DE

BUS 3410 Federal Income Tax I 3
Study of tax law and procedures for individuals, with an introduction to corporations and other entities. Prerequisite: Cumulative GPA of 2.5 or higher.

BUS 3500 Marketing Principles 3
Study of basic marketing principles, functions, concepts, and terminology. Prerequisite: Cumulative GPA of 2.5 or higher. [DE]

BUS 3510 Business Programming 3
Includes basics of business systems development using programming languages supporting the Windows environment. Prerequisites: MIS 2100, completion of at least 40 credits, and cumulative GPA of 2.5 or higher. [DE]

BUS 3610 Introduction to Entrepreneurship 3
Introduction to entrepreneurship and the initial developmental processes of new ventures. Helps students become familiar with entrepreneurship, its role in the economy, and its viability as a career path. Focuses on identifying and analyzing potential business opportunities. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits.

BUS 3620 Developing Entrepreneurial Competencies 3
Focuses on the development of persuasion, delegation, organizational, leadership, and other practical competencies for individuals who launch businesses and/or play a significant role in their growth. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits. [DE]

BUS 3700 Operations Management Fundamentals 3
Study of basic concepts and tools relating to managing the operations of a business. Prerequisites: Cumulative GPA of 2.5 or higher; MATH 1100 or 1210; STAT 2300 or 3000. [DE]

BUS 3710 Interpersonal and Team Skills 3
Focuses on the role of teams and interpersonal relationships in emerging organizations. Designed to help individuals and teams learn the skills needed for organizational effectiveness. Uses examples and exercises relevant to emerging organizations. [DE]

BUS 3820 International Ventures 3
Explores international culture and content of entrepreneurship, the impact of globalization on emerging businesses, and the pressures and complexities of operating in global markets, including the processes of managing multicultural resources. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits. [DE]

BUS 4010 Selected Topics in Finance 3
Selected topics in finance pursued in depth. Topics may vary. Prerequisites: Cumulative GPA of 2.5 or higher; BUS 3400.

BUS 4020 Selected Topics in Marketing 3
Selected topics in marketing pursued in depth. Topics may vary. Prerequisites: Cumulative GPA of 2.5 or higher; BUS 3500.

BUS 4030 Selected Topics in Management 3®
Selected topics in management pursued in depth. Topics may vary. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits.

BUS 4040 Selected Topics in Human Resources 3
Selected topics in human resources pursued in depth. Topics may vary. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits.

BUS 4050 Selected Topics in Information Systems 3
Selected topics in information systems pursued in depth. Topics may vary. Prerequisites: BUS 3330, completion of at least 40 credits, and cumulative GPA of 2.5 or higher.

BUS 4200 Advanced Accounting 3
Explores accounting principles and theory relating to business combinations, nonprofit organizations, and governmental accounting. Prerequisites: Cumulative GPA of 3.0 or higher; grade of *B* or better in BUS 3010; admittance to a USU major; and completion of at least 40 credits. (Alt Su)

BUS 4250 Advanced Internship 1-9®
Advanced or middle-level internship experience in a career-related position approved by the Cooperative Education Office. One credit for every 75 hours of internship experience, with a maximum of 9 credits. Prerequisite: Permission of instructor. (F,Sp,Su) [DE]

BUS 4410 Taxation of Business Entities 3
Examines federal taxation of partnerships, S-corporations, estates and trusts, and other special entities. Prerequisites: Cumulative GPA of 3.0 or higher, grade of *B* or better in BUS 3010; BUS 3410; admittance to a USU major; and completion of at least 40 credits. (Alt F) [DE]

BUS 4500 Accounting Systems 3
Studies concepts underlying the accounting systems' computerized support of business processes. Covers accounting systems development, internal controls, security, and systems auditing. Prerequisites: Cumulative GPA of 3.0 or higher; grade of *B* or better in BUS 3010; admittance to a USU major; and completion of at least 40 credits. (Alt F) [DE]

BUS 4510 Auditing Principles 3
Teaches fundamental principles and techniques of financial statement auditing. Also addresses internal controls, professional ethics, legal environment, auditing standards, and fraud detection. Prerequisites: Cumulative GPA of 3.0 or higher; grade of *B* or better in BUS 3010; admittance to a USU major; and completion of at least 40 credits. (Alt Sp) [DE]

BUS 4610 Advanced Entrepreneurship 3
Theoretical and practical aspects of starting or buying a business. Includes development of a business plan, conducting due diligence for buying a business, valuation, and related topics. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits. [DE]

BUS 4710 Entrepreneurship Project 3
Students plan and complete advanced entrepreneurship projects that may include developing their own business, a significant consulting project with a start-up or growth business, or other approved project. Prerequisites: Cumulative GPA of 2.5 or higher and completion of at least 40 credits.

BUS 4880 CI Business Strategy 3
Capstone course dealing with the processes of operating a business venture. Emphasizes market entry, finance, operations, managing growth, business ethics, and social responsibility. Addresses entrepreneurial issues and global strategies. Prerequisites: Cumulative GPA of 2.5 or higher; BUS 3110, 3400, 3500, 3700. [DE]

BUS 5100 Systems Analysis and Design and Project Management 3
Requires students to build an information system using state-of-the-art analysis and design principles, as well as project management essentials. The project must be completed for an external organization using state-of-the-art software. Prerequisites: BUS 3330, 3510, completion of at least 40 credits, and cumulative GPA of 2.5 or higher.

BUS 6250 Graduate Internship 1-6®
Graduate-level internship in a career-related position for graduate students wishing to develop or expand their occupational experience. Maximum of 6 credits. Prerequisite: Permission of instructor. (F,Sp,Su)

BUS 6310 MBA Career Development 0.5®
Provides background in theory and practice of career development, including student assessment, organizational entry, and career planning and mentoring. (F,Sp,Su)

BUS 6860 Applied Business Research 3
Provides students with the capability to design and conduct applied business research projects in all areas of business. Introduces students to the philosophy of science, research design, measurement and scaling, reliability and validity, communication of research results, and other topics. (Sp) [DE]

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Civil and Environmental Engineering (CEE)

See Department of Civil and Environmental Engineering, pages 203-210

CEE 1880 Civil and Environmental Engineering Orientation and Computer Applications 1
Orients students to programs of the Department of Civil and Environmental Engineering, professional and academic advising, student services, professional societies, and engineering careers. Laboratory activities emphasize problem solving using computer applications, such as spreadsheets and the HP48 Scientific Calculator. (F,Sp)

CEE 2240 Engineering Surveying 3
Experience with a wide variety of common surveying equipment, including use and operation of levels, theodolites, total station equipment, and GPS. Prior to graduation, computer applications and field exercises prepare students for civil engineering employment early in their careers. Prerequisites: ACT Math score of 27 or higher or credit for MATH 1050 and 1060. Enrollment limited to students having majors within the College of Engineering. (F,Su)

CEE 2870 Sophomore Seminar 1
Supervised discussion and review of problems encountered by professional engineers. (Sp)

CEE 2890 Environmental Engineering Sophomore Seminar 1
Introduces students to the field of environmental engineering, emphasizing design, ethics, and leadership in the environmental engineering profession. Emphasizes creative thinking, organizational skills, team work, professional ethics, and social responsibility. Prerequisite: Sophomore standing in environmental engineering. (Sp)

CEE 3010 Mechanics of Materials 2
Includes principal stresses; combined loading and stresses; deflection of beams by direction integration, moment-area, and superposition; and deflection of beams and frames by energy methods and columns. Includes visual animations to demonstrate the mechanical behavior of materials. Prerequisites: Minimum grades of *C-* in ENGR 2010 and 2140. (F)

CEE 3020 Structural Analysis 2
Classification of structural types and development of loads. Analysis of both statically determinate and indeterminate structures. Analysis of trusses, beams, frames, cables, and arches. Utilization of approximate methods of analysis focusing on structural behavior. Prerequisite: CEE 3010. (Sp)

CEE 3030 Uncertainty in Engineering Analysis 2
Principles of probability and statistics applied specifically to problems in civil and environmental engineering, including transportation, water quality, waste treatment, hydrology, and materials. (F,Sp)

CEE 3080 Design of Reinforced Concrete Structures 3
Design of reinforced concrete structural elements, simple and continuous reinforced beams, columns, joints, and one-way slabs. Includes concrete materials laboratory. Prerequisite: CEE 3010. Prerequisite or corequisite: CEE 3020. (Sp)

CEE 3210 Introduction to Transportation Engineering 3
Introduction to basic concepts of roadway geometric design, and intersection and highway capacity analysis. Other topics include: traffic flow characteristics, traffic studies, signal design, and transportation project evaluation. Prerequisite: CEE 3030. (Sp)

CEE 3430 Engineering Hydrology 3
Provides a basic understanding of engineering hydrology through the hydrologic cycle, watershed characteristics, atmospheric water, rainfall-runoff processes, infiltration and evaporation, stream flow analysis, groundwater flow, and related designs. Prerequisite: CEE 3500. (Sp)

CEE 3500 Civil and Environmental Engineering Fluid Mechanics 3
Explores fluid properties, hydrostatics, fluid dynamics similitude, energy and momentum principles, closed conduit flow, open channel flow, and flow measurement. Prerequisites: MATH 1220; MATH 2210 or 2250; ENGR 2010, 2030. (F,Sp)

CEE 3510 Civil and Environmental Engineering Hydraulics 3
Steady flow in open channel and closed circuits, nonuniform flow in open channels, combined energy losses in pipelines, and distribution in pipe networks. Includes laboratory and computer exercises in data collection, pipe networks, and unsteady and nonuniform flow. Prerequisite: CEE 3500. (F,Sp)

CEE 3610 Environmental Management 3
Introduction to environmental health, emphasizing relationships among environmental quality, public health, environmental and occupational health regulations, human health risk assessment, institutions, and engineered systems in environmental health management. Prerequisites: CHEM 1210; BIOL 1610 or Breadth Life Sciences course; MATH 1210. Corequisite: CEE/PUBH 3870. Also taught as PUBH 3610. (F)

CEE 3640 Water and Wastewater Engineering 4
Engineering analysis and design of processes for treatment of water and wastewater. Major topics include water quality evaluation; physical, chemical, and biological treatment systems; design of facilities for production of drinking water and for treatment and reclamation of municipal and industrial wastewater; and management of residuals from water and wastewater treatment facilities. Prerequisites: CEE/PUBH 3610 and acceptance into professional program in engineering. (Sp)

CEE 3670 Transport Phenomena in Bio-Environmental Systems 3
Core course in both biological and environmental engineering. Students develop a detailed understanding of the principles, concepts, modes, and methods of calculating heat and mass transfer. Emphasis given to contaminant and nutrient flux, along with their state transformations, in order for the biological or environmental engineer to evaluate options for production, clean-up, and control of bio-environmental systems. Prerequisite: Minimum grade of *C-* in BIE 2400 or MAE 2300. Also taught as BIE 3670. (Sp)

CEE 3780 Solid and Hazardous Waste Management 3
Introduction to integrated management of municipal and industrial solid waste; household, commercial, and industrial hazardous waste; and resource recovery, recycling, and sustainability principles. Three lectures augmented by computer modeling and field trip experiences related to modern solid and hazardous waste management principles. Prerequisite: Acceptance into professional program in engineering. (F)

CEE 3870 CI Professional/Technical Writing in Civil and Environmental Engineering 2
Gives CEE students intensive practice with oral and written communication in business and technical CEE writing. Requires concurrent enrollment in CEE/PUBH 3610. Also taught as PUBH 3870. (F)

CEE 3880 Civil Engineering Design I 1
Introduction to senior engineering students' integrated design experience. Design project is identified and proposal for its completion during the senior year is produced. Emphasizes project scheduling, and completion of design proposal. Prerequisite: CEE 3870. (Sp)

CEE 3890 Environmental Engineering Design I 1
Introduction to senior environmental engineering students' integrated design experience. Design project identified and proposal for its completion during the senior year is produced, under mentoring of course instructor. Emphasizes project identification, project scoping, manpower and materials budgeting, project scheduling, and completion of design proposal. Prerequisites: CEE/PUBH 3610, CEE 3640, CEE/BIE 3670. (Sp)

CEE 4200 Engineering Economics 2
Applications of the mathematics of finance to engineering decision making. Should be taken during the junior year of the engineering curriculum. (F)

CEE 4300 Engineering Soil Mechanics 4
Physical and mechanical properties of soils. Topics include: classification, permeability, soil stresses and settlement analysis, soil strength, slope stability, lateral earth pressures, introduction to foundations, numerical solutions, and computer applications. Prerequisite: ENGR 2140. Prerequisite or corequisite:CEE 3500. (Sp)

CEE 4790 CI Environmental Engineering Design II 2
Provides senior environmental engineering students with integrated design experience in two-semester sequence. Design projects proposed in CEE 3890 completed under mentoring of course instructor. Emphasizes team work, scheduling, design calculations, and completion of design report. Prerequisites: CEE 3890 and concurrent enrollment in environmental engineering technical elective course during fall semester. (F)

CEE 4870 CI Civil Engineering Design II 2
Provides senior engineering students with integrated design experience in two-semester sequence. Design projects proposed in Junior Design Proposal placed on team work, scheduling, design calculations, and completion of design report. Prerequisite: CEE 3880; senior design technical elective should be taken concurrently. (F)

CEE 4880 CI Civil Engineering Design III 2
Provides senior engineering students with integrated design experience in two-semester sequence. Design projects started in CEE 4870 will be completed with presentation, report, and defense of design project. Prerequisite: CEE 4870. (Sp)

CEE 4890 CI Environmental Engineering Design III 2
Provides senior environmental engineering students with integrated design experience in two-semester sequence. Completion of design projects begun in CEE 4790, with presentation, report, and defense. Prerequisite: CEE 4790. (Sp)

CEE 4930 Independent Study 1-3®
Laboratory design or research project on problem selected by student. Requires review of literature, preparation of proposal describing project, completion of design or research project, and preparation of report. (F,Sp,Su)

CEE 5010 Matrix Analysis/Finite Element 3
Analysis of structures using matrix methods. Application of software based on the stiffness method to practical analysis problems. Introduction of Finite Element method based on stiffness approach and mathematical derivation of simple finite elements, along with application to practical problems. Prerequisite: CEE 3020. (F)

CEE 5020 Finite Element Methods in Solid Mechanics I 3
Introduction to finite element methods and their application to the analysis and design of mechanical engineering systems. Prerequisite: MAE 3040. Also taught as MAE 5020. (F)

CEE 5050 Design of Wood and Masonry Structures 3
Design of beams, columns, joints, walls, and diaphragms in both wood and masonry materials. Current design codes will be utilized. Prerequisite: CEE 3080. (Sp)

CEE 5060 Mechanics of Composite Materials I 3
Stress-strain relations for nonisotropic composites, such as fiber-reinforced plastic laminates, properties and their uses, strength and life determination, and methods for design using composite materials. Prerequisite: MAE 3040 or CEE 3010. Also taught as MAE 5060. (F)

CEE 5070 Structural Steel Design 3
Structural steel design using load and resistance factor design (LRFD) method. Focuses on design of structural beams, columns, and connections utilizing steel design codes. Prerequisites: CEE 3020, 3080. (F)

CEE 5080 Numerical Methods in Elasticity 3
(dual listing 6080)
Elasticity theory, stress and strain analysis, and yield criteria. Governing equilibrium, kinematic, and compatibility equations. Generalized Hooke's law. Classical solutions of flex and torsion problems. Energy methods. Introduction to finite difference, finite element, and boundary element methods. Computer applications. Prerequisite: CEE 3020. (F)

CEE 5100 Infrastructure Evaluation and Renewal 3
Evaluation of existing structural systems and techniques to improve their performance. Focuses on structures which are seismically deficient. Prerequisites: CEE 3080, 5070. (Sp)

CEE 5110 Steel Bridge Design Project 3
Civil Engineering undergraduate technical elective involving design of a steel bridge. Course topics include: geotechnical, structures, and materials analysis and design. Written reports and presentations required. Hours arranged. Prerequisite: CEE 3870 (may be taken concurrently). (Sp)

CEE 5120 Concrete Canoe Design Project 3
Civil Engineering undergraduate technical elective involving design of a concrete canoe. Course topics include: hydraulic, structures, and materials analysis and design. Written reports and presentations required. Hours arranged. Prerequisite: CEE 3870 (may be taken concurrently). (Sp)

CEE 5190 Geographic Information Systems
(dual listing 6190) for Civil Engineers 3
Introduction to GIS concepts addressing data structures, spatial entities, and queries. Topics include location referencing methods, data collection techniques, current applications, and institutional and organizational issues. (Sp)

CEE 5220 Traffic Engineering 3
(dual listing 6220)
Topics covered include characteristics, measurements, and analysis of volume, speed, density, and travel time; capacity and level of service analysis; signalization and traffic control devices. (Sp)

CEE 5230 Geometric Design of Highways 3
(dual listing 6230)
Principles of highway location and planning, with full consideration of economic, environmental, and other impacts. Capacity analysis of intersections and highways, passing-lane design, and risk-cost based horizontal and vertical alignment design. Introduction to design software through coursework and term projects. Prerequisite: CEE 3210. (Sp)

CEE 5240 Urban and Regional
(dual listing 6240) Transportation Planning 3
Examination of travel demand forecasting, data collection, and survey data analysis techniques. Focuses on transportation-land use interactions and impact of market-based policies on travel demand. Theories and applications of traditional and advanced trip distribution, mode choice, and route assignment models. (F)

CEE 5250 Environmental Engineering Cooperative Practice 2
Applied environmental employment with primary focus of work experience related to one of the environmental engineering specialty areas. Prerequisites: Senior status and permission of instructor. (F,Sp,Su)

CEE 5350 Foundation Analysis and Design 3
(dual listing 6350)
Applications of theories studied in soil mechanics. Design considerations for various foundation types, including shallow foundations, driven piles, drilled shafts, walls, soil anchorages, and mechanically-stabilized earth support systems. Field investigation techniques and computer applications. Prerequisite: CEE 4300. (F)

CEE 5380 Earthquake Engineering 3
(dual listing 6380)
Covers wide variety of earthquake engineering topics, including seismology and earthquake source characterization, strong ground motion, seismic hazard analysis, wave propagation, soil dynamics, ground response, local site effects, liquefaction, seismic slope stability, soil improvement, vibrational analyses, and structural seismic design. Prerequisite: CEE 4300. (Sp)

CEE 5430 Groundwater Engineering 3
(dual listing 6430)
Explores fundamentals of groundwater hydrology by focusing on theory related to aquifer systems and flow analysis, regional groundwater balance, well hydraulics, aquifer testing, capture zone analysis, unsaturated flow, saltwater intrusion, and basics of flow modeling. Prerequisite: CEE 3430 or a similar hydrology course. (F)

CEE 5450 Hydrologic Modeling 3
(dual listing 6450)
Case studies and hands-on experience with hydrologic models and modeling methods for: (1) Design floods and spillway evaluation; (2) Flood plain delineation; (3) Dam break and inundation modeling; (4) Reservoir yield and time series modeling; (5) Reservoir inflow forecasting and operation; and (6) Urban hydrology, detention, and sedimentation basins. Prerequisite: CEE 3430. (Sp)

CEE 5460 Water Resources Engineering 3
(dual listing 6460)
Engineering design course covering a wide range of topics, including: surface and groundwater hydrology, statistical analysis, water law, hydroelectric power, water supply, irrigation, flood control, wastewater, drainage, dams and reservoirs, pipelines, open channels, and planning. Prerequisites: CEE 3430, 3500, and 4200. (F)

CEE 5470 Sedimentation Engineering 3
(dual listing 6470)
Explores river response, sediment transport, sediment and watershed yield, flow resistance, scour and erosion, and floodplain management. Prerequisite: CEE 3500. (Sp)

CEE 5500 Open Channel Hydraulics with an
(dual listing 6500) Emphasis on Gradually Varied Flow 3
Theory and applications of steady uniform and gradually varied flow under both subcritical and supercritical flow conditions. Solutions to multiple-network canal systems by solving systems of combined ordinary differential and algebraic equations. Method for defining natural channel systems and solving steady-state flows in them. Prerequisites: CEE 3500, 3510. (F)

CEE 5540 Hydraulic Structures Design 3
(dual listing 6540)
Design of a variety of hydraulic structures is explored, both in the classroom and laboratory. Integrates student-developed, original computer programs; commercially available software; field trips; and hands-on laboratory design projects to further students' understanding of hydraulic structures. Prerequisites: CEE 3500 and 3510. (F)

CEE 5550 Hydraulics of Closed Conduits 3
(dual listing 6550)
Includes design and operation of piping systems; economics; feasibility and impact of pipelines; pipe, pump, and valve selection; transient and cavitation analysis; and pipeline operation and filling. Prerequisites: CEE 3500 and 3510. (Sp)

CEE 5610 Environmental Quality Analysis 3
(dual listing 6610)
Familiarizes students with various methods used for analysis of chemical parameters in environmental samples (water, soil, and air). Provides students with skills enabling them to make proper selection/evaluation of analytical procedure and evaluate data generated. Prerequisite: CHEM 1210. (F)

CEE 5620 Aquatic Chemistry 3
Provides students with understanding of principles of aquatic chemistry, emphasizing chemical equilibria, acid-base reactions, complex formation, oxidation-reduction reactions, complex formation, and dissolution chemistry. Prerequisite: CHEM 1210 or equivalent. Also taught as SOIL 5620. (F)

CEE 5670 Hazardous Chemicals Handling and Safety 2
Provides students with necessary skills and knowledge for working safely in areas associated with hazardous chemicals. Topics covered include: regulations, exposure routes, toxicology, chemical and physical hazards, personal protective equipment, sampling, monitoring, decontamination, and emergency response procedures. Prerequisite: CHEM 1210. Also taught as PUBH 5670. (Sp)

CEE 5680 Soil-based Waste Management 2
(dual listing 6680)
Engineering management of wastes present in the vadose zone, including extraction, containment, and biological, chemical, and physical destruction technologies for sustainable agriculture and environmental quality. Aspects include engineering characterization, problem definition, treatment, and monitoring. Analysis and design emphasized through problems, examinations, and report writing. Prerequisites: CEE/PUBH 3610, CEE 3640, 3870, CEE/BIE 3670. Also taught as BIE 5680/6680. (Sp)

CEE 5690 Natural Systems Engineering 3
(dual listing 6690)
Explores integrated nature of river basin planning and management through introduction of most commonly employed assessment modeling frameworks and tools for modeling physical, chemical, and ecological processes at the study site to watershed scales. Topics include: water resources system modeling; physical, chemical, and ecological processes modeling; impact assessment methods; and risk assessment. Prerequisites: CEE/PUBH 3610, CEE 3500, 3510, 3640; or instructor's permission. (F)

CEE 5710 Pollution Prevention and
Industrial Ecology* 2**
Explores pollution prevention and waste minimization concepts, focusing on implementation of these concepts in design of production processes and products. Discussion of pollution prevention/waste minimization concepts, energy and materials conservation, Life Cycle Analysis, materials and process audits, industrial process design for waste minimization and energy conservation, packaging, and ISO 14000. Prerequisite: Acceptance into professional program in engineering. (Sp)

CEE 5720 Natural Systems Modeling 3
(dual listing 6720)
Provides hands-on approach to utilizing several of the most commonly applied modeling tools employed to estimate physical, chemical, and biological impacts of existing and proposed water resource systems. Focuses on utility and limitations of specific modeling approaches, while also stressing integrative multi-disciplinary nature of impact assessment frameworks. Prerequisite: CEE 5690/6690 or instructor's permission. (Sp)

CEE 5730 Analysis and Fate of
(dual listing 6730) Environmental Contaminants 3
Provides students with understanding of methods used in analysis of environmental samples for organic contaminants. Examines various properties and processes determining the fate of organic contaminants in the environment. Taught first half of fall semester. Prerequisites: Grades of *C-* or better in CHEM 1210 and 1215. Also taught as PUBH 5730/6730. (F)

CEE 5750 Air Quality Measurements 2
Laboratory-based course designed to familiarize participants with federally-approved reference measurement techniques for embient and source air pollutants. Also provides understanding of temporal and spatial pollutant behavior. (Sp)

CEE 5760 Hydraulic Structures Field Course 1
Week-long course, with one day of in-class lectures and four days of field trips. Introduces students to field applications of hydraulic structures design. Field trips may involve backpacking to remote areas. (F,Su)

CEE 5790 Accident and Emergency Management* 3**
Introduction to fundamentals of accident, hazard, and emergency management. Topics include legislation; chemical safety fundamentals; fire, explosion, and spill fundamentals; contaminant air transport fundamentals; hazard and risk assessment; dispersion applications; and hazard and risk management applications. Prerequisite: CHEM 1220. Also taught as PUBH 5790. (Sp)

CEE 5810 Biochemical Engineering 3
(dual listing 6810)
Fundamentals of bioreactor design and bioengineering to produce biological commodities. Emphasizes mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: BIE 3200 and BIE/CEE 3670; *or* BIE/CEE 3670, CEE/PUBH 3610, and CEE 3640. Also taught as BIE 5810/6810. (F)

CEE 5830 Management and Utilization of
(dual listing 6830) Biological Solids and Wastewater 3
Focuses on production, management, and disposal of biosolids and wastewater generated in food processing and wastewater treatment. Emphasizes beneficial use of biosolids and wastewater for agricultural production, forest enhancement, and land reclamation. Prerequisite: BIE/CEE 3670. Also taught as BIE 5830/6830. (F)

CEE 5860 Air Quality Management 3
Introduction to air quality management. Explores the legislation, sources, behaviors, and effects of regulated and nonregulated air pollution, control techniques, and air dispersion modeling. Prerequisites: CEE 3640, 3780, CEE/BIE 3670, MAE 2300. (F)

CEE 5870 Hazardous Waste Incineration 2
Provides introduction to hazardous waste incineration principles. Topics include: thermodynamics, stoichiometry, thermochemistry, chemical kinetics, energy recovery, pollution control systems, and incinerator design principles. Prerequisites: CEE 3780 and acceptance into professional program in engineering. (Sp)

CEE 5880 Remediation Engineering 3
Physical, chemical, and biological principles associated with remediation of hazardous waste contaminated soil, water, sediments, and air. Topics include: source removal and source control, product recovery, chemical treatment methods, biological remediation concepts, in situ processes, ex situ processes, and integrated process design. Prerequisites: CEE 3780, CEE/PUBH 3610. (F)

CEE 5900 Cooperative Practice 3
A planned work experience in industry. Detailed program must have prior approval. Written report required. (F,Sp,Su)

CEE 6010 Finite Element Methods in Solid Mechanics II 3
Advanced theory and applications of finite element methods to both static and dynamic solid mechanics problems. Prerequisite: CEE 5020. (Sp)

CEE 6020 Structural Stability 3**
Elastic and inelastic buckling of columns; analysis of beam columns, thin-walled beams of open cross-section. Stability analysis of frame and plate structures. Large deflection theory. Historical notes on stability of structures. Computer applications. Prerequisite: CEE 3010. (F)

CEE 6030 Structural Optimization* 3
Introduction to optimization techniques for linear and nonlinear, univariable, and multivariable functions with or without constraints. Computer applications, and applications to structural design. Prerequisite: CEE 3010 or instructor's consent. (Sp)

CEE 6040 Structural Reliability* 3
Elements of probability theory and its application to structural engineering and mechanics. Statistical distribution of loads. Uncertainties in material parameters and their effects in design. Reliability-based safety analysis and computer applications. Prerequisite: Instructor's consent. (F)

CEE 6050 Experimental Methods in Structural Engineering 3
Experimental techniques used in research and design in structural engineering and mechanics. Structural models. Theory and practical applications. Development of principles used to design research projects. Prerequisite: Instructor's consent. (Sp)

CEE 6070 Mechanics of Composite Materials II 3
Second course in composite materials. Stress-strain states of laminated composite structures, including interlaminar stresses, failure criteria, and hygrothermal stresses. Prerequisite: MAE 5060. Also taught as MAE 6070. (F)

CEE 6080 Numerical Methods in Elasticity 3
(dual listing 5080)
Elasticity theory, stress and strain analysis, and yield criteria. Governing equilibrium, kinematic, and compatibility equations. Generalized Hooke's law. Classical solutions of flex and torsion problems. Energy methods. Introduction to finite difference, finite element, and boundary element methods. Computer applications. Prerequisite: CEE 3020. (F)

CEE 6090 Theory of Plates and Shells 3
Introduction to plate and shell theories. Development of bending and buckling of plates and shells through classical theory. Prerequisite: MAE 3040 or CEE 3010. Also taught as MAE 6090. (F)

CEE 6110 Probabilistic and Statistical Methods in Engineering 3
Explores principles related to probability and statistical methods commonly used in engineering practice, as well as applying these principles to the solution of engineering problems. Prerequisites: Undergraduate-equivalent knowledge in statistical methods or CEE 3030, plus 3000-level calculus and numerical methods. (F)

CEE 6120 Bridge Engineering 3**
Provides students with a basic understanding of the facets of bridge design pertinent to a structural engineer. Focuses on analysis and design of a slab and prestressed concrete girder bridge. (F)

CEE 6130 Structural Dynamics and Seismic Design 3
Development and solutions for equations of motion for single- and multi-degree of freedom systems. Dynamic analysis by Modal Superposition and Response Spectra. Design of structures for seismically active areas. Also taught as MAE 6130. (Sp)

CEE 6140 Advanced Reinforced Concrete* 3
Develops improved understanding of the behavior of reinforced concrete members. After students understand general behavior, codes are placed in proper perspective. Then students can design in situations not explicitly considered in current codes. (F)

CEE 6180 Dynamics and Vibrations 3
Fundamentals of two-dimensional and three-dimensional rigid body dynamics, including Newtonian, Lagrangian, and Leavit Energy Methods. Equations of motion, mode shapes, and natural frequencies for continuous media and multi degree-of-freedom systems. Prerequisite: MAE 5300 or CEE/MAE 6130. Also taught as MAE 6180. (Sp)

CEE 6190 Geographic Information Systems
(dual listing 5190) for Civil Engineers 3
Introduction to GIS concepts addressing data structures, spatial entities, and queries. Topics include location referencing methods, data collection techniques, current applications, and institutional and organizational issues. (Sp)

CEE 6200 Pavement Design 3
Analysis and design of flexible and rigid pavements for highways and runways, including the design of overlays. Equal emphasis on current practice and advanced concepts of pavement management. Prerequisite: CEE 3010. (F)

CEE 6210 Transportation Systems Analysis 3
Introduces systems approach to analysis of transportation services and infrastructure. Focuses on basic and advanced concepts, including operations research techniques, simulation, and artificial intelligence. Topics include facility sizing and location, financial and economic analysis of investment projects, and privatization. Prerequisite: CEE 3030 or equivalent. (F)

CEE 6220 Traffic Engineering 3
(dual listing 5220)
Topics covered include characteristics, measurements, and analysis of volume, speed, density, and travel time; capacity and level of service analysis; signalization and traffic control devices. (Sp)

CEE 6230 Geometric Design of Highways 3
(dual listing 5230)
Principles of highway location and planning, with full consideration of economic, environmental, and other impacts. Capacity analysis of intersections and highways, passing-lane design, and risk-cost based horizontal and vertical alignment design. Introduction to design software through coursework and term projects. Prerequisite: CEE 3210. (Sp)

CEE 6240 Urban and Regional Transportation
(dual listing 5240) Planning 3
Examination of travel demand forecasting, data collection, and survey data analysis techniques. Focuses on transportation-land use interactions and impact of market-based policies on travel demand. Theories and applications of traditional and advanced trip distribution, mode choice, and route assignment models. (F)

CEE 6250 Transportation Data/Safety Analysis 3
Statistical analysis of transportation data, including safety and risk assessment. Regression and multivariate analysis, such as discriminant analysis, canonical correlation, and factor analysis. In-depth study of selected methodologies for analyzing transportation safety and designing counter measures. Prerequisite: CEE 3210 or equivalent. (F)

CEE 6260 Public Transportation 3
Principles of planning, design, and operation of transit systems in urban and rural areas. Determination of optimal route alignments, schedules, and station/stop spacings. Exploration of innovations in financing and pricing, including cost-cutting techniques. (Sp)

CEE 6270 Traffic Operations Analysis 3
Traffic flow fundamentals, macroscopic and microscopic models of traffic flow, shock wave analysis, car following principles, queuing systems, and simulation. (Sp)

CEE 6290 Transportation Network Analysis 3
Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium, comparison with system optimal stochastic user equilibrium, origin-destination matrix estimation, and network design problems. (Sp)

CEE 6300 Earth Structures 3
Design and construction of earth and rockfill dams, embankments, excavations, and retaining structures. Prerequisites: CEE 4300, 5350/6350. (Sp)

CEE 6310 Environmental Geotechniques 3
Geotechnical aspects of environmental systems, with concentration on waste containment facilities. Prerequisite: CEE 4300. (F)

CEE 6320 Deep Foundations 3
Analysis, design, and construction of deep foundations with emphasis on driver piles and drilled shafts. Prerequisites: CEE 4300, 5350/6350. (Sp)

CEE 6330 Ground Reinforcement, Improvement, and Treatment 3
Theory, design, and construction methods for ground reinforcement, improvement, and treatment applications. Prerequisites: CEE 4300, 5350/6350. (F)

CEE 6340 Laboratory and Field Methods in Geotechnical Engineering 3
Subsurface investigation, field testing and instrumentation, and laboratory testing. Prerequisites: CEE 4300, 5350/6350. (F)

CEE 6350 Foundation Analysis and Design 3
(dual listing 5350)
Applications of theories studied in soil mechanics. Design considerations for various foundation types, including shallow foundations, driven piles, drilled shafts, walls, soil anchorages, and mechanically-stabilized earth support systems. Field investigation techniques and computer applications. Prerequisite: CEE 4300. (F)

CEE 6360 Geotechnical Principles 3
Theoretical soil behavior. Hydraulic conductivity, compression, and shearing properties. Prerequisites: CEE 4300, 5350/6350. (F)

CEE 6370 Buried Structures 3
Analysis of structural performance of buried structures (pipes, tanks, silos, etc.) using principles of mechanics of materials and finite element methods. Prerequisite: CEE 4300. (Sp)

CEE 6380 Earthquake Engineering 3
(dual listing 5380)
Covers wide variety of earthquake engineering topics, including seismology and earthquake source characterization, strong ground motion, seismic hazard analysis, wave propagation, soil dynamics, ground response, local site effects, liquefaction, seismic slope stability, soil improvement, vibrational analyses, and structural seismic design. Prerequisite: CEE 4300. (Sp)

CEE 6400 Physical Hydrology 3
Fundamentals of hydrologic cycle and hydrologic processes. Precipitation, infiltration, runoff generation, evaporation and transpiration, and snowmelt. Representation of hydrologic processes in hydrologic models. Prerequisite: CEE 3430. (F)

CEE 6410 Water Resource Systems Analysis 3
Systems formulation of decision problems. Solution by simulation and optimization, constrained and unconstrained optimization algorithms, case studies and applications to water supply, and quality and ecosystems management. (Sp)

CEE 6420 Engineering Risk Assessment and Risk Management 3
Comprises both quantitative risk assessment techniques and a range of issues in risk management. Examples drawn from various civil engineering subdisciplines such as: environmental engineering, geotechnical engineering, hydraulics and hydrology, structural engineering, transportation engineering, and water resource management. (Sp)

CEE 6430 Groundwater Engineering 3
(dual listing 5430)
Explores fundamentals of groundwater hydrology by focusing on theory related to aquifer systems and flow analysis, regional groundwater balance, well hydraulics, aquifer testing, capture zone analysis, unsaturated flow, saltwater intrusion, and basics of flow modeling. Prerequisite: CEE 3430 or a similar hydrology course. (F)

CEE 6440 Geographic Information Systems in Water Resources 3
Principles and operation of geographic information systems. Spatial hydrologic modeling done by developing a digital representation of the environment in the GIS, then adding functions simulating hydrologic processes. Includes term project on use of GIS in water resources. (F)

CEE 6450 Hydrologic Modeling 3
(dual listing 5450)
Case studies and hands-on experience with hydrologic models and modeling methods for: (1) Design floods and spillway evaluation; (2) Flood plain delineation; (3) Dam break and inundation modeling; (4) Reservior yield and time series modeling; (5) Reservoir inflow forecasting and operation; and (6) Urban hydrology, detention, and sedimentation basins. Prerequisite: CEE 3430. (Sp)

CEE 6460 Water Resources Engineering 3
(dual listing 5460)
Engineering design course covering a wide range of topics, including: surface and groundwater hydrology, statistical analysis, water law, hydroelectric power, water supply, irrigation, flood control, wastewater, drainage, dams and reservoirs, pipelines, open channels, and planning. Prerequisites: CEE 3430, 3500, and 4200. (F)

CEE 6470 Sedimentation Engineering 3
(dual listing 5470)
Explores river response, sediment transport, sediment and watershed yield, flow resistance, scour and erosion, and floodplain management. Prerequisite: CEE 3500. (Sp)

CEE 6480 Groundwater Contamination: Modeling, Monitoring, and Management 3
In-depth exploration of physical, chemical, and biological processes related to fate and transport of contaminants in the subsurface, mathematical modeling, remediation technologies, and mitigation of contaminated sites using risk-based decision-making. Prerequisite: CEE 5430/6430 or equivalent. (F)

CEE 6490 Integrated River Basin/Watershed Planning and Management 3
Reviews fundamental building blocks of water resource institutions, emphasizing creation of institutions which are sensitive to a particular culture, economic, and political environment. Addresses institutional mission and regulatory roles, public participation, property and water rights, and elements of production. (Sp)

CEE 6500 Open Channel Hydraulics with an
(dual listing 5500) Emphasis on Gradually Varied Flow 3
Theory and applications of steady uniform and gradually varied flow under both subcritical and supercritical flow conditions. Solutions to multiple-network canal

systems by solving systems of combined ordinary differential and algebraic equations. Method for defining natural channel systems and solving steady-state flows in them. Prerequisites: CEE 3500, 3510. (F)

CEE 6510 Numerical Methods for Civil Engineers 3
Engineering applications of approximation and interpolation, solution methods for ordinary differential equations, numerical solution of partial differential equations, nonparametric and parametric probability and regression estimation, and Monte Carlo and uncertainty analysis. (F)

CEE 6520 Applied Hydraulics 3
Basic fluid mechanics applied to wildland watershed systems and directed at nonengineering students. Explores nature of fluid state, fluid motion, and steady uniform and varied flow in open channels, under both subcritical and supercritical conditions. Surveys concepts of boundary layers, turbulence, convection, dispersal, and wave formation in unsteady flows. Emphasizes problem formulation and solving. Prerequisites: WATS 5490/4490; MATH 2280 (recommended). Also taught as WATS 6520. (F)

CEE 6530 Unsteady Flows in Open Channels and Numerical Solutions of St. Venant Equations 3
Derivation and physical meaning of the St. Venant equations, types of water waves, solutions to unsteady free surface flows based on the characteristics, and direct and iterative implicit methods of solution. Emphasizes solving unsteady flow problems in channel systems. Prerequisite: CEE 6500. (Sp)

CEE 6540 Hydraulic Structures Design 3
(dual listing 5540)
Explores design of a variety of hydraulic structures, both in the classroom and laboratory. Integrates student-developed, original computer programs; commercially available software; field trips; and hands-on laboratory design projects to further students' understanding of hydraulic structures. Prerequisites: CEE 3500 and 3510. (F)

CEE 6550 Hydraulics of Closed Conduits 3
(dual listing 5550)
Includes design and operation of piping systems; economics; feasibility and impact of pipelines; pipe, pump, and valve selection; transient and cavitation analysis; and pipeline operation and filling. Prerequisites: CEE 3500 and 3510. (Sp)

CEE 6580 Intermediate Fluid Mechanics 3
Survey of mathematical methods used in fluid mechanics, including: potential flow solutions (complex variables), laminar flow and turbulent flow solutions, boundary layer theory, and introduction to dispersion in fluid. (F)

CEE 6590 Evaluation of Hydrologic Modeling Systems 3
Focuses on different techniques for evaluating the performance, diagnosing the model structure, and assessing the uncertainty of hydrologic modeling systems. Examines mathematical and systems theory methods for examining the interrelation between model inputs and outputs. Prerequisite: CEE 6400. (Sp)

CEE 6600 Environmental Chemistry of Inorganic Contaminants 2
Inorganics of environmental concern discussed in terms of processes affecting their behavior in soil and water systems. Explores remediation of environmental systems contaminated with inorganic pollutants. Taught second half of spring semester. (Sp)

CEE 6610 Environmental Quality Analysis 3
(dual listing 5610)
Familiarizes students with various methods used for analysis of chemical parameters in environmental samples (water, soil, and air). Provides students with skills enabling them to make proper selection/evaluation of analytical procedure and evaluate data generated. Prerequisite: CHEM 1210. (F)

CEE 6620 Field Sampling and Analysis of Environmental Systems 3
Explores applied field sampling, as well as field and laboratory techniques used in the monitoring of environmental media. Includes theory and practice of field site monitoring and measurement of physical, chemical, and biological processes in the environment. Prerequisite: Consent of instructor. (F)

CEE 6630 Process Dynamics in Environmental Engineering Systems 2
Fundamental principles used in analysis and simulation of environmental systems. Emphasizes reaction kinetics, mass transfer, reactor analysis and design, and development and solution of mathematical models to describe natural and engineered environmental systems. Prerequisites: CEE 3500, 3510. (F)

CEE 6640 Physical and Chemical Environmental Process Engineering 3
Principles of physical and chemical environmental engineering processes, including sedimentation, filtration, gas transfer, aeration, absorption, ion exchange, membrane processes, coagulation, flooculation, precipitation, oxidation, reduction, and disinfection. Process modeling and analysis applications in treatment of water, wastewater, industrial wastes, vapor treatment, and soil remediation. Prerequisites: CEE 5610/6610 and 6630. Corequisites: CEE 6650 and 6670. (Sp)

CEE 6650 Biological Processes in Environmental Engineering 2
Theory and design of biological processes used in environmental engineering. Stoichiometric, energetic, and kinetic analysis of biological treatment processes; modeling and design of suspended growth and fixed-film processes for treatment of municipal, industrial, and hazardous wastes; nutrient removal; and bioremediation. Prerequisites: CEE 6630 and 6710. Corequisites: CEE 6640 and 6670. (Sp)

CEE 6660 Environmental Data Analysis and Experimentation 2
Data analysis and experimental design for environmental science and engineering. Graphical data analysis, parametric and nonparametric statistics, frequency distributions, hypothesis testing, propagation of variance, censored data, correlation and causation, parameter estimation, factorial experimental design and response surfaces, environmental monitoring and uncertainty. (F)

CEE 6670 Environmental Process Laboratory 2
Laboratory testing to demonstrate physical, chemical, and biological principles utilized in environmental engineering processes. Corequisites: CEE 6640, 6650. (Sp)

CEE 6680 Soil-based Waste Management 2
(dual listing 5680)
Engineering management of wastes present in the vadose zone, including extraction, containment, and biological, chemical, and physical destruction technologies for sustainable agriculture and environmental quality. Aspects include engineering characterization, problem definition, treatment, and monitoring. Analysis and design emphasized through problems, examinations, and report writing. Prerequisites: CEE/PUBH 3610, CEE 3640, 3870, CEE/BIE 3670. Also taught as BIE 6680/5680. (Sp)

CEE 6690 Natural Systems Engineering 3
(dual listing 5690)
Explores integrated nature of river basin planning and management through introduction of most commonly employed assessment modeling frameworks and tools for modeling physical, chemical, and ecological processes at the study site to watershed scales. Topics include: water resources system modeling; physical, chemical, and ecological processes modeling; impact assessment methods; and risk assessment. Prerequisites: CEE/PUBH 3610, CEE 3500, 3510, 3640; or instructor's permission. (F)

CEE 6710 Environmental Engineering Microbial Ecology 2
Principles of microbial ecology applied to engineered and natural systems. Prerequisites: BIOL 3300, CEE/PUBH 3610. (F)

CEE 6720 Natural Systems Modeling 3
(dual listing 5720)
Provides hands-on approach to utilizing several of the most commonly applied modeling tools employed to estimate physical, chemical, and biological impacts of existing and proposed water resource systems. Focuses on utility and limitations of specific modeling approaches, while also stressing integrative multi-disciplinary nature of impact assessment frameworks. Prerequisite: CEE 6690/5690 or instructor's permission. (Sp)

CEE 6730 (dual listing 5730) Analysis and Fate of Environmental Contaminants 3
Provides students with understanding of methods used in analysis of environmental samples for organic contaminants. Examines various properties and processes determining the fate of organic contaminants in the environment. Taught first half of fall semester. Prerequisites: Grades of *C-* or better in CHEM 1210 and 1215. Also taught as PUBH 6730/5730. (F)

CEE 6740 Environmental Quality Modeling 3
Development and application of mathematical models for conventional and toxic pollutants in environmental systems. Description of advection, dispersion, sediment transport, partitioning, interphase transfer, and transformation kinetics applied to organic and inorganic pollutants. Equilibrium, steady state, and nonsteady systems. (Sp)

CEE 6750 Eco-Hydraulics for Natural Systems Engineering 4
Provides students with advanced multi-disciplinary modeling course in the application of hydraulics and water resource modeling in light of impact assessment frameworks for natural systems modeling. Focuses on application on one-dimensional and two-dimensional hydraulic modeling as basis for examining quantitative impacts on stream and riparian ecosystems under altered flow, as well as channel conditions with particular emphasis on fish and aquatic macro-invertebrates. Prerequisite: CEE 6690/5690. (F)

CEE 6800 Division of Environmental Engineering Seminar 1
Environmental engineering graduate seminar for faculty, student, and guest lecturer research presentations. (F,Sp)

CEE 6810 Biochemical Engineering 3
(dual listing 5810)
Fundamentals of bioreactor design and bioengineering to produce biological commodities. Emphasizes mathematical models of microbial and enzymatic processes in environmental and industrial biotechnology. Prerequisites: BIE 3200 and BIE/CEE 3670; *or* BIE/CEE 3670, CEE/PUBH 3610, and CEE 3640. Also taught as BIE 6810/5810. (F)

CEE 6830 (dual listing 5830) Management and Utilization of Biological Solids and Wastewater 3
Focuses on production, management, and disposal of biosolids and wastewater generated in food processing and wastewater treatment. Emphasizes beneficial use of biosolids and wastewater for agricultural production, forest enhancement, and land reclamation. Prerequisite: BIE/CEE 3670. Also taught as BIE 6830/5830. (F)

CEE 6840 Application of Technology Transfer for Teachers 2®
Focuses on application of modern instructional strategies to the transfer of technology and science to the public education setting. Part of a series of six courses. Prerequisite: Participation in an In*Step Science Program in the public schools. (F,Sp,Su)

CEE 6850 Atmospheric and Air Pollution Chemistry 3
Provides students with training in the fundamentals of natural and anthropogenically impacted atmospheric chemistry, primarily focusing on tropospheric meteorology, kenetics, and photochemistry, including gas-phase, aqueous-phase, and aerosol-forming reactions. Prerequisite: CEE 5680/6680 or upper-level chemistry or consent of instructor. (Sp)

CEE 6900 Directed Reading 1-3®
Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 6930 Special Problems 1-4®
Independent or group study of engineering problems not covered in regular course offerings. Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 6940 Snow Hydrology 3
Focuses on snow science, including atmospheric formation, precipitation, distribution on the landscape, metamorphosis prior to melt, and snow pack melt dynamics. Also covers related issues, such as snow melt modeling, remote sensing, water supply, and biogeochemical cycling. Prerequisites: WATS 3700 or 4600 or SOIL 4600 or CEE 3430, or permission of instructor. Also taught as WATS 6940. (Sp)

CEE 6950 Practical Training 3
Intended for graduate students who are interested in practical training before graduation. Graded Pass/Fail *only*. (F,Sp,Su)

CEE 6970 Thesis Research 1-6®
Graded Pass/Fail *only*. Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 7050 Plasticity 3
Analysis of stresses, deformation, and collapse in devices constructed of plastic material. Prerequisite: MAE 6040 or CEE 6080/5080 or instructor's consent. Also taught as MAE 7050. (Sp)

CEE 7080 Advanced Plate and Shell Theory 3
Analysis of plate and shell structures by classical and numerical methods. Emphasis on numerical solutions. Prerequisite: Instructor's consent. Also taught as MAE 7080. (F)

CEE 7110 Constitutive Modeling and Structural Response of Engineering Materials 3**
Constitutive modeling of reinforced concrete, metals, soils, and composite materials. Plasticity and endochronic theories. Finite element modeling and predictive analysis of two- and three-dimensional structures. Computer applications and implementations. Prerequisite: Instructor's consent. (F)

CEE 7120 Advanced Topics in Civil Engineering 3
Discussion of current research topics conducted by civil and other engineering faculty and staff at USU and elsewhere. Offered on either arranged or regular basis. Topics and times can be arranged with instructor and advisor. Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 7150 Effective Engineering Instruction 1
Seminar-style course designed to give PhD candidates insight and guidance for becoming effective engineering instructors. (F)

CEE 7160 Successful Faculty Strategies 1
Seminar-style course designed to give PhD candidates insight and guidance into the expectations and approaches for becoming successful university faculty members. (Sp)

CEE 7170 Research Methods in Engineering 1
Seminar-style course designed to give PhD candidates insight and guidance into research methods in engineering. (F)

CEE 7270 Travel Demand and Supply Analysis 3
Fundamentals of demand and supply analysis. Theoretical aspects of travel demand modeling techniques. Modeling of performance characteristics and costs of transportation modes. Emphasis on theoretical aspects of discrete choice analysis and their applications in the modeling of transportation systems. (F)

CEE 7300 Theoretical Soil Mechanics 3
Advanced studies of stress distribution in soil masses, shear strength, consolidation, constitutive modeling, and finite applications. Prerequisite: CEE 6360. (Sp)

CEE 7310 Fundamentals of Soil Behavior 3**
The influence of clay mineralogy, clay chemistry, and soil origin on the engineering properties of soil. Prerequisite: CEE 6360. (F)

CEE 7320 Advanced Soil Dynamics 3**
Advanced studies in the response of soil structures and foundations to dynamic loads. Prerequisite: CEE 6360. (F)

CEE 7430 Stochastic Hydrology* 3**
Stochastic description of hydrologic variability in time, space, and space-time. Markov processes, time series synthesis and forecasting, spectral analysis, spatial interpolation and random field simulation, data imputation, and parameter estimation for physical models. Lattice and Markov chain Monte Carlo methods, simulated annealing, and Gibbs processes. Applications to rainfall, streamflow, groundwater quality and quantity, and subsurface characterization. (Sp)

CEE 7460 Advanced Topics in Hydrology 3®
Topics of prominent current interest for advanced MS and PhD students. Can be repeated for credit with consent of instructor. (Sp)

CEE 7470 Continuous and Macro-Scale Hydrologic Modeling 3
Presents existing different approaches to the modeling of continuous hydrologic systems and long-term forecasting. Reviews and analyzes lumped and distributed catchment and macroscale hydrologic models, as well as state-of-the-art computer codes. Prerequisite: CEE 6440. (F)

CEE 7520 Mathematical Methods for Civil and Environmental Engineers 3
Applications of advanced mathematical methods to analyze civil and environmental engineering problems, including analysis of dynamical systems, solutions to nonlinear and stochastic differential equations, Fourier analysis, and neural networks. (Sp)

CEE 7580 Advanced Finite Element Analysis in Fluid Mechanics 3
Application of the finite element method of analysis to problems in fluid mechanics. Use of higher order element to two- and three-dimensional flows. Prerequisites: CEE 3510 or MAE 3420, CEE/MAE 5020. Also taught as MAE 7580. (Sp)

CEE 7970 Dissertation Research 1-10®
Graded Pass/Fail *only*. Prerequisite: Instructor's consent. (F,Sp,Su)

CEE 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. Prerequisite: Instructor's consent. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
*Taught 2010-2011.
**Taught 2009-2010.
***This course is taught alternating years. Check with department for information about when course will be taught.

Chemistry and Biochemistry (CHEM)

See Department of Chemistry and Biochemistry, pages 196-202

CHEM 1010 BPS Introduction to Chemistry 3
For nonscience majors. Includes basic chemical concepts and a survey of the various branches of chemistry. Heavy emphasis on everyday applications to problems involving environmental pollution, radioactivity, energy sources, and human health. No prerequisites. (F,Sp) DE

CHEM 1110 BPS General Chemistry I 4
For nonscience majors. Progression made from the basic tenets of general chemistry to introduction to organic chemistry, with ascent in terms of practical importance and sophistication. Prerequisite: Math ACT score of at least 23, or MATH 1050 or higher; or corequisite of MATH 1050. (F,Sp) DE

CHEM 1115 General Chemistry Laboratory 1
Laboratory course designed for nonscience majors. Covers basic aspects of general chemistry. Prerequisite: CHEM 1110. (F,Sp)

CHEM 1120 BPS General Chemistry II 4
Continuation of CHEM 1110. Continued coverage of organic chemistry, along with introduction to biochemistry. Prerequisite: CHEM 1110. (Sp)

CHEM 1210 Principles of Chemistry I 4
First of a two-semester sequence, covering fundamentals of chemistry. Designed for science and engineering students. Prerequisite: Math ACT score of at least 25, or MATH 1050 or higher; or corequisite of MATH 1050. High school chemistry recommended. (F,Sp) DE

CHEM 1215 Chemical Principles Laboratory I 1
Laboratory course designed to be taken concurrently with CHEM 1210. Experiments cover acids/bases, thermochemistry separations, molecular weights, gases, and spectroscopy. Prerequisite: CHEM 1210 (may be taken concurrently). (F,Sp) DE

CHEM 1220 BPS Principles of Chemistry II 4
Continuation of CHEM 1210. Prerequisite: CHEM 1210. (F,Sp,Su) DE

CHEM 1225 Chemical Principles Laboratory II 1
Continuation of CHEM 1215. Normally taken concurrently with CHEM 1220. Experiments cover elementary kinetics, electrochemistry, gravemetric analysis, chromatography, and equilibria. Prerequisite: CHEM 1215. (F,Sp) DE

CHEM 1990 Introduction to the Chemistry and Biochemistry Professions 1®
Seminar-format course designed to expose students to exciting areas of chemistry and biochemistry. Includes seminars on topical issues presented by faculty and invited guests. Discussion of career options. Graded Pass/Fail *only*. (Sp)

CHEM 2300 Principles of Organic Chemistry 3
Shape, bonding, nomenclature, stereochemistry, physical properties, and reactivity of organic molecules is covered for a range of molecules, beginning with simple alkanes and finishing with some of the more complex abiotic and biotic organic molecules known today. Prerequisite: CHEM 1210. (F)

CHEM 2310 Organic Chemistry I 4
First of a two-semester sequence, covering physical properties, nomenclature, mechanisms of reactions, and biological relevance of organic and bioorganic molecules. Prerequisite: CHEM 1220. (F) DE

CHEM 2315 Organic Chemistry Laboratory I 1
Laboratory course designed to accompany CHEM 2310. Covers basic aspects of experimental organic chemistry. Prerequisites: CHEM 1210 and 1215. (F) DE

CHEM 2320 Organic Chemistry II 4
Continuation of CHEM 2310. Prerequisite: CHEM 2310 *or* CHEM 2300 and permission of instructor. (Sp) DE

CHEM 2325 Organic Chemistry Laboratory II 1
Continuation of CHEM 2315. Prerequisite: CHEM 2315. (Sp) DE

CHEM 3000 QI Quantitative Analysis 3
Basic theory and laboratory practice in analytical chemistry, including introduction to multiple equilibria and chemical separation methods. Prerequisites: CHEM 1215, 1225, MATH 1050 or higher. (F)

CHEM 3005 Quantitative Analysis Laboratory 1
One three-hour laboratory per week. Must be taken concurrently with CHEM 3000. Prerequisites: CHEM 1215, 1225, MATH 1050 or higher. (F)

CHEM 3060 QI Physical Chemistry 3
Chemical thermodynamics. Laws of thermodynamics. Changes of state. Chemical equilibrium. Introduction to quantum mechanics. Schrodinger equation. Exactly-soluble problems. Prerequisites: CHEM 1220, MATH 2210, PHYX 2220. (F)

CHEM 3070 QI Physical Chemistry 3
Chemical applications of quantum mechanics, periodic table, and chemical bonding. Spectroscopy. Statistical thermodynamics. Chemical kinetics. Rate laws. Reaction mechanisms. Theories of reaction rates. Prerequisite: CHEM 3060. (Sp)

CHEM 3080 CI Physical Chemistry Laboratory I 1
Experimental work to accompany CHEM 3060. Corequisite: CHEM 3060. (F)

CHEM 3090 CI Physical Chemistry Laboratory II 1
Continuation of CHEM 3080. Experimental work to accompany CHEM 3070. Corequisite: CHEM 3070. (Sp)

CHEM 3510 Intermediate Inorganic Chemistry 2
Survey of basic structure, bonding, and reactivity across the periodic table. Prerequisites: CHEM 1220, 2310, and 2315. (Sp)

CHEM 3520 Inorganic Chemistry Laboratory 1
Covers basic aspects of inorganic synthesis and compound characterization. Corequisite: CHEM 3510. (Sp)

Course Descriptions

CHEM 3650 DSC Environmental Chemistry* 3**
Survey of issues and chemical nature of environmental problems, including air, soil, and water pollution. Prerequisite: CHEM 1010 or 1120 or 1220. (Sp)

CHEM 3700 Introductory Biochemistry 3
Brief survey of the chemistry of biologically important compounds and their role in microbial, animal, and plant metabolism. Prerequisite: CHEM 2300 or 2310. (Sp) DE

CHEM 3710 Introductory Biochemistry Laboratory 1
Laboratory course designed to accompany CHEM 3700. Corequisite: CHEM 3700. (Sp) DE

CHEM 3750 Chemistry Special Topics (Topic) 1-3
(F,Sp,Su)

CHEM 4250 Cooperative Experience 1-2®
Planned work outside the University. Specific experience must receive prior approval for credit to be earned. Consult advisor or department head for details. (F,Sp,Su)

CHEM 4800 CI Research Problems 1-3®
Directed undergraduate research. Departmental permission required. (F,Sp,Su) DE

CHEM 4890 CI Undergraduate Biochemistry Seminar 2
Presentation of scientific seminars, critiquing of and participation in departmental seminars, scientific literature searching, accessing and using scientific databases, career preparation and development. To be taken during senior year of biochemistry major. (F,Sp)

CHEM 4990 CI Undergraduate Seminar 2®
Writing and speaking skills necessary for presenting scientific information. (F,Sp)

CHEM 5070 Biophysical Chemistry 3
Biological applications and theories of physical chemistry. Equilibrium, thermodynamics, chemical kinetics, transport properties, and spectroscopy. Prerequisites: CHEM 1220; MATH 1220; and PHYX 2120 or 2220. (F)

CHEM 5520 Advanced Inorganic Chemistry 2
Advanced treatment of the structure/bonding/reactivity relationships across the periodic table. Prerequisites: CHEM 3070, 3510. (F)

CHEM 5530 Advanced Synthesis Laboratory 2
Laboratory course in advanced synthetic techniques, including vacuum lines, inert atmosphere, Schlenk manipulations, liquid ammonia solvent, and tube furnace reactions. Prerequisites: CHEM 2325, 3070, 3520. (Sp)

CHEM 5640 Instrumental Analysis 3
Theory and application of physiochemical methods of analysis. Chromatography. Selected electrochemical and optical methods. Prerequisites: CHEM 3005, 3080. (Sp)

CHEM 5650 Instrumental Analysis Laboratory 2
Laboratory course to accompany CHEM 5640. Two three-hour labs per week. Prerequisites: CHEM 3005, 3080. (Sp)

CHEM 5670 Intermediate Environmental Chemistry 3**
Survey of chemical processes and pollutants in the environment. Sampling and analysis of pollutants to determine chemical fate. Prerequisites: CHEM 3000 and 3005; CHEM 3070 recommended. (Sp)

CHEM 5680 Environmental Chemistry Laboratory 2**
Laboratory course to accompany CHEM 5670. Field sampling and laboratory analysis of air, water, and soil samples. Method building and hypothesis testing. Prerequisites: CHEM 3000, 3005. Corequisite: CHEM 5670. (Sp)

CHEM 5700 General Biochemistry I 3
General biochemistry for science majors, including proteins, enzymes, catalysis, bioenergetics, and catabolic metabolism. Prerequisite: CHEM 2320. (F)

CHEM 5710 General Biochemistry II 3
Continuation of CHEM 5700. General biochemistry for science majors, including anabolic metabolism, DNA, RNA, and protein synthesis. Prerequisite: CHEM 5700. (Sp)

CHEM 5720 General Biochemistry Laboratory 3
Prerequisite: CHEM 5710 (may be taken concurrently). (Sp)

CHEM 5730 Genomic Technologies 4
Provides theoretical background in genomics/proteomics technologies and laboratory training in advanced techniques. Topics include: whole genome sequencing, transcriptome and proteome characterization, DNA and expressed gene libraries, and operation of modern genomics laboratory equipment. Prerequisites: BIOL 1220, 3200; CHEM 3700 or 5710; CS 2200; STAT 3000. Also taught as BIOL 5730. (Sp)

CHEM 6010 Quantum Chemistry* 3**
Quantum mechanics applied to chemical problems. Theory of atoms and molecules. Prerequisites: CHEM 3070, MATH 2250. (F)

CHEM 6020 Molecular Spectroscopy* 3**
Spectroscopy of atoms and molecules. Prerequisite: CHEM 6010. (Sp)

CHEM 6250 Curricular Practical Training 1-6®
Work experience tied to academics, in the graduate student's major field of study, either chemistry or biochemistry, for which the student is paid. Prerequisite: Permission of department head prior to enrollment. (F,Sp,Su)

CHEM 6300 Advanced Modern Organic Chemistry* 3**
Covers topics in molecular structure, reaction mechanisms of organic molecules, and physical organic chemistry. Prerequisites: CHEM 2320, 3070. (F)

CHEM 6500 Reactivity and Mechanisms in Inorganic Chemistry* 3**
Inorganic reactions and mechanisms relevant to areas of main group, transition metals, and bioinorganic and organometallic chemistry. Prerequisite: CHEM 5520. (Sp)

CHEM 6510 Chemical Applications of Group Theory 1
Introduction to symmetry point groups and theorems of group theory for application to structure, bonding, and spectroscopy. Some familiarity with linear algebra is recommended. Prerequisite: CHEM 3070. (F)

CHEM 6600 Modern Chemical Analysis* 3**
Methodology and statistical treatment of chemical data, experimental design, quality control, and chemical separations. Prerequisites: CHEM 5640, graduate standing, or instructor's permission. (Sp)

CHEM 6700 Advanced Biochemistry I 3
Advanced-level biochemistry course intended for biochemistry MS and PhD students. Covers proteins, enzyme mechanism, nucleic acid structure and function, and catabolic metabolism at a level appropriate for students preparing for the qualifying examination. This course (which is co-instructed with CHEM 5700, with additional projects for CHEM 6700) cannot be taken for credit by students who have previously taken CHEM 5700 for credit. (F)

CHEM 6710 Advanced Biochemistry II 3
Advanced-level biochemistry course intended for biochemistry MS and PhD students. Covers anabolic metabolism and bioinformation processes at a level appropriate for students preparing for the qualifying examination. This course (which is co-instructed with CHEM 5710, with additional projects for CHEM 6710) cannot be taken for credit by students who have previously taken CHEM 5710 for credit. (Sp)

CHEM 6720 Advanced Biochemistry Laboratory 2®
To obtain advanced laboratory skills, students complete specific laboratory experiments in research laboratories of departmental faculty members. (F,Sp)

CHEM 6730 Principles of Enzymology* 3
Mechanisms of enzyme action, emphasizing recent advances in enzymology, including theory and modern experimental approaches to elucidation of mechanism. Prerequisite: CHEM 5700 or 6700 or permission of instructor. (Sp)

CHEM 6740 Cellular Communication by Small Molecules and Proteins 3**
Using post-translational modifications, small molecules, and protein motifs in cellular communication. Variances in the communication systems related to disease state and/or cell stress and therapeutic strategies to manipulate the communication systems. Prerequisite: CHEM 5700 or 6700 or permission of instructor. Also taught as BIOL 6740. (Sp)

CHEM 6750 Principles of Structural Biology* 3
General principles of protein and nucleic acid structure. Approaches to understanding biological function through structural analysis. Prerequisite: CHEM 5700 or 6700 or instructor approval. (F)

CHEM 6760 Principles of Bioenergetics 3**
Global biological energy cycles including carbon, nitrogen, and sulfur cycles; respiration; electron transfer; and energy transduction. Prerequisite: CHEM 5700 or 6700 or permission of instructor. (F)

CHEM 6910 Special Problems in Chemistry and Biochemistry 1-4
Selected problems in chemistry and biochemistry. Registration permitted only with written permission from department head. (F,Sp,Su)

CHEM 6970 Thesis Research 1-10®
Research for MS degree. Graded Pass/Fail *only*. (F,Sp,Su)

CHEM 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

CHEM 7020 Statistical Mechanics* 3**
Statistical mechanics with applications to research problems of current interest. Prerequisite: CHEM 6010.

CHEM 7030 Special Topics in Physical Chemistry (Topic)* 3®**
Covers special areas of current interest and activity in physical chemistry. (F,Sp)

CHEM 7300 Reactions and Synthesis in Modern Organic Chemistry* 3
Reactions of modern organic chemistry and their application to organic synthesis. Prerequisite: CHEM 6300. (Sp)

CHEM 7310 Molecular Structure/Spectroscopy of Organic Compounds 3**
Modern methods of predicting and determining molecular structure of organic compounds using advanced computational and spectroscopic tools. Prerequisite: CHEM 6300. (F)

CHEM 7330 Special Topics in Organic Chemistry (Topic)* 3®**
Covers special areas of current interest and activity in organic chemistry. Prerequisite: CHEM 6300. (F,Sp)

CHEM 7500 Coordination Chemistry* 3**
Theory and spectroscopy of transition metal coordination complexes. Prerequisites: CHEM 3070, 6500, 6510. (Sp)

CHEM 7510 Bioinorganic Chemistry* 1-3**
Advanced systematic study of metallobiochemical structure and function. Prerequisite: CHEM 6500. (F)

CHEM 7530 Special Topics in Inorganic Chemistry (Topic)* 3®**
Topics of current interest in inorganic chemistry. Prerequisite: CHEM 6500. (Sp)

CHEM 7600 Analytical Spectroscopy 3**
Practical description of spectroscopy-based analysis, emphasizing instrumentation and methods. Prerequisites: CHEM 5640, graduate standing, or instructor's permission. (Sp)

CHEM 7610 Chemical Separations* 3
Survey of theory and practice of modern chemical separations, including extractions, chromatography, distillation, and phase separations. Prerequisites: CHEM 5640, graduate standing, or instructor's permission. (F)

CHEM 7620 Electrochemistry* 3**
Survey of electrochemistry with emphasis on electrochemical analysis. Prerequisites: CHEM 5640, graduate standing, or instructor's permission. (F)

CHEM 7640 Special Topics in Analytical Chemistry (Topic)* 1-3®**
Topics may include electronics from the scientist's perspective, laser-based spectroscopy, mass spectrometry, and chemometrics. Prerequisites: CHEM 5640, graduate standing, or instructor's permission. (F,Sp)

CHEM 7770 Special Topics in Biochemistry (Topic)* 1-3®
Topics of current interest in biochemistry.

CHEM 7800 Seminar 1®
Graduate seminar. Graded Pass/Fail *only*. (F,Sp)

CHEM 7970 PhD Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

CHEM 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

*Taught 2010-2011.
**Taught 2009-2010.
***Contact Department o!f Chemistry and Biochemistry for information about when this course will be taught.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Chinese (CHIN)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

CHIN 1010 Chinese First Year I 5
Communicative competencies in the four language skills: speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. (F) DE

CHIN 1020 Chinese First Year II 5
Communicative competencies in the four language skills: speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. Prerequisite: CHIN 1010 or equivalent. (Sp) DE

CHIN 2010 Chinese Second Year I 5
Second-year overview of speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. Prerequisite: CHIN 1020 or equivalent. (F)

CHIN 2020 Chinese Second Year II 5
Second-year overview of speaking, listening, reading, and writing with exposure to cultures and customs. Native speaker instructor. Prerequisite: CHIN 2010 or equivalent. (Sp)

CHIN 3010 Chinese Third Year I 4
First segment of the third-year overview of speaking, listening, reading, and writing, with additional exposure to cultures and customs. Readings include excerpts from televised drama. Prerequisite: CHIN 2020 or equivalent. (F)

CHIN 3020 Chinese Third Year II 4
Second segment of the third-year overview of speaking, listening, reading, and writing, with additional exposure to cultures and customs. Readings include short essays, Chinese proverbs and folktales, and other literary selections. Prerequisite: CHIN 3010 or equivalent. (Sp)

CHIN 3100 DHA Readings in Contemporary Chinese Culture 3
Introduction to contemporary Chinese culture through readings from newspapers and other source materials. Prerequisite: CHIN 3010 or permission of instructor. (F)

CHIN 3510 Chinese Business Language 3
Designed to develop students' business Chinese language skills in speaking, listening, reading, and writing, as well as cultural competence. Classwork focuses on Chinese business terms, business conversation, and basic business practices, as well as the Chinese cultural environment. Prerequisite: CHIN 2020 or equivalent. (F)

CHIN 3880 Individual Readings in Chinese 1-2
Individual study of selected readings in Chinese. Designed to broaden student's reading comprehension beyond the level addressed in CHIN 3020. Prerequisite: Instructor's permission. (F,Sp) DE

CHIN 4920 Chinese Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Classics (CLAS)

See Classics Minor, page 211

Also see Department of History, pages 304-309

CLAS 1100 The Latin and Greek Element in English* 3
Survey of classical word roots in English, with a view to enhancing students' comprehension of English vocabulary and its Indo-European heritage. (F,Sp)

CLAS 3210 Classical Mythology* 3
Introduces major myths of the Classical world. Explores how these myths serve as keys to understanding the documents and arts of Classical civilization. Also taught as ART 3210. (F,Sp)

*Taught 2010-2011.

Climate (CLIM)

See Department of Plants, Soils, and Climate, pages 415-423

Note: Effective Spring Semester 2010, courses listed with the CLIM prefix will use the Plants, Soils, and Climate (PSC) prefix.

CLIM 2000 BPS The Atmosphere and Weather 3
Survey of the processes governing the behavior of the atmosphere and the phenomenon of weather. Basic physical principles of radiation, energy, evaporation, and heat transport are introduced and connected to atmospheric circulation and weather. (F,Sp)

CLIM 3250 Aviation Weather 3
Discussion, observation, and analysis of weather important for pilots and those associated with air travel. (Sp)

CLIM 3820 DSC/QI Climate Change 3
Emphasizes physical basis of climate (climate dynamics), as well as the mechanisms and processes for its fluctuations on sub-seasonal to interannual time scales (climate variations) and on regional to hemispheric/global time scales. Prerequisites: CLIM 2000 or GEOG 1130. Also taught as WATS 3820. (Sp)

CLIM 5250 Remote Sensing of Land Surfaces 4
(dual listing 6250)
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as BIE 5250/6250 and WATS 5250/6250. (Sp)

CLIM 5400 General Meteorology 3
(dual listing 6400)
Designed for senior and graduate students in different fields who desire some basic introduction to meteorology. Bridges a large gap between courses describing meteorological phenomena in broad and simple terms and other courses treating the atmosphere more theoretically. (F)

CLIM 5500 Land-Atmosphere Interactions 3
(dual listing 6500)
Examination of interactions between the surface and atmosphere. Consideration of flows of mass and energy in soil-vegetation-atmosphere continuum, and their linkage to local and regional climates. Detailed study of feedbacks between vegetation and atmosphere. (Sp odd)

CLIM 5680 Paleoclimatology* 3
(dual listing 6680)
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as GEO 5680/6680 and WATS 5680/6680.

CLIM 6250 Remote Sensing of Land Surfaces 4
(dual listing 5250)
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as BIE 6250/5250 and WATS 6250/5250. (Sp)

CLIM 6400 General Meteorology 3
(dual listing 5400)
Designed for senior and graduate students in different fields who desire some basic introduction to meteorology. Bridges a large gap between courses describing meteorological phenomena in broad and simple terms and other courses treating the atmosphere more theoretically. (F)

CLIM 6500 Land-Atmosphere Interactions 3
(dual listing 5500)
Examination of interactions between the surface and atmosphere. Consideration of flows of mass and energy in soil-vegetation-atmosphere continuum, and their linkage to local and regional climates. Detailed study of feedbacks between vegetation and atmosphere. (Sp odd)

CLIM 6680 Paleoclimatology* 3
(dual listing 5680)
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as GEO 6680/5680 and WATS 6680/5680.

CLIM 6800 Environmental Biophysics 2
Explores connections between biosphere and atmosphere at many scales. Introduces processes governing exchanges of mass and energy between surface and atmosphere, as well as connections to climate. Examines role of the biota at local to global scales. (Sp)

CLIM 6910 Special Problems in Climatology 3®
Study of physical causes and effects of various climate regimes found upon the Earth. Study of the basis and mechanisms of all types of physically-based climate models. Assists students in comprehending relative complexities and applicabilities of the whole range of climate models. (Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
*This course is taught alternating years. Check with department for information about when course will be taught.

Communicative Disorders and Deaf Education (COMD)

See Department of Communicative Disorders and Deaf Education, pages 212-220

COMD 2400 Orientation and Observation 1®
Introduces students to the professional responsibilities required of communicative disorders and deaf education specialists in a variety of employment settings. Observation of normal/abnormal communication abilities. Language, hearing, and speech disorders. Graded Pass/Fail *only*. (F,Sp)

COMD 2500 Language, Speech, and Hearing Development 3
Language, speech, and hearing development throughout life and strategies for facilitating development. Requisites for human communication and language learning. Theoretical models of language acquisition and intracultural/intercultural differences. (F,Sp) DE

COMD 2600 Introduction to Communication Disorders 2
Addresses undergraduate study of types of communication disorders existing across the lifespan. Includes characteristics, etiologies, and brief introduction to assessment and intervention practices. Also explores fields of speech language pathology and audiology. (F)

COMD 2910 CI Sign Language I 4
Introduction to American Sign Language and Deaf Culture. Basic study of grammatical structure of ASL, as well as the history and folklore associated with the culture. Students have ample opportunities for laboratory practice of ASL. Course taught in a no-voice, total immersion atmosphere. (F,Sp,Su) DE

COMD 3050 Practicum and Methods in Teaching Children who are Deaf and Hard of Hearing 1-3®
Students investigate various aspects of teaching methods through field experiences in the classroom, curriculum and effective teaching assessment, observation and reflections, and guest speakers focusing on areas of mathematics and science in the primary grades. (F,Sp)

COMD 3080 American Sign Language Practicum 1®
Provides opportunities for practice and continued improvement of receptive and expressive skills in American Sign Language. (F,Sp)

COMD 3100 Fundamentals of Anatomy for Speech and Language 3
Basic study of the structures and functions associated with the subprocesses of speech and hearing, including respiration, phonation, resonation, articulation, neurology, and hearing. Prerequisite: BIOL 2320 or 2420. (F) DE

COMD 3120 Disorders of Articulation and Phonology 3
Introduction to articulation and phonological disorders and related problems. Emphasis directed at evaluation, management, and measures of success. Principles of programming are presented. Prerequisites: COMD 2500 and 3500. (Sp) DE

COMD 3300 Introduction to Blindness and Visual Impairment 3
Explores learning characteristics and needs of children and youth (preschool through high school) who are blind or visually impaired, as well as educational settings they are in and professionals who serve them. (F,Sp,Su)

COMD 3320 The Human Eye and Visual System 3
Covers structure and function of the human eye and visual system. Addresses the most common eye conditions causing visual impairment in children and youth, along with their implications and treatment. Explores the role of eye care specialists. (F,Sp,Su) DE

COMD 3330 Introduction to Low Vision 3
Introduction to the needs of students having low vision. Methods of adapting materials, activities, and the environment to better meet the learning needs of these students. Includes training in the use of low-vision aids. Explores the role of professionals and their services. (F,Sp,Su)

COMD 3340 The Role of Paraeducators with Individuals who are Blind or Visually Impaired 3
Addresses the roles and responsibilities of paraeducators who work in educational settings with children and youth who are blind or visually impaired. Covers the role of the educational team, as well as how the paraeducator functions as part of that team. (F,Sp,Su)

COMD 3350 Introduction to Multiple Disabilities 3
Presents introductory information about various disabilities, including those associated with sensory losses. Covers neurological issues related to brain development and learning. Addresses communication issues and strategies for working with individuals having multiple disabilities and sensory loss. (F,Sp,Su)

COMD 3360 Introduction to Braille 3
Introduction to braille literacy, as well as braille codes, software, and technology used to produce braille. Teaches students how to read and write uncontracted braille using a slate and stylus and a braille writer (actual or simulated). (F,Sp,Su) DE

COMD 3400 Acoustics and Anatomy of the Ear 3
Principles of physical acoustics as applied to Communicative Disorders. Course includes anatomy, physiology, and metabolism of the human auditory system. (Sp) DE

COMD 3500 Phonetics/Developmental Phonology 3
Study of the development of the phonological subsystem in English and the acoustic and physiological characteristics of speech sounds. (F) DE

COMD 3650 CI Clinical Processes and Behavior 2
A consideration of clinical management as an interactive process. Interpersonal sensitivity, technical knowledge and skills, professional infection-control measures, and behavior modification are core considerations. Prerequisites: COMD 2500 and PSY 1010. (Sp) DE

COMD 3700 Basic Audiology 3
Study of pure tone audiometry, including clinical masking, speech audiometry, and clinical immittance measures. Laboratory exercises are required. Prerequisite: COMD 3400. (F) DE

COMD 3910 Sign Language II 4
Provides a more in-depth study of American Sign Language, Deaf folklore and literature, and the grammatical structure of ASL. Focuses on unique number systems, idioms, lexicalized fingerspelling, and ASL poetry. Course taught with a total immersion approach, with ample opportunities for practice with fluent users of ASL in the lab. Prerequisite: COMD 2910 or instuctor approval. (F,Sp,Su)

COMD 4100 CI Clinical Practicum in Speech-Language Pathology 1-2®
Supervised diagnostic and treatment practicum with individuals who have communication disorders. Prerequisites: COMD 2500, 3120, 3650, and permission of instructor. (F,Sp,Su)

COMD 4250 Cooperative Practicum/ Work Experience 1-6
Provides practicum and work experience in serving children and youth having deaf-blindness or blindness. Assignments and projects vary, depending upon the student and the setting. (F,Sp,Su) DE

COMD 4400 Clinical Practicum in Audiology 1-2®
Supervised diagnostic and treatment practicum with individuals with hearing loss. Prerequisites: COMD 3400, 3650, 3700, and consent of instructor. (F,Sp,Su)

COMD 4450 Assessment and Treatment of Communicative Disorders in the Pediatric Population 3
Designed to give students an introductory understanding of assessment and treatment procedures when working with the pediatric population having communicative disorders. Addresses multicultural considerations in assessment and treatment of communicative disorders. (Sp)

COMD 4600 Senior Thesis 1-6®
Student-initiated research project under faculty supervision. Prerequisites: Satisfactory grade point average, instructor recommendation, and approval of Honors Committee. (F,Sp,Su)

COMD 4630 (dual listing 6630) Teaching Speech to Deaf and Hard of Hearing Children 3
Evaluative and instructional models, processes, and methodologies in the development of speech for children who are deaf and hard of hearing. (Sp)

COMD 4660 (dual listing 6660) Introduction to Deaf-blindness 3-5
Covers combined vision and hearing loss, as well as its impact on learning, communication, and overall development. Also explores neurological issues and other senses. (F,Sp,Su) DE

COMD 4750 (dual listing 6750) Teaching the English Language to Individuals who are Deaf and Hard of Hearing 3
Evaluation and teaching of the English language to individuals who are deaf and hard of hearing. Language development and remediation using structure, modeling, natural approach, and grammar. Prerequisite: COMD 2500. (F)

COMD 4760 (dual listing 6760) Early Intervention for Children who are Deaf and Hard of Hearing 3
Family-centered early intervention for infants and young children who are deaf and hard of hearing. Identification, testing, hearing aids, communication, auditory, language, and emerging literacy programming, parent and family programs, mentoring. (F)

COMD 4770 (dual listing 6770) Audiology and Teachers of Children who are Deaf and Hard of Hearing 3
Focuses on the fields of hearing science and audiology and how information from these disciplines relates to education of deaf and hard of hearing children. (F)

COMD 4780 (dual listing 6780) Socio-Cultural Aspects of Deafness 3
Leads students to understand how society, political institutions, and education have impacted the Deaf culture. (F)

COMD 4790 (dual listing 6790) Psychological Principles and Individuals who are Deaf and Hard of Hearing 3
Psychological theories and research used to describe the deaf and hard of hearing. Exploration of principles that can be used in helping these individuals achieve emotional well-being. Also taught as PSY 4790/6790. (Sp)

COMD 4840 (dual listing 6840) Children with Combined Vision, Hearing Loss, and Multiple Disabilities 3-5
Designed to teach students how to implement appropriate intervention strategies for infants and young children (ages 0-3) related to communication, cognition, touch, play, self-care, orientation to the environment, etc., and how to help the family learn to communicate with their child. (F,Sp,Su) DE

COMD 4910 CI (dual listing 6910) Sign Language III 4
Students receive individual, detailed feedback concerning their expressive ASL skills. Students present material in American Sign Language, with a focus on improving identified areas of weakness. Cooperative learning is encouraged. Experiences with fluent users of ASL and interpreter mentors via the lab provide students with basic interpreting skills. Prerequisites: COMD 2910 and 3910; or instructor approval. (F,Sp)

COMD 4920 (dual listing 6920) Sign Language IV 4
Basic concepts of linguistics are explored, as well as an in-depth analysis of ASL history, grammatical structure, and ASL poetry. Students apply linguistic principles to the analysis of American Sign Language, with ample opportunities to interact with fluent users of ASL via the lab experience. Prerequisites: COMD 2910 and 3910; or permission of instructor. (Sp)

COMD 5000 Institute in Communicative Disorders and Deaf Education 0.5-3®
Special colloquial offerings in communicative disorders and deaf education. (F,Sp,Su) DE

COMD 5070 Speech Science 3
Explores contemporary theory, research findings, clinical applications, and measurement and analysis of normal speech and voice production and perception. Speech production subsystems of respiration, phonation, articulation, and resonation are examined in detail through the collection and analysis of physiologic data. (F) DE

COMD 5100 Language Science 3
Study of clinical analysis of syntactic and morphological properties of speech. (Sp) DE

COMD 5200 Language Assessment and Intervention for Children Birth to Age Five 3
Language assessment and intervention for children from birth to age five, including language sampling and analysis procedures, interpreting formal and informal testing, facilitating language through strategies and corresponding theories, planning clinical management and intervention, and enhancing emergent literacy. Prerequisites: COMD 2500, 5100, or equivalent. (Sp) DE

COMD 5210 (dual listing 6210) Cultural and Linguistic Diversity in Communicative Disorders 3
Assessment and remediation of culturally and linguistically diverse clients in communicative disorders. Graduate students taking course as COMD 6210 must complete different and additional assignments than are required for undergraduate students enrolled in COMD 5210. (F)

COMD 5250 Diagnosis and Treatment of Adults in Speech-Language Pathology 3
Introduction to the diagnostic and treatment methods used for communication disorders associated with the adult population. Discusses specific disorders, including asphasia, apraxia, dysarthria, laryngectomy, stuttering, dysphagia, voice, and foreign accent/dialect. Explores cognitive and social aspects of communication. (Sp)

COMD 5330 Pediatric Aural Rehabilitation 3
Ramifications of hearing loss for children. Rehabilitative audiologic techniques and programs to improve communication abilities of children having hearing loss. (Sp) DE

COMD 5600 Classroom Teaching Using American Sign Language 3
Emphasizes development and presentation of lesson plans for different grade levels. Focuses on developing students' abilities in moving from and linking Language 1 (American Sign Language) and Language 2 (the written form of English). Prerequisites: COMD 2910, 3910, and 4910. (Sp)

COMD 5610 Introduction to Education of the Deaf and Hard of Hearing 3
Overview of the history of educating children who are deaf and hard of hearing. Presents an overview of techniques, anatomy of the ear, and different philosophical views for teaching people who are deaf and hard of hearing. (F)

COMD 5620 Teaching School Subjects to Students who are Deaf and Hard of Hearing 3
Focuses on effective strategies for teaching students who are deaf and hard of hearing across curricular subject areas. Emphasizes infusion of language and reading into all content areas. (Sp)

COMD 5730 (dual listing 6730) Children with Multiple Disabilities and Hearing Loss 3
Students will obtain a basic understanding of the problems and characteristics of children who have hearing loss plus one or more disabling conditions. Teaching strategies will also be discussed. (F)

COMD 5740 (dual listing 6740) Teaching Reading to Deaf and Hard of Hearing Children 3
Exploration of resources and methods used to teach reading to deaf and hard of hearing children. Discussion of current research regarding the effectiveness of these methods and ideas for improving reading instruction. (F)

COMD 5860 (dual listing 6860) Interdisciplinary Training in Assistive Technology I 3
Provides interdisciplinary training in assistive technology, focusing on assistive devices related to powered mobility, seating and positioning, computer access, and augmentative and alternative communication. Prerequisite: Departmental permission. (F)

COMD 5870 (dual listing 6870) Interdisciplinary Training in Assistive Technology II 3
Provides advanced training in assistive technology, focusing on assistive devices related to cognitive, hearing, visual, and dual sensory impairments. Funding issues also addressed. (Sp)

COMD 5900 Independent Study 1-6®
Selected work individually assigned, handled, and directed. Problems of mutual interest to students and the instructor are investigated and reported. (F,Sp,Su) DE

COMD 6020 Language Assessment and Intervention for School-age Children and Adolescents 3
Language assessment and intervention for school-age children and adolescents, including developmental oral and written language deficits, dynamic language assessment, interpreting formal and informal testing, facilitating language through strategies and corresponding theories, planning clinical management and intervention, and linking curriculum-based instruction. Prerequisite: COMD 5200 or equivalent. (F)

COMD 6030 Disorders of Fluency—Stuttering 3
Provides understanding of theory, nature, etiologies, and principles of diagnosis and treatment of communication disorders related to stuttering and other disorders of fluency. (F)

COMD 6040 Communication Disorders Related to Orofacial Anomalies 3
Nature, etiologies, and principles of diagnosis and treatment of communication disorders related to orofacial anomalies. Prerequisite: Graduate standing. (F)

COMD 6050 Professional Practice in Speech-Language Pathology 1
Lecture, discussion, and guest presenters on various professional practice topics pertaining to speech-language pathology. Prerequisite: Graduate standing. (F)

COMD 6060 Seminar in Speech-Language Pathology 1-3®
Covers professional issues and school-based practices in speech-language pathology. (Sp)

COMD 6100 Advanced Clinical Practicum in Speech-Language Pathology 1-4®
Supervised diagnostic and treatment practicum with individuals who have communication disorders. Prerequisites: COMD 2500, 3120, 3650, or equivalent, and permission of instructor. (F,Sp,Su) DE

COMD 6120 Adult Disorders of Motor Speech and Swallowing 4
Considers the neurological substrates and clinical manifestation of dysarthria, apraxia, and dysphagia in the adult population. Addresses diagnostic methods and management of these disorders. (Sp) DE

COMD 6130 Neuropathologies of Speech and Language 4
Study of neuropathologies of speech and language associated with aphasia, traumatic brain injury, right hemisphere syndrome, dementia, and degenerative neurological diseases. (F) DE

COMD 6140 Pediatric Neurogenic Disorders 3
Global perspective of normal pediatric development. Study of neurogenic pathologies and effects on respiration, phonation, and articulation. Also addresses assessment and intervention of oral-motor skills for speech and swallowing purposes. (Sp)

COMD 6150 Phonological Assessments and Intervention 3
Graduate study of theoretical and clinical issues related to the assessment and intervention of articulation and phonological disorders in children. (Sp)

COMD 6200 Internship in Public Schools—Speech-Language Pathology 4-5®
Supervised public school practicum in speech-language pathology. (F,Sp,Su)

COMD 6210 (dual listing 5210) Cultural and Linguistic Diversity in Communicative Disorders 3
Assessment and remediation of culturally and linguistically diverse clients in communicative disorders. Graduate students taking course as COMD 6210 must complete different and additional assignments than are required for undergraduate students enrolled in COMD 5210. (F)

COMD 6220 Severe Communication Impairments 3
Study of assessment and treatment strategies for individuals with severe communication impairments, including those requiring augmentative and alternative communication systems. (Sp)

COMD 6230 Introduction to Research in Communicative Disorders 3
Introduction to experimental research designs, including educational research and development, causal-comparative, correlational, and qualitative research. Includes research reviews, research proposals, threats to internal and external validity, and statistical/practical significance. Prerequisite: PSY 2800. (F)

COMD 6300 Externship in Speech-Language Pathology 1-12®
Supervised off-campus practicum in speech-language pathology. Prerequisite: Consent of instructor. (F,Sp,Su) DE

COMD 6320 Language Learning and Literacy Acquisition in Children with Hearing Loss 3
Addresses unique process of language learning in children with hearing loss. Explores processes and strategies to facilitate literacy acquisition in these children through an auditory-oral approach. (Su)

COMD 6340 Auditory Learning and Spoken Language for Young Children with Hearing Loss 3
Examines developmental processes underpinning audition and spoken language acquisition. Explores specific techniques, strategies, and teaching behaviors for developing listening and spoken language in young children who are deaf or hard of hearing. (F,Sp,Su)

COMD 6370 Educational Audiology 3
Management of deaf and hard of hearing children in the regular schools. Population and individual profiles, evaluation and staffing, models of delivery, integration considerations, remedial and facilitative programming. (F)

COMD 6430 Speech Communication and Hearing Loss 3
History of listening and speech programs for the hearing impaired. Hearing aids and FM systems, as well as computer and electronic devices used in supporting the speech of this population. Discussion of cochlear implants, the palatometer, and TranSonic hearing aids. (F)

COMD 6500 Studies in Blindness and Visual Impairment 3
Survey and discussion of studies of the learning characteristics and needs of children and youth who are blind or visually impaired (preschool through high school), the educational settings they are in, and the professionals who serve them. (F,Sp,Su)

COMD 6520 Anatomy, Function, and Disorders of the Eye 3
Covers structure and function of the human eye and visual system. Explores the most common eye conditions causing visual impairment in children and youth, as well as their implications and treatment. Examines the role of eye care specialists. With additional projects and readings, course goes beyond the information provided in undergraduate courses. (F,Sp,Su) DE

COMD 6530 Issues in Low Vision 3
Investigates students having low vision. Explores methods of adapting materials, activities, and the environment to better meet their learning needs. Includes training in the use of low-vision aids, while exploring the role of professionals and their services. Continuation and expansion of the related undergraduate course, COMD 3330. (F,Sp,Su)

Course Descriptions

COMD 6540 Visual Impairments and the Role of Paraeducators 3
Examines the roles and responsibilities of paraeducators who work with children and youth who are blind or visually impaired in educational settings. Explores the role of the educational team and how team members can best include and utilize paraeducators as part of the team. Continuation and expansion of the related undergraduate course, COMD 3340. (F,Sp,Su)

COMD 6550 Vision Loss with Multiple Disabilities 3
Presents specific information about the impact of multiple disabilities on individuals having visual sensory losses. Covers neurological issues related to brain development and learning. Addresses communication issues and strategies for working with individuals who have multiple disabilities and sensory loss. Continuation and expansion of the related undergraduate course, COMD 3350. (F,Sp,Su)

COMD 6560 Braille 3
Online course open to graduate students. Explores braille literacy. Provides instruction in braille codes, software, and technology used to produce braille. (F,Sp,Su) DE

COMD 6600 Practicum in Early Intervention, 0-3 1-4®
Supervised student practice in early intervention programs for children ages 0-3. (F,Sp,Su)

COMD 6630 (dual listing 4630) Teaching Speech to Deaf and Hard of Hearing Children 3
Evaluative and instructional models, processes, and methodologies in the development of speech for children who are deaf and hard of hearing. (Sp)

COMD 6640 Strategies for Teaching Children who are Deaf and Hard of Hearing 3
Explores strategies employed in providing appropriate services to children who are deaf and hard of hearing. Includes application of special education law, appropriate assessment to aid instruction, supervision techniques, and learning principles applied to deaf and hard of hearing students. Prerequisite: COMD 4630/6630. (F)

COMD 6650 Strategies for Teaching English Language to Children who are Deaf and Hard of Hearing 3
Practical methods for applying theories of teaching the English language in classrooms where deaf and hard of hearing children are educated. Prerequisite: COMD 4750/6750. (F)

COMD 6660 (dual listing 4660) Introduction to Deaf-blindness 3-5
Covers combined vision and hearing loss, as well as its impact on learning, communication, and overall development. Also explores neurological issues and other senses. (F,Sp,Su) DE

COMD 6670 Medical Aspects and Assessment of Young Children with Visual Impairments, 0-3 3-5
Examines impact of vision impairment on the development and learning of infants and toddlers; medical aspects of vision loss; tools, materials, and strategies to use in assessing functional vision and overall development; and working with families and intervention teams. (F)

COMD 6680 SKI*HI Training 1-3
Training in implementation of the SKI*HI Model. Early home intervention for infants and young children who are deaf and hard of hearing, and their families. (F,Sp,Su) DE

COMD 6690 Early Intervention Methods and Materials for Young Children with Visual Impairments, 0-3 3-5®
Covers intervention strategies and materials; adapting routines and materials in the home; working with support staff; use of other senses; and familiarization with curriculum resources in all developmental domains (e.g., fine and gross matter, communication and language, cognition, etc.). (F,Sp) DE

COMD 6700 Practicum in Education of Children who are Deaf and Hard of Hearing 1-3®
Supervised diagnostic and remedial casework in education of the deaf and hard of hearing. (F,Sp,Su)

COMD 6710 Mainstreaming Children who are Deaf and Hard of Hearing 3
Rationale and procedures used to successfully mainstream children with hearing loss. Also methods of evaluating programs where children with hearing loss are to be placed. (F)

COMD 6720 Serving Preschoolers with Vision Impairments in Center Based Settings 3-4
To provide students with knowledge and skills in working with children with visual impairments in the preschool setting. (F,Sp,Su) DE

COMD 6730 (dual listing 5730) Children with Multiple Disabilities and Hearing Loss 3
Students will obtain a basic understanding of the problems and characteristics of children who have hearing loss plus one or more disabling conditions. Teaching strategies will also be discussed. (F)

COMD 6740 (dual listing 5740) Teaching Reading to Deaf and Hard of Hearing Children 3
Exploration of resources and methods used to teach reading to deaf and hard of hearing children. Discussion of current research regarding the effectiveness of these methods and ideas for improving reading instruction. (F)

COMD 6750 (dual listing 4750) Teaching the English Language to Individuals who are Deaf and Hard of Hearing 3
Evaluation and teaching of the English language to individuals who are deaf and hard of hearing. Language development and remediation using structure, modeling, natural approach, and grammar. Prerequisite: COMD 2500. (F)

COMD 6760 (dual listing 4760) Early Intervention for Children who are Deaf and Hard of Hearing 3
Family-centered early intervention for infants and young children who are deaf and hard of hearing. Identification, testing, hearing aids, communication, auditory, language, and emerging literacy programming, parent and family programs, mentoring. (F)

COMD 6770 (dual listing 4770) Audiology and Teachers of Children who are Deaf and Hard of Hearing 3
Focuses on the fields of hearing science and audiology and how information from these disciplines relates to education of deaf and hard of hearing children. (F)

COMD 6780 (dual listing 4780) Socio-Cultural Aspects of Deafness 3
Leads students to understand how society, political institutions, and education have impacted the Deaf culture. (F)

COMD 6790 (dual listing 4790) Psychological Principles and Individuals who are Deaf and Hard of Hearing 3
Psychological theories and research used to describe the deaf and hard of hearing. Exploration of principles that can be used in helping these individuals achieve emotional well-being. Also taught as PSY 6790/4790. (Sp)

COMD 6800 Student Teaching—Day-School Program 6-12®
Full-time student teaching in a day-school program for the deaf. (F)

COMD 6810 Disorders of Phonation 3
Explores anatomy and physiology of the laryngeal and respiratory systems, contemporary theory, and evidence-based practice in the diagnosis and treatment of voice disorders. (F)

COMD 6820 Principles of Intervention for Children who are Deaf and Hard of Hearing 3
Application of teaching principles to classrooms for the deaf and hard of hearing. Practicum with children is part of this course. Prerequisites: COMD 6640, 6650, and permission of instructor. (Sp)

COMD 6830 Student Teaching—Residential 6-12
Full-time student teaching at a residential school for the deaf. Prerequisite: Permission of instructor. (Sp)

COMD 6840 (dual listing 4840) Children with Combined Vision, Hearing Loss, and Multiple Disabilities 3-5
Designed to teach students how to implement appropriate intervention strategies for infants and young children (ages 0-3) related to communication, cognition, touch, play, self-care, orientation to the environment, etc., and how to help the family learn to communicate with their child. (F,Sp,Su) DE

COMD 6850 Seminar in Communicative Disorders and Deaf Education 1-3®
Research and analysis of selected topics. (F,Sp,Su)

COMD 6860 (dual listing 5860) Interdisciplinary Training in Assistive Technology I 3
Provides interdisciplinary training in assistive technology, focusing on assistive devices related to powered mobility, seating and positioning, computer access, and augmentative and alternative communication. Prerequisite: Deparartmental permission. (F)

COMD 6870 (dual listing 5870) Interdisciplinary Training in Assistive Technology II 3
Provides advanced training in assistive technology, focusing on assistive devices related to cognitive, hearing, visual, and dual sensory impairments. Funding issues also addressed. (Sp)

COMD 6880 Methods and Procedures in Early Intervention 3
Teaches specific methods and procedures necessary for working in early intervention programs serving families of infants and young children with hearing loss, including assessment procedures, specific home visit delivery procedures, and methods of working with support professionals and team members. (Sp)

COMD 6900 Independent Study 1-9®
Prerequisite: Permission of instructor. (F,Sp,Su) DE

COMD 6910 (dual listing 4910) Sign Language III 4
Students receive individual, detailed feedback concerning their expressive ASL skills. Students present material in American Sign Language, with a focus on improving identified areas of weakness. Cooperative learning is encouraged. Experiences with fluent users of ASL and interpreter mentors via the lab provide students with basic interpreting skills. Prerequisites: COMD 2910 and 3910; or instructor approval. (F,Sp)

COMD 6920 (dual listing 4920) Sign Language IV 4
Basic concepts of linguistics are explored, as well as an in-depth analysis of ASL history, grammatical structure, and ASL poetry. Students apply linguistic principles to the analysis of American Sign Language, with ample opportunities to interact with fluent users of ASL via the lab experience. Prerequisites: COMD 2910 and 3910; or permission of instructor. (Sp)

COMD 6950 Practicum in Early Intervention 1-6®
Supervised student practicum in parent-infant home-based and preschool programs. (F,Sp)

COMD 6960 Master's Project 1-4®
This experience provides student with opportunity to design and carry out a creative project which is closely related to his or her area of teaching specialty. May require a written report. (F,Sp,Su)

COMD 6970 Thesis 1-7®
Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su) DE

COMD 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

COMD 7200 Introduction to Clinical Practice 2®
Supervised diagnostic practicum for first-year students in the Audiology Program. Prerequisite: Admission to the Audiology Program. (F,Sp,Su)

COMD 7300 Intermediate Clinical Practicum 2®
Supervised diagnostic practicum for second-year students in the Audiology Program. Prerequisite: Admission to the Audiology Program. (F,Sp,Su)

COMD 7310 Psychoacoustics and Instrumentation 3
Covers psychoacoustic aspects of human audition, with emphasis on application in the clinical settting. Explores basic electronics and audio systems. Prerequisite: Admission to the Audiology Program. (F)

COMD 7320 Amplification I 1-4
Hearing aid types and uses, hearing aid components and characteristics, electroacoustic performance, hearing aid candidacy and hearing aid evaluation, and hearing aid fitting and orientation. Prerequisite: Admission to the Audiology Program. (Sp)

COMD 7330 Supervision Internship 1-7®
Provides extensive supervisory experience for advanced students. Internship is for a period of time to be specified by the department and cooperating agency. Prerequisite: Permission of instructor. (F,Sp,Su)

COMD 7340 Pediatric Audiology 2-3
Provides students with understanding of normal auditory development and theoretical, clinical, and practical issues involved in screening, assessment, and management of children with hearing loss. Prerequisite: Admission to the Audiology Program. (F)

COMD 7380 Advanced Audiology 2
Special auditory testing for site of lesion in the conductive, sensory, and neural/central auditory systems with special emphasis on the comprehensive behavioral audiologic test battery. Prerequisite: Admission to the Audiology Clinical Doctoral Program. (F)

COMD 7400 Advanced Clinical Practicum 2-4®
Supervised clinical practicum for third-year students in the Audiology Program. Prerequisite: Admission to the Audiology Program. (F,Sp,Su)

COMD 7410 Noise and Hearing Conservation 2
Principles of noise hazard evaluation, effects of noise on the auditory mechanism, and development and maintenance of an effective hearing conservation program. Prerequisite: Admission to the Audiology Program. (F)

COMD 7420 Amplification II 1-4
Applications of advanced hearing aid circuitry. Hearing aid troubleshooting, modifications, and repairs, as well as various aspects of measuring hearing aid satisfaction, are included. Tinnitus management and cochlear implants also examined. Prerequisite: Admission to the Audiology Graduate Program. (F)

COMD 7430 Electrophysiology 3
Provides students with extensive working knowledge of early, middle, and late evoked potentials. Assessment of the sensory function of the auditory system with otoacoustic emissions also included. Prerequisite: Admission to the Audiology Clinical Doctorate Program. (F)

COMD 7460 Adult Aural Rehabilitation 3
Focuses on traditional aural rehabilitation models, amplification, counseling, speech reading, and assistive listening devices. Upon course completion, students should be able to effectively use these elements to assist adults in compensating for hearing impairment. Prerequisite: Admission to the Audiology Program. (Sp)

COMD 7470 Educational Audiological Management and Audiologic Counseling 3
Management plans for audiological services, as well as appropriate intervention strategies for children. Students develop plans and present methods for bringing change to schools. Principles of audiologic counseling also discussed. Prerequisite: COMD 6370. (Sp)

COMD 7490 Medical Aspects of Audiology 3
Study of the etiology, symptomatology, audiological manifestations, and medical treatment of various pathological conditions of the auditory system. Prerequisite: Admission to the Audiology Program. (Sp)

COMD 7510 Supervision in Communicative Disorders 2
Principles and practices of supervision in Communicative Disorders and Deaf Education. Emphasizes clinical and educational supervision as these styles relate to individuals who are deaf and hard of hearing or who have communicative disorders. (Su)

COMD 7520 Physiological Bases for the Cochlear Implant 2-3
Advanced clinical training, working with children who are cochlear implant recipients. Study of physiological bases of cochlear implantation, including anatomy, embryology, cochlear physiology, and the effects and function of a cochlear implant. Prerequisite: Graduate standing in Communicative Disorders and Deaf Education Department.

COMD 7530 Balance Evaluation and Management 3
Explores techniques and technology for vestibular and balance assessment, including electronystagmography, videonystagmography, rotational testing, and posturography. Prerequisite: Admission to the Audiology Program. (Sp)

COMD 7800 Clinical Externship in Audiology 6®
Twelve-month full-time clinical practicum experience in one or more off-campus clinical sites. Prerequisite: Admission to the Audiology Program. (F,Sp,Su)

COMD 7810 Research Seminar in Educational Audiology 1-3®
Identification of research problem, consideration of research strategies and methods, application of research and statistical concepts in departmental focus, interaction with faculty. (F,Sp,Su)

COMD 7820 Clinical Research in Audiology 3®
Facilitates completion of doctoral students' clinical research projects in audiology. Further enables students to incorporate evidence-based practice into the profession of audiology. Prerequisite: Admission to the Audiology Program. (F)

COMD 7830 Special Topics in Speech-Language Pathology 3®
Discussion of advanced topics and issues in speech and language disorders, including theories of information processing and learning mechanisms underlying speech and language disorders, the nature of various types of speech and language disorders, current research in speech and language disorders, assessment practices, and/or intervention practices. (F,Sp,Su)

COMD 7840 Journal Reading Group in Speech-Language Pathology 1®
Under faculty direction, students read and discuss published research. Students learn to critique empirical and theoretical papers, as well as current research findings in important areas of speech-language pathology. (F,Sp,Su)

COMD 7850 Externship Seminar 3®
Internet-based seminar in current clinical-related topics for fourth-year students in the Doctorate of Audiology Program. Prerequisite: Admission to Doctorate of Audiology Program. (F,Sp,Su)

COMD 7860 Practice Management in Audiology 3
Audiology business and practice management. Discussion of business set-up, the business plan, managerial accounting and financial analysis, marketing, pricing, reimbursement, record keeping, and forensics. Prerequisite: Admission to the Audiology Program. (Sp)

COMD 7870 Audiology Capstone Project 1-6®
Under the direction of his or her advisory committee, student develops a clinically-related project. This project is a creative work at a doctoral level and worthy of publication or presentation. Prerequisite: Admission to the Audiology Program. (F,Sp,Su)

COMD 7900 Independent Study 1-2®
Advanced students, under direction of a faculty member, will study independently; however, departmental permission is necessary. (F,Sp,Su)

COMD 7910 Independent Research 1-2®
Advanced students, under direction of a faculty member, will do research in an area of interest to themselves. (F,Sp,Su)

COMD 7970 Dissertation 1-9®
Variable credit for dissertation project in connection with the doctoral program emphasis in educational audiology. Graded Pass/Fail *only*. (F,Sp,Su)

COMD 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Computer Science (CS)

See Department of Computer Science, pages 221-227

CS 1020 Campus Computing and Beyond 1
Hands-on laboratory for CS 1030. Introduces the campus network and the Internet. Emphasizes general problem-solving strategies and skills associated with computer and application software use. (F,Sp,Su)

CS 1030 BPS Foundations of Computer Science 3
Investigation of computers and computing in today's society, including the basic scientific and mathematical concepts that underlie computer science, computing, and computer systems. No prerequisites. (F)

CS 1050 Problem Solving with Computers 3
Investigates problem-solving using methodologies of computer science. Emphasizes techniques used by computer scientists to solve problems, as well as the scientific method. Develops problem-solving methodology for both new and traditional computer applications. (F,Sp)

CS 1060 BPS Cyber Security: Threats, Analysis, and Defense 3
Investigation of cyber-security threats through an analysis of computer systems and communication methods. Develops skills for identifying potential attacks, analyzing problems, and implementing solutions. Students learn to minimize vulnerabilities and defend against attacks in the cyber world. (Sp)

CS 1400 Introduction to Computer Science—CS 1 3
Introduction to science of problem solving, programming, program development, algorithm analysis, and data structures. Students will learn to develop correct software in a current programming language environment. Computer science majors must enroll in CS 1405 concurrently with CS 1400. Prerequisite: Grade of *C*- or better in MATH 1050 or Math ACT score of at least 25. (F,Sp,Su) DE

CS 1405 Introduction to Computer Science—CS 1 Lab 1
One-hour lab taught in conjunction with CS 1400. Students learn to develop correct software in a hands-on structured environment. Computer science majors are required to pass both the laboratory and the lecture, and are required to enroll in CS 1400 concurrently with CS 1405. For students not majoring in computer science, this laboratory is advised, but not required, for CS 1400. Prerequisite: Grade of *C*- or better in MATH 1050 or Math ACT score of at least 25. (F,Sp,Su)

CS 1410 QI Introduction to Computer Science—CS 2 3
Introduction to science of problem solving, programming, program development, algorithm analysis, and data structures. Students will learn to develop correct software in a current programming language environment. Prerequisite: Grade of *C*- or better in CS 1400. (F,Sp,Su) DE

CS 2250 Cooperative Work Experience 1-9®
Provides credit for students working at a participating firm under faculty supervision. Prerequisites: 2.5 GPA; permission of instructor. (F,Sp,Su)

CS 2420 QI Algorithms and Data Structures—CS 3 3
Introduction to science of problem solving, programming, program development, algorithm analysis, and data structures. Students will learn to develop correct software in a current programming language environment. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 1410. (F,Sp,Su)

CS 2450 CI Introduction to Software Engineering I 3
First part of a two-course series in software engineering, covering fundamental principles and practices. Provides hands-on experience in development of complete software application in a group situation. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. (F,Sp)

CS 2550 Computer Organization 3
Fundamental building blocks of digital computers, and the underlying theories upon which these building blocks are assembled. Introduction to information representation, number systems, combinational logic circuits, sequential logic circuits, and instruction sets. Programming such systems at the assembly level. Prerequisites: 2.5 GPA; grade of *C-* or better in *both* CS 1400 and MATH 1050 and Math ACT score of at least 23. This course is not currently being taught. For information about when it may be taught, contact the Computer Science Department.

CS 2810 Computer Systems Organization and Architecture I 3
Examines organization and architecture of computer systems. Covers terminology, data representation, Boolean Algebra, and combinational and sequential logic circuits as they apply to computer hardware and software. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 1410. (F,Sp)

CS 3000 Undergraduate Seminar 1
Serves as a capstone course for the pre-computer science curriculum, as well as an introduction to the advanced standing curriculum. Also includes discussion of computer science as a career and discussion of the advanced standing test. Graded Pass/Fail *only*. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420; fulfillment of Computer and Information Literacy (CIL) requirement; grade of *C-* or better in ENGL 2010; or permission of instructor. (F,Sp,Su) DE

CS 3010 DSC/CI/QI Information Acquisition, Analysis, and Presentation 3
Introduces students to use of scientific method and computer technology in analysis of multi-faceted problem, and presentation of that analysis. Each semester, built around single topic such as global warming. Prerequisites: Completion of University Studies Computer and Information Literacy (CIL) and Quantitative Literacy (QL) requirements. (F,Sp,Su) DE

CS 3100 Operating Systems and Concurrency 3
Design and implementation of operating systems. UNIX will be used as one example, but all categories of operating systems will be discussed. Presentation of the concept of concurrency as it applies to operating system design and application. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (F,Sp) DE

CS 3410 DSC/QI Computational Science: JAVA/Internet 3
Introduces computational science for algorithm development in JAVA-based applications. Examines information representation, storage, retrieval, and transmission in quantitative Internet-based environments. Prerequisites: CS 1410 and completion of University Studies Quantitative Literacy (QL) requirement. (F,Sp,Su) DE

CS 3420 DSC/QI Computational Science: C# and .NET 3
Introduces algorithm development for C#/.NET applications. Examines digital representation, storage, retrieval, and transmission of information, and quantitative applications such as distributed network problems, along with the algorithms for such applications. Prerequisites: CS 1410, completion of University Studies Breadth Physical Sciences (BPS) course, and fulfillment of University Studies Quantitative Literacy (QL) requirement. (F,Sp,Su)

CS 3430 DSC/QI Computational Science: Python and Perl Programming 3
Introduces students to algorithm development and programming in computational science for Python and Perl applications on a Linux platform. Examines computer-based representation, storage, retrieval, and transmission of information, along with the algorithms used to perform such operations. Examines specific applications in bioinformatics and biology. Prerequisites: CS 1400, completion of University Studies Breadth Life Sciences (BLS) course, and fulfillment of University Studies Quantitative Literacy (QL) requirement. (F,Sp,Su)

CS 3450 Introduction to Software Engineering II 3
Second part of a two-course series in software engineering, covering fundamental principles and practices. Provides hands-on experience in development of complete software application in group situation. Prerequisite: CS 2450. (F)

CS 3810 Computer Systems Organization and Architecture II 3
Examines high-level architecture of computer systems. Covers processor and memory design for optimal performance, I/O subsystems, networking, and computer security. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2810. Not available to pre-Computer Science majors. (F,Sp)

CS 4250 Cooperative Work Experience 1-9®
Provides credit for students working at a participating firm under faculty supervision. Prerequisites: 2.0 GPA; permission of instructor. Not available to pre-Computer Science majors. (F,Sp,Su)

CS 4700 Programming Languages 3
Theories of programming design and implementation. Introduction to variety of programming languages, showing how they represent trade-offs with respect to these theories. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (F,Sp)

CS 4720 Computer Networking I 3
Focuses on client/server model, which is the dominant architectural model for today's computer systems. Explores the network underlying this model, specifically examining the topology, protocol(s), user interface(s), and hardware. Emphasizes the general theory and functionalities underlying the client/server model and computer networks in general. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (F,Sp,Su) DE

CS 4730 Computer Networking II 3
Focuses on client/server model, which is the dominant architectural model for today's computer systems. Emphasizes the specifics of the products of today's dominant network companies, which are currently Novell and Microsoft. Completion of this course prepares students for certification under such products. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 4720. Not available to pre-Computer Science majors. (Sp)

CS 4890 Topics in Computer Science (Topic) 3
Current topics in computer science as determined by advances in the field. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (F,Sp,Su)

CS 4950 Undergraduate Research 1-4®
Participation in research projects, under supervision of a computer science faculty member. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420 and permission of instructor. Not available to pre-Computer Science majors. (F,Sp,Su)

CS 5000 Theory of Computability 3
Theory of computation, including presentation of computability, decidability, and complexity. Includes formal grammars, finite and pushdown automata, and turing machines. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (Sp)

CS 5050 Advanced Algorithms 3
Study of algorithms and their analysis, including: design by induction, algorithms involving sequences and sets, graph algorithms, geometric algorithms, algebraic algorithms, reductions, NP-completeness, and parallel algorithms. Prerequisites: Grade of *C-* or better in CS 2420 and admission into Computer Science major. (F,Sp)

CS 5070 Computer Science Capstone 1
Students develop a project that includes the use of a significant portion of the computer science topics presented in the core curriculum. Completion of the project requires an oral presentation and a detailed written report. Graded Pass/Fail *only*. Prerequisite: 2.0 GPA. Not available to pre-Computer Science majors. (F,Sp,Su)

CS 5100 Graphical User Interfaces and Windows Programming 4
Design principles of GUIs and philosophy, structure, and programming in Windows environments. Prerequisites: 2.0 GPA; grade of *C-* or better in CS 2420. Not available to pre-Computer Science majors. (Sp)

CS 5200 Distributed and Network Programming 4
Introduction to programming concepts and techniques for distributed and networked environments. Explores concurrency, process synchronization, network protocols, connectionless and connection-oriented communications, network architectures and topology, load balancing, and transmission media. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 3100. Not available to pre-Computer Science majors. (F)

CS 5300 Compiler Construction 4
Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of declarations, expressions, statements, and procedures/functions. Organization and design of a compiler. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2810 and 4700. Not available to pre-Computer Science majors. (F)

CS 5370 Advanced Software Engineering 3
Advanced software engineering concepts, including the improvement process, requirements acquisition, development process models, object-oriented design, and software testing. Student cannot receive credit for both CS 5370 and CS 6370. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 3450. Not available to pre-Computer Science majors. (Sp)

CS 5400 Computer Graphics I 4
Introduction to concepts of graphical techniques. Digital and pictorial representation of information. Prerequisites: 2.0 GPA; grade of *C*- or better in *all* of the following: CS 2420; MATH 1220; MATH 2250 or 2270. Not available to pre-Computer Science majors. (F)

CS 5410 Game Development 4
Explores technical game development. Emphasizes integration of multiple computer science topics within a single application, including: graphics, AI multi-threading, multi-core, networking, synchronization, optimization, and scripting languages. Includes a team project to develop a computer-based game. Prerequisites: CS 2420 and 3100. (Sp)

CS 5450 Multimedia Systems* 4
Introduction to concepts and techniques underlying multimedia-based systems. Deals with both the hardware aspects of multimedia systems (e.g., transfer rates, capacities, resolution, etc.) and the software requirements of such systems. Each student required to develop a multimedia-based system. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420. Not available to pre-Computer Science majors. (Sp)

CS 5460 Computer Security I 3
Introduction of computer security principles, data protection models, and application techniques. Develops basic skills necessary for protecting systems and communication from a variety of computer security threats. Topics include encryption, policies, access control, network security, OS security, and software security. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420. Not available to pre-Computer Science majors. (F)

CS 5500 Parallel Programming 3
Examines basic techniques for designing parallel algorithms, such as balanced trees, pointer jumping, partitioning, pipelining, accelerated cascading, list ranking, and tree contraction. Consideration of classic parallel algorithms in graphs, merging, sorting, planar geometry, string matching, and randomized techniques. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420. Not available to pre-Computer Science majors. (Sp)

CS 5600 AI: Problem Solving and Expert Systems 3
Introduction to practical artificial intelligence methods for building problem solving and expert sytems. Covers search, knowledge representation, and reasoning. Students will develop projects in LISP and expert system shells. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420. Not available to pre-Computer Science majors. (F)

CS 5650 CVPRIP I: Computer Vision, Pattern Recognition, and Image Processing 3
Introduction to theories and techniques of machine intelligence, with emphasis on pattern recognition, computer vision, fuzzy logic, and neural networks. Prerequisites: 2.0 GPA; grade of *C*- or better in *all* of the following: CS 2420, MATH 2270, STAT 2000 or 3000. Not available to pre-Computer Science majors. (F)

CS 5660 Bioinformatics I 3
Introduction to tools and techniques used in the study of bioinformatics, genomics, and computational biology. Explores usage of these tools and techniques for storage, retrieval (mining), processing, visualization, and analysis of biological information. Prerequisite: Permission of instructor. (F) DE

CS 5670 Bioinformatics II 3
Builds on material presented in CS 5660, presenting more advanced topics in bioinformatics, such as data mining, machine learning, and evolutionary algorithms. Students *cannot* receive credit for *both* CS 5670 and 6670. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 5660. Not available to pre-Computer Science majors. (Sp)

CS 5700 Object-Oriented Software Development 3
Study of fundamental object-oriented principles, e.g., abstraction, encapsulation, classification, and inheritance. Application of these principles in all phases of software development, with emphasis on analysis, design, and testing. Introduction to software design patterns. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 3450. Not available to pre-Computer Science majors. (F)

CS 5800 Introduction to Database Systems 3
Comparison of various database systems. Normal forms, protection, concurrency, security and integrity, and distributed and object-oriented systems. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420. Not available to pre-Computer Science majors. (F) DE

CS 5850 Systems Analysis 3
Theory and practice of analysis, design, and implementation of information systems. Students will construct an information system. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 5800. Not available to pre-Computer Science majors. (Sp)

CS 5890 Topics in Computer Science (Topic) 1-4®
Current topics in computer science as determined by advances in the field. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420 and permission of instructor. Not available to pre-Computer Science majors. (F,Sp,Su)

CS 5950 Independent Study 3®
Provides for independent study of selected topics. Prerequisites: 2.0 GPA; grade of *C*- or better in CS 2420 and permission of instructor. Not available to pre-Computer Science majors. (F,Sp,Su) DE

CS 6050 Computational Geometry: Algorithms and Applications 3
Computational geometry is the study of computation involving geometric objects, such as lines, polygons, and circles. It has application in bioinformatics, graphics, robotics, CAD/CAM, etc. This course presents the algorithms, data structures, and techniques of computational geometry. Prerequisite: Permission of instructor. (Sp)

CS 6100 MultiAgent Systems 3
MultiAgent systems are composed of multiple interacting computing elements, known as agents. Agents are software systems with two important capabilities: first, autonomous actions; and second, interacting with other agents by engaging in cooperation, coordination, and negotiation. Prerequisites: 3.0 GPA and enrollment in Computer Science master's or PhD program. (F)

CS 6200 Distributed System Design* 3
Examines advanced design concepts related to development of distributed software systems. Students learn how to model and evaluate communication protocols and study techniques for time coordination, distributed process synchronization, object replication and migration, and distributed transaction processing. Students also learn about Common Object Request Broker Architecture (CORBA). Prerequisites: 3.0 GPA; grade of *B*- or better in CS 5200 and enrollment in Computer Science master's or PhD program. (Sp)

CS 6220 Concurrent Systems* 3
Explores concurrency in its various forms, emphasizing debugging techniques, development techniques that guarantee correctness, and performance evaluation and tuning. Prerequisite: CS 5200. (F)

CS 6250 Cooperative Work Experience, Graduate 1-9®
Provides credit for students working at a participating firm under faculty supervision. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 6300 Supercompilers for Sequential and Parallel Computers* 3
Analysis and optimization for sequential and parallel computers, including loop restructuring, concurrency analysis, vector analysis, and optimizations for shared and distributed memory computers. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5300 and enrollment in Computer Science master's or PhD program. (Sp)

CS 6370 Software Engineering with a Project 3
Advanced software engineering concepts, including the improvement process, requirements acquisition, development process models, object-oriented design, and software testing. Students will work in teams, developing significant software products. Student cannot receive credit for both CS 5370 and CS 6370. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 2450 and enrollment in Computer Science master's or PhD program. (F)

CS 6400 Computer Graphics II* 3
Study of computer rendering of three-dimensional objects. Object representation, hidden surface removal, and shading. Ray tracing of synthetic scenes using mathematically defined surfaces. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5400 and enrollment in Computer Science master's or PhD program. (Sp)

CS 6460 Computer Security II 3
Maintaining the integrity and security of computer systems is critical. Course explores aspects of system vulnerabilities and protection, attack categories and methodologies, the development of secure computer systems, etc. Prerequisite: CS 5460 or permission of instructor. (Sp)

CS 6500 Advances in Parallel Systems 3
Survey of current advances in parallel processing and concurrent systems. Review of current scientific literature to understand current issues, problems, and progress in advanced topics of parallel processing. Students read, summarize, report, and discuss up-to-date scientific papers in the field. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5500 and enrollment in Computer Science master's or PhD program. (F)

CS 6550 Parallel Computing Systems 3
Design of large-scale parallel systems. Explores machine organizations SIMD and/or MIMD modes of parallelism, emphasizing interconnection patterns among processors. Discussion of low-level parallel processing algorithms. Presents case studies of existing and proposed systems. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5500 and enrollment in Computer Science master's or PhD program. (F)

CS 6600 AI: Advanced Intelligent Systems 3
Investigation of advanced techniques for creating intelligent systems. Covers machine learning, reasoning under uncertainty, decision making, natural language understanding, and advanced knowledge representation. Students develop projects in LISP and expert system shells. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5600 and enrollment in Computer Science master's or PhD program. (Sp)

CS 6630 Fuzzy Logic and its Application 3
Introduces students to machine learning and problem solving techniques based on fuzzy logic. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 2420 and advanced standing, or instructor's permission; and enrollment in Computer Science master's or PhD program. (F)

CS 6650 Neural Networks* 3
Advanced course in theories and techniques of machine intelligence, using neural networks. Emphasizes various neural network paradigms and the types of problems they are best suited to solve. Prerequisite: CS 2420 or permission of instructor. (Sp) DE

CS 6655 Evolutionary Computation 3
In-depth analysis of the foundations of optimization techniques founded on evolutionary computation. Includes evolutionary algorithms, genetic algorithms, genetic programming, etc. Prerequisite: CS 2420 or permission of instructor. (Sp)

CS 6660 Evolutionary Algorithms* 3
Analyzes the major algorithms associated with evolutionary computation. Emphasizes use of such algorithms for the solution of optimization problems. Presents genetic, swarm, and genetic programming algorithms. Prerequisite: CS 2420 or permission of instructor. (Sp)

CS 6670 Advanced Bioinformatics 3
Focuses on the various advanced algorithms and models used in bioinformatics applications. Opportunties and needs for improvement of such algorithms discussed in the context of current and future problems in bioinformatics. Prerequisite: CS 5670. (F)

CS 6690 AI: Advanced Topics in Artificial Intelligence (Topic) 3
Advanced course in selected theories and techniques of artificial intelligence. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (Sp)

CS 6700 Object-Oriented Models, Methods, and Tools 3
Study of object-oriented concepts, principles, techniques, development processes, and tools across all areas of software engineering, with special emphasis on current research topics. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5700 and enrollment in Computer Science master's or PhD program. (F)

CS 6800 Advanced Database Systems 3
Covers advanced topics in database systems, including XML, OODBMS, query optimization, query processing, deductive databases, concurrency, theory of relational databases, normalization, and recovery. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5800 and enrollment in Computer Science master's or PhD program. (Sp) DE

CS 6890 Topics in Computer Science (Topic) 1-4®
Current topics in computer science as determined by advances in the field. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 6900 Seminar 1
Series of one-hour seminars on current research topics presented by computer science faculty. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F) DE

CS 6950 Directed Readings in Computer Science 3®
Directed reading on advanced topics in computer science. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su) DE

CS 6970 Thesis and Research 1-9®
Graduate research in computer science. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su) DE

CS 6990 Continuing Graduate Advisement 1-6®
Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su) DE

CS 7100 Advanced MultiAgent Systems* 3
Advanced topics in multiAgent systems, including algorithms for finding solutions, social welfare with preferences and utilities, multiAgent learning, and distributed search problems. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 6100 (or permission of instructor) and enrollment in Computer Science master's or PhD program. (Sp)

CS 7350 Patterns in Computer Software Systems 3
Investigates patterns in computer software systems and how they can be better cataloged, understood, and reused to improve development productivity and quality. Includes readings of current literature, writing research papers, and participation in group discussions. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5700 and enrollment in Computer Science master's or PhD program. (Sp)

CS 7380 Software Testing* 3
Explores current issues, including testing object-oriented software, test data generation and sufficiency, domain-based testing, functional testing, and code-based testing. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F)

CS 7460 Advances in Computer Security Research 3
Covers recent research directions in computer security. Reviews current state of the field, and explores possible research directions for further work. Prerequisite: CS 6460 or permission of instructor. (F)

CS 7500 Fault-Tolerant Systems 3
Advanced study of design and implementation of operating systems for fault-tolerant parallel and distributed systems. Topics chosen will provide students with knowledge of current research issues, practices, and techniques for the design and development of such systems. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (Sp)

CS 7550 Interconnection Networks for Parallel Computer Systems 3
Explores the design of large-scale parallel processing systems generally suited for multi-microprocessor implementation. Emphasizes interconnection patterns among the processing elements in parallel processors. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F)

CS 7650 Advanced CVPRIP: Computer Vision, Pattern Recognition, and Image Processing 3
Investigates new developments in representation and processing of gray-level and color images, including thresholding, segmentation, curve detection, etc. Also examines visual perception, as well as statistical and syntactical pattern classification. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (Sp)

CS 7660 Robotics and Autonomous Systems 3
Surveys current advances in robotic and autonomous systems. Reviews current scientific literature in the field, with emphasis on understanding the problems solved and the approaches used. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F)

CS 7670 Data Mining and Machine Learning 3
Covers cutting-edge research in machine learning, data mining, and intelligent information retrieval. Focuses on how these topics relate to data mining. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (Sp)

CS 7680 Advanced Computer Vision* 3
Emphasizes current topics and research in the general area of computer vision. Focuses on detection, recognition, tracking, and analysis of human activity by using computer vision. Prerequisites: 3.0 GPA; grade of *B-* or better in CS 5650 and enrollment in Computer Science master's or PhD program. (Sp)

CS 7900 Seminar 2
Series of lectures and presentations on current topics in computer science. Students participate by giving presentations. As part of the course, students are expected to prepare their dissertation proposal. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (Sp)

CS 7910 Special Topics in Intelligent Systems (Topic) 3®
Discussion of current topics in intelligent systems, such as parallelism and software systems. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. Taught on demand. (F,Sp,Su)

CS 7920 Special Topics in Parallelism (Topic) 3®
Topics of current interest in the area of parallelism. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 7930 Special Topics in Software Systems (Topic) 3®
Topics of current interest in the area of software systems. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 7935 Topics in Mobile Systems 3
Mobile computing devices are now ubiquitous. Computations and communications on such devices require a new computing paradigm and raise issues such as power-awareness, location-awareness, security, reliability, etc. This course explores mobile systems and issues pertaining to reliable operation. Prerequisites: CS 3100, 4700, and 5200; or permission of instructor. (F)

CS 7950 Reading and Reports 3®
Directed reading on cutting-edge topics in computer science. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 7960 Topics in Bioinformatics (Topic) 3
Topics of current interest in bioinformatics. Prerequisite: Permission of instructor. (F,Sp,Su)

CS 7970 Dissertation Research 1-15®
PhD dissertation research. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

CS 7990 Continuing Graduate Advisement 1-6®
Continuing PhD-level advisement. Graded Pass/Fail *only*. Prerequisites: 3.0 GPA; permission of instructor and enrollment in Computer Science master's or PhD program. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*This course is taught alternating years. Check with department for information about when course will be taught.

Dance West Summer, Dance Education (DE)

See Department of Health, Physical Education and Recreation, pages 296-303

DE 1700 Jazz 1®
Provides training and experience in the styles of jazz, one of the popular forms of American dance. (Su)

DE 1800 Dance West Performance 1-3®
Students will learn dances to be performed in "The West: America's Odyssey." Prerequisite: Audition. (Su)

DE 1840 Beginning Classical Ballet 2®
A discipline in recognized classic form. Includes barre exercises, port de bras, and center practice in balance, jumping, and turns. (Su)

DE 1870 Beginning Classical Modern Dance 2®
Designed to develop coordination, ease, and poise in handling the body. Focuses on dance as an art using the body as a medium of expression. (Su)

DE 2850 Intermediate Classical Ballet 2®
Barre exercises, port de bras, and center practice in balance, jumps, beats, and turns with more emphasis on exactness and precision of line. Prerequisite: One year of ballet or permission of instructor. (Su)

DE 2880 Intermediate Classical Modern Dance 2®
Stresses alignment of the skeletal structure, freedom and movement of the torso, and technical work enabling the dancer to secure the natural axis of balance. Prerequisite: One year modern dance or permission of instructor. (Su)

DE 3800 Advanced Ballet 3®
Pointe and Pas de Deux. Intensified center floor work concentrating on longer adagio and allegro combinations. Prerequisite: Five years of ballet or permission of instructor. (Su)

DE 4500 American Character Ballet 3®
History through movement from seventeenth century European dance through contemporary styles. (Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Electrical and Computer Engineering (ECE)

See Department of Electrical and Computer Engineering, pages 236-242

ECE 1000 Introduction to Electrical and Computer Engineering 2
Basic concepts and techniques for electrical and computer engineering majors. Introduction to analog and digital electronics with fundamental laboratory skills. One lecture and one lab. Prerequisites: MATH 1050 and 1060; or AP Calculus score of at least 3 on the AB test; or Math ACT score of at least 27. Enrollment limited to electrical engineering and computer engineering majors *only*. (F)

ECE 2250 Electrical Circuits 4
Introduction to electrical circuits and basic circuit elements. Circuit theory, analysis techniques, and introduction to design. DC analysis. First-order inductive and capacitive circuits. Operational amplifiers. AC steady-state analysis. Introduction to computer-aided design and analysis. Three lectures, one lab. Prerequisites: MATH 2270, 2280. (F,Sp)

ECE 2700 Digital Circuits 4
Design of combinational and sequential logic circuits with discrete and programmable logic devices. Simulations and timing analysis. Use of CAD tools. Design of digital systems. Three lectures, one lab. Prerequisite: Minimum grade of *C-* in CS 1400. (F,Sp)

ECE 3260 DSC/QI Science of Sound 3
Applications of principles of acoustics (study of sound) to everyday life. Explores physical acoustics, psychoacoustics, musical acoustics, and architectural acoustics. Uses algebra and reasoning to solve problems in acoustics. Prerequisite: Grade of *C-* or better in MATH 1050 or Math ACT score of at least 23. This course is *not currently being taught*. For information about when it may be taught, contact the Electrical and Computer Engineering Department.

ECE 3410 Microelectronics I 4
Fundamentals of transistors, operational amplifiers, and other integrated circuits, along with their utilization in amplifiers, switches, and other applications. Laboratory work required. Prerequisite: ECE 2250. Prerequisite or corequisite: ECE 3620. (Sp) DE

ECE 3620 Circuits and Signals 3
Continuation of basic circuit concepts. Second-order response, time-domain analysis of higher-order systems. Impulse response and convolution. Transform domain analysis of circuits and other systems. Some lab and computational work required. Prerequisites: MATH 2270, 2280, ECE 2250, CS 1410, PHYS 2220 (may be taken concurrently). (F) DE

ECE 3640 Signals and Systems 3
Systems realizations. Time and transform domain analysis of discrete-time systems. Vector-space concepts and Fourier series. Fourier transforms in continuous and discrete time. Some lab and computational work required. Prerequisite: ECE 3620. (Sp) DE

ECE 3710 Microcomputer Hardware and Software 4
Synthesis of microcomputer systems, including interfacing, component analysis, signaling requirements, and programming. Covers architecture basics, including instruction sets, assembly language programming, loading, timing, and interrupts. Includes hands-on implementation. Three lectures, one lab. Prerequisites: ECE 2250, 2700, CS 1410. (F,Sp) DE

ECE 3720 Microcomputer Systems Progamming 3
Advanced assembly language and systems programming concerned with performance and I/O. Study of modern computer architecture issues, such as caching, pipelining, concurrent instruction execution, memory access time, and role and structure of device drivers. Prerequisite: ECE 3710. (Sp) DE

ECE 3810 Engineering Professionalism 1
Introduces students to life as an engineer, including: the design process, working in teams, understanding professional and ethical responsibility, the impact of engineering on society, and the need for continued professional development. Also includes discussion of how engineering meets the contemporary needs of society. (F,Sp)

ECE 3860 Transmission Lines 1
Covers transmission line analysis and high frequency effects, including reflections, standing waves and interference, VSWR, crosstalk, and coupling. Intended to be taken by computer engineers. Meets simultaneously with ECE 3870 during the first five weeks of the semester. Prerequisites: ECE 2250, PHYS 2220, MATH 2250. This course is not currently being offered. For information about when it may be offered, contact the department.

ECE 3870 Electromagnetics I 4
Discussion of Maxwell's equations, electromagnetic waves, power and energy, reflection and refraction processes, transmission lines, waveguides, and antennas. Explores electrostatic and magnetostatic fields produced by charge and current distributions, as well as electromagnetic forces and materials. Prerequisites: ECE 2250, MATH 2210, 2270, 2280, PHYS 2220. (Sp) DE

ECE 4250 Internship/Co-op 3®
Planned, career-related work experience in industry. Students must register with USU Co-op Office and have program approved by the ECE co-op advisor. Written report required. Graded Pass/Fail *only*. Prerequisite: Professional standing. (F,Sp,Su)

ECE 4650 Optics I 3
(dual listing 6650)
Topics include mathematics of wave motion, electromagnetic theory of light, light propagation, geometrical optics, and superposition of waves. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Also taught as PHYS 4650/6650. Prerequisite: ECE 3870. (F)

ECE 4680 Optics II 3
(dual listing 6680)
Topics include polarization, interference, diffraction, Fourier optics, coherence theory, and the quantum nature of light. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Prerequisite: PHYS/ECE 4650 or PHYS/ECE 6650. Also taught as PHYS 4680/6680. (Sp)

ECE 4740 Computer and Data Communications 3
Systems approach to computer and data communications. Includes transmission lines, hardware controllers, computer interfaces, and protocols relating to local and wide area networks. (F)

ECE 4840 CI Engineering Design 3
Individual or team engineering project, including design, development, and testing. Interdisciplinary projects strongly encouraged. Design reviews and written progress reports required. Prerequisite: ECE 3810. (F,Sp)

ECE 4850 CI Engineering Communications 2
Includes a written proposal and project report, oral design reviews, presentation graphics, and project presentation. Must be taken concurrently with a senior-level capstone design course. Prerequisite: ECE 3810. (F,Sp)

ECE 4930 Special Studies for Undergraduates 1-3®
Independent or group study of engineering problems not covered in regular course offerings. (F,Sp,Su) DE

ECE 5230 Spacecraft Systems Engineering 3
Spacecraft communications, telemetry systems, and command and data handling. Introduction to astrodynamics and orbit design. Electrical power generation and storage. Spacecraft subsystems (e.g., guidance, navigation, and control). Prerequisites: MATH 2270, 2280. (F)

ECE 5240 Space System Design 3
Students in teams perform a space system design involving all aspects, including technical, cost, and schedule. Class is linked to national design competitions and/or current USU spacecraft design projects. Prerequisite: ECE 5230 or MAE 5520. Also taught as MAE 5530. (Sp)

ECE 5310 Control Systems 3
Study of analog and computer controlled systems, classical and modern control system design methods, s-domain and z-domain transfer function models, state space, dynamics of linear systems, and frequency domain analysis and design techniques. Introduction to controllability and observability, and full-state pole placement controller design. Laboratory work required. Prerequisite: ECE 3640. (F)

ECE 5320 Mechatronics 4
Principles, modeling, interfacing, and signal conditioning of motion sensors and actuators. Hardware-in-the-loop simulation and rapid prototyping of real-time closed-loop computer control of electromechanical systems. Modeling, analysis, and identification of discrete-time or sampled-data dynamic systems. Commonly used digital controller design methods. Introduction to nonlinear effects and their compensation in mechatronic systems. Laboratory work and a design project required. Three lectures and one lab. Prerequisite: ECE 5310. (Sp)

ECE 5340 Mobile Robots 4
Hardware, including embedded processors, sensors, DC motors, interface electronics, wheeled platforms, and battery power. Software, including low-level device drivers and mobile rocket simulation. Algorithms, including reactive and planning approaches. Advanced sensors. Mobile robot kinematics, dynamics, and control. A project is required. Prerequisite: ECE 3640. (F)

ECE 5410 Semiconductor Devices 3
Introduction to semiconductor physics and devices. Students receive an introduction to the operation of the most important devices used in integrated circuit technology. Emphasis placed on understanding device operation. (F) DE

ECE 5420 Microelectronics II 3
Design of electronic circuits for applications in instrumentation, communication, control, and power systems. Prerequisite: ECE 3410. (F)

ECE 5430 Applied CMOS Electronics 3
(dual listing 6430)
Analysis, design, and application of digital and analog MOS integrated circuits in electronic systems. Includes device-lever VLSI, fabrication technology, and semiconductor device physics. Prerequisites: ECE 3410 and 5530. (Sp) DE

ECE 5440 Analog VLSI I 3
Introduces design principles and techniques for fully-integrated CMOS analog circuits. Topics include advanced MOSFET device modeling, design and verification of operational amplifiers, and switched-capacitor circuits. Prerequisite: ECE 5420. (Sp)

ECE 5460 Digital VLSI System Design I 3
(dual listing 6460)
Team-oriented design of large digital systems using hardware description languages. Schematic capture and standard-cell libraries. Behavioral system modeling and simulation. Preparation of behavioral models for floor-planning, testability, and design synthesis. Extensive use of CAD tools. Design project. Prerequisite: ECE 5530. (Sp) DE

ECE 5470 Digital VLSI System Design II 3
(dual listing 6470)
Continuation of ECE 5460/6460. Logic synthesis, timing analysis, and structural simulation and back annotation. Design refinement to the point of final mask artwork production. Design validation through LVS, DRC, and gate-level or device-level simulation. Formal methods of circuit verification. Extensive use of CAD tools. Design project. Prerequisite: ECE 5460/6460. (F)

ECE 5480 Electromagnetic Compatibility* 3
Introduces concepts and techniques of electromagnetic compatibility to students who will be designing and working with high-speed electronic systems. Prerequisites: ECE 3640, 3870. (Sp)

ECE 5530 Digital System Design 3
Presents modern top-down, bottom-up approach to design of digital systems, emphasizing programmable devices. Extensive use of CAD tools. Designing with ABEL, and introduction to designing with Verilog HDL. Laboratory work required. Prerequisite: ECE 2700. (F,Sp) DE

ECE 5630 Introduction to Digital Signal Processing 3
Theory and principles of digital signal processing, including discrete-time signals and systems, Z-Transforms, Fourier analysis, FIR and IIR digital filter design, discrete Fourier transforms, and multi-rate processing. Laboratory work required. Prerequisite: ECE 3640. (F) DE

ECE 5640 Real-Time Processors* 4
Real-time processor architectures and methods used for digital signal processing. Includes C and assembly language programming, modern DSP architectures, tools for real-time system development, and finite word-length effects. Laboratory includes implementation of hardware-based real-time systems. Three lectures, one lab. Prerequisites: ECE 3640 and 3710. (Sp)

ECE 5660 Communication Systems I 3
Explores fundamentals of analog and digital communication systems. Focuses on modulation, demodulation, detection, and synchronization. Prerequisites: ECE 3640 and MATH 5710; or graduate standing. (Sp) DE

ECE 5740 Concurrent Programming 3
Analysis of problems associated with the use of multiple threads and processes (e.g., deadlock, livelock, and starvation) and methods for avoiding them. Proper usage of synchronization operations (mutual exclusion, critical sections, semaphores, and monitors) and communication operations (message passing, remote procedure calls, remote method invocation, and rendezvous). Extensive programming exercises in C and JAVA. Taught on demand.

ECE 5750 High-Performance Microprocessor Architecture 3
Modern architecture fundamentals, instruction set analysis and design, pipelined and superscalar architectures, software-hardware interaction, memory hierarchy, and virtual memory stresses processor-specific low-level code optimization. Prerequisite: ECE 3710 or equivalent. (Sp) DE

ECE 5770 Microcomputer Interfacing 4
Design of hardware and software interfaces to microcomputers for instrumentation and control applications. Three lectures, one lab. Prerequisite: ECE 3710. (Sp)

ECE 5780 Real-Time Systems 4
Real-time system design and implementation of basic concepts, including interrupts and controllers, context switch, concurrent processes, semaphores, message passing, rate monotonic and deadline scheduling, hardware system design and test issues, and typical engineering practice. Includes hands-on implementation. Three lectures, one lab. (F) DE

ECE 5800 Electromagnetics II 3
General plane wave solution of Maxwell's equations, potential functions, radiation, 2-D solution to Laplace's equation, and fundamental electromagnetic theory. Prerequisite: ECE 3870. (F)

ECE 5810 Microwaves I 3
Impedance matching, microwave network anaysis, waveguides, nonlinear elements, analysis and design of power dividers, filters, and ferromagnetic circuits. Laboratory work required. Prerequisite: ECE 3870. (Sp)

ECE 5820 Electromagnetics Laboratory* 3
Measurement theory, practice, and safety. Design and characterization of microwave filters, amplifiers, and antennas. Also includes practical considerations. Prerequisites: ECE 3870 and 5420; or equivalent. (F)

ECE 5850 Antennas I 3
Theory and application of electromagnetic radiation and radiating structures. Emphasis on antenna designs for modern wireless communications and radar systems. Prerequisite: ECE 3870. (F)

ECE 5870 Wireless Communication and Laboratory* 3
Characteristics of the physical channel, fading and multipath, frequency reuse, interference, and system capacity. Equalization, diversity, and channel coding. Laboratory experiments focus on design issues and tradeoffs in a wireless communication system. Prerequisite: ECE 3710 or 3870. (F)

ECE 5930 Special Topics in Electrical and Computer Engineering 1-4®
Independent or group study of engineering problems not covered in regular course offerings. (F,Sp,Su)

ECE 6010 Stochastic Processes in Electronic Systems 3
Introduction to stochastic processes in communications, signal processing, digital and computer systems, and control. Topics include continuous and discrete random processes, correlation and power spectral density, optimal filtering, Markov chains, and queuing theory. Prerequisite: Graduate status. (F) DE

ECE 6030 Mathematical Methods for Signals and Systems 3
Signal representation using vector spaces. Linear algebraic techniques for signal modeling and estimation. Optimal detection and estimation algorithms, with applications. Prerequisite: Graduate status. (Sp) DE

ECE 6240 Space Environment and Engineering 3
Study of space environment and models used for engineering analysis. Topics include considerations for engineering in the space environment, such as plasma interactions, debris, chemical reactions, radiation effects, and thermal issues. Prerequisites: MATH 2270, 2280. Corequisite: ECE 5230. Also taught as PHYS 6240. (F)

ECE 6250 Graduate Internship/Co-op 1-3
Planned work experience in industry. Detailed program; must have prior approval. Written report required. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

ECE 6320 Linear Multivariable Control 3
Modeling, analysis, and design of multi-input, multi-output control systems, including both state space and transfer matrix approaches, with an emphasis on stability. Prerequisite: ECE 5310 or MAE 5310. Also taught as MAE 6320. (F) DE

ECE 6340 Spacecraft Attitude Control 3
Spacecraft attitude dynamics and controls. Spin stabilized, three axis, and dual spin modes. Attitude determination techniques. Prerequisite: ECE 5310 or MAE 5310. Also taught as MAE 6340. (Sp)

ECE 6350 Robotics 3
Fundamentals of robotic systems, including kinetics, kinematics, sensors, actuators, control algorithms, motion planning, and computer systems. Integration of critical design components to develop complete systems. Robotic manipulator analysis and design. Applications in manufacturing. Mobile robots, including wheeled, legged, and alternative locomotion robots. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as MAE 6350. (Sp) DE

ECE 6430 Applied CMOS Electronics 3
(dual listing 5430)
Analysis, design, and application of digital and analog MOS integrated circuits in electronic systems. Includes device-lever VLSI, fabrication technology, and semiconductor device physics. Prerequisites: ECE 3410 and 5530. (Sp) DE

ECE 6440 Analog VLSI II 3
Project-oriented course, focusing on design and verification of manufacturable analog integrated circuits. Whenever possible, student projects developed for fabrication and testing. Advanced lecture topics include voltage references, ESD protection circuits, oscillators, and phase-locked loop design. Prerequisite: ECE 5440. (F)

ECE 6460 Digital VLSI System Design I 3
(dual listing 5460)
Team-oriented design of large digital systems using hardware description languages. Schematic capture and standard-cell libraries. Behavioral system modeling and simulation. Preparation of behavioral models for floor-planning, testability, and design synthesis. Extensive use of CAD tools. Design project. Prerequisite: ECE 5530. (Sp) DE

ECE 6470 Digital VLSI System Design II 3
(dual listing 5470)
Continuation of ECE 6460/5460. Logic synthesis, timing analysis, and structural simulation and back annotation. Design refinement to the point of final mask artwork production. Design validation through LVS, DRC, and gate-level or device-level simulation. Formal methods of circuit verification. Extensive use of CAD tools. Design project. Prerequisite: ECE 6460/5460. (F)

ECE 6490 Radar I 3
Emphasizes the system aspects of radar. After introducing the basic concepts of radar, methods for the prediction of radar performance are developed and the principles of CW, FM, MTI, and tracking radars are presented. Prerequisites: ECE 3640 and 5800 or equivalent knowledge. Taught on demand.

ECE 6560 Spacecraft Navigation 3
Fundamentals of aircraft and spacecraft navigation systems. Techniques in celestial and inertial navigation. Global Positioning System (GPS) principles. Least squares estimation and Kalman filtering for optimal estimation of stochastic systems. Prerequisite: MAE 5310 or ECE 5310 or equivalent. Also taught as MAE 6560. (Sp)

ECE 6600 Computer Networking I 3
Topics include network topology, flow, capacity and queuing analysis, detailed description of the standard layers, and specific networking systems, including local area networks. Some lab work included. (F) DE

ECE 6620 Introduction to Digital Image Processing* 3
Digital processing theory and techniques for two-dimensional signals. Topics include two-dimensional transforms, image perception, sampling, modeling, enhancement, and data compression. Prerequisite: ECE 5630. (Sp)

ECE 6650 Optics I 3
(dual listing 4650)
Topics include mathematics of wave motion, electromagnetic theory of light, light propagation, geometrical optics, and superposition of waves. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Also taught as PHYS 6650/4650. Prerequisite: ECE 3870. (F)

ECE 6670 Communication Systems II 3
Communication over bandlimited channels, equalization, multiple antenna systems, space-time codes, spread spectrum, CDMA, OFDM. Prerequisites: ECE 5660, 6010, 6030. (F)

ECE 6680 Optics II 3
(dual listing 4680)
Topics include polarization, interference, diffraction, Fourier optics, coherence theory, and the quantum nature of light. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Prerequisite: PHYS/ECE 4650 or PHYS/ECE 6650. Also taught as PHYS 6680/4680. (Sp)

ECE 6750 Concurrent Systems Engineering I* 3
Reliable and efficient software design for multiprocessor and multithreaded applications on real-time or embedded systems. Use of CASE tools to develop substantial concurrent programs for single and multiprocessor systems. Prerequisite: BS degree in Electrical and Computer Engineering or Computer Science. Taught on demand.

ECE 6760 Fault-tolerant Systems* 3
Methods for design and implementation of fault-tolerant computer systems, emphasizing small real-time and embedded applications. Detection, assessment, confinement, and treatment of faults. Checkpointing, rollback, and secure protocols. Fault-tolerance on distributed systems. Prerequisite: BS degree in Electrical and Computer Engineering or Computer Science. Taught on demand.

ECE 6780 Device Drivers 3
Design and implementation of UNIX and Windows device drivers. Includes hardware/software design tradeoffs in light of modern operating systems. Students implement working device drivers. Prerequisite: ECE 5780. Taught on demand.

ECE 6800 Electrical Engineering Colloquium 0.5®
Weekly seminars or colloquia. Students are normally required to enroll for two semesters. Graded Pass/Fail *only*. (F,Sp) DE

ECE 6830 Microwaves II* 3
Microwave amplifier design for noise, gain, and power match; microwave semiconductor and vacuum-tube devices; microwave oscillators; and microwave system performance characterization. Laboratory work required. Prerequisite: ECE 5810 or equivalent. (F)

ECE 6930 Special Topics in Electrical Engineering 1-6®
Independent or group study in electrical engineering topics, such as automated systems, optics and laser engineering, electro-acoustics, solid-state materials, devices, and intelligent systems engineering. (F,Sp,Su)

ECE 6950 Design Project 3®
Graded Pass/Fail *only*. (F,Sp,Su)

ECE 6970 Thesis Research, MS 1-6®
Graded Pass/Fail *only*. (F,Sp,Su)

ECE 6990 Continuing Graduate Advisement 1-6®
Graded Pass/Fail *only*. Prerequisite: Permission of Electrical and Computer Engineering Department. (F,Sp,Su)

ECE 7030 Detection and Estimation Theory* 3
Foundations of detection theory, including Neyman-Pearson, Bayes, and Minimax Bayes detection. Maximum likelihood and Bayes estimation theory. Recursive estimation and Kalman filtering and smoothing. Expectation maximization and hidden Markov models. Prerequisites: ECE 6010, 6030. (F)

ECE 7210 Spacecraft Instrumentation* 3
Theory, engineering, and data reduction techniques of spacecraft instrumentation for space science and spacecraft systems. Prerequisite: ECE/PHYS 6240. Also taught as PHYS 7210. (Sp)

ECE 7330 Nonlinear and Adaptive Control 3
Methods of nonlinear and adaptive control system design and analysis. Includes qualitative and quantitative theories, graphical methods, frequency domain methods, sliding surface design, linear parameter estimation methods, and direct and indirect adaptive control techniques. Prerequisite: ECE/MAE 6320. Also taught as MAE 7330. (Sp)

ECE 7350 Intelligent Control Systems* 3
Intelligent control strategies, including neural network, fuzzy logic, associated memory networks, and rule-based control systems. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as MAE 7350. (Sp)

ECE 7360 Optimal and Robust Control* 3
Advanced methods of control system analysis and design. Operator approaches to optimal control, including LQR, LQG, and L1 optimization techniques. Robust control theory, including QFT, H-infinity, and interval polynomial approaches. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as MAE 7360. (F)

ECE 7390 Topics in Controls 3
Topics selected from advanced control theory. Taught on demand.

ECE 7440 Mixed-Signal VLSI Systems 3
Covers specification, design, and verification of integrated systems with both analog and digital components. Particular emphasis given to data converter circuits (ADC and DAC), focusing on current research problems in the field. Prerequisite: ECE 5440. (F)

ECE 7610 Computer Networking II 4
Advanced TCP/IP protocols, routing strategies, major applications. Details of Unix systems for advanced use of BSD sockets and TLI/Streams. Prerequisite: ECE 6600. (Sp)

ECE 7620 Advanced Digital Image Processing* 3
Advanced digital processing theory and techniques. Topics include image restoration, image reconstruction from projections (computed tomography), and data compression. Prerequisites: ECE 6010, 6620. (F)

ECE 7630 Advanced Digital Signal Processing* 3
Advanced digital signal processing theory and methods. Topics include optimal filter design (Wiener and Kalman filters), adaptive filtering, spectral estimation, and beamforming. Prerequisites: ECE 5630, 6010. (F)

ECE 7640 Topics in Signal Processing 3
Topics in advanced signal or image processing. Taught on demand.

ECE 7670 Coding Theory and Practice in Communication* 3
Examination of codes employed in digital communications, including discussion of error correction codes over finite fields. Reed-Solomon, convolutional, and trellis coding. Advanced coding techniques. Prerequisite: ECE 6010 or 6030. Prerequisite or corequisite: ECE 5660. (F)

ECE 7690 Topics in Communication Theory 3
Topics selected from advanced communication theory. Taught on demand.

ECE 7710 Concurrent Systems Engineering II* 3
Advanced work on the development of reliable and correct concurrent systems, including those with time constraints. Substantial experience with CASE tools and application development. Prerequisite: ECE 6750. (F)

ECE 7730 Reconfigurable Computing 3
Advanced study of reconfigurable computing fabrics, design automation algorithms related to FPGAs, and embedded hardware-software co-designed on FPGAs. Topics discussed and project implementations teach students state-of-the-art skills in digital, embedded hybrid processor design. Prerequisite: ECE 5530. (F)

ECE 7750 Distributed Control Systems* 3
Design and implementation issues concerning distributed control systems. Real-time processing, distributed stability methods, network techniques and standards, system development and management, smart sensors, and control actuators. Survey of current literature. Prerequisite: ECE/MAE 6320. Also taught as MAE 7750. (Sp)

ECE 7760 Advanced Topics in Distributed Systems 3
Advanced topics in parallel and distributed computing, emphasizing small-scale real-time and embedded systems. Prerequisite: ECE 6750. Taught on demand.

ECE 7770 Advanced Topics in Real-Time Systems 3
Topics in real-time systems, such as scheduling analysis, adaptive scheduling, multiprocessor systems, fault tolerance, etc. Also design and implementation of real-time operating systems. Prerequisite: ECE 5780. Taught on demand.

ECE 7780 Model-Based Embedded Software 3
Topics include: Modeling, model-based tool development, examination of current embedded systems design tools, real-time operating systems, and formal methods for embedded system analysis. Surveys current literature in embedded systems. Prerequisite: ECE 5780 or permission of instructor. (Sp) DE

ECE 7850 Antennas II* 3
Topics include: apertures, reflectors and lens, finite and infinite arrays, broadband antennas, Fresnel Fraunhofer regions, and Huygens' principle. Concepts for synthetic aperture radar and radar cross section. Prerequisites: ECE 5800 and 5850. (Sp)

ECE 7860 Computational Electromagnetics* 3
Topics selected from advanced numerical methods including: finite element, finite difference, and mement method for solving differential and integral equations of electromagnetic radiation and scattering problems. Programming in C/C++ or MatLab required. Prerequisite: ECE 5800. (Sp)

ECE 7890 Topics in Electromagnetics 3
Topics selected from advanced electromagnetics, microwave, and radar fields. Taught on demand.

ECE 7930 Special Topics in Electrical Engineering 1-6®
Independent or group study in electrical engineering topics, such as automated systems, laser engineering, electroacoustics, solid-state materials, devices, and intelligent systems engineering. (F,Sp,Su)

ECE 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ECE 7990 Continuing Graduate Advisement 1-9®
Prerequisite: Permission of Electrical and Computer Engineering Department. Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

*This course is taught alternating years. Check with department for information about when course will be taught.

Economics (ECN)

See Department of Economics and Finance, pages 230-233

Note: Effective Fall Semester 2009, courses previously listed under the ECON prefix will be taught under *either* the ECN prefix *or* the Applied Economics (APEC) prefix. (APEC courses are shown on pages 499-501.) Students registering for Summer Semester 2009 Economics courses can find them under the ECON prefix by logging into Access at: **http://www.usu.edu/myusu/**

ECN 1500 BAI Introduction to Economic Institutions, History, and Principles 3
Designed to build an understanding of economic institutions, history, and principles. Relationship between private and public sectors of U.S. economy. Analysis of major economic institutions, such as property rights, markets, business organizations, labor unions, money and banking, trade, and taxation. No prerequisites. (F,Sp,Su) DE

ECN 2010 BSS Introduction to Microeconomics 3
Designed to build an understanding of the economics of the marketplace from the perspectives of individual consumer and producer or business. Development and application of microeconomic principles to demonstrate the role and limitations of competitive markets in motivating socially efficient consumer, business, and public sector choices. Prerequisite: ECN 1500. Also taught as APEC 2010. (F,Sp,Su) DE

ECN 3010 DSS Managerial Economics 3
Microeconomic principles applied to economic decision-making and policy formulation, with emphasis at the level of business firm and the individual consumer. Designed for undergraduate business and accounting majors. Credit will not be given for both ECN 3010 and ECN/APEC 4010. Prerequisites: ECN/APEC 2010, MATH 1100, STAT 2300. (F,Sp) DE

ECN 3170 Law and Economics 3
Explains legal and political rules, the organization of government, and other institutional processes. Uses standard microeconomic tools and concepts, such as scarcity, choice, preferences, incentives, and supply and demand. Prerequisite: POLS 1100. Also taught as POLS 3170. (Sp)

ECN 3300 Contemporary Issues in International Trade 3
Examines interrelated economic, political, and social issues faced by institutions and individuals at various points in the trade process. Prerequisite: Admission to Huntsman Scholars Junior Year Program. Also taught as MGT 3300. (F)

ECN 3400 DSS International Economics for Business 3
Primary issues in international economics as applied to contemporary business problems. Topics include trade patterns and policies, capital markets, and technology transfer. Prerequisite: ECN/APEC 2010. (F,Sp,Su) DE

ECN 4010 Intermediate Microeconomics 3
Analysis of behavior of consumers and business firms. Application of theory to the solution of real world problems. Credit will not be given for both ECN 3010 and ECN/APEC 4010. Prerequisites: ECN/APEC 2010, MATH 1100, and STAT 2300. Also taught as APEC 4010. (Sp)

ECN 4020 Intermediate Macroeconomics 3
Analysis of underlying causes of unemployment, economic instability, inflation, and economic growth. Prerequisite: ECN 1500. (F,Sp) DE

ECN 4310 QI Mathematical Methods in Economics and Finance I 3
Covers single-variable and multi-variable calculus, exponents and logarithms, linear algebra, and implicit functions. These concepts find economics applications in the theory of the firm, time value of money, IS-LM macro modeling, and more. Prerequisites: ECN/APEC 2010 and MATH 1100. (F)

ECN 4900 Independent Reading and Research 1-3®
(F,Sp,Su)

ECN 4950 Senior Honors Thesis/Project 3
Creative project that will then be written up, and presented, as a Senior Thesis as required for an Honors Plan. (Sp)

ECN 4990 Senior Seminar 1-3®
Introduces students to current research and special topics in economics. (F,Sp)

ECN 5000 Advanced Macroeconomic Topics 3
Covers advanced topics in macroeconomics. Exact topics depend on recent developments in the macroeconomic discipline, the research and teaching expertise of the faculty, and the current state of the macroeconomy, both inside and outside of the U.S. Focuses on studying the most recent developments in macroeconomic theory and applying the theory to the pressing problems in the contemporary macroeconomy. Prerequisite: ECN 4020. (F)

ECN 5100 History of Economic Thought 3
Origin and development of economic theories of leading thinkers in western civilization. Prerequisite: ECN/APEC 2010. (Sp)

ECN 5110 DSS Economic History of the United States 3
Development of agriculture, industry, transportation, and finance from colonial times. Prerequisite: ECN/APEC 2010. (F)

ECN 5150 DSS Comparative Economic Systems 3
History, economic theories, and comparative policies of communist, socialist, and capitalistic economies. Problems facing transition economies. Prerequisite: ECN/APEC 2010. (F) DE

ECN 5200 Money and Banking 3
Covers financial markets and the determination of interest rates and asset prices; the money supply process; the structure of the Federal Reserve System and the goals of the Federal Open Market Committee; other topical central banking issues; and the effects of monetary policy on output, interest rates, inflation, unemployment, financial markets, and exchange rates. Prerequsite: ECN 4020. (F)

ECN 5300 Industrial Organization—Game Theory 3
Emphasizes market structure, firm conduct, and economic efficiency. Topics include competition, game theory, monopoly, oligopoly, monopolistic competition, firm strategies, and anti-trust policy in the United States. Prerequisites: ECN/APEC 4010 and ECN 4020. (F)

ECN 5310 QI Mathematical Methods in Economics and Finance II 3
Covers constrained optimization, unconstrained optimization, integral caculus, differential equations, probability theory, and other related topics. These concepts find application in the theory of the firm, the theory of the consumer, game theory, least squares regression analysis, portfolio theory, asset pricing, insurance contracts, choice under uncertainty, and more. Prerequisite: ECN 4310. (Sp) DE

ECN 5330 QI Applied Econometrics 3
Introduction to basic statistics, simple linear regression, multiple regression, and simultaneous equation models for economics. Prerequisites: STAT 2000 or 2300 or 3000. Also taught as APEC 5330. (Sp)

ECN 5400 International Trade Theory 3
Intermediate-level issues in international trade theory and commercial policy. Topics include competitive and noncompetitive trade models, trade policy, balance of payments accounting, exchange rates, international lending and investment, and economic growth. Prerequisites: ECN 4020; ECN 3010 or ECN/APEC 4010. (F) DE

ECN 5500 Public Finance 3
One of the most important questions in economics is when or if we should abandon the personal decisions of markets and substitute choosing with and for others through government. By examining the economic activities of government, including taxation, spending, and regulation, this course attempts to answer that question. Prerequisite: ECN 1500. (F)

ECN 5600 Financial Economics 3
Introduction to development of our present system of money, banking, and financial institutions. Analysis of central bank policy, capital markets, speculative markets, and portfolio theory. Prerequisites: ECN 4020; ECN 3010 or ECN/APEC 4010. (Sp) DE

ECN 5950 CI Senior Project 3
A current economic problem is identified and analyzed, bringing together other agricultural economics and economics course concepts and methods. (Sp) DE

ECN 6000 Macroeconomic Theory I 3
(dual listing 7230)
Lays a foundation of advanced macroeconomic analysis, integrating theory, data, and computational methods. Special attention given to real-world issues, with an emphasis on how economists use macro models and data to improve business and public policy decisions. Topics covered include neoclassical and endogenous growth theories, real business cycle and new Keynesian theories of economic fluctuations, monetary theory, macroeconomic policy, and open-economy macroeconomics. Also taught as APEC 6000/7230. (F)

ECN 6050 Fundamentals of Economics 3
Introduction of economic principles for students entering a master's degree in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

ECN 6250 Graduate Internship 1-3®
(F,Sp,Su)

ECN 6310 Managerial Economics 3
Application of concepts and theories, based on managerial economics, to business problems. Addresses cost theory, pricing, market structures, and forecasting. (Sp)

ECN 6330 Applied Econometrics 3
Provides graduate-level introduction to applied regression tools, including: simple and multivariate regression analysis; linear, nonlinear, and qualitative dependent variable models; distributed lags; seemingly unrelated regression; and model specification and validation tests. Prerequisite: Background in statistics and calculus. Also taught as APEC 6330. (F) DE

ECN 6910 Independent Research 1-3®
Directed readings. Credits from this course toward any economics graduate degree require approval of the student's advisory committee, the department graduate committee, and the department head. Prerequisites: ECN/APEC 4010 and ECN 5000. Also taught as APEC 6910. (F,Sp,Su)

ECN 6970 Thesis Research 1-9®
Master's level research. Graded Pass/Fail *only*. (F,Sp,Su)

ECN 6990 Continuing Graduate Advisement 1-9®
Master's level advisement. Graded Pass/Fail *only*. (F,Sp,Su)

ECN 7130 Microeconomic Theory I 3
Provides a rigorous introduction to graduate-level microeconomic theory. While the specific focus is on the theoretical construct of graduate-level microeconomic models, the broad objective of the class is to lay the foundation for empirical applications in microeconomics. To meet this broad objective, the course covers theory of the firm, consumer theory, market structure, theory of public goods and externalities, and welfare economics. Also taught as APEC 7130. (F)

ECN 7140 Microeconomic Theory II 3
Extends the theoretical foundations of microeconomics with an emphasis on model building in economics. Topics include static games of complete and incomplete information, dynamic games of complete and incomplete information, imperfectly competitive markets, risk and uncertainty, public goods, general equilibrium, and information economics. Prerequisites: ECN/APEC 7130, ECN/APEC 7360. (Sp)

ECN 7230 Macroeconomic Theory I 3
(dual listing 6000)
Lays a foundation of advanced macroeconomic analysis, integrating theory, data, and computational methods. Special attention given to real-world issues, with an emphasis on how economists use macro models and data to improve business and public policy decisions. Topics covered include neoclassical and endogenous growth theories, real business cycle and new Keynesian theories of economic fluctuations, monetary theory, macroeconomic policy, and open-economy macroeconomics. Also taught as APEC 7230/6000. (F)

ECN 7240 Macroeconomic Theory II 3
Extends the foundations of ECN 7230 with a more in-depth look at the theory and computational aspects of various models of economic growth and business cycles. Prerequisites: ECN/APEC 7230 and ECN/APEC 7360. Also taught as APEC 7240. (Sp)

ECN 7310 Econometrics I 3
Begins with a review of probability and statistics. Remainder of course is spent discussing the Classical linear regression model, least squares and maximum likelihood estimation, finite and asymptotic sample properties, inference, prediction, and nonlinear optimization. Prerequisite: ECN/APEC 7360. Also taught as APEC 7310. (F)

ECN 7320 Econometrics II 3
Extension of ECN 7310, covering topics such as nonspherical disturbances, panel data, simultaneous equations, time series and distributed lag models, and limited and qualitative dependent variable models. Prerequisite: ECN/APEC 7310. Also taught as APEC 7320. (Sp)

ECN 7350 Mathematical Economics I 3
Includes linear equations, matrix algebra, multivariate calculus, static optimization, comparative static analysis, constrained optimization, and Kuhn-Tucker conditions. Also taught as APEC 7350. (F)

ECN 7360 Mathematical Economics II 3
Extends the presentation of ECN 7350 by covering applications of constrained optimization, the envelope theorem and applications, differential equations, dynamic economics, and optimal control. Prerequisite: ECN/APEC 7350. (Sp)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Education and Human Services (EDUC)

See Emma Eccles Jones College of Education and Human Services, pages 128-129

Note: Effective Fall Semester 2009, many of the courses previously listed under the EDUC prefix will be taught under the Teacher Education and Leadership (TEAL) prefix. (TEAL courses are shown on pages 667-671.) Students registering or Summer Semester 2009 Education and Human Services courses can find them under the EDUC prefix by logging into Access at:
http://www.usu.edu/myusu/

EDUC 5000 Senior Honors Seminar 2
For students in the Emma Eccles Jones College of Education and Human Services to explore an honors interdisciplinary theme selected by the Honors Committee as a culmination of an honors experience. (Sp)

EDUC 5560 Special Topics 0.5-4®
(dual listing 6560)
Field-based program focusing upon characteristics of effective teaching methodologies, teaching performance, curriculum decision making, value guidelines, and the characteristics of the learner. May be graded with a letter grade *or* graded as Pass/Fail, as determined by the instructor. Also taught as TEAL 5560/6560. (F,Sp,Su) DE

EDUC 6010 Introduction to Program Evaluation: Evaluation Models and Practical Guidelines 3
Alternative approaches and practical guidelines for conducting evaluation studies. Through case studies and simulations, addresses impact of social, political, and ethical issues on evaluation. Also taught as PSY 6010. (F,Sp) DE

EDUC 6540 Data-Based Decision Making for School Leaders 3
Prepares prospective school leaders to conduct research, as well as to collect and analyze data for decision making and program evaluation in schools. (F)

EDUC 6550 Research for Classroom Teachers 3
Assists teachers in applying measurement issues and research methods to classroom problems; in locating, interpreting, and using research reports; and in writing research-related papers on teaching. (F,Sp,Su) DE

EDUC 6560 Special Topics 0.5-4®
(dual listing 5560)
Field-based program focusing upon characteristics of effective teaching methodologies, teaching performance, curriculum decision making, value guidelines, and the characteristics of the learner. May be graded with a letter grade *or* graded as Pass/Fail, as determined by the instructor. Also taught as TEAL 6560/5560. (F,Sp,Su)

EDUC 6570 Introduction to Educational and Psychological Research 3
Provides introduction to research methods, including identification of research problem, review and evaluation of research literature, and design and implementation of research project. Also taught as PSY 6570. (F,Sp,Su)

EDUC 6600 Research Design and Analysis I 3
Research design and statistical concepts for research in education, human services, and psychology, with emphasis on the selection and interpretation of statistical analyses. Prerequisites: EDUC/PSY 6570, passing score on 6600 Pretest via WebCT, and permission of instructor. Also taught as PSY 6600. (F,Sp,Su)

EDUC 6700 Single-Subject Research
(dual listing 7700) Methods and Designs 3
Examines single-subject research methodology for applied research in schools, including measurement, design, and analysis issues. Also taught as SPED 6700/7700. (F)

EDUC 6770 Qualitative Methods I* 3
Introduction to qualitative research, including foundations; research designs and strategies of inquiry (case studies, ethnography, phenomenology, grounded theory, biographical, historical, participative inquiry); sampling; fieldwork and data collection; and analysis. Prerequisite: EDUC/PSY 6570. (Sp) DE

EDUC 6780 Qualitative Methods II 3
(dual listing 7780)
Builds on and applies concepts covered in EDUC 6770, emphasizing analysis of data, critique of qualitative research, and design and implementation of qualitative research. Students registered for 6780 conduct a qualitative research project. Prerequisite: EDUC 6770. (Sp)

EDUC 7610 Research Design and Analysis II 3
Advanced treatment of research design and statistical concepts and issues in educational, human services, and psychological research. Prerequisite: EDUC/PSY 6600. Also taught as PSY 7610. (F,Sp,Su) DE

EDUC 7650 Longitudinal Research Design and Analysis* 3
Applied longitudinal study design and analysis for research in behavioral and educational sciences. Explores case-control, cohort, cross-over, complex sample, and randomized controlled trial designs. Examines analytical methods for observed outcomes of various distributions (e.g., Gaussian, Binomial, Poisson). Prerequisite: EDUC/PSY 7610. Also taught as PSY 7650. (Sp)

EDUC 7670 Literature Reviews in Education and Psychology 2
Advanced concepts in designing, writing, and critiquing literature reviews. Prerequisites: EDUC/PSY 6600 or consent of instructor. Also taught as PSY 7670. (Sp,Su)

EDUC 7700 Single-Subject Research
(dual listing 6700) Methods and Designs 3
Examines single-subject research methodology for applied research in schools, including measurement, design, and analysis issues. Also taught as SPED 7700/6700. (F)

EDUC 7780 Qualitative Methods II 3
(dual listing 6780)
Builds on and applies concepts covered in EDUC 6770, emphasizing analysis of data, critique of qualitative research, and design and implementation of qualitative research. Students registered for 6780 conduct a qualitative research project. Prerequisite: EDUC 6770. (Sp)

EDUC 7970 Dissertation Research 1-18®
Dissertation research for students in the Research and Evaluation specialization. Graded Pass/Fail *only*. (F,Sp,Su) DE

EDUC 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*This course is taught during alternate years. For information about when it will be taught, contact the Emma Eccles Jones College of Education and Human Services.

Elementary Education (ELED)

See Elementary Education Program, School of Teacher Education and Leadership (TEAL), pages 243-252

Note: Effective Fall Semester 2009, many of the courses previously listed under the ELED prefix will be taught under the TEAL prefix. (TEAL courses are shown on pages 667-671.) Students registering for Summer Semester 2009 Elementary Education courses can find them under the ELED prefix by logging into Access at: **http://www.usu.edu/myusu/**

ELED 1010 Orientation to Elementary Education 3
Level I. Students assess themselves as prospective teachers. Students will also have an opportunity to do observations in the public schools (grades K-8) and complete volunteer service in other community educational settings. (F,Sp,Su) DE

ELED 3000 CI Historical, Social, and Cultural Foundations of Education and School Practicum 4-6®
Introduction to the historical, social, and cultural foundations of education. Students examine the interdependence of school and society, along with the influence of that interdependence on curricular and instructional practices in early childhood, elementary, and middle-level classrooms. (F,Sp) DE

ELED 3005 Beginning Classroom Management 1
Explores essential principles of classroom motivation and management. Focuses on understanding a learning environment where children work well independently and collaboratively. Prerequisite: Admission to Level II of the SODIA teacher education program. (F,Sp) DE

ELED 3010 Practicum Remediation Level II 2-4
Students work to develop defensible teaching ideas and to translate these ideas into practical experiences in elementary classroom settings. Specific arrangements for scheduling, placement with a cooperating teacher, and course requirements are handled by professors from the program level recommending remediation and the Elementary Education Advising Office. Graded Pass/Fail *only*. (F,Sp)

ELED 3100 Classroom Reading Instruction 3
Introduction to classroom reading instruction. Initial topics include the components of reading and organizing for reading instruction. Focuses heavily on how to teach the core components of phonemic awareness, phonics, fluency, vocabulary, and comprehension as identified in the Utah Language Arts Core Curriculum (2003) and the National Reading Panel (2000). Students will teach these components in hands-on practicum experiences. Prerequisite: Admission to teacher education. (F,Sp,Su) DE

ELED 4000 Teaching Science and Practicum Level III 3
Investigation and practical application of science programs, materials, and techniques of instruction for the teaching of science. Prerequisites: Admission to teacher education; completion of Level II and BIOL 1010 with a lab, or USU 1350; PHYX 1200 and GEOL 1100 or their equivalents. (F,Sp,Su) DE

ELED 4005 Intermediate Classroom Management 1
Explores essential principles of classroom motivation and management. Focuses on facilitating a learning environment where children work well independently and collaboratively, are self-governing, and make socially appropriate decisions. Prerequisite: Admission to Level III of the SODIA teacher education program. (F,Sp,Su) DE

ELED 4010 Practicum Remediation Level III 2-4
Students work to develop defensible teaching ideas and to translate these ideas into practical experiences in elementary classroom settings. Specific arrangements for scheduling, placement with a cooperating teacher, and course requirements are handled by professors from the program level recommending remediation and the Elementary Education Advising Office. Graded Pass/Fail *only*. (F,Sp)

ELED 4030 CI Teaching Language Arts and Practicum Level III 3
Study of language development in children and its implications and application in a practicum setting. Curriculum development, instructional methods, and assessment in the areas of writing and spelling. Prerequisite: Admission to teacher education. (F,Sp,Su) DE

ELED 4040 CI Assessment and Instruction for Struggling Readers 3
Prepares undergraduate students to use data from a variety of reading assessments to identify elementary students' reading strengths and weaknesses and plan instruction. Special attention given to providing explicit differentiated reading instruction to meet the needs of students who struggle with learning to read. Prerequisite: Admission to teacher education, ELED 3100. (F,Sp,Su) DE

ELED 4050 Teaching Social Studies and Practicum Level III 3
Students develop necessary knowledge and skills to plan and implement an appropriate social studies program consistent with the nature of the child and our democratic society. Includes practicum work. Prerequisite: Admission to teacher education. (F,Sp,Su) DE

ELED 4060 Teaching Mathematics and Practicum Level III 3
Relevant mathematics instruction in the elementary and middle-level curriculum; methods of instruction, evaluation, remediation, and enrichment. Prerequisite: Admission to teacher education. (F,Sp,Su) DE

ELED 4250 Advanced Cooperative Work Experience 1-8®
Advanced or middle level career-related experience designed to integrate classroom study with practical work experience. Students must work a minimum of 50 hours per credit hour. Graded Pass/Fail *only*. (F,Sp,Su) DE

ELED 4410 Gifted Education in the Regular Classroom 3
Introduction to characteristics of gifted learners. Exploration of strategies for challenging gifted learners in regular classroom settings. (F,Sp)

ELED 4420 Multiple Talent Approach to Thinking 2
Explores one model for the teaching of creative and critical thinking embedded in regular curricula. Includes practical application requirements. Also taught as SCED 4420. (Su)

ELED 4480 Early Childhood Education Kindergarten through Grade 3 3
Study of early childhood (K-3) curriculum, methodology, and learning environments. (F,Sp) DE

ELED 4710 Diversity in Education 3
Provides educators with background and techniques for more effectively addressing the needs of students in a culturally and linguistically diverse society. Diversity topics also include religion, socioeconomic class, ability differences, race, gender, and sexual orientation. Prerequisite: Admission into a teacher education program. Also taught as SCED 4710. (F,Sp) DE

ELED 4900 Senior Project 1-5®
All honors students are required to submit a senior project for graduation from the Honors Program. Students work with a departmental advisor on a topic of their choice. (F,Sp)

ELED 4970 Senior Thesis 1-5®
An in-depth paper or project culminating in a formal presentation. Required of all students for graduation from the Honors Program in Elementary Education. (F,Sp)

ELED 5050 Student Teaching—Kindergarten 3-6
Constitutes 6 semester credit hours of student teaching in a kindergarten classroom. Student teachers need to demonstrate competency and professionalism in teaching. An understanding of developmentally appropriate curriculum is necessary. Graded Pass/Fail *only*. (F,Sp) DE

ELED 5100 Student Teaching—Primary Grades (1-3) 6
Constitutes 6 semester credit hours of student teaching in a primary grade (1-3). Student teachers will demonstrate competency in designing and implementing a developmentally appropriate learning environment. Graded Pass/Fail *only*. (F,Sp) DE

ELED 5150 Student Teaching—Elementary (Grades 4-6) 6
Constitutes 6 semester credit hours of student teaching at the upper elementary grade level. Student teachers need to demonstrate competency and professionalism in teaching. Students begin their transition from university student to professional teacher. Graded Pass/Fail *only*. (F,Sp) DE

ELED 5200 Student Teaching—Middle Level (Grades 7-8) 6
Constitutes 6 semester credits of student teaching at the middle school level. Student teachers need to demonstrate competency and professionalism in teaching. Students begin their transition from university student to professional teacher. Graded Pass/Fail *only*. (F,Sp) DE

ELED 5250 Advanced Classroom Management and Student Teaching Seminar 3
Provides opportunities for student teachers/interns to learn about and practice skills in classroom management, curriculum development, instructional strategies, and lesson design and implementation in classroom contexts. Mentor teachers and University supervisors support context appropriate, effective teaching. Accompanies one of ELED 5050, 5100, 5150, or 5200. Graded Pass/Fail *only*. (F,Sp) DE

ELED 5300 Associate Teaching—Level V 3-6®
Designed to allow students who have completed student teaching to extend their teaching time in a classroom. In order to better prepare for their own classroom, students continue to develop individual teaching skills and competencies. Graded Pass/Fail *only*. (F,Sp)

ELED 5900 Independent Study 0.5-2®
(F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

English (ENGL)

See Department of English, pages 259-270

ENGL 0010 Writing Tutorial 3
Provides additional instruction for students whose score on the ACT is 16 or less, or who are advised into the course on the basis of writing diagnosis given the first day of class in ENGL 1010. Graded Pass/Fail *only*. Remedial class not carrying USU or transfer credit. (F,Sp,Su)

ENGL 1010 CL1 Introduction to Writing: Academic Prose 3
Students learn skills and strategies for becoming successful academic readers, writers, and speakers: how to read and write critically, generate and develop ideas, work through multiple drafts, collaborate with peers, present ideas orally, and use computers as writing tools. (F,Sp,Su) DE

ENGL 1020 Individualized Writing Instruction 1-3®
For students in Distance Education international programs who need further practice in specific areas of writing. (F,Sp,Su)

ENGL 1110 English Orientation 1
Introduction to English as a profession. Reviews career opportunities for English majors. (F,Sp) DE

ENGL 1120 Elements of Grammar 3
Introduction to the study of the English sentence. Discussion of punctuation and usage to facilitate editing, as well as clarity and precision in writing. (F,Sp) DE

ENGL 1600 American Cultures in Film 3
Introduction to major ethnic groups in America and their treatment in recent feature films. Also taught as HIST 1600. (F)

ENGL 2010 CL2 Intermediate Writing: Research Writing in a Persuasive Mode 3
Writing of reasoned academic argument supported with appropriately documented sources. Focuses on library and Internet research, evaluating and citing sources, oral presentations based on research, and collaboration. Prerequisites: Completion of 30 credits; fulfillment of Communications Literacy CL1 requirement through coursework (*C*- or better in ENGL 1010) or examination; and completion of Computer and Information Literacy (CIL) requirement. (F,Sp,Su) DE

ENGL 2140 British Literary History: Anglo-Saxon to 18th Century 3
Survey of British literature from the Anglo-Saxon period through the 18th century. (F,Sp) DE

ENGL 2150 British Literary History: Romanticism to Present 3
Survey of British literature from Romanticism to the present. (F,Sp) DE

ENGL 2160 American Literary History: Colonialism to 1865 3
Survey of American literature from the colonial period to 1865. (F,Sp) DE

ENGL 2170 American Literary History: 1865 to Present 3
Survey of American literary history from 1865 to the present. (F,Sp) DE

ENGL 2200 BHU Understanding Literature 3
Introduction to fiction, drama, and poetry of different periods and cultures. (F,Sp) DE

ENGL 2210 BHU Introduction to Folklore 3
Introduction to major genres of folklore (folk narrative, custom, folk music and song, vernacular architecture and arts), folk groups (regional, ethnic, occupational, familial), and basic folklore research methods (collecting and archiving). Also taught as ANTH 2210 and HIST 2210. (F,Sp) DE

ENGL 2300 BHU Introduction to Shakespeare 3
Introduction to comedies, histories, tragedies, and nondramatic poetry for nonmajors. (F)

ENGL 2600 Literary Analysis 3
Writing-intensive course in literary analysis and research. Introduces English majors to techniques and problems of critical interpretation. Enrollment limited to English majors *only*. (F,Sp) DE

ENGL 2630 BHU Survey of American Culture 3
Introduces students to American Studies methodology through a broad selection of American literary, historical, artistic, and cultural works, allowing them to examine the roots of American culture. Focuses on interdisciplinary research. (F,Sp)

ENGL 2720 Survey of American Folklore* 3
Principal ethnic, regional, and occupational folk groups in America. Relations between folklore and American history, literature, and society. Key genres in American folklore (narrative, art, song, etc.) and their role in American culture. Also taught as ANTH 2720 and HIST 2720. (F,Sp)

ENGL 3020 DHA Perspectives in Linguistics* 3
In-depth study of linguistics for nonmajors. Topics vary according to faculty expertise. (Sp)

ENGL 3030 DHA Perspectives in Literature 3
In-depth study of literature for nonmajors. Topics vary according to faculty expertise. (F,Sp,Su) DE

ENGL 3040 DHA Perspectives in Writing and Rhetoric 3**
In-depth study of rhetoric and writing for nonmajors. Topics vary according to faculty expertise. (F,Sp)

ENGL 3050 DHA Masterpieces of World Literature 3
In-depth study of masterpieces of world literature from the earliest times to the present. For nonmajors. (F,Sp)

ENGL 3060 DHA British and Commonwealth Cultures 3
In-depth study of literatures and cultures from the British Isles and the Commonwealth nations. Topics vary according to faculty expertise. Taught alternate years.

ENGL 3070 DHA Perspectives in Folklore 3®**
In-depth study of folklore for nonmajors. Topics vary according to faculty expertise. Also taught as HIST 3070. (F,Su)

ENGL 3080 CI Introduction to Technical Communication 3
Introduces students to a variety of technical documents and improves their written and oral communication skills. Available to nonmajors as a technical communication service course. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (F,Sp) DE

ENGL 3300 Period Studies in American Literature 3®
Exploration of single period or movement in literary history of the United States, or a comparative study of a topic during various periods. Periods and topics will vary. (F,Sp)

ENGL 3310 Period Studies in British Literature 3®
Exploration of single period or movement in British literary history, or a comparative study of a topic during various periods. Periods and topics will vary. (F,Sp) DE

ENGL 3320 Period Studies in World Literature 3®
Exploration of single period or movement in literary history outside the United States and Great Britain, or a comparative study of a topic during various periods. Periods and topics will vary. (F,Sp) DE

ENGL 3330 Literary Theory 3**
Covers a range of different critical approaches to literature, helping students to analyze literature from a variety of theoretical perspectives and preparing them for upper-division English major coursework. Prerequisite: ENGL 2600. (F,Sp)

ENGL 3400 CI Professional Writing 3
Introduces students to workplace writing as a profession, emphasizing transition from writing for academic audiences to writing for readers of workplace documents. Students learn to design and write professional documents for science, industry, business, and/or government, including print portfolios and other job search materials. Enrollment limited to English majors *only*. (F,Sp)

ENGL 3410 Professional Writing Technology 3
Introduces students to technologies of professional writing. Surveys software used in the Professional and Technical Writing emphasis curriculum. Students learn to design and implement electronic portfolios documenting their work in the program. Enrollment limited to English majors *only*. (F,Sp)

ENGL 3420 Fiction Writing 3
Covers basic elements of writing fiction: form, structure, plot, theme, characterization, dialogue, point of view, and imagery. (F,Sp)

ENGL 3430 Poetry Writing 3
Covers basic elements of writing poetry: language, detail, voice, tone, literal and figurative imagery, rhythm, open and closed form, structure, and theme. (F,Sp) DE

ENGL 3440 Creative Nonfiction Writing 3
Focuses on the essay as creative nonfiction, emphasizing persona, audience, purpose, tone, and style. Students study difference between fiction and nonfiction. Goal is to write publishable nonfiction. (F,Sp)

ENGL 3450 Methods and Research in Profesional and Technical Communication 3
Teaches students to conduct research using methods employed by professional and technical communicators in the workplace. Students learn to work with Subject Matter Experts, gather data in organizational contexts, and design user-centered documents. (Sp)

ENGL 3460 Modern Rhetorical Theory 3
Teaches students to analyze rhetoric as it is enacted in a variety of texts and contexts. Students learn to define and understand rhetorical situations and to evaluate rhetorical strategies chosen by other writers. (F)

ENGL 3510 Young Adult Literature 3
Study of a variety of genres written specifically for adolescent audience. Intended for those interested in teaching secondary school English. (F,Sp) DE

ENGL 3520 Multicultural American Literature 3
Introduction to study of diverse literatures of the United States, including Native American, Asian American, Hispanic/Latino, and African American. (F,Sp) DE

ENGL 3530 Children's Literature* 3
Study of aesthetic merit of poetry and prose available for children, ages 1-12. Intended for those interested in teaching or writing for children. (Sp) DE

ENGL 3620 Native American Studies* 3
Multidisciplinary introduction to study of Native Americans, emphasizing folklore, history, anthropology, literature, traditions, and contemporary issues such as the environment. (F,Sp)

ENGL 3700 CI Regional Folklore* 3
Study of folklore and folklife as they relate to regional cultures. Also taught as HIST 3700. (F,Sp)

ENGL 3710 CI Folklore Colloquium 3®
Issues, problems, and methodologies in folklore study. Focus and instructor variable. Also taught as HIST 3710 and RELS 3710. (Sp)

ENGL 4200 Linguistic Structures 3
Introduction to linguistic science: phonetics, phonology, morphology, and syntax, especially as relating to English. Exposure to other aspects of linguistic analysis, including language origins and linguistic diversity. (F,Sp,Su) DE

ENGL 4210 History of the English Language 3
Introduction to linguistic history of English, beginning with its Indo-European roots and continuing through Old English and Middle English to Modern English. Covers sociolinguistic aspects of English use, as well as strict grammatical history. (Sp) DE

ENGL 4220 Ethnic Literacy 3
Examines the diversity of literacy skills in American ethnic groups and explores appropriate teaching methods. Topics include effects of socio-economic status, child-rearing practices, first and second language acquisition, American dialects, etc. (F,Sp)

ENGL 4230 Language and Society 3**
Covers sciences of sociolinguistics and anthropological linguistics. Indroduces concepts dealing with relationship of language to society and culture, and interaction of language with society and culture. (F)

ENGL 4250 Playwriting 3
Study of dramatic theory and sample plays, combined with practice in writing short plays. Students must write a minimum of three plays. Prerequisite: THEA 1713. Also taught as THEA 4250. (F)

ENGL 4300 Shakespeare 3®
Selected works of William Shakespeare, with attention to biographical and cultural contexts. (F,Sp)

ENGL 4310 American Writers 3®**
Selected works of either a single author or a closely related group of authors based in the United States, with attention to biographical and cultural contexts. (F,Sp)

ENGL 4320 British Writers* 3®
Selected works of either a single author or a closely related group of authors based in Great Britain, with attention to biographical and cultural contexts. (F,Sp)

ENGL 4330 World Writers* 3®
Selected works of either a single author or a closely related group of authors based outside the United States, with attention to biographical and cultural contexts. (F)

ENGL 4340 Studies in Prose 3®**
Analysis of the genre of prose fiction and/or prose nonfiction, emphasizing nature and evolution of specific forms. (Sp)

ENGL 4350 Studies in Poetry* 3®
Analysis of the genre of poetry, emphasizing nature and evolution of specific forms. (F) DE

ENGL 4360 Studies in Drama/Film* 3®
Analysis of dramatic and cinematic genres, emphasizing nature and evolution of specific forms. (Sp)

ENGL 4370 Studies in Nonfiction Prose 3®**
Analysis of the genre of nonfiction prose, emphasizing nature and evolution of specific forms. (F)

ENGL 4400 CI Professional Editing 3
Editing of technical and scientific documents; working with deadlines, different levels of editing, and editing marks; working with groups of editors and clients; and revising document design. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (Sp)

ENGL 4410 Document Design and Graphics 3®
Explores elements of page layout, graphic design, type fonts, and design of documents to suit client's needs for print (F) or digital (Sp) media. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (F,Sp)

ENGL 4420 CI Advanced Fiction Writing 3®
Offers advanced study in art and skill of writing publishable fiction. Relies on workshop method. Prerequisite: ENGL 3420 or equivalent. (Sp)

ENGL 4430 CI Advanced Poetry Writing 3®
Provides course for undergraduate students desiring to write publishable poetry. Relies on workshop method. Prerequisite: ENGL 3430 or equivalent. (Sp)

ENGL 4440 CI Advanced Nonfiction Writing 3®
Offers advanced study in the art and skill of writing publishable literary or creative nonfiction. Prerequisite: ENGL 3440. (F,Sp)

ENGL 4500 CI Teaching Writing 3
Prepares students to teach writing at secondary level. Teaches appropriate pedagogical techniques for teaching writing for a variety of purposes and contexts to diverse students. Techniques taught include designing effective writing assignments, responding constructively to student writing, assessing student writing, and incorporating technology into writing courses. (F,Sp)

ENGL 4510 CI Teaching Literature 3
Prepares students to teach literature through a variety of texts. Explores multiple pedagogical strategies for teaching diverse literary traditions to students of various backgrounds and developmental levels. (F,Sp)

ENGL 4610 Western American Literature 3**
Examines major themes and important writers (both "popular" and "literary") in western regional writing. Investigation of significance of environment, history, gender, and ethnicity in a variety of genres. Appropriate for American Studies majors and minors. (F,Sp)

ENGL 4620 CI Advanced Seminar in American Studies 3
Practical introduction to theories and methods of American Studies, utilizing interdisciplinary research around a central theme, subject, or text(s). Strongly recommended for American Studies majors and American Studies minors. Open to students who have taken three courses in literature and/or history. Also taught as HIST 4620. (F,Sp)

ENGL 4630 American Nature Writers* 3
Interdisciplinary study of historical, social, literary, and environmental contexts of nature writing. Examines key authors, major theories, enduring concerns (e.g., conservation, preservation, and management), and current issues (including gender and ethnicity). Appropriate for American Studies majors and minors. (F,Sp)

ENGL 4640 CI Studies in the American West 3
Interdisciplinary course in American Studies, exploring the region of the West through the analysis of literary texts, historical sources, and socio-cultural materials. Also taught as HIST 4640. (F,Sp) DE

ENGL 4700 Folk Material Culture 3**
Study of folk objects and their connections with culture and history. Also taught as HIST 4700. (Sp)

ENGL 4750 Advanced Folklore Workshop: Fife Conference 3®
Focuses on a theme or topic in folklore, and offers lectures from nationally prominent scholars in the area. Taught during one week, every day and all day. Also taught as HIST 4750. (Su)

ENGL 4900 Internship/Cooperative Work Experience 1-15®
Offers credit for professional experience obtained outside the classroom, prior to graduation. Requires statement of professional goals and summary report following the experience. Graded Pass/Fail *only*. Prerequisite: Departmental approval. (F,Sp,Su)

ENGL 4910 Tutoring Practicum 1®
Inservice training class for first-semester Writing Center staff members. Repeatable for up to 2 credits. (F,Sp)

ENGL 5210 Topics in Linguistics* 3®
Provides students with opportunity to study topics which are not regularly taught, but which are designed to enrich understanding of linguistics. Typical topics include Old English, roots of English in Germanic, discourse analysis, and English as a world language. (F) DE

ENGL 5300 CI Literature and Gender 3®
Exploration of cultural relations between literature and gender. Topics vary. (F,Sp)

ENGL 5320 CI Literature and Cultural Difference 3®
Exploration of relations between literature and cultural difference. Topics vary. (Sp)

ENGL 5340 CI Studies in Literary and Cultural Theory 3®
Applications in literary and cultural studies. Topics vary. (F) DE

ENGL 5400 Specialized Documents 3®
Students in the Professional and Technical Writing emphasis prepare documents frequently encountered in business and government, including proposals, environmental impact statements, brochures, and newsletters. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (F,Sp)

ENGL 5410 Studies in Writing for Digital Media Production 3®
Students in the Professional and Technical Writing emphasis examine process of publishing online documents, studying digital media and genres. Topics vary and include building complex CD-ROM environments, help files, websites, interactive animations, and games. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (F)

ENGL 5420 Publications Production 3
Students in the Professional and Technical Writing emphasis examine process of publishing printed documents, beginning with idea and ending with hard copy, printed and bound. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (F)

ENGL 5430 CI Professional Writing Capstone 3
Capstone course for students in Professional and Technical Writing emphasis, in which students develop a professional portfolio of their own writing. Should be taken during the senior year. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (F,Sp)

ENGL 5490 Topics in Professional and Technical Writing 3®
Provides students with opportunity to study topics designed to enrich understanding of professional and technical writing. Typical topics include usability studies, career investigation, game theory, medical writing, and writing for magazines and journals. Prerequisites: Admittance to program and completion of ENGL 3400 and 3410 with grades of *B-* or better. (Sp)

ENGL 5550 English Teaching Capstone 3
Students synthesize and assess their knowledge of the field and their teaching, reading, and writing strengths; and evaluate the program through formal reflection on their own professional growth. Enrollment limited to English majors *only*. This course is not currently being taught. For information about when it may be taught, contact the department.

ENGL 5690 CI American Studies Capstone Seminar 3
Required for students majoring in American Studies. Enables students to synthesize American Studies theory and methods with interdisciplinary cognate courses. Supports senior thesis design and writing, allowing topics to reflect individual programs of study. Also taught as HIST 5690. (Sp)

ENGL 5700 Folk Narrative 3
Forms and functions of folk narrative genres: myth, legend, folktale, memorate, and ballad. Also taught as ANTH 5700 and HIST 5700. (Sp)

ENGL 5900 Senior Honors Seminar 1-3®
Capstone course for students enrolled in English Honors Program. Prerequisite: Enrollment in English Honors Program. (F,Sp,Su)

ENGL 5910 CI Senior Honors Thesis 1-6®
Students work in conjunction with English faculty member to write a thesis. Prerequisite: Enrollment in English Honors Program. (F,Sp,Su)

ENGL 5920 Directed Study 1-3®
Provides students with opportunity to work individually with faculty member. Contract for work to be completed must be signed by faculty member and student, then filed with English Department. (F,Sp,Su) DE

ENGL 6320 Literary Theory 3®
Introduces students to advanced literary theories and provides training in sophisticated critical methods. (F,Sp)

ENGL 6330 Topics in Literary Studies 3®
Allows in-depth study of specific literary topics and theoretical questions. (F,Sp)

ENGL 6340 British Literature and Culture 3®
Explores British literature and provides training in literary and cultural criticism. Promotes research and writing skills. (F,Sp)

ENGL 6350 American Literature and Culture 3®
Explores American literature and provides training in literary and cultural criticism. Promotes research and writing skills. (F,Sp)

ENGL 6360 World Literature and Culture 3®
Explores world literature and provides training in literary and cultural criticism. Promotes research and writing skills. (F,Sp)

ENGL 6400 Advanced Editing 3
(dual listing 7400)
Examines complex roles editors assume in creating technical and nontechnical documents. Principal components include working with substance of documents, mediating the writer-reader relationship, and exemplifying the application of rhetorical theory in editing. (F,Sp) DE

ENGL 6410 Theory and Research in
(dual listing 7410) Professional Communication 3
Introduction to contemporary theories of written discourse. Emphasizes the implications of these theories for research in professional communication. (F,Sp) DE

ENGL 6420 Usability Studies and Human Factors
(dual listing 7420) in Professional Communication 3®
Examines concepts and practices of usability studies and human factors in the design and production of print and online documents. Emphasizes developing objectives, criteria, and measures for conducting tests in the lab and field. (F,Sp)

ENGL 6430 Publications Management 3
(dual listing 7430)
Covers processes for developing and producing publications, including information development cycles, supervision, and budgets. (F,Sp) DE

ENGL 6440 Studies in Culture and
(dual listing 7440) Professional Communication 3®
Covers topics in rhetorical, critical, and cultural theory, emphasizing their application to contemporary practices in professional communication. (F,Sp)

ENGL 6450 Reading Theory and Document Design 3
(dual listing 7450)
Examines how reading theory interacts with rhetoric of graphics, layout, and type to influence the way documents are designed for maximum information and readability. (F,Sp)

ENGL 6460 Studies in Digital Media 3®
(dual listing 7460)
Focuses on the production of advanced digital media documents. Examination of theories underlying such publications, plus the related hardware and software. Topics vary. (F,Sp) DE

ENGL 6470 Studies in Specialized Documents 3®
(dual listing 7470)
Focuses on writing and design of specific genres in professional communication. Genres include environmental impact statements, software documentation, proposals, manuals, annual reports, newsletters, and fact sheets. Topics vary. (F,Sp)

ENGL 6480 Studies in Technology and Writing 3®
(dual listing 7480)
Study of theoretical aspects of technologies affecting writing in professional contexts. Course topics may include an examination of the history of computing, rhetorics of hypertext, or theories of communication in virtual space. Topics vary. (F,Sp)

ENGL 6490 Portfolio 3
Design and preparation of a portfolio containing at least five documents, each accompanied by a justification and discussion.

ENGL 6600 American Studies Theory and Method 3
Provides students with theory and method of graduate-level research in American Studies. Also taught as HIST 6600. (F)

ENGL 6610 Seminar on the American West 3-4®
Readings and research on topics in the American West. Interdisciplinary focus suitable for graduate students in History and American Studies. Also taught as HIST 6610. (F)

ENGL 6620 Seminar in Native American Studies 3-4®
Readings and research on topics in Native American history and culture. Interdisciplinary focus suitable for graduate students in History and American Studies. Also taught as HIST 6620. (F)

ENGL 6630 Studies in Film and Popular Culture 3®
Offered annually on a rotating basis by professors in folklore and English (Cultural Studies, Literature, British and Commonwealth). Topics and theoretical approaches vary, but the primary focus is on feature films. Also taught as HIST 6630. (Sp)

ENGL 6700 Folklore Theory and Method 3
Serves as orientation for new graduate students in folklore. Introduces students to comparative annotation, folklore indices, oral-formulaic theory, performance theory, contextual analysis, and other approaches. Also taught as HIST 6700. (F)

ENGL 6710 Space, Place, and Folklore 3
Study of expressive culture in relation to space and place in social theory. Perspectives range from ideas about landscape and region to globalization. Also taught as HIST 6710. (Sp)

ENGL 6720 Folklore Fieldwork 3
Basic methodology class for folklorists and oral historians. Students learn interviewing techniques and other methods for observing and recording the performance of tradition and traditional history. Also taught as HIST 6720. (Sp)

ENGL 6730 Public Folklore 3
Provides history and analysis of governmental involvement in protecting, promoting, and otherwise manipulating and utilizing cultural heritage. Also taught as HIST 6730. (F)

ENGL 6740 Folk Narrative 3
Covers principal narrative genres in folk tradition (myth, tale, legend, ballad) and the basic theories for their analysis and discussion. Also taught as HIST 6740. (Sp)

ENGL 6750 Advanced Folklore Workshop
(the Fife Conference) 3
Intensive workshop focusing on a topic in folklore. Brings in nationally known experts as lecturers and discussants. Taught during one week, every day and all day. Also taught as HIST 6750. (Su)

ENGL 6760 Cultural and Historical Museums 3
Examines outdoor cultural and historical museums, examining their function in modern multi-cultural societies. Also taught as HIST 6760. (Sp)

ENGL 6770 Seminar in Folklore and Folklife 3®
Conducts close, professional-level study of major areas of folklore and folklife research. Also taught as HIST 6770. (F)

ENGL 6800 Theory and Practice of Online
(dual listing 7800) Education in Writing 3®
Examination of principles and their implementation in online writing instruction. Emphasis placed on writing instruction within English departments. (Sp)

ENGL 6810 Introduction to Composition Studies 3
Introduces students to scholarship in the field of composition studies. Students become acquainted with scholars, forums, themes, and methods of the field. (F,Sp)

ENGL 6820 Practicum in Teaching English 3
Introduction to teaching writing, designed specifically for graduate instructors teaching in the English Department writing program. Focuses on theory and practice of teaching writing, specifically ENGL 1010, but also prepares graduate instructors for further teaching responsibilities. Not offered online. (F)

ENGL 6830 Rhetorical Theory 3
(dual listing 7830)
Covers intellectual traditions of rhetoric from classical times to the present. As students study major theories, theoreticians, and controversies in the field, they come to understand rhetoric as the study of relations between discourse, knowledge, and power. (F,Sp) DE

ENGL 6850 Advanced Studies in the
Teaching of English 3®
Provides a critical approach to English pedagogy. Prepares students to teach English classes such as literature, composition, and creative writing. (F,Sp)

ENGL 6860 Teaching Technical Writing 3
(dual listing 7860)
Prepares students to teach general purpose technical writing courses at the undergraduate level. Students read and discuss articles on technical writing and practice writing a series of technical documents. (F,Sp)

ENGL 6880 Topics in Creative Writing 3®
Examines field of creative writing as an art, concentrating on issues of craft and creation. May study the fundamentals of a particular genre, the history of a genre, theories of form, how writers work, how they approach their genre, etc., all with an eye toward craft and examined from a writer's perspective. Enrollment limited to graduate students *only*. (F,Sp,Su)

ENGL 6882 Fiction Writing Workshop 3®
Students write fiction and participate in writing workshops, where their work is critiqued by the class. Course also involves study of the art and craft of fiction, its history, form, and content, especially that of contemporary fiction examined from a writer's perspective. Enrollment limited to graduate students *only*. (F,Sp,Su)

ENGL 6883 Poetry Writing Workshop 3®
Students write poetry and participate in writing workshops, where their work is critiqued by the class. Course also involves study of the art and craft of poetry, its history, form, and content, especially that of contemporary poetry examined from a writer's perspective. Enrollment limited to graduate students *only*. (F,Sp,Su)

ENGL 6884 Creative Nonfiction Writing Workshop 3®
Students write creative nonfiction and participate in writing workshops, where their work is critiqued by the class. Course also involves study of the art and craft of creative nonfiction, its history, form, and content, especially that of contemporary creative nonfiction examined from a writer's perspective. Enrollment limited to graduate students *only*. (F,Sp,Su)

ENGL 6890 Studies in Writing and Rhetoric 3®
(dual listing 7890)
Allows in-depth study of specific rhetorical topics and theoretical questions. (F,Sp) DE

ENGL 6900 Graduate Internship 1-15®
Format and credit limit vary for different programs in the department. See program advisor for details and approval to enroll in this course. (F,Sp,Su)

ENGL 6920 Directed Study 1-6®
(F,Sp,Su)

ENGL 6970 Thesis 1-6®
Taught Pass/Fail *only*. (F,Sp,Su)

ENGL 6990 Continuing Graduate Registration 1-6®
Taught Pass/Fail *only*. (F,Sp,Su)

ENGL 7000 Advanced Research Methods in Professional Communication 3
Survey of major research methods (qualitative and quantitative) for conducting professional communication research in academic and nonacademic settings. Coursework will culminate in a formal proposal to conduct a discipline-appropriate study in the workplace. (Sp)

ENGL 7400 Advanced Editing 3
(dual listing 6400)
Examines complex roles editors assume in creating technical and nontechnical documents. Principal components include working with substance of documents, mediating the writer-reader relationship, and exemplifying the application of rhetorical theory in editing. (F,Sp) DE

ENGL 7410 Theory and Research in
(dual listing 6410) Professional Communication 3
Introduction to contemporary theories of written discourse. Emphasizes the implications of these theories for research in professional communication. (F,Sp) DE

ENGL 7420 Usability Studies and Human Factors
(dual listing 6420) in Professional Communication 3®
Examines concepts and practices of usability studies and human factors in the design and production of print and online documents. Emphasizes developing objectives, criteria, and measures for conducting tests in the lab and field. (F,Sp)

ENGL 7430 Publications Management 3
(dual listing 6430)
Covers processes for developing and producing publications, including information development cycles, supervision, and budgets. (F,Sp) DE

ENGL 7440 Studies in Culture and
(dual listing 6440) Professional Communication 3®
Covers topics in rhetorical, critical, and cultural theory, emphasizing their application to contemporary practices in professional communication. (F,Sp)

ENGL 7450 Reading Theory and Document Design 3
(dual listing 6450)
Examines how reading theory interacts with rhetoric of graphics, layout, and type to influence the way documents are designed for maximum information and readability. (F,Sp)

ENGL 7460 Studies in Digital Media 3®
(dual listing 6460)
Focuses on the production of advanced digital media documents. Examination of theories underlying such publications, plus the related hardware and software. Topics vary. (F,Sp) DE

ENGL 7470 Studies in Specialized Documents 3®
(dual listing 6470)
Focuses on writing and design of specific genres in professional communication. Genres include environmental impact statements, software documentation, proposals, manuals, annual reports, newsletters, and fact sheets. Topics vary. (F,Sp)

ENGL 7480 Studies in Technology and Writing 3®
(dual listing 6480)
Study of theoretical aspects of technologies affecting writing in professional contexts. Course topics may include an examination of the history of computing, rhetorics of hypertext, or theories of communication in virtual space. Topics vary. (F,Sp)

ENGL 7800 Theory and Practice of Online
(dual listing 6800) Education in Writing 3®
Examination of principles and their implementation in online writing instruction. Emphasis placed on writing instruction within English departments. (Sp)

ENGL 7830 Rhetorical Theory 3
(dual listing 6830)
Covers intellectual traditions of rhetoric from classical times to the present. As students study major theories, theoreticians, and controversies in the field, they come to understand rhetoric as the study of relations between discourse, knowledge, and power. (F,Sp) DE

ENGL 7860 Teaching Technical Writing 3
(dual listing 6860)
Prepares students to teach general purpose technical writing courses at the undergraduate level. Students read and discuss articles on technical writing and practice writing a series of technical documents. (F,Sp)

ENGL 7890 Studies in Writing and Rhetoric 3®
(dual listing 6890)
Allows in-depth study of specific rhetorical topics and theoretical questions. (F,Sp) DE

ENGL 7900 Research Internship 6
Application of workplace field research and methods in an actual workplace setting. Prerequisite: ENGL 7000. (F) DE

ENGL 7920 Directed Study 3®
(F,Sp,Su)

ENGL 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ENGL 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Engineering (ENGR)

See College of Engineering, pages 130-134

ENGR 1000 Introduction to Engineering Design 2
(formerly ENGR 1010)
Introduction to engineering design, problem solving, and computer application skills. Orients students to college programs, academic advising, student services, professional societies, ethics, and engineering careers. A background in trigonometry is strongly recommended. (F) DE

ENGR 1940 Women in Engineering Seminar 1
Designed for incoming female freshman engineering students. Speakers selected from practice share their knowledge and experience about the many career options available in engineering. Discussions center on ways in which women balance their professional and personal lives. Provides information and strategies for the academic and interpersonal skills needed for women to succeed in engineering. (F)

ENGR 2010 Engineering Mechanics Statics 2
(formerly ENGR 2000)
Force and position vectors; equilibrium of particles; rigid bodies; equivalent system of forces; equilibrium; free body diagrams; static analysis of trusses, frames, and machines; centroids and centers of gravity; friction; and moments of inertia. Prerequisites: MATH 1210, 1220. (F,Sp) DE

ENGR 2030 Engineering Mechanics Dynamics 3
(formerly ENGR 2020)
Equations of motion, kinetics of particles, kinetics of rigid bodies, work and energy, impulse and momentum, three-dimensional kinematics, and vibrations. Prerequisites: ENGR 2010, MATH 1210, 1220. (F,Sp,Su) DE

ENGR 2140 Strength of Materials 2
(formerly ENGR 2040)
Stress, strain, and deflection due to axial loads; moment and torsion; shear and moment diagrams; and equations of equilibrium and compatibility. Prerequisite: ENGR 2010. (F,Sp,Su) DE

ENGR 2450 Engineering Numerical Methods 2
(formerly ENGR 2210)
Programming and numerical solution techniques for solving ordinary and partial differential equations. Prerequisite: MATH 1220 or 2250. (Sp)

ENGR 2930 Special Problems 1-18
Independent or group student study of engineering problems not covered in regular course offerings. (F,Sp,Su)

ENGR 5500 High Performance Computing for Engineers 3
Introduction to high performance computing on Beowulf clusters with distributed memory paradigm. Hands-on design and profiling of algorithms and software to solve large scale problems in engineering. Topics in scientific visualization. Prerequisites: MAE 2450 or CS 1410. (F) DE

DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Environment and Society (ENVS)

See Department of Environment and Society, pages 271-278

ENVS 1990 Professional Orientation for Environment and Society 2
Introduces new students to university scholarship and citizenship, careers in environmental and natural resources science and management, development of leadership and team skills, and analysis of issues relating to the diverse relationships between society and the natural environment. (F)

ENVS 2250 Introductory Internship/Co-op 1-3®
Introductory-level educational experience in internship/cooperative education position approved by department. Prerequisite: Permission of department. (F,Sp,Su)

ENVS 2340 BSS Natural Resources and Society 3
Examines human values, uses, and management of natural settings at the individual, community, and societal levels. Topics include: psychological responses to nature, history of U.S. park and natural resource management, environmental sociology and politics, and nature in non-Western cultures. (F,Sp) DE

ENVS 3000 Natural Resources Policy and Economics 4
Introduction to natural resource policy and economics. Policy components include models, processes, participants, laws, and tools for decision-making and policy implementation. Economics components include theory, interest calculations, financial analysis, nonmarket valuation, and regional impact analysis. (F)

ENVS 3300 Fundamentals of Recreation Resources Management 3
Principles of wildland recreation management including: characteristics of recreation use and users, introduction to planning concepts, management of wildland recreation facilities and infrastructure, and integration with other natural resource uses. (F) DE

ENVS 3330 Environment and Society 3
Emphasizes how human actions modify the physical environment and how physical systems affect human systems and the changes occurring in the meaning, use, and importance of resources at a global and regional scale. (Sp)

ENVS 3500 QI Quantitative Assessment of Environmental and Natural Resource Problems 3
Overview of analytical and sampling methods used for collecting, organizing, and interpreting numeric data to evaluate problems and monitor conditions relating to relationships between environment and society. Prerequisites: STAT 2000 or 3000; MATH 1050; and passing score on the Computer and Information Literacy (CIL) Exam. (F)

ENVS 3600 DSC Living With Wildlife 3
Reviews history and development of wildlife management programs in the United States. Explores diversity of attitudes toward wildlife, which affect development and evolution of wildlife management programs. Development and analysis of case histories of contemporary and controversial wildlife management decisions. (Sp) DE

ENVS 4000 DSS Human Dimensions of Natural Resource Management 3
Focuses on balancing science and social values in ecosystem management and decision-making. Topics include environmental justice, communication and behavior change strategies, landscape perception and attitudes, resource-dependent communities, public involvement, and conflict management. (F) DE

ENVS 4110 Fisheries and Wildlife Policy
(dual listing 6110) and Administration* 3
Examination of policy issues and administrative approaches in fish and wildlife management, with particular emphasis on nonbiological issues facing wildlife managers and administrators. (F)

ENVS 4130 Recreation Policy and Planning 3
Examines the historical, legal, and political context of outdoor recreation policy on public lands; government agency culture, regulation, and partnering; relationship of outdoor recreation to tourism; and theory and application of principal planning tools for outdoor recreation settings. (Sp) DE

ENVS 4250 Advanced Internship/Co-op 1-9®
Directed and evaluated cooperative education or work experience for undergraduates in public and private organizations. Prerequisite: Permission of department. (F,Sp,Su)

ENVS 4400 Economic Applications in Natural Resource Management 4
Applied economics course exposing students to tools used in natural resource decision-making. Includes principles and techniques of nonmarket valuation, linear programming, budgeting, benefit-cost analysis, and regional economic analysis as encountered by natural resource managers. Prerequisites: ENVS 3000, MATH 1050 or higher, and passing score on Computer and Information Literacy (CIL) exam. (Sp)

ENVS 4440 Stegner Center Annual Symposium 1®
(dual listing 6440)
Offered through the University of Utah College of Law. Topics vary each year, but always focus on natural resource policy-related issues. (Sp)

ENVS 4500 CI Wildland Recreation Behavior 3
Social, psychological, and geographic influences on human behaviors in wildland recreation settings. Emphasis on critical problems affecting public land recreation management. (F)

ENVS 4600 Natural Resource Interpretation 3
Planning processes and techniques for providing interpretive programs developed for wildland recreation areas and visitor centers. Evaluation and planning of visitor information efforts. (F)

ENVS 4920 Special Projects in Recreation Management 1-3®
Participation in special projects to assist public recreation agencies or nonprofit organizations, while gaining hands-on experience in recreation management, planning, and monitoring. Many experiences entail intensive, short-duration efforts away from campus. Prerequisite: Permission of department. (F,Sp,Su)

ENVS 4950 Special Topics 1-3®
Individual study and research upon selected environmental and societal problems. Prerequisite: Permission of department. (F,Sp,Su) DE

ENVS 4960 Directed Readings 1-3®
Individual reading research on selected environmental and societal readings. Prerequisite: Permission of department. (F,Sp,Su)

ENVS 4970 Undergraduate Research 1-3®
Individual or team research. Prerequisite: Permission of department. (F,Sp,Su)

ENVS 4980 Undergraduate Seminar 1
Intended to bring upperclassmen up-to-date on environmental and societal topics. Graded Pass/Fail *only*. (Sp)

ENVS 4990 Environmental and Natural Resource Professionalism Seminar 2
Introduces concepts of professionalism in natural resources, including ethical issues in science and management, organizational culture, and workplace expectations. Analyzes current issues with practicing professionals. Reinforces leadership and team-building skills. Prerequisites: ENVS 1990, 3000. (F)

ENVS 5000 Collaborative Problem-Solving for Environment and Natural Resources 3
Project-based capstone course for environmental studies majors. Students work in teams to develop plans and alternative solutions relevant to actual issues or land areas, integrating knowledge from a range of environmental and natural resource disciplines. Prerequisites: Senior standing; ENVS 3000, 4000. (Sp)

ENVS 5110 Environmental Education 3
Covers teaching about the environment, and using the environment and the natural world to teach other subjects, with a strong emphasis on participation and on practicing teaching techniques. (Sp)

ENVS 5300 Natural Resources Law and Policy* 2
Legal and administrative regulation of forests and associated resources (water, air, fish, wildlife, and scenery). Emphasis on agency organizational culture, federal legislation, court cases, administrative procedures, and federal natural resources agencies' interactions with tribal, state, and local governments. (Sp)

ENVS 5320 Water Law and Policy in the United States 3
Introduction to policies, laws, institutions, and practices guiding western water allocation, emphasizing how to efficiently and equitably allocate increasingly scarce supplies. Explores reserved water rights, water markets, stream adjudication, public trust doctrine, basinwide management, and riparian management. (Sp)

ENVS 5550 Sustainable Development* 3
(dual listing 6550)
Examines the challenges and opportunities humanity faces in sustainably managing human resources. Provides a global perspective on the status of both renewable and nonrenewable resources, as well as the impact of globalization and policies designed to meet long-term human needs. (Sp)

ENVS 5570 Sustainable Living 3
Theories and techniques for decision-making about environmental impacts of consumer decision-making, and about alternatives for a sustainable future. Incorporates meanings of sustainable living, relationships between lifestyle choices and the environment, and feasible steps toward ecological sustainability. (Sp) DE

ENVS 5640 Conflict Management in
(dual listing 6640) Natural Resources 3
Introduction to conflict management techniques for those involved in natural resource management. Also taught as SOC 5640/6640. (Sp)

ENVS 5800 Field Studies in Collaborative Natural Resource Stewardship 3
Two-week field course introduces students to methods and philosophical approaches incorporated in Tehabi, a summer-long internship program focusing on collaborative stewardship of natural resources. Enrollment limited to students accepted into the Tehabi program. (Su)

ENVS 5810 Internship in Collaborative Natural Resource Stewardship 3
Mentored internship involving participation in the Tehabi program, which teaches collaborative stewardship of natural resources within a federal, state, or nonprofit agency. Enrollment limited to students accepted into the Tehabi program. (Su)

ENVS 6000 Theoretical Foundations in
(dual listing 7000) Human Dimensions of Ecosystem Science and Management 3
Overview of interdisciplinary theories and frameworks concerning how human societies affect, and are affected by, ecosystem processes at local, regional, and global scales. Focuses on systems theory, social and environmental sustainability, and scientific integration for ecosystem planning, policy, and management. (F)

ENVS 6050 Best Research Practices in the Natural Resources and Environmental Sciences* 3
Explores best research practices from top scientific articles for planning and carrying out reliable experiments in the natural resources and environmental sciences, conceiving and testing research hypotheses, establishing cause and effect, deducing new knowledge from existing knowledge, and more. (Sp)

ENVS 6110 Fisheries and Wildlife
(dual listing 4110) Policy and Administration* 3
Examination of policy issues and administrative approaches in fish and wildlife management, with particular emphasis on nonbiological issues facing wildlife managers and administrators. (F)

ENVS 6130 Policy Aspects of Wildland Recreation 3
Political, legal, and economic bases for wildland recreation management. Relationship between outdoor recreation and tourism. Lectures concurrent with ENVS 4130. Also includes weekly discussion session focusing on relevant scientific research and policy analyses. (Sp)

ENVS 6200 Bioregional Analysis and Planning 5
Compilation and analysis of data for assessing biophysical and socio-economic features of landscapes, and for evaluating impacts of land-use policies across both landscapes and time. Provides real-world learning experience in working with stakeholders and agency decision-makers. (F)

ENVS 6210 Bioregional Management and Policy 5
Continuation of ENVS 6200. Assessment of land-use policies across landscapes and time, with an emphasis on evaluating consequences of community growth via the generation and analysis of future development and management alternatives. Prerequisite: ENVS 6200. (Sp)

ENVS 6240 Graduate Internship/Co-op 1-9®
Graduate-level educational experience in internship/cooperative education position approved by department. (F,Sp,Su)

ENVS 6300 (dual listing 7300) Social and Environmental Psychology of Natural Resources 3**
Examines how people respond as individuals to nature and environmental phenomena, drawing on theory and research from social psychology, environmental psychology, and behavior analysis. Emphasizes applications to knowledge, attitude, and behavior change strategies for improving environmental sustainability. (Sp)

ENVS 6400 Ecological Aspects of Wildland Recreation* 3
Assessment of current knowledge and knowledge gaps concerning impacts of wildland recreation on wildlife, plants, soil and water resources, and processes. Strategies for coexistence of recreation visitors and nonhuman ecosystem elements. (Sp)

ENVS 6440 (dual listing 4440) Stegner Center Annual Symposium 1®
Offered through the University of Utah College of Law. Topics vary each year, but always focus on natural resource policy-related issues. (Sp)

ENVS 6500 Behavioral Aspects of Wildland Recreation 3
Social and psychological analysis of visitor behavior in outdoor recreation settings. Sources of recreation management problems and practical and theoretical basis for management practices. Lectures concurrent with ENVS 4500. Separate discussion sessions focus on research concerning recreation behavior. (F)

ENVS 6530 Natural Resources Administration 2**
Organizational structures and processes common in natural resources administration on federal and state levels, and how they impact career development and land management. (Sp) DE

ENVS 6550 (dual listing 5550) Sustainable Development* 3
Examines the challenges and opportunities humanity faces in sustainably managing human resources. Provides a global perspective on the status of both renewable and nonrenewable resources, as well as the impact of globalization and policies designed to meet long-term human needs. (Sp)

ENVS 6600 Advanced Natural Resource Interpretation 3
Planning processes, techniques, and evaluation procedures for using information and education to influence human behavior and increase benefits to visitors in natural settings. Leadership of teams involved in producing interpretive plans and materials. (F)

ENVS 6640 (dual listing 5640) Conflict Management in Natural Resources 3
Introduction to conflict management techniques for those involved in natural resource management. Also taught as SOC 6640/5640. (Sp)

ENVS 6700 (dual listing 7700) Research Approaches in Human Dimensions of Ecosystem Science and Management 3
Experience conceptualizing and prioritizing research problems involving human societies and ecosystems. Reviews approaches for creating and testing interdisciplinary hypotheses pertaining to human-ecosystem interactions. Explores methods for integrating social and biophysical data. (Sp)

ENVS 6800 (dual listing 7800) Environment and Society Departmental Seminar 1®
Graded Pass/Fail *only*. (F,Sp)

ENVS 6810 (dual listing 7810) Research Techniques in Human Dimensions of Ecosystem Science and Management* 3
Experience using various quantitative and qualitative techniques and tools to collect and analyze data in research projects focused on human-ecosystem interactions. Topics range from survey sampling to use of simulation models and spatial statistics involving Geographic Information Systems (GIS). (F)

ENVS 6840 (dual listing 7840) Graduate Introductory Seminar for Environment and Society 1
Each faculty member meets with first-year graduate students in a seminar format to review and discuss in depth the faculty member's area of academic specialization. Graded Pass/Fail *only*. (F)

ENVS 6870 Ecology Seminar 1®
The Ecology Center schedules regular seminars throughout the school year with ecological scientists from other institutions participating. Ecology majors are required to attend a minimum of 10 such lectures. Graded Pass/Fail *only*. Students should register for fall semester, but attend through spring semester. Also taught as BIOL 6870, PSC 6870, WATS 6870, and WILD 6870. (F)

ENVS 6900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su) DE

ENVS 6910 Directed Study 1-6®
(F,Sp,Su) DE

ENVS 6960 Graduate General Ecology 4
General concepts, history, and issues in all major areas of the science of ecology including: environmental biophysics; and physiological, behavioral, evolutionary, community, ecosystem, and applied ecology in both terrestrial and aquatic enviroments. Also taught as BIOL 6960, PSC 6960, WATS 6960, and WILD 6960. (F)

ENVS 6970 Thesis Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ENVS 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

ENVS 7000 (dual listing 6000) Theoretical Foundations in Human Dimensions of Ecosystem Science and Management 3
Overview of interdisciplinary theories and frameworks concerning how human societies affect, and are affected by, ecosystem processes at local, regional, and global scales. Focuses on systems theory, social and environmental sustainability, and scientific integration for ecosystem planning, policy, and management. (F)

ENVS 7300 (dual listing 6300) Social and Environmental Psychology of Natural Resources 3**
Examines how people respond as individuals to nature and environmental phenomena, drawing on theory and research from social psychology, environmental psychology, and behavior analysis. Emphasizes applications to knowledge, attitude, and behavior change strategies for improving environmental sustainability. (Sp)

ENVS 7700 (dual listing 6700) Research Approaches in Human Dimensions of Ecosystem Science and Management 3
Experience conceptualizing and prioritizing research problems involving human societies and ecosystems. Reviews approaches for creating and testing interdisciplinary hypotheses pertaining to human-ecosystem interactions. Explores methods for integrating social and biophysical data. (Sp)

ENVS 7800 (dual listing 6800) Environment and Society Departmental Seminar 1®
Graded Pass/Fail *only*. (F,Sp)

ENVS 7810 (dual listing 6810) Research Techniques in Human Dimensions of Ecosystem Science and Management 3**
Experience using various quantitative and qualitative techniques and tools to collect and analyze data in research projects focused on human-ecosystem interactions. Topics range from survey sampling to use of simulation models and spatial statistics involving Geographic Information Systems (GIS). (F)

ENVS 7840 (dual listing 6840) Graduate Introductory Seminar for Environment and Society 1
Each faculty member meets with first-year graduate students in a seminar format to review and discuss in depth the faculty member's area of academic specialization. Graded Pass/Fail *only*. (F)

ENVS 7900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

ENVS 7910 Directed Study 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

ENVS 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

ENVS 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010

Engineering and Technology Education (ETE)

See Department of Engineering and Technology Education, pages 253-258

ETE 1000 Orientation to Engineering and Technology Education 1
Introduction to the technology education teaching profession, including programs, facilities, goals, and opportunities. (F)

ETE 1010 Communications Technology 3
Introduction to tools, materials, equipment, and processes used to transmit and receive messages. Major emphasis on hardware, software, communications, and the digital age. (F)

ETE 1020 Energy, Power, Transportation Systems Control Technology 3
Exploration of the concepts and processes relating to the control and automation (both hard and programmable) of technical systems in the areas of energy and power, transportation, and agricultural and related biotechnologies. (Sp)

ETE 1030 Material Processing Systems 3
Introduction to properties of industrial materials (metallic, polymeric, ceramic, and composite), processes used to produce standard stock and finished products, and the use of precision measuring instruments in manufacturing. (F,Sp)

ETE 1040 Construction and Estimating 3
Overview of construction industry and its practices. Reviews four major parts of construction industry, including: (1) Inputs: materials; (2) Process: design and building of structures; (3) Outputs: sites, buildings, etc.; and (4) Feedback: effects of building systems. Provides prospective technology education teachers with opportunity to study and perform activities related to the field of construction and estimating. At completion of course, students should be able to demonstrate knowledge and skills required to implement a construction technology program. (Sp)

ETE 1200 Computer-Aided Drafting and Design 3
Provides students with ability to accurately produce basic engineering, 2-D, and pictorial drawings using traditional and computer-aided drafting techniques. Introduction to drafting fundamentals and equipment associated with the drafting industry, including drawings, reproductions, and computer-aided techniques. (F,Sp) DE

ETE 1640 Introduction to Welding 3
Theory of Oxy-Acetylene Welding, Shielded-Metal Arc Welding, and Gas Metal Arc Welding. (F)

ETE 2020 Computer-Integrated Manufacturing Systems 3
Introduction to principles, operations, and applications of automated manufacturing systems, including: data acquisition and controls, CNC, CAD/CAM, and robotics. Prerequisites: ETE 1030, 1200. (Sp)

ETE 2030 Wood-Based Manufacturing Systems 3
Focuses on the instructional strategy of establishing a manufacturing enterprise utilizing woodworking equipment and techniques. Topics include management; finance and marketing strategies; and the design of product, tooling, and production systems. Prerequisite: ETE 1030. (F)

ETE 2210 Electrical Engineering for Nonmajors 4
Study and application of DC and AC concepts. Includes circuit fundamentals, theorems, laws, analysis, components, equipment, and measuring devices. Laboratory will include circuit design, construction and analysis of AC/DC circuits, and the use of measuring instruments, power supplies, and signal generators. *Not available* to students majoring in Electrical Engineering *or* Computer Engineering. Prerequisites: MATH 1210 and 1220. (F,Sp,Su) DE

ETE 2220 Civil Engineering and Architecture 3
Introduction to fields of civil engineering and architecture. Software applications used to solve problems and communicate solutions. Topics include: project planning, site planning, building design, and project documentation and presentation. Prerequisites: ETE 1200, MATH 1050. (F)

ETE 2240 Analog Devices and Circuits 3
Study of differential amplifiers; operational amplifiers; regulators; and generator instrumentation amplifier, multiplier, and active filters. Prerequisites: ETE 2310; ETE 2400 (must be taken concurrently). (F)

ETE 2270 Computer Engineering Drafting 2
Provides engineering students with introduction to computer-aided drafting environment. Explores AutoCAD and gives background in drafting theory and applications through use of hand CAD techniques. Students gain ability to contribute in the workplace using creative thinking skills and team environments. Enrollment limited to *only* students having majors within the College of Engineering. (F,Sp)

ETE 2300 QI Electronic Fundamentals 4
Study and application of DC and AC concepts, semiconductors, digital electronics, and microcomputers. Prerequisite: MATH 1050. (Sp)

ETE 2310 AC/DC Circuits 2
Study of AC/DC principles beyond those taught in ETE 2300. Includes network theorems, capacitance, inductance, impedance, reactance, resonance, and transformers. Prerequisite: ETE 2300. (Sp)

ETE 2320 Electronic Drafting 2
Study of electronic drafting practices. Students exposed to various areas of electronic drafting and fabrication. Prerequisite: ETE 2300. (F)

ETE 2360 Digital Circuits 3
Logic circuits, combinational and repeated circuits, counters, shifts registers, state tables, PLD's, and digital computer simulations. Prerequisite: ETE 2300 or equivalent. (Sp)

ETE 2370 Computer and Microprocessor Programming 3
Introduction to microprocessors and computers. Study of machine language programming, assemblies and cross assemblies, emulators, and input and output devices. Prerequisite: ETE 2300. (Sp)

ETE 2400 Active Devices and Circuits 3
Study of diodes; transistor principles, including semiconductor theory, bipolar, and field effect device characteristics; and modern thyristor devices. Prerequisite: ETE 2310. (F)

ETE 2660 Principles of Engineering Education 3
Prepares students to teach pre-engineering in the high school environment. Topics include the engineering design process and reliability, engineering systems, statics and dynamics, and materials. Prerequisites: MATH 1060 (or equivalent), ETE 1200 (or equivalent). (Sp)

ETE 2850 Statics and Strength of Materials 3
Engineering technology course covering resultants and equilibrium of force systems; moments of inertia; method of work; stress, strain, and deflection due to tension, compression, and torsion; and Mohr's circle for stress and strain. Prerequisites: MATH 1050, 1060. (F)

ETE 3040 Engineering Systems 3
Prepares students to teach engineering at the secondary level. Includes basic overview of math concepts needed to successfully teach engineering, problem solving, teamwork, design, technical communication, and engineering fundamentals. Through use of open-ended problem solving methodologies, students receive hands-on experience while teaching concepts of statics, dynamics, thermodynamics, electrical circuits, and engineering economics. (F,Sp)

ETE 3050 Computer Systems and Networking 3
Introduction to modern graphic and electronic communication systems. Emphasizes design, development, production, and dissemination of both electronic and graphic messages. Covers major concepts, including desktop publishing, and audio and video production techniques. (Sp)

ETE 3070 K-8 Engineering and Technology Education 3
Introduction to technology education and to science, technology, and society (STS) curricula for elementary schools, emphasizing teaching, developing, and managing technology-based activities. (F)

ETE 3200 Methods of Teaching Engineering and Technology Education I 3
Classroom laboratory practicum for design, practice, and performance of technology education demonstrations and lab activities. Prerequisites: ETE 1000; ETE 3300 (must be taken concurrently). (F)

ETE 3230 Machine and Production Drafting 3
Teaches students to accurately produce both design drawings and working drawings. Explores techniques, symbols, and conventions used to represent gears, cams, jigs, and fixtures. Also includes advanced techniques of production drawing, emphasizing Geometric Dimensioning and Tolerancing. Prerequisites: ETE 1200, MATH 1050, or equivalent. (F)

ETE 3240 Technical Illustration 3
In-depth study of technical illustration. Includes preparation of pictorial drawings with rendering added. Explores industrial and architectural environments. Introduces rendering and animation software, emphasizing three-dimensional modeling. Prerequisite: ETE 1200. (Sp)

ETE 3270 Advanced Computer-Aided Drafting 3
Designed to enhance CADD productivity, encourage customization, and introduce students to advanced CADD techniques, including programming and introduction to parametric design. Prerequisite: ETE 1200. (Sp)

ETE 3300 Clinical Experience I 1
Field-based experiences in secondary schools. Students complete 30 hours of tutoring students and assist teachers with managerial, clerical, and other professional tasks. Graded Pass/Fail *only*. Prerequisites: ETE 1000; ETE 3200 (must be taken concurrently). (F)

ETE 3380 Microprocessor and Computer Interfacing 3
Microcomputer interface applications, including digital system interface, serial and parallel interfacing, and D/A and A/D converters. Prerequisites: ETE 2240, 2370. (Sp)

ETE 3390 Microcontrollers 3
Study of microcontrollers and applications. Includes programming and building circuits. Prerequisite: ETE 3380. (F)

ETE 3400 Communication Circuits 3
Introduction to radio frequency communication circuits. Includes oscillators, modulation, transmitters, receivers, transmission lines, antennas, RF propagation, digital signal processing, GPS, and spread spectrum. Prerequisites: ETE 2300 and 2400. (Sp)

ETE 3440 DSC Science, Technology, and Modern Society 3
Designed to challenge students from all academic majors to develop an understanding of the dynamic interaction between science, technology, and society. Explores responsibility of humans for directing the utilization of technology as a creative enterprise. Also taught as ASTE 3440. (F,Sp)

ETE 3510 Introduction to Networking 3
Study of hardware and software required to build, install, maintain, and support a local area network. Emphasizes laboratory applications. (F)

ETE 3710 Electronics/Computer Design I 1
Students select and plan a senior project. Requires written proposal, including technical description of the project and management plans. Prerequisite: ETE 2320 (may be taken concurrently). (F)

ETE 3740 Facility and Equipment Maintenance 3
Systems approach to facility, equipment, and tool maintenance, including principles of woodworking, machine construction, adjustment, and sharpening.

ETE 3900 Principles and Objectives of Career and Technical Education 3
Comprehensive study of philosophy and purposes of career and technical education programs and their place in the total program of modern education.

ETE 3930 Evaluation of Career and Technical Education 2
Factors for evaluation of attitudes, skills, work habits, technical information, and instrument construction.

ETE 4300 Clinical Experience II 1
Field-based experience, in which students complete 30 hours of teaching-related experiences in the classroom. Graded Pass/Fail *only*. Prerequisites: ETE 3200, 3300; ETE 4400 (must be taken concurrently). (Sp)

ETE 4310 Corrosion and Corrosion Control 2
(dual listing 6310)
Analysis of corrosion mechanisms for ferrous metals, nonferrous metals, and nonmetallic materials, as well as the control of corrosion. Prerequisites: CHEM 1110 and MATH 1060. (Sp)

ETE 4400 Methods of Teaching Engineering and Technology Education II 3
Techniques of teaching as applied to individual and group instruction. Students apply various methods in presenting lessons. Prerequisites: ETE 3200, 3300; ETE 4300 (must be taken concurrently). (Sp)

ETE 4440 Technology and Society 3
(dual listing 6440)
Challenges students to develop an understanding of the dynamic interaction between science, technology, and society. Explores the responsibility of humans to direct the utilization of technology as a creative enterprise. Students critically investigate technological innovations, issues, and impacts on society from a global perspective. (F,Sp)

ETE 4700 Student Teaching in Postsecondary Schools 4
Planning, presenting, and evaluating instruction for students in postsecondary industrial and technical programs under the supervision of an experienced teacher. Enrollment by permission only.

ETE 4710 CI Electronics/Computer Design II 3
Execution and completion of a team or individual project. Requires design reviews and written reports. Prerequisite: ETE 3710. (Sp)

ETE 4930 Independent Study 1-4®
Upon application, students may propose and complete work above and beyond regular coursework to support or supplement their major. (F,Sp,Su)

ETE 4940 Related Industrial Experience 1-12®
Provision for enrollment in industry schools conducted on university level. Approved by department upon application for trade competency examination and work experience in industry. (F,Sp,Su)

ETE 5040 Manufacturing Enterprise 3
Focuses on management technology used to establish a manufacturing enterprise, engineer a product and production system, finance the operation, and market the product. Prerequisite: ETE 1030.

ETE 5220 CI Program and Course Development 3
Review of basic principles and practices of curriculum and course development used in applied technology and technology education. Emphasizes components needed to develop a curriculum guide. Prerequisites: ETE 3200, 3300. (Sp)

ETE 5230 Technical Training Innovative Program 1-4®
Prepares prospective and incumbent teachers to implement and conduct contemporary programs. Includes skill development and the philosophy needed for curriculum innovation.

ETE 5240 Principles of Technology 2-3
Introduction to applied technology principles forming the basis for today's society.

ETE 5500 Student Teaching Seminar 2
Focuses on observations and problems arising during student teaching. Includes review of teaching plans, procedures, adaptive classroom practices, and evaluation. Graded Pass/Fail *only*. Prerequisite: ETE 5630 (must be taken concurrently). (F)

ETE 5630 Student Teaching in Secondary Schools 10
Candidates assigned to cooperating teachers in public secondary schools within their major and minor subjects. Students have professional responsibilities with teaching. Graded Pass/Fail *only*. Prerequisite: ETE 5500 (must be taken concurrently). (F)

ETE 5800 Seminar—Technology Education 1-3®
Provides opportunity for students to participate in variety of enriching experiences, such as guest speakers, field trips, demonstrations, and conferences.

ETE 5900 Workshop in Engineering and Technology Education 1-4®
Special workshops for education or industry. May be repeated providing content varies. DE

ETE 5910 Special Problems in Engineering and Technology Education 1-4®

ETE 5920 Related Technical Training 1-12®

ETE 6090 Program Design 3
Study of contemporary program design and development in technology and industrial education. Reviews complete curriculum developmental process. (F,Sp,Su)

ETE 6100 Contemporary Issues 3
Study of present and future foundational professional developments in technology and industrial education. Students identify and investigate contemporary trends and issues affecting and facing technology and industrial education. (F,Sp,Su)

ETE 6150 Evaluation and Assessment 3
Study of various methods used to measure and evaluate student achievement, including cognitive, affective, and psychomatic. Reviews principles of learning and teaching, and of evaluation of instruction. (F,Sp,Su)

ETE 6200 Composite Manufacturing Processes and Repair 3
Composite manufacturing processes, composite materials survey, tooling design and fabrication, autoclave processes, vacuum bag techniques, filament winding processes, equipment requirements, materials cutting and storage, and composite materials testing. (Sp)

ETE 6250 Internship 1-6
Advanced instruction through supervised work experience in teaching, supervising, or administering educational or industrial program. (F,Sp,Su)

ETE 6310 Corrosion and Corrosion Control 2
(dual listing 4310)
Analysis of corrosion mechanisms for ferrous metals, nonferrous metals, and nonmetallic materials, as well as the control of corrosion. Prerequisites: CHEM 1110 and MATH 1060. (Sp)

ETE 6440 Technology and Society 3
(dual listing 4440)
Challenges students to develop an understanding of the dynamic interaction between science, technology, and society. Explores the responsibility of humans to direct the utilization of technology as a creative enterprise. Students critically investigate technological innovations, issues, and impacts on society from a global perspective. (F,Sp)

ETE 6450 Administration and Organization 3
Administrative and supervisory techniques for successful operation of technology education and applied technology education programs. (F,Sp,Su)

ETE 6520 Explorations of Industry 3
Study of contemporary industry, business, and service through a series of site visits. Includes various management and finance methods and techniques. (F,Sp,Su)

ETE 6750 Research Methods and Design 3
Introduction to practical research planning and design. Guides students from proposal selection to completed proposal to final research report. (F,Sp,Su)

ETE 6800 Seminar 1-2
(F,Sp,Su)

ETE 6900 Readings and Conference 1-3
Advanced individualized study on selected topics in technology and industrial education. Scheduled consultation with faculty member. (F,Sp,Su)

ETE 6910 Experimental Laboratory 3
Introduction to elements of a research report through selection and development of experimental study utilizing tools, equipment, materials, and processes for improving programs and teaching techniques. (F,Sp,Su)

ETE 6930 Independent Study 1-6
Advanced educational experience through individual investigation. (F,Sp,Su)

ETE 6960 Master's Project 3-6®
Development of creative project emphasizing a thoroughly developed plan of action. Includes proposal, project paper, and final presentation. (F,Sp,Su)

ETE 6970 Thesis Research 1-9
Graded Pass/Fail *only*. (F,Sp,Su)

ETE 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

ETE 7010 The Role of Cognition in Engineering and Technology Education 3
Study of cognitive science and research relating to engineering and technology education. (F)

ETE 7020 Design Thinking in Engineering and Technology 3
Engineering design as applied to technology education. (Sp)

ETE 7030 Engineering Design and Analysis for Technology Education 3
Engineering design methodology for technology education teacher educators. Focuses on science principles and predictive mathematics comprising the engineering sciences needed to solve problems in a design framework that is analytical, predictive, and repeatable. (F)

ETE 7040 Dynamic and Network Engineering Processes for Technology Education 3
Examines dynamic and network processes in engineering through the use of simulation software. Students use these techniques to develop standards-based engineering curricular modules for use in grades 6 through 12. (Sp)

ETE 7230 Foundations of Technology 3
Study of the objectives, legislative foundations, principles, philosophy, impact, and organization of technology and industrial education. (F,Sp,Su)

ETE 7400 Occupational Analysis and Curriculum Development* 3
Students learn techniques for conducting an occupational analysis (both job and task analysis) and for developing performance-based or competency-based curriculum. Explores industrial and educational applications for this style of curriculum development.

ETE 7460 Finance and Grant Writing 3
Procedures in financial administration of industrial education monies. Budget preparation, budget operation and control, and school accounting. In-depth review of steps and techniques needed for grant writing. (F,Sp,Su)

ETE 7500 Internationalizing Institutions of Higher Education 3
Explores the need and methodology of internationalizing higher education institutions, with the purpose of understanding the global society and delivering education worldwide. (F,Sp,Su)

ETE 7600 Academic Issues and Politics in Higher Education 3
Study of higher education in Utah, the social political impacts, and the role of faculty members in higher education institutions. (F,Sp,Su)

ETE 7810 Research Seminar 1®
Identification of research problems, consideration of research strategies and methods, application of research and statistical concepts in departmental focus, and interaction with faculty. Graded Pass/Fail *only*. (F,Sp,Su)

ETE 7900 Independent Study* 1-3
Individually directed reading and conference. Departmental approval required before registration. (F,Su)

ETE 7970 Dissertation Research 1-15®
Graded Pass/Fail *only*. (F,Sp,Su)

ETE 7990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*.

*This course is taught alternating years. Check with department for information about when course will be taught.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Family, Consumer, and Human Development (FCHD)

See Department of Family, Consumer, and Human Development, pages 279-289

FCHD 1010 BSS Balancing Work and Family 3
Introduces students to issues facing familes trying to balance work with family responsibilities. Examines integration of work and family across areas of marriage and family relationships, financial management, and child development and parenting. (F,Sp) DE

FCHD 1100 Critical Issues in Family, Consumer, and Human Development 1
Introduction to the majors, minors, emphases, and disciplines in family, consumer, and human development. Emphasizes career opportunities and how scholars in this field address critical social issues. Available online *only*. (F,Sp,Su) DE

FCHD 1500 BSS Human Development Across the Lifespan 3
Overview of human development across the lifespan, from conception to death. (F,Sp) DE

FCHD 2100 Family Resource Management 3
Explores the significance of values, goals, planning, and decision-making strategies in the development, management, and allocation of human, economic, and environmental resources. (F,Sp) DE

FCHD 2200 Introductory Workshop in Family, Consumer, and Human Development 1-12®
Introductory workshop. Topics of discussion vary each semester. (F,Sp,Su) DE

FCHD 2400 BSS Marriage and Family Relationships 3
Overview of couple and family relationships, including marriage, child bearing and rearing, intergenerational relationships, and alternative family forms. (F,Sp) DE

FCHD 2450 BSS The Consumer and the Market 3
Explores how the marketplace operates, including factors influencing consumer purchases, current consumer problems, and assistance provided to consumers by federal and state agencies, businesses, and other organizations. (F,Sp) DE

FCHD 2500 Child Development Associate Workshop 3®
Training provided by an approved instructor and following an approved curriculum that leads to the fulfillment of requirements for the National Child Development Associate (CDA) credential. Elective credits granted for this course. This course is not currently being taught. For information about when it may be taught, contact the department.

FCHD 2550 Child Development Associate Training and Practicum 6
During and after the coursework associated with FCHD 2500, students fulfill a practicum. At the conclusion of FCHD 2500, the CDA advisor/trainer conducts a comprehensive observation of the CDA candidate and the CDA observation instrument is completed and included as part of application materials submitted for the final assessment by the CDA granting organization (Council for Early Childhood Professional Recognition). When the CDA candidate receives the CDA credential, then he or she receives credit for FCHD 2550. Prerequisite: FCHD 2500. This course is not currently being taught. For information about when it may be taught, contact the department.

FCHD 2600 Seminar in Early Childhood Education 2
Orientation to the profession of early childhood education, current philosophies, teaching techniques, and approaches to curricula found in programs for young children. Must be taken concurrently with FCHD 2630. Prerequisite: Admission to teacher education or instructor's permission. (F,Sp) DE

FCHD 2610 Child Guidance 3
Review of parenting styles and child guidance philosophies with emphasis on principles and techniques. (F,Sp) DE

FCHD 2630 Practicum in Early Childhood Education 2
Students participate in developmentally appropriate preschool programs as classroom aides. Must be taken concurrently with FCHD 2600. Prerequisite: Admission to teacher education or instructor's permission. (F,Sp) DE

FCHD 3100 Abuse and Neglect in Family Context 3
Causes, treatment, and laws regarding family violence, including child abuse and neglect, partner abuse, and elder abuse. Prerequisites: Sophomore standing, FCHD 1500, 2400. (F,Sp) DE

FCHD 3110 Human Sexuality 3
Development and expression of human sexual values, attitudes, and behaviors in family and cultural contexts. Prerequisites: FCHD 1500, 2400. (F) DE

FCHD 3130 QI Research Methods 3
Common methodologies used in current family and human development research. Emphasis on becoming a knowledgeable and informed consumer of research. Enrollment limited to FCS and FCHD majors *only*. Prerequisite: STAT 1040. (F,Sp) DE

FCHD 3210 CI Families and Cultural Diversity 3
Similarities and differences in family patterns and functions in terms of race and ethnicity, gender, social class, and international development. Prerequisites: FCHD 1500, 2400, and fulfillment of Communications Literacy CL2 requirement. Enrollment limited to FCHD majors *only.* (F,Sp) DE

FCHD 3280 Economic Issues for Individuals and Families 3
Focuses on issues related to economic well-being of individuals and families, with special emphasis on income and wealth, poverty, consumption and saving, work and leisure, human capital investment, and aging. (Sp) DE

FCHD 3310 Consumer Policy 3
Examines different tools for policy analysis. Provides conceptual and analytical framework for understanding the role of consumer sciences professionals as political actors and the potential to influence the shaping of public policy, particularly consumer and government policies. (Sp)

FCHD 3340 Housing: Societal and Environmental Issues 3
Studies housing in the contemporary U.S., including affordability, access, expectations, aesthetic considerations, and effects of public and private policies on housing choices. (F) DE

FCHD 3350 DSS Family Finance 3
Achieving personal and family financial goals, including financial planning and record keeping, different types of insurance, taxes, use of credit, investments, retirement, and estate planning. (F,Sp,Su) DE

FCHD 3450 Consumer Credit Problems 3
Consumer credit problems, debt reduction strategies, credit collection policies and practices, bankruptcy, and government assistance programs. Prerequisite: FCHD 3350. (F) DE

FCHD 3510 Infancy and Early Childhood 3
Development and growth of the child from conception to five years. Physical, social, and emotional growth; and parenting skills. Prerequisites: Junior standing and FCHD 1500, 2610. (F,Sp) DE

FCHD 3520 Children in the Middle Years 3
Growth and development of normal children. Guidance principles related to behavior of children at these age levels. Prerequisites: Junior standing and FCHD 1500, 2610. (F,Sp) DE

FCHD 3530 Adolescence 3
Social, psychological, and physical aspects of adolescence in modern societies. Social and cultural expectations and influences on adolescents stemming from the family, peers, school, and the community. Prerequisites: Junior standing and FCHD 1500. (F,Sp) DE

FCHD 3540 Adult Development and Aging 3
Interdisciplinary perspective on developmental issues in adulthood and old age. Biosocial, cognitive, and psychosocial changes in older adults in family, community, cultural, and socio-political contexts. Prerequisites: Junior standing and FCHD 1500. (F,Sp) DE

FCHD 3550 Infant Lab 1
Practical experience in laboratory setting with children birth through two years of age. Lab supplements/complements course content of FCHD 3510. Prerequisites: Junior standing, FCHD 1500, 2610. Corequisite: FCHD 3510. (F,Sp) DE

FCHD 3560 Middle Childhood Lab 1
Practical experience in laboratory setting with children in the middle years. Lab supplements/complements course content of FCHD 3520. Prerequisites: Junior standing, FCHD 1500, 2610. Corequisite: FCHD 3520. (F,Sp) DE

FCHD 4220 Family Crises and Interventions 3
Normative and nonnormative stressors provoking individual and family crises. Principles and techniques for family interventions. Prerequisites: Junior standing, FCHD 2400. (F,Su) DE

FCHD 4230 Families and Social Policy 3
Local, state, and federal policies with implications for individuals and families across the lifespan. Prerequisites: Junior standing and FCHD 2400. (F,Sp) DE

FCHD 4240 Social and Family Gerontology 3
Social, cultural, and family contexts of aging. Intergenerational family relations in later life. Social policies and services affecting older adults and their families. Prerequisites: Junior standing and FCHD 2400, 3540. (F,Sp) DE

FCHD 4330 Family Finance Career Seminar 1
Exploration of career options through readings, guest lecturers, interviews of practitioners, and development of an internship and career plan. Prerequisite: FCHD 3350. (F)

FCHD 4350 Advanced Family Finance 3
Managing personal and family financial resources to achieve goals relating to investments, retirement, and estate planning. Prerequisite: FCHD 3350. (Sp)

FCHD 4400 Research Practicum in FCHD 1-12®
Provides placement experience in applying skills and knowledge in a research setting. (F,Sp,Su)

FCHD 4460 Financial Counseling 3
Development and application of financial counseling and presentation skills. Analysis of various financial problems and development of appropriate solutions and resources. Prerequisites: FCHD 3350, 3450. Enrollment limited to FCHD majors with a Family Finance Emphasis. (Sp)

FCHD 4550 Preschool Methods and Curriculum 3
Use of materials, equipment, and activities in planning and implementing curricula for preschool children. Prerequisites: Junior standing and FCHD 1500. (F,Sp) DE

FCHD 4800 Senior Project 3
Project in area of student's choice, selected and prepared in conjunction with an advisor from the FCHD faculty. Prerequisites: Senior standing and enrollment in FCHD major. (F,Sp,Su)

FCHD 4820 Current Issues in Family Life Studies 3
Explores history, purpose, impact, and contemporary status of family life studies. Discussion of current issues, policies, ethics, and approaches to family life studies. Development of empirically-informed and methodologically-sound plans and strategies. Prerequisite: Advisor approval. Enrollment limited to Family Life Studies majors. Available online *only*. (F,Sp,Su) DE

FCHD 4830 Senior Capstone Project 3
Capstone course for the family life studies format. Prepares students as professionals, while providing professional development through research, teaching, and outreach. Development documented in portfolio, which is submitted and graded as the final senior project. Prerequisite: Advisor approval. Enrollment limited to Family Life Studies majors. Background check required. Available online *only*. (F,Sp,Su) DE

FCHD 4900 CI Pre-Practicum Skills 3
Acquisition and integration of interpersonal skills, conflict resolution, and ethical decision-making for active participation in FCHD practica. Enrollment limited to FCHD majors *only*. Prerequisites: Junior standing, FCHD 2610, 3100, and fulfillment of Communications Literacy CL2 requirement. (F,Sp) DE

FCHD 4940 Gerontology Integration 1
Integration of gerontology coursework and practicum. Written paper requires approval by FCHD Gerontology Coordinator. (F,Sp,Su)

FCHD 4950 Practicum: Consumer Science 1-12®
Placement experience in applying skills and knowledge in community agencies. Prerequisites: Junior standing, completion of 24 credits in major. Enrollment limited to Family and Consumer Sciences majors who have at least junior standing, or to FCHD majors with a Family Finance Emphasis, who have completed at least 30 credits in the major. The application deadlines are: February 15 for fall semester, June 15 for spring semester, and October 15 for summer semester. (F,Sp,Su)

FCHD 4960 Practice Teaching in Child Development Laboratories 3 or 6
Intensive teaching practicum in the Child Development Lab program. Students must sign up at least three full semesters in advance in FL 205. Prerequisites: Junior standing, FCHD 4550, and departmental permission. (F,Sp,Su) DE

FCHD 4970 Gerontology Practicum 1-3®
Placement experience in gerontology settings. Practical opportunities to apply theory, knowledge, and skills. Prerequisites: Senior standing and FCHD 3540, 4240. Apply one semester in advance. The application deadlines are: February 15 for fall semester, June 15 for spring semester, and October 15 for summer semester. (F,Sp,Su)

FCHD 4980 Practicum 1-12®
Placement experience in applying skills and knowledge in community agencies. Enrollment limited to FCHD majors *only*. Prerequisites: Junior standing and FCHD 4900; must have completed a total of 30 FCHD credits and the practicum application. The application deadlines are: February 15 for fall semester, June 15 for spring semester, and October 15 for summer semester. (F,Sp,Su) DE

FCHD 4990 Readings and Conference 1-6®
Directed independent study of topics preselected by faculty and student. Instructor permission required before registration. (F,Sp,Su)

FCHD 5340 Housing Finance and Regulations 3
Exploration of mortgage loan industry, with in-depth examination of various lending products and procedures. Study of regulations affecting housing, including Fair Housing, predatory lending, and mortgage default. Prerequisites: FCHD 3340, 3350. Enrollment limited to students in the Family Finance emphasis and FCS majors. (Sp)

FCHD 5540 Family Life Education Methods 3
Introductory course focused on theory, principles, and skills necessary to prepare, present, and evaluate family life education programs and workshops. Prerequisites: Junior standing, FCHD 1500 and 2400. Enrollment limited to FCHD majors *only*. (F,Sp) DE

FCHD 5550 Interdisciplinary Workshop 1-3®
(F,Sp,Su) DE

FCHD 5950 Financial Counseling Practicum 3®
Students apply their knowledge by conducting one-on-one counseling sessions, observing other counselors, and teaching workshops. Students develop valuable management, communication, and counseling skills. Students should sign up as far in advance as possible after being admitted to the Family Finance emphasis. Prerequisites: FCHD 4220, 4460, 5340 (may be taken concurrently). Enrollment limited to FCHD majors with a Family Finance Emphasis. The application deadlines are: February 15 for fall semester, June 15 for spring semester, and October 15 for summer semester. (F,Sp,Su)

FCHD 6010 Survey of Family Relations Research 3
Overview and critique of substantive areas of research in marriage and the family. Prerequisite: FCHD 2400 or equivalent. (Sp) DE

FCHD 6020 Survey of Human Development Research 3
Examines contemporary research and developmental issues. Highlights social development from social-historical and social change framework. Prerequisite: FCHD 1500 or equivalent. (Sp) DE

FCHD 6030 Research Methods 3
Overview of methods for studying family relations and human development, including sampling, measurement, research design, and data analyses/ interpretations. Research proposal required. Prerequisite: FCHD 3130 or equivalent. (Sp)

FCHD 6040 Family Economics 3
Examination of contemporary research and current issues in family economics. (Sp)

FCHD 6050 Consumer Science Theories 3
Critical review and assessment of theories in consumer science. (F)

FCHD 6060 Human Development Theories 3
Overview of major developmental theories, including contributions from philosophical, personality, and learning thoeries. Explores epistemology, ethology, and systems theories relating to human development. Prerequisite: FCHD 1500 or equivalent. (F) DE

FCHD 6070 Family Theories 3
Critical review and assessment of theories in family research, along with construction and application of family theory. Prerequisite: FCHD 2400 or equivalent. (F)

FCHD 6080 Professional Development 3
(dual listing 7080)
Capstone course for graduate students, emphasizing issues related to professional development (e.g., grant writing, publishing, vitae development, interview skills, developing a research agenda, networking, ethics, professional conduct, teaching, etc.). (Sp)

FCHD 6200 Topical Seminar in Family Relations 3®
Selected issues in family relations. Usually offered once per year. Semester taught will vary.

FCHD 6210 Cultural Diversity in Families* 3
(dual listing 7210)
Covers selected issues related to family patterns and functions associated with ethnicity, gender, and social class, as well as additional topics related to expertise of instructor. (F)

FCHD 6220 Interpersonal Family Relationships 3**
(dual listing 7220)
In accordance with expertise of instructor, covers selected interpersonal issues in intimate and family relations. (F)

FCHD 6230 Family and Social Policy* 3
(dual listing 7230)
In accordance with expertise of instructor, covers issues and implications of local, state, and federal policies relating to individuals and families across the lifespan. (Sp)

FCHD 6310 Survey of Marriage and Family Therapy 3
Overview of marriage and family therapy models. Historical development of marriage and family therapy as a profession and a practice. Enrollment limited to FCHD Marriage and Family Therapy master's students *only*. (F)

FCHD 6320 Foundations of Marriage and Family Therapy 3
Epistemological and philosophical directions of marriage and family therapy, beginning with early applications of General Systems theories and cybernetics through constructivist and postmodern frameworks. (F)

FCHD 6330 Marriage and Family Therapy Practice I: Traditional Approaches 3
Traditional approaches to marriage and family therapy, with a focus on individual and couple issues, including sexuality and personality issues within a systems framework. Prerequisite: FCHD 3110 or equivalent. (Sp)

FCHD 6340 Marriage and Family Therapy Practice II: Contemporary Approaches 3
Contemporary approaches to marriage and family therapy. Focuses on couple and family interaction issues, including conflict, parenting, and other common family problems. (Sp)

FCHD 6350 Clinical Practice in Marriage and Family Therapy 3®
Selected clinical issues in marriage and family therapy. (Sp)

FCHD 6360 Ethical and Professional Development in Marriage and Family Therapy 3
Ethical, legal, and professional issues in marriage and family therapy. (F)

FCHD 6370 Assessment in Marriage and Family Therapy 3
Development, application, and interpretation of major individual and family assessment techniques used in marriage and family therapy practice and research. (Sp)

FCHD 6380 Survey of Marital and Family Therapy Research 3®
Examines contemporary research issues in marriage and family therapy. (F)

FCHD 6390 Practicum in Marriage and Family Therapy 1-6®
Supervised clinical experience in marriage and family therapy. May be graded Pass/Fail, as determined by instructor or section. Prerequisites: Admission to Marriage and Family Therapy specialization and instructor's permission. (F,Sp,Su)

FCHD 6400 Topical Seminar in Consumer Science 3®
(dual listing 7400)
Selected issues in consumer science. Usually offered once per year. Semester taught will vary.

FCHD 6410 Family Financial Problems 3
Review of research on family financial problems, including bankruptcy and related public policies. (Sp)

FCHD 6420 Housing Policy and Issues 3
(dual listing 7420)
Housing market forces and housing policies at the local, state, national, and international levels. Additional assignments required for FCHD 7420. (F)

FCHD 6430 Economics of Aging 3
(dual listing 7430)
Explores economic behavior of the elderly, including financial preparation and security, health-wealth connection, labor force behavior, intergenerational transfers and supports, and living arrangements. Additional assignments required for FCHD 7430. (F)

FCHD 6500 Topical Seminar in Human Development 3®
Selected issues in human development. Usually offered once per year. Semester taught will vary. DE

FCHD 6510 Development in Infancy* 3
(dual listing 7510)
Covers developmental period from birth to age three and the major developmental domains of physical, neurological, perception, cognition, language, emotion, and social development. Additional topics discussed relating to expertise of instructor. To receive credit for 7510, students must fulfill additional requirements. (F)

FCHD 6520 Development in Childhood 3**
(dual listing 7520)
Covers developmental period from age 3 to about age 12. Focuses on major developmental domains of physical, cognitive, and emotional/social development across context related to expertise of instructor. To receive credit for 7520, students must fulfill additional requirements. (F)

FCHD 6530 Development in Adolescence 3**
(dual listing 7530)
Covers developmental period from age 12 to about age 20. Focuses on major developmental domains associated with adolescence, including physical, cognitive, and emotional/social development across context related to expertise of instructor. To receive credit for 7530, students must fulfill additional requirements. (Sp)

FCHD 6900 Topical Seminar in Family, Consumer, and Human Development 1-3®
Selected issues in family, consumer, and human development. (F,Sp,Su)

FCHD 6910 Parenting* 3
(dual listing 7910)
Covers topic of parenting from perspectives of human development, family relations, and consumer science. Specific topics selected within each of these perspectives. To receive credit for 7910, students must fulfill additional requirements. (Sp)

FCHD 6960 Readings and Conference 1-6®
Directed independent study of topics preselected by faculty and student. Prerequisite: Instructor's permission. (F,Sp,Su)

FCHD 6970 Thesis Research 1-6®
Research for master's thesis, arranged with advisor. Graded Pass/Fail *only*. Prerequisite: Advisor's permission. (F,Sp,Su)

FCHD 6980 Graduate Practicum 1-9®
Application of family and human development skills and knowledge in a supervised setting, as arranged by advisor. Prerequisite: Advisor's permission. (F,Sp,Su)

FCHD 6990 Continuing Graduate Advisement 1-9®
Continuing registration to complete thesis requirements. Graded Pass/Fail *only*. Prerequisite: Six credits of FCHD 6970. (F,Sp,Su)

FCHD 7050 Advanced Research and Theory in Consumer Science 3
Critical review of research and theories in consumer science. Prerequisite: FCHD 6050. (F)

FCHD 7060 Advanced Research and Theory in Human Development 3
Critical review of research and theories in human development. Prerequisite: FCHD 6060 or equivalent. (Sp)

FCHD 7070 Advanced Research and Theory in Family Relations 3
Critical review of research and theories in marriage and family relationships. Prerequisite: FCHD 6070 or equivalent. (Sp)

FCHD 7080 Professional Development 3
(dual listing 6080)
Capstone course for graduate students, emphasizing issues related to professional development (e.g., grant writing, publishing, vitae development, interview skills, developing a research agenda, networking, ethics, professional conduct, teaching, etc.). (Sp)

FCHD 7200 Topical Seminar in Family Relations 3®
Selected issues for advanced professionals in family relations. Usually offered once per year. Semester taught will vary.

FCHD 7210 Cultural Diversity in Families* 3
(dual listing 6210)
Covers selected issues related to family patterns and functions associated with ethnicity, gender, and social class, as well as additional topics related to expertise of instructor. (F)

FCHD 7220 Interpersonal Family Relationships 3**
(dual listing 6220)
In accordance with expertise of instructor, covers selected interpersonal issues in intimate and family relations. (F)

FCHD 7230 Family and Social Policy* 3
(dual listing 6230)
In accordance with expertise of instructor, covers issues and implications of local, state, and federal policies relating to individuals and families across the lifespan. (Sp)

FCHD 7400 Topical Seminar in Consumer Science 3®
(dual listing 6400)
Selected issues for advanced professionals in consumer science. Usually offered once per year. Prerequisite: FCHD 6400. Semester taught will vary.

FCHD 7420 Housing Policy and Issues 3
(dual listing 6420)
Housing market forces and housing policies at the local, state, national, and international levels. Additional assignments required for FCHD 7420. (F)

FCHD 7430 Economics of Aging 3
(dual listing 6430)
Explores economic behavior of the elderly, including financial preparation and security, health-wealth connection, labor force behavior, intergenerational transfers and supports, and living arrangements. Additional assignments required for FCHD 7430. (F)

FCHD 7500 Topical Seminar in Human Development 3®
Selected issues for advanced professionals in human development. Usually offered once per year. Semester taught will vary.

FCHD 7510 Development in Infancy* 3
(dual listing 6510)
Covers developmental period from birth to age three and the major developmental domains of physical, neurological, perception, cognition, language, emotion, and social development. Additional topics discussed relating to expertise of instructor. To receive credit for 7510, students must fulfill additional requirements. (F)

FCHD 7520 Development in Childhood 3**
(dual listing 6520)
Covers developmental period from age 3 to about age 12. Focuses on major developmental domains of physical, cognitive, and emotional/social development across context related to expertise of instructor. To receive credit for 7520, students must fulfill additional requirements. (F)

FCHD 7530 Development in Adolescence 3**
(dual listing 6530)
Covers developmental period from age 12 to about age 20. Focuses on major developmental domains associated with adolescence, including physical, cognitive, and emotional/social development across context related to

expertise of instructor. To receive credit for 7530, students must fulfill additional requirements. (Sp)

FCHD 7900 Topical Seminar in Family, Consumer, and Human Development 1-3®
Selected issues for advanced professionals in family, consumer, and human development. (F,Sp,Su)

FCHD 7910 Parenting* 3
(dual listing 6910)
Covers topic of parenting from perspectives of human development, family relations, and consumer science. Specific topics selected within each of these perspectives. To receive credit for 7910, students must fulfill additional requirements. (Sp)

FCHD 7960 Readings and Conference 1-6®
Directed independent study of topics preselected by faculty and student. Prerequisite: Instructor's permission. (F,Sp,Su)

FCHD 7970 Dissertation Research 1-9®
Research for dissertation, as arranged with advisor. Graded Pass/Fail *only*. Prerequisite: Advisor's permission. (F,Sp,Su)

FCHD 7980 Advanced Graduate Practicum 1-9®
Professional supervision of doctoral students, applying general principles from the study of research in family and human development. Prerequisite: Advisor's permission. (F,Sp,Su)

FCHD 7990 Continuing Graduate Advisement 1-9®
Continuing registration to complete dissertation requirements. Graded Pass/Fail *only*. Prerequisite: Twenty credits of FCHD 7970. (F,Sp,Su)

*Taught 2010-2011.
**Taught 2009-2010.
® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Family and Consumer Sciences Education (FCSE)

See Department of Agricultural Systems Technology and Education, pages 149-155

FCSE 1140 Introductory Sewing 2
Introductory-level sewing techniques geared toward beginning sewing students. Includes use of sewing machines and sergers. No previous sewing experience needed. Graded Pass/Fail *only*. (F,Sp)

FCSE 2040 Clothing Production Principles 3
Intermediate-level clothing construction techniques, pattern alteration and fitting, and use of sewing machine and serger. Previous sewing experience recommended. Enrollment limited to FCSE majors *only*, or with instructor's permission. (F,Sp)

FCSE 2510 Orientation to Family and Consumer Sciences Education 3
Overview of the integrated Family and Consumer Sciences Education system. Students learn how family and human development, nutrition, finance, clothing production, and consumerism is planned, implemented, and evaluated through FCSE programs in the public schools. Enrollment limited to FCSE majors *only*. (Sp)

FCSE 3030 DSC/QI Textile Science 4
Study of fibers, yarns, fabric constructions, and finishes related to suitability for desired end uses. Use of mathematics and descriptive statistics for reporting and interpreting data collected from lab experiments. Prerequisites: Completion of at least 30 credits and *C-* or better in a QL course. Lectures and laboratory. (Sp)

FCSE 3040 Advanced Clothing Production Principles 3
Flat pattern design and tailoring techniques. Prerequisite: FCSE 2040. (F)

FCSE 3060 DSS/CI Human Behavior Related to Dress 3
Analyzes economic, historic, psychological, social, and cultural contexts shaping individual and group dress and appearance. Prerequisite: Completion of a course having University Studies Breadth Social Sciences (BSS) designation. (Su)

FCSE 3080 DHA Dress and Humanity 3
Explores relationship of dress and humanity. Collaborative group assignments, discussions of history related to dress, cultures as related to dress, and the influence dress has in today's society. Prerequisite: Completion of course having University Studies Breadth Humanities (BHU) designation. (F,Sp)

FCSE 3300 Family and Consumer Sciences Education Clinical Experience I 1
Provides on-site experience for students to model a secondary family and consumer sciences education teacher. Students are expected to learn teaching and classroom management principles. Graded Pass/Fail *only*. Must be taken concurrently with FCSE 3400. Prerequisite: Admission to Secondary Education Professional Education Component. (Sp)

FCSE 3400 Family and Consumer Sciences Education Methods I 3
Methods of successfully planning and maintaining family and consumer sciences work education programs in secondary schools. History and philosophy of applied technology education. Prerequisite: Admission to Secondary Education. FCSE 3400 and 3300 must be taken concurrently. (Sp)

FCSE 3790 Housing and Interior Design Teaching Methods 3
Online course mirroring Utah's state standards for housing and interior design. Students review housing and interior design content, and then generate teaching strategies appropriate for teaching that content at the high school level. Prerequisites: ID 1790, FCSE 3400. Enrollment limited to FCSE majors *only*. (F,Sp,Su)

FCSE 4250 Internship in Family and Consumer Sciences Education 1-12®
Midmanagement-level experience in a position approved by the department. One credit earned for each 60 hours of experience. Graded Pass/Fail *only*. Prerequisite: Junior standing. (F,Sp,Su)

FCSE 4300 Family and Consumer Sciences Education Clinical Experience II 1
Provides on-site experience for students to model a secondary family and consumer sciences education teacher. Students expected to learn teaching and classroom management principles. Graded Pass/Fail *only*. Prerequisites: FCSE 3300, 3400. (F)

FCSE 4400 Family and Consumer Sciences Education Methods II 3
Development of competency in curriculum planning, and skill and sensitivity in the use of various teaching-learning strategies and resources. Includes assessment for vocational education. Prerequisites: FCSE 3300, 3400. (F)

FCSE 4900 Independent Study in Family and Consumer Sciences Education 1-5®
Prior to registration, students must identify a project of interest and discuss the project with instructor. Prerequisite: Junior standing and approval of faculty. (F,Sp,Su)

FCSE 5500 Student Teaching Seminar 2
Taken during student teaching in secondary schools to complement school experience. Focuses upon problems arising during student teaching. Includes teaching plans, procedures, adaptive classroom practices, and evaluation. Graded Pass/Fail *only*. Prerequisites: FCSE 4300, 4400. Must be taken concurrently with FCSE 5630. (Sp)

FCSE 5550 Workshop Topics in Family and Consumer Sciences Education 0.5-3®
Concentrated offerings to increase knowledge, skills, or creative expression in current Family and Consumer Sciences Education topics or curriculum areas. (F,Sp,Su)

FCSE 5630 Student Teaching in Secondary Schools 10
After assignment to a cooperating family and consumer sciences educator, students are given professional responsibilities associated with teaching. Graded Pass/Fail *only*. Prerequisites: FCSE 4300, 4400. Must be taken concurrently with FCSE 5500. (Sp)

FCSE 6210 Analysis of Social Research Data ** 3**
Explores the use of SPSS for descriptive statistics, contingency tables, differential statistics, and correlational statistics. Discussion of syntax, procedure options, and interpretation of output. (F)

FCSE 6240 Graduate Topics in Career and Technical Education 1-3®
Surveys selected topics in career and technical education. Topics will be unique each time course is offered. (F,Sp,Su)

FCSE 6250 Graduate Internship in Career and Technical Education 1-6®
Designed for graduate students who wish to acquire or upgrade their experience in an occupational field related to their area of study. One credit earned for each 60 hours of experience. Repeatable for up to 6 credits. Prerequisite: Instructor approval prior to enrollment. (F,Sp,Su) DE

FCSE 6290 Current Issues in Education and Extension Research* 3
Investigation and reporting of current issues related to career and technical education and extension education research. (F) DE

FCSE 6520 Administration and Supervision in Education and Extension 3
Application of research and theory of administration and supervision to define and clarify the role of leadership in formal education and extension situations. (F)

FCSE 6530 Classroom Management, Student Motivation, and Guidance 3
Multiple-strategy approach for increasing teachers' effectiveness and satisfaction in classroom management and discipline. (Sp)

FCSE 6540 Program Development, Testing, and Evaluation in Career and Technical Education ** 3**
Examines current trends in curriculum and program development related to specific educational outcomes. Includes curriculum development process. (F)

FCSE 6550 Advanced Teaching Techniques* 3®
Explores advanced application of teaching strategies and theory, as well as the creation of innovative classroom materials. (F) DE

FCSE 6560 Mentoring New Professionals* 3
Explores the role of mentoring in the success of new teaching professionals. Reviews four components of professional practice. Examines techniques for observation and conferencing. Students reflect upon their own teaching/ mentoring exeriences and the impact upon professional practice. (Sp)

FCSE 6570 Adult Education and Volunteer Programs 3
Explores current program formats and instructional materials developed for adult education. Emphasizes program and course development and teaching strategies suitable for adults. This course is currently inactive. Contact department for information about when this course may be taught.

FCSE 6900 Graduate Independent Study in Career and Technical Education 1-4®
Independent study in an area of career and technical education. For approval of project and allowable credits, students should check with committee. (F,Sp,Su) DE

*Taught 2010-2011.
**Taught 2009-2010.
® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Finance (FIN)

See Department of Economics and Finance, pages 230-233

Note: Effective Fall Semester 2009, some of the courses previously listed under the Business Administration (BA) prefix will be taught under the FIN prefix. These courses are shown below. Other courses previously listed under the BA prefix will be taught under the Management (MGT) prefix. (MGT courses are shown on pages 603-607.) Students registering for Summer Semester 2009 Business Administration courses can find them under the BA prefix by logging into Access at: **http://www.usu.edu/myusu/**

FIN 3400 QI Corporate Finance 3
How corporations raise and manage capital. Study of modern financial principles, methods, policies, and institutions. Corporate organization, creation, and reorganization. Prerequisites: MATH 1050; ACCT 2010; choose one statistics course from: STAT 1040, 2300, 3000, or PSY 2800; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp,Su) DE

FIN 4300 International Finance 3
Overview of international financial management, including international financial markets, exchange rate behavior, and financing international trade. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

FIN 4410 Financial Institutions 3
Role of domestic and international financial institutions in supplying services to consumers, businessmen, and government. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

FIN 4420 Insurance 3
Studied from the standpoint of insurance services consumers, course explores types of life, property, and casualty insurance contracts; nature and uses of life and property insurance; and the organization, management, and government supervision of insurance companies. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F)

FIN 4430 Real Estate Finance 3
Covers theory, principles, and techniques of real estate investment, emphasizing present value and cash-flow approaches to real estate investment decisions. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (Sp)

FIN 4450 Fundamentals of Valuation 3
Augments and extends the basic equity valuation material in corporate finance to the specific and complex setting of valuing equity securities. Covers valuation models (i.e., dividend discount model) as well as multiples and technical approaches. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

FIN 4460 Investments 3
Provides an understanding of security analysis and portfolio management. Market operations; risk and return; stock, bond, and option analysis; and portfolio theory and creation. Prerequisites: Grade of *B-* (2.67) or better in FIN 3400; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

FIN 4900 Independent Research and Reading 1-3®
(F,Sp,Su) DE

FIN 4950 Senior Honors Thesis/Project 3
Creative project that will then be written up, and presented, as a Senior Thesis as required for an Honors Plan. (Sp)

FIN 5350 Quantitative Financial Modeling and Applications 3
Introduction to quantitative methods and computer applications applicable in financial modeling. Covers financial statement modeling, asset allocation, risk analysis, scenario generation, and option pricing through the introduction and proper uses of spreadsheet modeling, decision analysis, simulation, and optimization techniques. Prerequisites: FIN 3400 and MIS 2100. Also taught as MIS 5350. (Sp)

FIN 5420 Risk Management 3
Examines a common set of techniques which can be used in dealing with pure risk, including risk assumption, prevention, diversification, and transfer via insurance and noninsurance market mechanisms. Prerequisites: FIN 3400 and 4460. (Sp)

FIN 5460 Advanced Investments 3
Advanced topics in investment instruments, portfolio management, markets, and financial modeling techniques impacting financial decisions. Prerequisites: FIN 3400 and 4460. (F)

FIN 6410 Corporate Finance Essentials 1.5
Introduction of corporate finance principles for students entering a master's degree program in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

FIN 6420 Financial Problems 3
Corporate finance case course, dealing with problems in working capital management, capital budgeting, cost of capital problems, and corporate restructuring. (F) [DE]

FIN 6440 Financial Decision Making 3
Presentation of financial modelling techniques impacting firm decisions. (Sp) [DE]

[®]Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

French (FREN)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

Lower Division

FREN 1010 French First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to those with more than one year high school French or equivalent. (F) [DE]

FREN 1020 French First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: FREN 1010 or equivalent. (Sp) [DE]

FREN 1030 Beginning French for Everyday Communication 3
Development of basic conversational skills, communication strategies, and cultural knowledge through immersion in a French-speaking environment. Offered only through USU's study abroad program in France. Cannot be substituted for FREN 1010 or 1020. Graded Pass/Fail *only*. (Su)

FREN 1050 French First Year I Study Abroad 4
Intensive first-year language course designed to increase proficiency in the four language skills and in intercultural knowledge. Offered only through USU's summer study abroad program in France. Not open to those with more than one year high school French or equivalent. (Su)

FREN 1150 French First Year II Study Abroad 4
Intensive first-year language course designed to increase proficiency in the four language skills and in intercultural knowledge. Offered only through USU's summer study abroad program in France. Prerequisite: FREN 1010 or 1050. (Su)

FREN 1820 Beginning Independent Study: Experiencing Paris 2
Beginning-level independent study project focusing on the city of Paris, its history, culture, and patterns of life. Offered only through USU's summer study abroad program in France. (Su)

FREN 2010 French Second Year I 4
Continued development of communicative competencies in the four language skills, with more emphasis on communication through reading and writing and continued exposure to cultures and customs. Prerequisite: FREN 1020 or equivalent. (F)

FREN 2020 French Second Year II 4
Continued development of communicative competencies in the four language skills, with more emphasis on communication through reading and writing and continued exposure to cultures and customs. Prerequisite: FREN 2010 or equivalent. (Sp)

FREN 2030 Intermediate French for Everyday Communication 3
Development of intermediate-level conversational skills, communication strategies, and cultural knowledge through immersion in a French-speaking environment. Offered only through USU's study abroad program in France. Cannot be substituted for FREN 2010 or 2020. Graded Pass/Fail *only*. (Su)

FREN 2050 French Second Year I Study Abroad 4
Intensive second-year language course designed to increase proficiency in the four language skills and in intercultural knowledge, with more emphasis on communication through reading and writing. Offered only through USU's summer study abroad program in France. Prerequisite: FREN 1020 or equivalent. (Su)

FREN 2150 French Second Year II Study Abroad 4
Intensive second-year language course designed to increase proficiency in the four language skills and in intercultural knowledge, with more emphasis on communication through reading and writing. Offered only through USU's summer study abroad program in France. Prerequisite: FREN 2010 or 2050 or equivalent. (Su)

FREN 2820 Intermediate Independent Study: Experiencing Paris 2
Intermediate-level independent study project focusing on the city of Paris, its history, culture and patterns of life. Offered only through USU's summer study abroad program in France. (Su)

FREN 2880 Individual Readings 3®
Individual study of selected readings in French. Cannot be substituted for FREN 2010 or 2020. Prerequisite: Instructor's permission. (Su)

Upper Division

Upper-division French courses (3000-level and above) are available *only* to students who have completed FREN 2020 or who can demonstrate equivalent proficiency through testing. (**Exception:** FREN 3500, Topics in French Literature in Translation, does *not* require the 2020-level prerequisite, and *will not count* toward the Bachelor of Arts degree language requirement.)

FREN 3030 Advanced French for Everyday Communication 3
Development of advanced conversational skills, communication strategies, and cultural knowledge through immersion in a French-speaking environment. Offered only through USU's study abroad program in France. Cannot be applied to requirements for the major or minor in French. Graded Pass/Fail *only*. (Su)

FREN 3060 CI French Conversation 3
Designed to develop effective communication skills, to increase vocabulary, and to teach students to express and justify facts, opinions, ideas, and emotions in French. Not open to students with foreign experience. Designed for students who have not had extended residence in a francophone country or extended exposure to a francophone environment.

FREN 3070 Advanced French Language Study Abroad I 4
Intensive upper-division language course combining grammar review, phonetics, advanced conversation and composition, and the study of culture, with an emphasis on current affairs. Offered only through USU's summer study abroad program in France. (Su)

FREN 3080 Advanced French Language Study Abroad II 4
Intensive upper-division language course combining grammar review, phonetics, advanced conversation and composition, and the study of culture, with an emphasis on current affairs. Offered only through USU's summer study abroad program in France. (Su)

FREN 3090 CI French Intermediate Written Communication 3
Provides students with intensive practice in various types of writing (e.g., summary, description, narration, letter-writing, etc.) based on a process approach. Involves discussion, writing, and revising. Stresses grammar review.

FREN 3500 DHA Topics in French Literature in Translation 3®
Reading, analysis, and discussion of important French literature in English translation. Topics and texts may vary. Course may be repeated for credit with different content.

FREN 3510 CI Business French* 3
Study of vocabulary, idioms, and expressions used in French business communications and an introduction to French business practices. (F)

FREN 3550 DHA French Civilization 3**
Study of historical, social, political, economic, and cultural conditions and institutions of France from early to modern times.

FREN 3570 France Today 3
Study of contemporary life in France, the French people, their daily habits, and their surroundings. What makes the French French. Extensive use of videos, films, and slides. Prerequisite: FREN 2020 or equivalent.

FREN 3600 Textual Analysis 3®
Introduction to the methods, terminology, and practice of textual analysis. Development of critical thinking and writing skills through the analysis of selected literary and nonliterary texts from different periods and genres, ranging from poetry, novels, and plays to film, painting, music, and art. Course may be repeated once for credit with different content.

FREN 3820 Advanced Independent Study: Experiencing Paris 2
Advanced-level independent study project focusing on the city of Paris, its history, culture, and patterns of life. Offered only through USU's summer study abroad program in France. (Su)

FREN 3880 Individual Readings 1-4®
Individual study of selected readings in French. Instructor's permission required. (F,Sp,Su)

FREN 3900 Topics in French and Francophone Studies 3®**
Studies through literature, media, and film on specific topics or themes. Discussion, analysis, and interpretation of selected literary and/or nonliterary works. Occasionally taught in English.

FREN 4060 CI Advanced French Conversation 3
Designed for students who have already reached advanced proficiency in speaking through foreign experience, but need to continue the development of their conversational skills. Prerequisite: FREN 3060 or permission of instructor.

FREN 4090 CI Advanced Written Communication 3
Continued development of French written communication skills based on a process approach. Includes the more advanced concepts of French grammar and extensive writing practice in variety of genres. Prerequisite: FREN 3090 or permission of instructor.

FREN 4200 Applied French Linguistics and Phonetics* 3
First part analyzes phonological and phonetic patterns of French. Second part deals with selected morphological and syntactic features of French.

FREN 4520 Information Technologies in French 3
Practices, theoretical issues, and policy concerns of information technologies resulting from computers, networking, and videodisk. Use of computer with French programs. Taught in French. This course is not currently being taught. For information about when it may be taught, contact the department.

FREN 4610 DHA Period Studies in French Literature* 3
Examination of a particular period or century. Involves close reading, discussion, analysis, and interpretation of selected literary and nonliterary texts. Sample topics include: The Medieval Period, The Renaissance, Classicism, Baroque, Romanticism, Naturalism, and Contemporary French Literature. Prerequisite: FREN 3600 or instructor's permission.

FREN 4620 DHA Genre Studies in French Literature 3**
Examination of a particular genre or body of works from a variety of periods and authors (e.g., novel, play, poetry, short story, film). Involves close reading, discussion, analysis, and interpretation of selected literary and nonliterary texts. Sample topics include: Romance Novels from the Middle Ages to the Present, From Classical to Contemporary French Theatre, French poetry from Baudelaire to Ponge, The Nouveau Roman, New Wave French Cinema, and The Negritude Movement. Prerequisite: FREN 3600 or instructor's permission.

FREN 4880 Individual Readings 1-4®
Readings in scientific, technical, or literary French. Prerequisite: Permission of instructor. (F,Sp,Su)

FREN 4900 Seminar in French and Francophone Studies 3®**
In-depth exploration of issues central to understanding language, literature, and culture. Critical reading and viewing of written and nonwritten texts with emphasis on student presentations, independent research, and the completion of extended projects. Seminar topics may focus on authors, literary periods, important historical events and social movements, and aspects of francophone cultures. Used periodically for literature in translation.

FREN 4920 French Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp)

FREN 6200 French Linguistics and Phonetics 3
Analysis of selected phonological, morphological, syntactic, and semantic features of contemporary French, including a study of colloquial French, comparing pronunciation, vocabulary, and grammar with standard forms. Prerequisite: FREN 2020, another 3000-level or higher FREN course, or demonstrated proficiency through testing.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Geology (GEO)

See Department of Geology, pages 290-295

GEO 1010 BPS Introduction to Geology: Geology of National Parks 3
Plate tectonics and internal and external earth processes, using national parks for examples. Emphasizes mineral and rock identification, as well as recognition of basic geologic features. Two lectures per week and seven weeks of lab. (F,Su) DE

GEO 1060 BPS Introduction to Environmental Geoscience 3
Explores the earth's internal and external processes. Interprets the roles these processes play in human habitation of the planet. Evaluates the interplay occurring between humans and the earth, as in the distribution of resources and the development of civilization. (Sp)

Course Descriptions

GEO 1110 BPS The Dynamic Earth: Physical Geology 4
Physical processes, both internal and external, shaping the Earth. Igneous, metamorphic, and sedimentary environments and products. Emphasizes geology as an applied science, relying on other basic sciences as tools for interpretation and understanding. Three lectures and one two-hour lab per week. (F,Sp) DE

GEO 1120 Geology of National Parks Field Trip 1
One weekend field trip to a western national park, allowing students to observe geologic features and processes, and to gain hands-on practice in rock identification. Limited to 30 participants. Requires some strenuous hiking. Prerequisite or corequisite: GEO 1010. (F,Su)

GEO 2250 Introductory Internship/Co-op 1-4®
Introductory educational work experience. (F,Sp,Su)

GEO 2500 Geology Field Excursions 1®
Geologic features and processes observed in the field. Graded Pass/Fail *only*. Prerequisite: GEO 1010 or 1110. (F,Sp)

GEO 3100 DSC Natural Disasters 3
Hazardous geologic processes affecting humans. Cause, prediction, avoidance, and frequency of natural disasters, including earthquakes, volcanic eruptions, tsunamis, landslides, floods, subsidence, meteorite impacts, and global changes. Topics discussed in the context of earth systems and cycles. Three lectures per week. Prerequisite: One Breadth Physical Sciences (BPS) course. (Sp) DE

GEO 3200 DSC The Earth Through Time 4
Investigates dynamic nature of Earth's physical and biological processes, and how these processes have shaped Earth's 4.5 billion-year history. Emphasis on interpretation of the story of the geologic record (rocks and landforms) and Earth's sequential physical and biological changes. Three lectures and one two-hour lab per week. Prerequisite: GEO 1010 or 1110. (Sp) DE

GEO 3300 DSC Geology of the World's Oceans 3
Geologic evidence for the development of ocean basins and continental margins through plate tectonic processes. Also, the interaction of the geo- and biospheres and their effect on the evolution of the oceans and atmosphere. Discussion of shoreline and marine environments, the organisms inhabiting them, and the physical and chemical processes in operation therein. Three lectures per week. Prerequisite: One University Studies Breadth Physical Sciences (BPS) course. (Sp)

GEO 3500 Mineralogy and Crystallography 4
Introduction to crystallography, crystal chemistry, and descriptive mineralogy. Three lectures and one three-hour lab per week. Prerequisites: CHEM 1210 and GEO 1110. (F)

GEO 3520 Optical Mineralogy and Petrography 2
Introduction to the theory of optical crystallography. Determination of minerals using the petrographic microscope. One lecture and one lab per week. Prerequisite: GEO 3500. (Sp)

GEO 3550 CI Sedimentation and Stratigraphy 4
Classification and analysis of sedimentary rocks and structures, with an emphasis on the interpretation of ancient sedimentary environments. Controls on sedimentary processes over time. Principles of stratigraphic correlation. Three lectures and one lab per week. Prerequisite: GEO 3200. (F)

GEO 3600 Geomorphology 4
Geomorphic processes, origin of landforms and surficial deposits. Emphasizes fluvial and hillslope landscape elements, and surficial geologic mapping. Three one-hour lectures and one three-hour lab per week. Prerequisite: GEO 1010 or 1110 or GEOG 1000. Also taught as WATS 3600. (F)

GEO 3700 Structural Geology 4
Geometries, mechanisms, and mechanics of rock deformation. Stress and strain relationships, fault and fold classification and description. Lab presents applications and techniques for representing deformed rocks in map, cross section, and three-dimensional views; interpretation of deformed rocks. Three lectures and one lab per week. Prerequisite: GEO 1110. (Sp)

GEO 4250 Advanced Internship/Co-op 1-4®
Advanced educational work experience. (F,Sp,Su)

GEO 4500 Igneous and Metamorphic Petrology* 4
Origin, processes of formation, classification, and identification of igneous and metamorphic rocks. Study of igneous and metamorphic rocks in hand specimens and thin sections. Three lectures and one three-hour lab per week. Prerequisite: GEO 3500; corequisite: GEO 3520. (Sp)

GEO 4700 CI Geologic Field Methods* 3
Collection, recording, and interpretation of geologic deposits and processes in the field. Written reports with geologic maps, cross-sections, and graphs are required. Two extended lab periods per week, weekend day trips, and one lecture per week. Fieldwork will end early. Prerequisite: GEO 3700. (F)

GEO 4900 Special Problems 1-4®
Directed study of selected topics. Written report required. Prerequisite: Permission of instructor. (F,Sp)

GEO 5150 Fluvial Geomorphology 3
(dual listing 6150)
Focuses on physical processes in streams that control their shape, plan form, slope, bed material, and distribution of channel bars. Emphasizes field analysis of these topics, and application of geomorphology to aquatic ecology and environmental restoration. Also taught as WATS 5150/6150. (F)

GEO 5170 Fluvial Geomorphology Lab 2
(dual listing 6170)
Field analysis focuses on physical processes in streams which control their shape, plan form, slope, bed material, and distribution of channel bars. Application of geomorphology to aquatic ecology and environmental restoration. Also taught as WATS 5170/6170. (F)

GEO 5200 Geology Field Camp* 5
Integrative approach to examining geologic relationships in the field, deciphering geologic evolution of map regions, and interpreting the structure and distribution of rocks. Results presented in reports, maps, cross-sections, and graphical formats. Requires 40-45 hours of lab per week for 3.5-4.0 weeks. Prerequisites: GEO 3500, 3550, 3600, 3700, 4700. (Su)

GEO 5410 Introduction to Clay Mineralogy* 2
(dual listing 6410)
Introduction to and application of techniques, such as X-ray diffraction, differential thermal analysis, and chemical analysis, to study of clay minerals. Examination of the effects of clay mineral structures on physical and chemical properties. Three lectures and one lab per week; half semester. Prerequisite: GEO 3500. (Sp)

GEO 5420 Metallic Mineral Deposits* 4
Origin and occurrence of metallic mineral deposits, study of representative ore suites, and field trips to active mines. Three lectures and one lab per week. Prerequisite: GEO 4500. (Sp)

GEO 5430 Paleontology* 2
Survey of prominent microfossil, invertebrate, and vertebrate groups, including their diagnostic morphologic features, stratigraphic ranges, and environmental tolerances. Equips students with the necessary information and techniques to enable them to recognize and utilize fossils in stratigraphic and paleoenvironmental interpretation. Three lectures and one lab per week. Half semester; may be paired with GEO 5440. Prerequisite: GEO 3200. (F)

GEO 5440 CI Paleoecology* 2
(dual listing 6440)
Interrelationships between various organisms and between organisms and their environment. Provides field, laboratory, and quantitative techniques for the interpretation of ancient environments and the analysis of past biotic interrelationships. Three lectures and one lab per week. Half semester; may be paired with GEO 5430. Prerequisite: GEO 5430. (F)

GEO 5460 Advanced Physical Sedimentology* 3
(dual listing 6460)
Detailed interpretation of sedimentary rocks, based on petrography and sedimentary characteristics. Source terranes, tectonic settings, depositional environments, and diagenetic changes during burial. Three lectures and two labs per week. Half semester. Prerequisites: GEO 3500 and 3550. (F)

GEO 5470 Chemical Sedimentary Rocks* 2
(dual listing 6470)
Application of field observations, hand-sample, thin-section, and X-ray diffraction analyses to the interpretation of chemical sedimentary rocks. Emphasizes determination of depositional environment and evaluation of diagenetic changes. Three lectures and one lab per week. Half semester. Prerequisites: GEO 3500 and 3550. (Sp)

GEO 5480 Sedimentary Basin Analysis 3
(dual listing 6480)
Detailed coverage of techniques of sedimentary basin analysis, including depositional systems, provenance, basin modeling, and fluid and heat flow history. Survey of types of sedimentary basins worldwide. Prerequisites: GEO 3500 and 3550. (F)

GEO 5500 Advanced Igneous Petrology* 4
(dual listing 6500)
Advanced concepts in the origin and evolution of magmatic systems, effects of different tectono thermal regimes on magma genesis, magma dynamics, and phase equilibria in magmatic systems. Concepts illustrated by rock suites from classic locations. Three lectures and three laboratory hours each week. Prerequisite: GEO 4500 or equivalent. (F)

GEO 5510 QI Groundwater Geology 3
Provides graduate students and senior undergraduates with understanding of fundamental principles of groundwater geology and hydrology, and helps prepare them for careers in hydrogeology or environmental geology. Three lectures per week. Prerequisites: GEO 1110 and MATH 1210 or permission of instructor; GEO/WATS 3600 recommended. (F)

GEO 5520 CI Techniques of Groundwater Investigations 3
(dual listing 6520)
Survey of techniques used in groundwater investigations for collecting physical and chemical data. Includes well drilling and construction; water level, flow rate, and discharge measurements; hydraulic and tracer tests; and groundwater sampling. Prerequisite: GEO 5510 or permission of instructor. (Sp)

GEO 5530 QI Petroleum Systems: Principles of Exploration and Development* 3
Analysis of the petroleum system from source to trap. Examines processes of generation, migration, and accumulation of oil and gas. Overview of petroleum economics and technology. Prerequisites: GEO 3550 and 3700; or permission of instructor. (Sp)

GEO 5540 QI Quantitative Methods in Geology* 3
(dual listing 6540)
Application of various quantitative methodologies to geologic problems. Requires student presentation on thesis research methodology. Two lectures and one lab per week. (F)

GEO 5550 Geochemical Application of Electron
(dual listing 6550) Microprobe and X-Ray Fluorescence Analysis* 4
Theory and application of X-ray fluorescence spectrometry and the electron microprobe to problems in geochemistry and materials analysis. Two hours lecture and six hours laboratory per week. Prerequisite: CHEM 1210 or equivalent, or permission of instructor. (Sp)

GEO 5560 Subsurface Analyses: Principles and Techniques* 1
Survey of techniques used to characterize subsurface geologic environments. Includes map and three-dimensional depictions, well-log analyses, reflection seismology, and volumetric and risk analysis. Prerequisites: GEO 3550, 3700, or permission of instructor. (Sp)

GEO 5600 Geochemistry 3
Application of thermodynamics, solution chemistry, phase diagrams, and both radioactive and stable isotopes to the understanding of earth processes. Three lectures per week. Prerequisite: GEO 3500. (F)

GEO 5610 Tectonic Evolution of North America* 3
(dual listing 6610)
Survey of tectonic styles and processes along plate margins, using the tectonic evolution of western North America as the prime example. Two lectures and one lab per week. Prerequisite: GEO 3700.

GEO 5620 QI Global Geophysics* 3
(dual listing 6620)
Application of physics to understanding geologic processes, the earth's interior, and the theory of plate tectonics. Two lectures and one two-hour lab per week. Prerequisites: GEO 3700 and PHYS 2220.

GEO 5630 Photogeology* 3
Interpretation of geologic features on aerial photographs. Three two-hour labs per week. Half semester; may be paired with GEO 4700. Prerequisites: GEO 3600, 3700. (Sp)

GEO 5650 Senior Thesis 1-4®
Prerequisite: Permission of instructor. (F,Sp)

GEO 5660 Applied Geophysics* 4
(dual listing 6660)
Field-oriented course involving data collection, data analysis, and overview/ introduction of geophysical imaging and analysis of the subsurface. For GEO 6660, students must complete a written project and presentation. Prerequisites: MATH 1210, PHYS 2210, 2220; or permission of instructor. (Sp)

GEO 5680 Paleoclimatology* 3
(dual listing 6680)
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as CLIM 5680/6680 and WATS 5680/6680. (Sp)

GEO 5900 Topics for Teachers 1-4®
Special topics in geology for elementary and secondary science teachers to provide an understanding of the geology of Utah and the Western United States. Emphasis on field and lab activities. Prerequisite: Introductory geology course or permission of instructor. DE

GEO 6050 Graduate Seminar in Tectonics (Topic) 1-3®
(dual listing 7050)
Advanced topics of current interest in tectonics and orogenesis. (F,Sp)

GEO 6100 Graduate Seminar in
(dual listing 7100) Geomorphology (Topic) 1-3®
Advanced topics of current interest in geomorphology and landscape evolution. (F,Sp)

GEO 6120 Advanced Geomorphology* 3
(dual listing 7120)
Process geomorphology seminar focusing on hillslope, tectonic, and climatic geomorphology research. (Sp)

GEO 6150 Fluvial Geomorphology 3
(dual listing 5150)
Focuses on physical processes in streams that control their shape, plan form, slope, bed material, and distribution of channel bars. Emphasizes field analysis of these topics, and application of geomorphology to aquatic ecology and environmental restoration. Also taught as WATS 6150/5150. (F)

GEO 6160 Hillslope and Landscape Geomorphology* 3
Includes basics of hillslope weathering, transport, and hydrologic processes. Surveys classic and recent literature on hillslope-scale and landscape-scale geomorphic research. Three lectures and several Saturday field trips. Prerequisite: GEO/WATS 3600. Also taught as WATS 6160. (Sp)

GEO 6170 Fluvial Geomorphology Lab 2
(dual listing 5170)
Field analysis focuses on physical processes in streams which control their shape, plan form, slope, bed material, and distribution of channel bars. Application of geomorphology to aquatic ecology and environmental restoration. Also taught as WATS 6170/5170. (F)

GEO 6200 Graduate Seminar in
(dual listing 7200) Geochemistry (Topic) 1-3®
Advanced topics of current interest in geochemistry. (F,Sp)

GEO 6240 Structural Analysis of Deformed Geological Materials* 3
Explores how rocks, sediments, ice, and soils deform. By examining the geometry, kinematics, mechanics, and mechanisms of deformation, students learn how to interpret deformed materials in the field and laboratory.

GEO 6250 (dual listing 7250) Mechanics and Processes in Earth Sciences* 3
Fundamentals of solid and fluid mechanics with applications to the earth sciences. Applications to rock deformation, fluid flow, glacier movement, and slope stability. Designed for graduate students in earth sciences and engineering. Two lectures, one lab per week. Prerequisites: MATH 1210, PHYS 2210, and graduate standing. (Sp)

GEO 6300 (dual listing 7300) Graduate Seminar in Petrology (Topic) 1-3®
Advanced topics of current interest in petrology of igneous, metamorphic, or sedimentary rocks. (F,Sp)

GEO 6350 (dual listing 7350) Graduate Seminar in Paleontology and Paleoecology (Topic) 1-3®
Advanced topics in paleontology and paleoecology. (F,Sp)

GEO 6400 (dual listing 7400) Graduate Seminar in Sedimentary Geology (Topic) 1-3®
Advanced topics of current interest in sedimentary geology, depositional systems, and basin evolution. (F,Sp)

GEO 6410 (dual listing 5410) Introduction to Clay Mineralogy* 2
Introduction to and application of techniques, such as X-ray diffraction, differential thermal analysis, and chemical analysis, to study of clay minerals. Examination of the effects of clay mineral structures on physical and chemical properties. Three lectures and one lab per week; half semester. Prerequisite: GEO 3500. (Sp)

GEO 6440 (dual listing 5440) Paleoecology* 2
Interrelationships between various organisms and between organisms and their environment. Provides field, laboratory, and quantitative techniques for the interpretation of ancient environments and the analysis of past biotic interrelationships. Three lectures and one lab per week. Half semester; may be paired with GEO 5430. Prerequisite: GEO 5430. (F)

GEO 6460 (dual listing 5460) Advanced Physical Sedimentology* 3
Detailed interpretation of sedimentary rocks, based on petrography and sedimentary characteristics. Source terranes, tectonic settings, depositional environments, and diagenetic changes during burial. Three lectures and two labs per week. Half semester. Prerequisites: GEO 3500 and 3550. (F)

GEO 6470 (dual listing 5470) Chemical Sedimentary Rocks* 2
Application of field observations, hand-sample, thin-section, and X-ray diffraction analyses to the interpretation of chemical sedimentary rocks. Emphasizes determination of depositional environment and evaluation of diagenetic changes. Three lectures and one lab per week. Half semester. Prerequisites: GEO 3500 and 3550. (Sp)

GEO 6480 (dual listing 5480) Sedimentary Basin Analysis 3
Detailed coverage of techniques of sedimentary basin analysis, including depositional systems, provenance, basin modeling, and fluid and heat flow history. Survey of types of sedimentary basins worldwide. Prerequisites: GEO 3500 and 3550. (F)

GEO 6500 (dual listing 5500) Advanced Igneous Petrology* 4
Advanced concepts in the origin and evolution of magmatic systems, effects of different tectono thermal regimes on magma genesis, magma dynamics, and phase equilibria in magmatic systems. Concepts illustrated by rock suites from classic locations. Three lectures and three laboratory hours each week. Prerequisite: GEO 4500 or equivalent. (F)

GEO 6510 (dual listing 7510) Graduate Seminar in Hydrology (Topic) 1-3®
Advanced topics of current interest in hydrology. (F,Sp)

GEO 6520 (dual listing 5520) Techniques of Groundwater Investigations 3
Survey of techniques used in groundwater investigations for collecting physical and chemical data. Includes well drilling and construction; water level, flow rate, and discharge measurements; hydraulic and tracer tests; and groundwater sampling. Prerequisite: GEO 5510 or permission of instructor. (Sp)

GEO 6540 (dual listing 5540) Quantitative Methods in Geology* 3
Application of various quantitative methodologies to geologic problems. Requires student presentation on thesis research methodology. Two lectures and one lab per week.

GEO 6550 (dual listing 5550) Geochemical Application of Electron Microprobe and X-Ray Fluorescence Analysis* 4
Theory and application of X-ray fluorescence spectrometry and the electron microprobe to problems in geochemistry and materials analysis. Two hours lecture and six hours laboratory per week. Prerequisite: CHEM 1210 or equivalent, or permission of instructor. (Sp)

GEO 6600 (dual listing 7600) Graduate Seminar in Geophysics (Topic) 1-3®
Advanced topics of current interest in geophysics. (F,Sp)

GEO 6610 (dual listing 5610) Tectonic Evolution of North America* 3
Survey of tectonic styles and processes along plate margins, using the tectonic evolution of western North America as the prime example. Two lectures and one lab per week. Prerequisite: GEO 3700.

GEO 6620 (dual listing 5620) Global Geophysics* 3
Application of physics to understanding geologic processes, the earth's interior, and the theory of plate tectonics. Two lectures and one two-hour lab per week. Prerequisites: GEO 3700 and PHYS 2220.

GEO 6660 (dual listing 5660) Applied Geophysics* 4
Field-oriented course involving data collection, data analysis, and overview/introduction of geophysical imaging and analysis of the subsurface. For GEO 6660, students must complete a written project and presentation. Prerequisites: MATH 1210, PHYS 2210, 2220; or permission of instructor. (Sp)

GEO 6680 (dual listing 5680) Paleoclimatology* 3
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as CLIM 6680/5680 and WATS 6680/5680. (Sp)

GEO 6700 (dual listing 7700) Graduate Seminar in Structural Geology (Topic) 1-3®
Advanced topics of current interest in structural geology. (F,Sp)

GEO 6800 Seminar 1-4®

GEO 6900 Graduate Internship/Co-op Experience 1-6®
Graduate educational work experience. Prerequisite: Approval of contract between student and department prior to enrollment. (F,Sp,Su)

GEO 6970 Thesis 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

GEO 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

GEO 7050 (dual listing 6050) Graduate Seminar in Tectonics (Topic) 1-3®
Advanced topics of current interest in tectonics and orogenesis. (F,Sp)

GEO 7100 (dual listing 6100) Graduate Seminar in Geomorphology (Topic) 1-3®
Advanced topics of current interest in geomorphology and landscape evolution. (F,Sp)

GEO 7120 (dual listing 6120) Advanced Geomorphology* 3
Process geomorphology seminar focusing on hillslope, tectonic, and climatic geomorphology research. (Sp)

GEO 7200 (dual listing 6200) Graduate Seminar in Geochemistry (Topic) 1-3®
Advanced topics of current interest in geochemistry. (F,Sp)

GEO 7250 (dual listing 6250) Mechanics and Processes in Earth Sciences* 3
Fundamentals of solid and fluid mechanics with applications to the earth sciences. Applications to rock deformation, fluid flow, glacier movement, and slope stability. Designed for graduate students in earth sciences and engineering. Two lectures, one lab per week. Prerequisites: MATH 1210, PHYS 2210, and graduate standing. (Sp)

GEO 7300 (dual listing 6300) Graduate Seminar in Petrology (Topic) 1-3®
Advanced topics of current interest in petrology of igneous, metamorphic, or sedimentary rocks. (F,Sp)

GEO 7350 (dual listing 6350) Graduate Seminar in Paleontology and Paleoecology (Topic) 1-3®
Advanced topics in paleontology and paleoecology. (F,Sp)

GEO 7400 (dual listing 6400) Graduate Seminar in Sedimentary Geology (Topic) 1-3®
Advanced topics of current interest in sedimentary geology, depositional systems, and basin evolution. (F,Sp)

GEO 7510 (dual listing 6510) Graduate Seminar in Hydrology (Topic) 1-3®
Advanced topics of current interest in hydrology. (F,Sp)

GEO 7600 (dual listing 6600) Graduate Seminar in Geophysics (Topic) 1-3®
Advanced topics of current interest in geophysics. (F,Sp)

GEO 7700 (dual listing 6700) Graduate Seminar in Structural Geology (Topic) 1-3®
Advanced topics of current interest in structural geology. (F,Sp)

GEO 7800 Graduate Seminar Series 1®
Graded Pass/Fail *only*. (F,Sp,Su)

GEO 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

GEO 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

*This course is taught alternating years. Check with department for information about when course will be taught.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Geography (GEOG)

See Department of Environment and Society, pages 271-278

GEOG 1000 BPS Physical Geography 3
Geographic analysis of physical processes and spacial distribution of natural elements (i.e., the atmosphere, hydrosphere, lithosphere, and biosphere). (F,Sp,Su) DE

GEOG 1005 Physical Geography Lab 1
Laboratory exercises in natural physical geography. Provides initial field and laboratory experiences in the earth system. Required for all geography majors. Prerequisite: GEOG 1000 (may be taken concurrently). (F,Sp)

GEOG 1300 BSS World Regional Geography 3
Survey of world cultural regions, with an analysis of political, economic, and resource patterns in their physical setting. (F) DE

GEOG 1400 BSS Human Geography 3
Spatial study within selected socio-cultural settings, including cultural landscapes, rural-urban linkages, languages, religions, politics, and economic activities. (Sp) DE

GEOG 1990 Professional Orientation for Geography 1
Introduces new Geography majors to the range of discipline and related professional careers utilizing concepts and tools of geography. Includes a discussion of current issues, education, curricula, faculty, professional societies, and employment opportunities. (F)

GEOG 2130 Population Geography 3
Spatial analysis of demographic data emphasizing global distribution, population growth, measures of density, migration, settlement, and economic development. (Sp)

GEOG 3430 Political Geography 3
Study of relationship between Earth, people, and the state. Global political phenomena studied from a geographic perspective. Explores impact of natural resources territorial seas and the nature of the state. Also taught as POLS 3430. (Sp)

GEOG 3610 Geography of Rural/Urban Planning* 3
Analysis of the organization and interrelationships of urban-city and rural space. Emphasizes spatial planning of rural-urban environments to improve quality of life, internal structure of cities, and applied principles and practices of community planning. Field trips and applied class projects integrated into lectures and demonstrations. (F)

GEOG 3850 Map, Air Photo, and GIS Interpretation 4
Introduces students to theoretical and practical nature of maps, basic mapping processes, issues of scale, basic photogrammetry, interpretation of remotely sensed imagery, geographic referencing strategies, and geographic information systems. Includes weekly laboratory sessions. (F)

GEOG 4100 (dual listing 6100) Geographic Approaches to the Human-Environmental Relationship 3
Introduces students to the study of human-environmental interactions from a geographic perspective, with special emphasis on the social and political dymanics of selected environmental problems and how these dynamics interrelate across different spatial and temporal scales. (Sp)

GEOG 4120 (dual listing 6120) Environment and Development in Latin America 3
Examines the changing environment and developmental geography of Latin America. Focuses on globalization throughout history, along with its impact on lives and environments in the region, varied and changing human-environment relationships, and processes of economic and social inequality. (F)

GEOG 4140 (dual listing 6140) Violent Environments: Linking Ecology and Conflict in Sub-Saharan Africa 3
Examines the relationship between violent conflict and natural resources, with particular attention given to human rights and political ecology perspectives. Through specific cases, conflict resources are explored, along with the threat they pose to national, regional, and global security. Also includes discussion of the diverse actors that profit from the persistence of conflict and civil unrest. (Sp)

GEOG 4200 CI Regional Geography 3®
Analysis of physical and cultural geography for a variety of regions. Can be repeated for each different region as offered (e.g., Pacific Rim, Africa, Middle East, Europe, Asia, Latin America, and North America). DE

GEOG 4300 Geography Education
(dual listing 6300) Classroom Practicum 1-3®
Allows geography education students to participate in actual geography classroom teaching with experienced geography teachers. Students observe, work with individuals and groups of students, team-teach lesson(s) with the teacher, and self-teach individual lesson(s). (F,Sp,Su)

GEOG 4800 Teaching Geography 3
(dual listing 6800)
Designed specifically for geography education/social studies education students preparing to teach grades K-12. Exploration of national and state standards and core curriculum, as well as state-of-the-art geography education technology and teaching resources. Students develop teaching lessons, and gain classroom teaching experience with local geography teachers. (F)

GEOG 4850 Cartographic Design* 3
Techniques used in design and construction of maps, charts, and map projections. (Sp)

GEOG 5130 Geography Education Field Practicum 1-6®
(dual listing 6130)
Specifically designed for undergraduate students and graduate students (teachers) who need specific classroom teaching experience in order to improve their quality of teaching and/or to carry out special classroom curriculum research as part of their geography education degrees. (F,Sp,Su)

GEOG 5650 DSS Developing Societies 3
(dual listing 6650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as ANTH 5650/6650 and SOC 5650/6650. (F) DE

GEOG 5810 Geography Education Inservice Workshop 3
(dual listing 6810)
Assists classroom teachers in broadening their perspective of Geography Education through increased knowledge, improving their geographic techniques, methods, and teaching resources for their classrooms. (F,Sp,Su)

GEOG 5900 Graduate Special Topics 1-4®
(dual listing 6900)
Designed for geography students involved in field research and/or internships. Provides opportunity for students to gain practical applied experience in their specialized academic emphasis in geography. (F,Sp,Su)

GEOG 5970 Classroom Technology
in Geography Education 3
Design, development, and application of contemporary technologies and multimedia classroom teaching resources for preservice and inservice geography education teachers. (F,Su)

GEOG 6100 Geographic Approaches to the
(dual listing 4100) Human-Environmental Relationship 3
Introduces students to the study of human-environmental interactions from a geographic perspective, with special emphasis on the social and political dymanics of selected environmental problems and how these dynamics interrelate across different spatial and temporal scales. (Sp)

GEOG 6120 Environment and Development
(dual listing 4120) in Latin America 3
Examines the changing environment and developmental geography of Latin America. Focuses on globalization throughout history, along with its impact on lives and environments in the region, varied and changing human-environment relationships, and processes of economic and social inequality. (F)

GEOG 6130 Geography Education Field Practicum 1-6®
(dual listing 5130)
Specifically designed for undergraduate students and graduate students (teachers) who need specific classroom teaching experience in order to improve their quality of teaching and/or to carry out special classroom curriculum research as part of their geography education degrees. (F,Sp,Su)

GEOG 6140 Violent Environments: Linking Ecology
(dual listing 4140) and Conflict in Sub-Saharan Africa 3
Examines the relationship between violent conflict and natural resources, with particular attention given to human rights and political ecology perspectives. Through specific cases, conflict resources are explored, along with the threat they pose to national, regional, and global security. Also includes discussion of the diverse actors that profit from the persistence of conflict and civil unrest. (Sp)

GEOG 6200 Advanced Regional Geography 3®
Critical analysis of world's regions, focusing on analysis and synthesis of a region's economic, political, population, and cultural themes in the context of physical environment and global processes. Repeatable for different regions. (F,Sp,Su)

GEOG 6300 Geography Education
(dual listing 4300) Classroom Practicum 1-3®
Allows geography education students to participate in actual geography classroom teaching with experienced geography teachers. Students observe, work with individuals and groups of students, team-teach lesson(s) with the teacher, and self-teach individual lesson(s). (F,Sp,Su)

GEOG 6650 Developing Societies 3
(dual listing 5650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as ANTH 6650/5650 and SOC 6650/5650. (F)

GEOG 6800 Teaching Geography 3
(dual listing 4800)
Designed specifically for geography education/social studies education students preparing to teach grades K-12. Exploration of national and state standards and core curriculum, as well as state-of-the-art geography education technology and teaching resources. Students develop teaching lessons, and gain classroom teaching experience with local geography teachers. (F)

GEOG 6810 Geography Education Inservice Workshop 3
(dual listing 5810)
Assists classroom teachers in broadening their perspective of Geography Education through increased knowledge, improving their geographic techniques, methods, and teaching resources for their classrooms. (F,Sp,Su)

GEOG 6900 Graduate Special Topics 1-4®
(dual listing 5900)
Designed for geography students involved in field research and/or internships. Provides opportunity for students to gain practical applied experience in their specialized academic emphasis in geography. (F,Sp,Su)

*Taught 2010-2011.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

German (GERM)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

Lower Division

GERM 1010 German First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to those with more than one year high school German or equivalent. (F,Sp) DE

GERM 1020 German First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: GERM

1010 or at least one (but not more than two) years of German in high school or equivalent. (F,Sp) DE

GERM 1800 German I Study Abroad 1-4®
Intensive study in a German-speaking country, advancing proficiency in the four language skills and multicultural knowledge at the beginning level. No prerequisites. (Su)

GERM 2010 German Second Year I 4
Further development of first-year competencies with emphasis on language structure, vocabulary expansion, reading, writing, and conversation in the context of cross-cultural analysis. Prerequisite: GERM 1020 or equivalent. (F,Sp)

GERM 2020 German Second Year II 4
Further development of first-year competencies with emphasis on language structure, vocabulary expansion, reading, writing, and conversation in the context of cross-cultural analysis. Prerequisite: GERM 2010 or equivalent. (F,Sp)

GERM 2550 German Civilization* 3
Covers the most important developments in German-speaking countries from the High Middle Ages to the present. Deals with political, social, literary, historical, and artistic expressions of an emerging culture. Taught in English. (F)

GERM 2570 Contemporary Germany 3**
Covers the most important elements of contemporary German culture in its literary, social, and artistic manifestations, and the political and historical dimensions of agents of change. Taught in English. (Sp)

GERM 2800 German II Study Abroad 1-4®
Intensive study in a German-speaking country, advancing proficiency in the four language skills and multicultural knowledge at the second-year level. (Su)

GERM 2880 Individual Readings 1-4®
Individual study of selected readings in German. Prerequisite: Instructor's permission. (F,Sp)

Upper Division

Upper-division German courses (3000 level and above) are available *only* to students who have completed GERM 2020 or who can demonstrate equivalent proficiency through testing. All upper-division courses are taught in German, unless otherwise indicated.

GERM 3000 DHA Introduction to German Studies 3
Introduction to the discipline of German Studies (history, literature, the arts, philosophy, science, economics, politics, etc.), addressing information resources, research methods, student career goals, and practice. Advances oral and written language proficiency. (F)

GERM 3040 CI Advanced German Grammar and Composition 3
GERM 3050 CI Advanced German Grammar and Composition 3
Thorough review of German grammar and style. Application of rules of writing to compositions. Oral presentations of contemporary topics with graded difficulty. (F) (Sp)

GERM 3300 DHA Contemporary German Speaking Cultures 3
Multidisciplinary examination of current trends in contemporary cultures. Written, oral, visual, and electronic texts from the post-World War II period will be analyzed and placed in sociopolitical, economic, historical, and literary contexts. Emphasis on Germany as a multicultural society, and on related popular and minority cultural discourse. Interactive format. (Sp)

GERM 3510 CI Business German* 3
Study of current German business and commercial practices, terminology, and business-related communications skills in a multi-disciplinary and global world context. Advances the four language skills. (Sp)

GERM 3540 CI Techniques in Translating German Texts* 3
Approaches to translation. Specialized vocabulary, reference materials, and aids. Translation theory. Practical exercises. (F)

GERM 3550 DHA Cultural History of German Speaking Peoples 3**
Overview and critical analysis of cultural, historical, and intellectual developments that have shaped the civilizations of German-speaking peoples from 800 A.D. until the end of World War II. Examination of written, oral, visual, and electronic texts integrated in the context of Western philosophy and humanist thought. Interactive format. (F)

GERM 3600 DHA Survey of German Literature I 3**
Overview, with selected readings, of the major literary trends in German-speaking cultures from the medieval period to the early nineteenth century, including the study of genres, epochs, styles, and theories in the context of evolving cultures. (F)

GERM 3610 DHA Survey of German Literature II 3**
Overview, with selected readings, of the major literary trends in German-speaking cultures from the early nineteenth century to the present, including the study of genres, epochs, styles, and theories in the context of evolving cultures. (Sp)

GERM 3800 German III Study Abroad 1-4®
Intensive study in a German-speaking country, advancing proficiency in the four language skills and multicultural knowledge at the third-year level. (Su)

GERM 3880 Individual Readings 1-4®
Individual study of selected readings in German. Prerequisite: Instructor's permission. (F,Sp)

GERM 4200 Applied German Linguistics and Phonetics 3**
Discussion of syntactical and morphological problems of German, principles of language learning, and analysis of phonological and phonetic patterns. (Sp)

GERM 4600 Faust's Legacy 3**
Examination of the legendary figure of Faust through historical and contemporary perspectives. Analysis of the Faust theme and character as presented in literature, films, stage productions, and musicals. Taught in English. (F)

GERM 4610 German Narratives 3**
Readings from a wide range of narrative texts representing various historical periods. Focus on literary traditions within historical contexts. Examination of styles, motifs, and the theory of the novel. (Sp)

GERM 4650 DHA Trends in Modern German Literature* 3
Study of literary movements, topics, and styles of modern (twentieth century) German literature. Concentration on texts representing a variety of aesthetic expressions, central to experiences of twentieth-century life. (F)

GERM 4800 German IV Study Abroad 1-4®
Intensive study in a German-speaking country, advancing proficiency in the four language skills and multicultural knowledge at the fourth-year level. (Su)

GERM 4880 Individual Readings 1-4®
Readings in technical, scientific, and literary German. Prerequisite: Instructor's permission. (F,Sp)

GERM 4900 Special Topics* 3®
Selected critical topics and themes relating to German literature, culture, film, pedagogy, linguistics, and associated theories. Includes readings in English and German. Content determined by student need and interest. (Sp)

GERM 4910 German for Special Purposes 3**
Advances German communicative proficiency in the fields of business, science, and pedagogy. Promotes professional applications of German terminologies and procedures for science and commerce, as well as teaching methodology. Discipline-interactive projects advance the four language skills. (Sp)

GERM 4920 German Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp,Su)

GERM 6200 German Linguistics and Phonetics 3
Discussion of syntactical and morphological problems of German and principles of language learning. Phonological and phonetic patterns of the German language also discussed. Prerequisite: GERM 2020, another 3000-level or higher GERM course, or demonstrated proficiency through testing. (Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Greek (GRK)

See Department of History, pages 304-309

Also see Classics Minor, page 211

GRK 1010 Beginning Ancient Greek I 5
Basics of Greek grammar and vocabulary. Beginning readings. Prerequisites: LATN 1010, 1020. (F)

GRK 1020 Beginning Ancient Greek II 5
Intermediate concepts of Greek grammar and vocabulary. Intermediate readings. Prerequisite: Minimum grade of *B* in GRK 1010. (F)

GRK 3300 Intermediate Greek Prose 3
Readings in ancient Greek prose. Prerequisite: Minimum grade of *B* in GRK 1020. (F)

GRK 3330 Intermediate Greek Poetry 3
Readings in Greek poetry. Prerequisite: Minimum grade of *B* in GRK 3300. (F)

GRK 4300 Advanced Greek Readings 3®
Readings in Ancient Greek poetry and/or prose. Prerequisites: Minimum grades of *B* in GRK 3300 and 3330. (F)

GRK 4930 Directed Readings in Greek Poetry and Prose Authors 1-3
Directed readings in advanced Greek poetry and prose authors. Prerequisite: Successful completion of at least three semesters of Greek. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Humanities, Arts, and Social Sciences (HASS)

See College of Humanities, Arts, and Social Sciences, pages 135-137

HASS 1250 Interdisciplinary Workshop 1-5®
(F,Sp,Su)

HASS 2250 Introductory Internship/Co-op 1-5®
Introductory-level educational work experience in an internship or cooperative education position approved by the College of Humanities, Arts, and Social Sciences. Graded Pass/Fail *only*. (F,Sp,Su) DE

HASS 3050 The Arts in Cultural Context 3
Interdisciplinary study of a work, figure, or theme in the arts. When possible, taught in conjunction with Arts and Lecture Series sponsored by Caine School of the Arts. Topics vary. (F,Sp)

HASS 4250 Advanced Internship/Co-op 1-15®
Internship or cooperative education position of a more professional level, with increased complexity, approved by the College of Humanities, Arts, and Social Sciences. Graded Pass/Fail *only*. (F,Sp,Su) DE

HASS 4900 Rhetoric Associates Seminar 2
Training course for students to learn how to effectively peer tutor fellow students in writing. Overview of theory, grammar, and interpersonal communication skills. (F)

HASS 4910 Study Abroad 1-20
A semester study abroad experience through a student exchange program. Graded SP (Satisfactory Progress) *only*. Prerequisite: Approval from the Study Abroad Office. (F,Sp,Su)

HASS 5250 Interdisciplinary Workshop 1-5®
(F,Sp,Su)

HASS 6250 Graduate Internship/Co-op 1-15®
Internship or cooperative education position approved by the department and/or the College of Humanities, Arts, and Social Sciences. (F,Sp,Su)

HASS 6910 Study Abroad 1-12
A semester study abroad experience through a student exchange program. Prerequisite: Approval from the Study Abroad Office. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Health Education Professional (HEP)

See Department of Health, Physical Education and Recreation, pages 296-303

HEP 2000 First Aid and Emergency Care 2
Provides instruction and practical experience for the development of first aid knowledge, skills, and personal judgment. Focuses on recognizing emergencies, activating EMS, and providing direct care. (F,Sp,Su) DE

HEP 2300 Cardiopulmonary Resuscitation 1
Techniques and skills of adult, child, and infant airway management and cardiopulmonary resuscitation for the lay person (one rescuer). Taught according to current standards. (Arr)[1]

HEP 2500 Health and Wellness 2
Designed to enable students to enhance personal wellness by gaining understanding about the social, physical, spiritual, and emotional dimensions of health, and by applying different strategies for improving personal health behaviors. (F,Sp,Su) DE

HEP 3000 Drugs and Human Behavior 3
Students evaluate the historical and modern use, misuse, and abuse of drugs in relation to current concepts of physical, social, and emotional wellness. Special emphasis on educational and community strategies for prevention of drug-related problems. (F,Su) DE

HEP 3100 School Health Programs 3
Essentials of the existing paradigm of Comprehensive School Health Programs and their development in relation to current child health status. Assessment, planning, implementation, and evaluation. Prerequisite: Formal acceptance into the School Health Education Emphasis or School Health Minor or consent of instructor. (F)

HEP 3200 Consumer Health 3
Focuses on helping students become discriminating consumers of health information, health products, and health services. (F,Su) DE

HEP 3300 Clinical Experience I 1
Clinical experience in school health education. Graded Pass/Fail *only*. Prerequisite: Acceptance into School Health major or minor. (F,Sp)

HEP 3400 Stress Management 3
Concepts and principles of personal stress management, with special emphasis on effective stress management coping strategies, maximizing positive stress outcomes, and minimizing negative stress effects, to aid in obtaining and maintaining a balanced health homeostatic condition. (F,Sp) DE

HEP 3500 Elementary School Health Education 2
Explores child health status and the vital roles that the school/elementary teacher plays in enabling children to acquire healthful lifestyle behaviors while increasing their potential for academic success. (F,Sp) DE

HEP 3600 CI Introduction to Community Health 3
Introduction to agencies, facilities, and programs playing a role in protection and promotion of health in the community. Special emphasis on competencies necessary for the health educator to function in a variety of community settings. (F) DE

HEP 3900 Social Marketing in Health Education 3
Explores social marketing techniques used in health promotion and examines the marketing process, which includes formative research, target audience analysis and segmentation, marketing mix, marketing strategies, pretesting, implementation, and evaluation. Prerequisites: HEP 2500 and passing score on Computer and Information Literacy (CIL) Exam. (Sp)

HEP 4100 Foundations of Community Health 3
Professional preparation course for health education majors. Primary emphasis on ethical issues, behavioral and sociological theories used in the profession, philosophical issues, technology, and health education methodologies. Prerequisite: HEP 2500. (Sp)

HEP 4200 QI Planning and Evaluation for Health Education 3
Provides indepth study of planning, implementation, and evaluation of school and community health education programs. Students obtain hands-on experience planning a health education program. Prerequisites: HEP 3600; MATH 1030 or STAT 1040. (F)

HEP 4250 Advanced Cooperative Work Experience 1-15®
Professional-level cooperative education work experience as student advances toward completion of the program. Graded Pass/Fail *only*. Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 4300 Clinical Experience II 1
Clinical experience in school health education. Graded Pass/Fail *only*. Prerequisite: Acceptance into School Health major or minor. (F,Sp)

HEP 4400 Creative Methods in Teaching Health Education 3
Planning, designing, and evaluating comprehensive school health education curricula and instruction for secondary school students, utilizing various creative instructional strategies and materials. Participation in peer teaching experiences. Prerequisites: HEP 2500, junior standing, and acceptance into School Health Education. (F,Sp)

HEP 4500 Sexuality Education Within the Schools 3
Emphasizes broad understanding of human sexuality, with specific focus on adolescent sexuality/behavior, age and topic appropriate instruction, state law, and effective curriculum/strategies for human sexuality education within the secondary schools. Prerequisite: Formal acceptance into the School Health Education emphasis or School Health minor, or consent of instructor. (Sp)

HEP 4600 Field Work in Health Education 1-9®
Supervised student participation in school or community health programs or directed projects. Prerequisites: HEP 3600, 4100, and consent of instructor. (F,Sp,Su)

HEP 4700 Honors Senior Thesis 1-6
Requirements for the honors thesis include: (1) a detailed review of scholarly literature on the health topic of interest to the student, and (2) the collection of primary data on the topic of interest (e.g., through interviews, surveys, focus groups, etc.), which must include references. The student must meet regularly with the faculty mentor, who will help with the development of the honors thesis. (F,Sp,Su)

HEP 5000 CI Race, Culture, Class, and Gender Issues in Health 3
Focuses on how multicultural issues affect health status and health choices. Special emphasis on how race, ethnicity, culture, socioeconomic status, and gender impact health status and access to health care. Prerequisite: Junior standing. (Sp)

HEP 5100 CI Cultural and Complementary Medicine 3
Provides in-depth view into health beliefs, traditions, and practices of various cultures and of the major minority groups in the U.S. Emphasizes ancient, eastern, and native health practices collectively known as complementary medicine and healing modalities. (Arr)[1]

HEP 5200 International Health 3
Explores meaning of "health" through the lens of different cultures. Provides an international comparison of health status, including morbidity and mortality data. Evaluates different programs, policies, and strategies for addressing international health problems. Prerequisite: Junior standing. (Arr)[1]

HEP 5300 Grant Proposal Writing 3
Teaches practical skills needed to plan and write proposals for federal, state, local, and private funding. Students develop proposals in area in which they have developed expertise, and coordinate with a local agency for funding. Prerequisites: HEP 2500, fulfillment of Communications Literacy CL2 requirement, and passing score on Computer and Information Literacy (CIL) Exam. Enrollment limited to Health Education and Public Health majors *only*. (Sp)

HEP 5500 Student Teaching Seminar 2
Weekly seminar dealing with the professional practice of school health education. Graded Pass/Fail *only*. Prerequisite: HEP 4400. (F,Sp)

HEP 5630 Student Teaching 10
Practical experience teaching health in the public school system. Graded Pass/Fail *only*. Prerequisite: HEP 4400. (F,Sp)

HEP 5700 Special Topics in Health 1-6®
In-depth review and discussion of special topics in health. May be graded Pass/Fail, as determined by instructor or section. (Arr)[1] DE

HEP 5900 Independent Study 1-3®
Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 5950 Independent Research 1-3®
Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 6000 Evaluating Health-Promotion Programs 3
Students learn to develop and carry out a health-promotion program evaluation, interpret the results of an evaluation, and identify implications for future program planning. (Sp)

HEP 6100 Current Trends in Health Promotion 3
Focuses on trends and issues in the promotion of health behaviors in a variety of settings. Analyzes and challenges prevailing assumptions and philosophies in relation to health promotion. (F)

HEP 6250 Graduate Cooperative Work Experience 1-15
Professional level of education work experience in a cooperative education position for graduate students. Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 6300 Stress Management 3
Explores concepts and principles of personal stress management, with special emphasis on effective stress management coping strategies, maximizing positive stress outcomes, and minimizing negative stress effects, thus aiding in obtaining and maintaining a balanced, healthy homeostatic condition. (Arr)[1]

HEP 6500 Proposal Seminar for Health Education 2
During this seminar, second-year health education graduate students develop a thesis proposal adhering to departmental, college, and University guidelines. Students apply what they have learned in theory, research methods, and statistics courses for the final proposal. Graded Pass/Fail *only*. Prerequisites: EDUC 6570, 6600, and HEP 6800; or consent of instructor. (F)

HEP 6600 Field Work in Health Education 2®
Supervised student participation in school or community health projects or directed projects. Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 6700 Special Topics in Health 1-6®
In-depth review and discussion of special topics in health. (Arr)[1]

HEP 6800 Seminar in Health Behavior 3
Explores current theoretical perspectives in relation to behaviors. Students critically examine theories commonly used in health education. Focuses on practical application of theory in health promotion programs. (F)

HEP 6900 Independent Study 1-3®
Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 6950 Independent Research 1-3®
Prerequisite: Consent of instructor. (F,Sp,Su)

HEP 6970 Thesis 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

HEP 6990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

[1]This class is not taught on a regular basis. See department for further information.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

History (HIST)

See Department of History, pages 304-309

HIST 1060 BHU Introduction to Islamic Civilization 3
Survey of Islamic civilization from the Prophet Muhammed to the present. DE

HIST 1100 BHU Foundations of Western Civilization: Ancient and Medieval 3
Survey of institutions and developments of early and medieval Western civilization from its Mediterranean origins to the beginning of the early modern period. (F,Sp,Su) DE

HIST 1110 BHU Foundations of Western Civilization: Modern 3
Survey of the institutions and developments in Western civilization from 1500 to the present. (F,Sp,Su) DE

HIST 1500 BHU Cultural and Economic Exchange in the Pre-Nineteenth Century World 3
Surveys pre-Nineteenth Century cultural and economic interactions in important zones of exchange. Regional focus determined by instructor. Themes may include: trade, religious conversion, migration, slavery, warfare, and other types of cross-cultural exchange. (F,Sp) DE

HIST 1510 BHU The Modern World 3
Survey of world history from the beginning of the nineteenth century to the present. (F,Sp,Su) DE

HIST 1600 American Cultures in Film 3
Introduction to major ethnic groups in America and their treatment in recent feature films. Also taught as ENGL 1600. (F,Sp)

HIST 1700 BAI American Civilization 3
Fundamentals of American civilization. Covers history, political system, and economic institutions of the United States. Fulfills American Institutions requirement. DE

HIST 2010 Special Topics Seminar 3
Study of special cross-cultural topics, including Imperial Paris, British India, Slavery in America, and Ute History.

HIST 2210 BHU Introduction to Folklore 3
Introduction to major genres of folklore (folk narrative, custom, folk music and song, vernacular architecture and arts), folk groups (regional, ethnic, occupational, familial), and basic folklore research method (collecting and archiving). Also taught as ANTH 2210 and ENGL 2210. (F,Sp) DE

HIST 2700 BAI United States to 1877 3
Survey of the development of American society, economy, culture, and politics to 1877. (F,Sp,Su) DE

HIST 2710 BAI United States 1877-Present 3
Survey of the development of American society, economy, culture, and politics since 1877. (F,Sp,Su) DE

HIST 2720 Survey of American Folklore 3
Principal ethnic, regional, and occupational folk groups in America. Relations between folklore and American history, literature, and society. Key genres in American folklore (narrative, art, song, etc.) and their role in American culture. Also taught as ENGL 2720 and ANTH 2720. (Sp)

HIST 3010 Introduction to Buddhism 3**
General survey of historical development, basic doctrine, and practice of Hinayana and Mahayana Buddhism. Also taught as RELS 3010.

HIST 3020 Introduction to Hinduism 3**
Surveys history, doctrinal developments, and sociological concerns of Hinduism from the Vedic Period through the Modern Period. Focuses primarily on Hindu religious thought as applied to Hindu life through various modes of religious action. Also taught as RELS 3020.

HIST 3070 DHA Perspectives in Folklore 3®
In-depth study of folklore for nonmajors. Topics vary according to faculty expertise. Also taught as ENGL 3070. (F,Su)

HIST 3110 DHA/CI Ancient Near East* 3
Survey of history and civilization of ancient Mesopotamia, Egypt, and Israel, from prehistory to 500 B.C. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. Also taught as ARTH 3110. (Sp)

HIST 3130 DHA/CI Greek History 3
History of Greece from Neolithic period to modern times. Special emphasis on politics, art, literature, and civilization. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3150 CI Roman History 3
History of Rome from Neolithic era to "fall" of the Western Empire. Special emphasis on politics, art, literature, and civilization. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (Sp)

HIST 3220 DHA/CI Medieval European Civilization, 500-1500 3
Provides students with overview of major themes in medieval European history from 500 to 1500 A.D. Also introduces major historiographical problems related to this period. Writing intensive and document based. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3230 Early Modern Europe 3
Explores major themes of early modern European history, such as secularization, the rise of the nation state, the Reformation, and the birth of capitalism. Introduces major historiographical issues of the period. Reading and writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3240 Modern Europe from 1789 to the Present 3
Historical survey of Europe from the French Revolution to the present, with special emphasis on political and cultural implications of imperialism. Prerequisite: HIST 1110. DE

HIST 3250 DHA/CI Renaissance Europe 1300 to 1520 3
Emphasizing writing and primary sources, covers significant changes in Europe in government, society, and intellectual life caused by the Black Death, the humanist revolution in arts and literature, and the centralizing efforts of popes and monarchs. (F,Sp) DE

HIST 3260 History of Spain and Portugal 3
History of Iberian peninsula from fifteenth century to the present. Age of Exploration, conquest and colonization in the Americas and Africa, eighteenth century reforms, constitutional monarchies, civil wars, and twentieth century dictatorships. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3280 East Central Europe Since 1520 3
Examines history of East Central Europe, with special emphasis on growth of nationalism and establishment of the states of Czechoslovakia, Hungary, and Poland. Emphasizes research and writing.

HIST 3310 Balkans Since 1389 3
Examines history of Balkan peninsula, with special emphasis on growth of nationalism and establishment of Bulgaria, Albania, Greece, Romania, and Yugoslavia. Emphasizes research and writing.

HIST 3320 Tsarist Russia 3
Political, economic, and cultural development of Russian people to 1917. Writing and computer intensive.

HIST 3330 The Soviet Union and its Heirs 3
Beginning with the Russian Revolution, surveys political, cultural, and economic history of the Soviet Union and the regional states emerging in its wake. Writing and computer intensive.

HIST 3410 The Modern Middle East 3
Examines history of the Middle East (Arabian peninsula, Fertile Crescent, Egypt, Iran, and Turkey), with special emphasis on social and political currents which have shaped the area's history. DE

HIST 3460 Comparative Asian History 3
Surveys history of Asian continent, analyzing common patterns in the cultures of West, South, Southeast, and East Asia.

HIST 3480 History of China 3
Development of traditional Chinese culture and effect on that culture of the growth of Western influence. Writing and computer intensive.

HIST 3490 Survey of Japanese History 3
Surveys history of Japan from its beginnings to the present. Explores early Japan's cultural, social, and economical evolution. Covers feudal Japan and its transition toward joining the fraternity of nations. Studies World War II and its effects on Japan. Discusses contemporary conditions of Japan. (F)

HIST 3510 Africa and the World 3
Explores foundation of Africa's contemporary problems. Surveys Africa's history of interactions with Asia and Europe. In addition to writing several short essays covering readings and films, students investigate an aspect of cultural, political, or economic interaction and prepare a short research paper.

HIST 3530 African Environmental History 3
Surveys changing historical relationship between Africans and their physical environment. Readings cover ecological change in arid, savanna, rain forest, and montane environments. Students also survey and evaluate the methods and sources used by environmental historians to explain environmental stress, degradation, and rehabilitation.

HIST 3550 DHA Culture of East Asia 3
Helps students explore and appreciate the culture of three East Asian countries: China, Japan and Korea. Students gain sincere view and understanding of these East Asian cultures through readings, hands-on cultural activities, viewing video materials, writing, and discussions. Topics include: major historical and social events, customs and traditions, thoughts and beliefs, people, food, contemporary issues, art, literature, and film. Also taught as ANTH 3550 and LANG 3550. DE

HIST 3620 History of Colonial Latin America 3
Surveys art, culture, religion, and social organization of the Aztecs, Incas, and Mayas, and of the European dominated post-conquest. Introduces students to major historiographical problems in the field. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3630 History of Modern Latin America 3
Introduces history and historiography of Latin America from the wars of independence to the contemporary era. Writing intensive.

HIST 3640 History of Social Movements in Latin America 3
Examines the changing nature of social movements in Latin America from the nineteenth century to the present. Topics include social movements concerning citizenship, religion, unions, feminism, torture, poverty, indigenous rights, and environmentalism. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3650 Caribbean History 3
Surveys the Caribbean from pre-Columbian cultures to the present, with special emphasis on slavery, colonialism, piracy, immigration, independence and revolutionary movements, nation-building, artistic creation, and tourism. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3660 History of Mexico 3
Surveys Mexico from the rise of indigenous states to the present, with special emphasis on indigenous culture, colonialism, independence, the U.S.-Mexican War, the French Intervention, the Mexican Revolution, political reform, everyday life, globalization, and border issues. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3670 Slavery in the Atlantic World 3
Examines slavery in the Americas from the Atlantic perspective (including Africa and Europe) from the Fifteenth Century until abolition, with special emphasis on the slave trade, the plantation system, daily life, slavery and race, resistance, the Haitian Revolution, and abolition in the Americas. Prerequisite: Fulfillment of Communications Literacy CL2 requirement.

HIST 3700 CI Regional Folklore* 3
Study of folklore and folklife as they relate to regional cultures. Also taught as ENGL 3700. (F,Sp)

HIST 3710 CI Folklore Colloquium 3®
Issues, problems, and methodologies in folklore study. Focus and instructor variable. Also taught as ENGL 3710 and RELS 3710. (Sp)

HIST 3720 Colonial America 3
Advanced survey of North American Colonies, emphasizing British experience, from their founding to 1763. Addresses major issues of interpreting America's beginnings. (F) DE

HIST 3730 The New American Nation 3
Advanced survey of American history from 1763 to 1800, with special emphasis on historiography of the Revolution, creation of a Republic, and efforts to define the New Nation. (Sp)

HIST 3740 United States in the Age of Jefferson and Jackson 3
Examines history of United States from 1800 to 1846, from election of Jefferson to outbreak of war with Mexico. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (F) DE

HIST 3750 Civil War and Reconstruction 3
Analysis of most trying period in U.S. history, with special emphasis on the course and results of the war. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (Sp) DE

HIST 3755 The Gilded Age (U.S. 1877-1900) 3
Examines national politics, culture, and social and economic change in late nineteenth-century America.

HIST 3760 DHA/CI The United States, 1900-1945 3
Analyzes scholars' approaches to U.S. history in the early twentieth century, with attention to socio-economic change, political reform, and transforming impact of American involvement in two world wars. Writing intensive. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (Sp) DE

HIST 3770 Contemporary America, 1945-Present 3
Domestic and foreign policy since World War II. Emphasizes Cold War, Civil Rights, and the political and social developments of contemporary United States. Contains intensive writing component. (F)

HIST 3840 Twentieth Century American West 3
Considers emerging scholarly literature about the American West in the twentieth century, with attention to economic, environmental, and demographic questions. (Sp)

HIST 3850 DHA/CI History of Utah 3
Prehistory to the present. Examines environment and peoples of Utah, emphasizing use of primary documents to view and interpret Utah's past. Reading and writing intensive. Requires use of USU Special Collections and Archives. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (Sp) DE

HIST 3900 DSC Science and Technology in World History 3
Explores the nature of scientific and technological change. Employs historical approach as the means for exploring the relationships between science, technology, and human values. Investigates how science and technology have shaped economic, political, military, societal, environmental, and cultural life. Prerequisites: Passing scores on all Computer and Information Literacy (CIL) exams, fulfillment of Communications Literacy CL2 requirement. (F)

HIST 3950 DHA/CI Environmental History 3
Surveys writings from a relatively new genre of historical scholarship that attempts to explain the relationship between human society and the natural world. Readings focus on North America, but students also have opportunity to survey materials from the non-Western world. Course is reading and writing intensive, and requires students to conduct a research project in which they construct the history of a particular landscape. DE

HIST 4010 Buddhism in the West 3**
One-semester introduction to Buddhism in the Western world for nonspecialists in Buddhism. Focuses on development of Buddhism as a Western religious phenomenon. Presents interpretive, historical introduction to Buddhism in the West. Also taught as RELS 4010.

HIST 4210 Celtic Europe 3**
History of Celtic peoples in British Isles, Scandinavia, and continental Europe, from Neolithic times to the Norman Conquest in 1066. Computer intensive. Also taught as ARTH 4210. (F)

HIST 4230 DHA/CI The History of Christianity in the West 3
Introduces students to history of Christian spirituality, asking how Christianity has been lived and how it has shaped lives over two thousand years. Uses original sources to introduce both the history and the historiographical problems surrounding the Christian religion. Writing intensive.

HIST 4250 The Reformation in Britain: 1450-1688 3
Focuses on major research questions in the field of early modern studies. Explores causes and consequences of English Reformation and British Civil War. Writing and research intensive. DE

HIST 4290 Europe and the French Revolution, 1700-1815 3
Examines causes and consequences of the French Revolution, introducing students to major themes in its interpretation.

HIST 4310 History of Nationalism 3
Examines development of nationalism. Addresses different theories of nationalism, and then tests these theories with various case studies. Emphasizes research and writing.

HIST 4320 DHA History of Scientific Thought 3
Examination of key episodes in the history of science and associated ideas about the nature of scientific knowledge and how it may be acquired. Also taught as PHIL 4320. (Sp)

HIST 4330 Modern Germany with Special Emphasis on the Twentieth Century 3
Historical survey of Germany beginning with Frederick the Great of Prussia, and considering the parallel history of the Habsburg empire and the Germany of the Kleinstaaterei. Considers wars and economic and political developments beginning in 1871, which produced the Nazi period. Prerequisite: HIST 1110.

HIST 4350 Greek Intellectual History 3
Through reading and discussing Greek literature and philosophy, attempts to understand the major Greek philosophers, in the context of the major literary authors of the period and contemporary political developments. Prerequisite: CLAS 3210. (Sp)

HIST 4390 British Imperialism from 1688 to the Present 3
Topical survey of British Imperialism from 1688 to the present. Topics include the interaction of British imperialism with foreign policy; social, economic, and political institutions; the life of the mind and senses; and non-European cultures. Prerequisite: HIST 1110.

HIST 4400 DHA History of Aviation and Aeronautics 3
Traces aeronautics from its origins to the present day. Examines selected topics concerning flight within the earth's atmosphere from an international perspective, with particular emphasis on the United States of America.

HIST 4510 The History of Urban America 3
Examines the history of communities, cities, and suburbs in American history, from the Colonial era to the present. Explores how forces, including immigration, economic growth, and technological change, shaped American cities. Also examines subjects connected to urban history, including architectural history, as well as the history of landscape architecture and urban planning.

HIST 4550 DHA/CI Women and Gender in America 3
Writing intensive course drawing on film, primary documents, and readings to trace the history of women, emphasizing race, class, and gender influences of each era. Also taught as WGS 4550. (F)

HIST 4600 DHA/CI The History of the American West 3
Traces major themes in nineteenth century history of the land between the Mississippi River and the Pacific Coast. In a writing intensive course, students use primary documents and secondary materials to discover the race, class, and gender issues that shaped the American West. DE

HIST 4610 Themes and Methods in Economic History 3
Themes and methods in economic history, drawing on various societies and time periods. Designed to prepare future historians to work in their field. Prerequisite: MATH 1030 or STAT 1040.

HIST 4620 CI Advanced Seminar in American Studies 3
Practical introduction to theories and methods of American Studies, utilizing interdisciplinary research around a central theme, subject, or text(s). Strongly recommended for American Studies majors and American Studies minors. Open to students who have taken three courses in literature and/or history. Also taught as ENGL 4620. (F,Sp)

HIST 4630 The History of Mexican Americans 3
Reading-intensive and writing-intensive course, examining the historical experiences of Mexican Americans, from prior to the U.S. annexation of Northern Mexico in 1848 to the present. Special emphasis given to immigration and migration, labor, gender, race and ethnicity, and the social and cultural evolution of Mexican Americans within American society.

HIST 4640 CI Studies in the American West 3
Interdisciplinary course in American Studies, exploring the region of the West through the analysis of literary texts, historical sources, and socio-cultural materials. Also taught as ENGL 4640. (F,Sp) DE

HIST 4700 Folk Material Culture 3**
Study of folk objects and their connections with culture and history. Also taught as ENGL 4700. (Sp)

HIST 4710 American Indian History 3
Prehistory to the present. Emphasizes ethnohistory and the Western U.S., focusing on intercultural contacts, subsistence and environmental change, and contemporary political and economic issues, while analyzing primary documents and secondary readings. (F)

HIST 4720 CI/DHA The Civil Rights Movement 3
Traces struggle of black Americans for equality since emancipation, with emphasis on the post-World War II period. Focuses on the individuals and social trends that laid the groundwork for change by the mid-Twentieth Century. Prerequisite: Fulfillment of Communications Literacy CL2 requirement. (F,Sp)

HIST 4730 CI History of Black America 3
Study of African-American experience from slavery to freedom, as well as the difficult quest for democracy and equality in contemporary America. Includes both creative and research writing components. (Sp)

HIST 4740 American Immigration History 3
Examines history of immigration to the United States from Europe, Africa, Latin America, and Asia. Requires library research, especially in government documents, and use of oral history techniques. (F)

HIST 4750 Advanced Folklore Workshop: Fife Conference 3®
Focuses on one theme or topic in folklore, and offers lectures from nationally prominent scholars in the area. Taught during one week, every day and all day. Also taught as ENGL 4750. (Su)

HIST 4780 DHA American Financial History 3
Explores American financial history from the nineteenth century to the present. Covers historical development of the U.S. banking system, the stock market, coins and currency, the Federal Reserve system, accounting practices, credit, monetary policy, taxation, and personal finance. (Sp)

HIST 4790 American Religious History 3**
Varieties of American religious experience from settlement to the present.

HIST 4800 The Supreme Court and American Constitutional History 3
Examines many of the major arguments made about the Constitution, which were presented before the Supreme Court of the United States. Also taught as POLS 4800.

HIST 4810 American Military History 3
Covers evolution of the military in American history and society from 1775 to the present.

HIST 4820 World War II in Europe 3
Focuses exclusively on World War II developments in the ETO. That is, the efforts of the Allied forces, mainly the United States, Britain, the Soviet Union, Free France, Canada, and resistance fighters and British Commonwealth soldiers against the expansion and occupation of most of Eurasia by Nazi Germany and/or Fascist Italy. Covers the chronology of 1939 to 1945. Included in the course's scope is the Holocaust. (Sp)

HIST 4821 DHA World War II in Asia 3
Focuses on Japanese and Allied fighting in the Pacific and the Asian mainland from 1937 to 1945. British, French, and Dutch losses in Asia to Japan, as well as efforts to recover them. U.S.-Japanese conflict in the Pacific Theater. (Sp)

HIST 4830 CI/DHA Structure of Engineering Revolutions 3
Provides an integrated approach to the history of engineering practice. Students research the life cycle of a major engineering project from historical, political, and economic perspectives, while using original sources and conducting interviews. Prerequisites: Completion of CIL exams; STAT 1040 or MATH 1050; fulfillment of Communications Literacy CL2 requirement. (Sp)

HIST 4850 Interpreting the Past for Teachers 3
Focuses on nonformal educational experiences open to secondary school students outside of the classroom. Interpretive modes examined include historical film, documentaries, living history programs, history fairs and festivals, and historical novels and magazines. (F,Sp)

HIST 4860 Teaching History 3
Designed to introduce history teaching majors to ethical and methodological issues arising in history classroom. (F) DE

HIST 4870 Teaching World History: Themes, Approaches, and Materials 3
For history teaching majors and minors *only*. Introduces students to a number of approaches to the study and teaching of world history. Students survey theoretical and pedagogical literature, then assemble a course package, which is presented to their peers. (Sp)

HIST 4880 History Workshop: Special Topics 1-3®
Focuses on a theme or topic in history. (F,Sp,Su)

HIST 4890 DHA Cold War in Asia 3
Explores history of the Cold War conflicts in Korea and Vietnam, from Asian and American perspectives. Students ascertain the economic, political, military, environmental, diplomatic, psychological, and demographic implications of these conflicts for the U.S., as well as for the Asians involved. (F,Sp)

HIST 4891 DHA Cold War: Vietnam and Afghanistan 3
Focuses on the later stages of the Cold War in Asia, 1961-1991, in Vietnam and Afghanistan.

HIST 4910 Special Studies in History 3®
Examination of special areas and themes in history. (F,Sp,Su) DE

HIST 4930 Directed Readings 1-3®
Directed readings in any special historical field. For each credit granted, minimum of four books must be read. Prerequisite: Instructor's approval. DE

HIST 4940 Historical Internship 1-3®
Directed internship involving participation in a historical research or cultural management project. (F,Sp,Su) DE

HIST 4945 (dual listing 6840) Archives Management/ Archives Internship 3
Through a mixture of lecture, discussion, and hands-on activities, provides an introduction to archives and archival practices. Examines archival practices in the real world, and discusses how archival institutions interact with the public in general and with historians in particular. Drawing on his experience as a professional archivist, the instructor uses materials held in USU Special Collections and Archives to teach this course.

HIST 4990 CI Special Topics in History 3®
Senior history seminar emphasizing historiographical literacy, research, and writing skills in relation to a specific historical topic. Prerequisites: Lower- and upper-division courses in areas relating to topic in question. (F,Sp,Su) DE

HIST 5690 CI American Studies Capstone Seminar 3
Required for students majoring in American Studies. Enables students to synthesize American Studies theory and methods with interdisciplinary cognate courses. Supports senior thesis design and writing, allowing topics to reflect individual programs of study. Also taught as ENGL 5690. (Sp)

HIST 5700 Folk Narrative 3
Forms and functions of folk narrative genres: myth, legend, folktale, memorate, and ballad. Also taught as ENGL 5700.

HIST 6000 Historical Methods and Research 3
Introduction to the historical profession, emphasizing research and writing skills, as well as the critical assessment of scholarly works. Should be taken at beginning of student's graduate program. Required for history master's students. (F)

HIST 6010 History and Theory 3®
Examination of major works that have influenced the theory and practice of historical writing. History master's students are required to complete HIST 6010, 6020, or another theory-enriched course.

HIST 6020 Approaches to History 3®
Uses readings in particular instructor's field to underscore theories and methods different historians bring to their subject. History master's students are required to complete HIST 6010, 6020, or another theory-enriched course.

HIST 6030 Research Seminar 3®
Research in primary sources for graduate students.

Course Descriptions

HIST 6100 Special Topics: Ancient History 3®
Intensive readings and group discussions of selected topics in ancient history.

HIST 6130 Special Topics: Early Modern European History 3®
Intensive readings and group discussions of selected topics in early modern European history.

HIST 6160 Special Topics: Modern European History 3®
Intensive readings and group discussions of selected topics in modern European history.

HIST 6200 Special Topics: Comparative World History 3®
Intensive readings and group discussions of selected topics in comparative world history.

HIST 6230 Special Topics: Middle Eastern History 3®
Intensive readings and group discussions of selected topics in middle eastern history.

HIST 6260 Special Topics: Asian History 3®
Intensive readings and group discussions of selected topics in Asian history.

HIST 6300 Special Topics: African History 3®
Intensive readings and group discussions of selected topics in African history.

HIST 6330 Special Topics: Latin American History 3®
Intensive readings and group discussions of selected topics in Latin American history.

HIST 6400 Special Topics: American History 3®
Intensive readings and group discussions of selected topics in American history. DE

HIST 6430 Special Topics: Western American History 3®
Intensive readings and group discussions of selected topics in Western American history.

HIST 6460 Seminar in Environmental History 3
Focuses on historical writings seeking to explain relationship between society and nature. Many of assigned readings are set in the non-Western world.

HIST 6500 Archiving Internship 2-4®
Directed internship at a regional archive. Internship should reflect eight to sixteen hours of work per week during the semester. (F,Sp,Su)

HIST 6520 Editing Internship 2®
Training in requirements of editorial work in scholarly journals and books. Emphasis placed on editing techniques and mechanics of editorial work. Can be repeated once for credit. (F,Sp,Su)

HIST 6540 Museum Internship 2-4®
Directed internship at a regional museum. Internship should reflect eight to sixteen hours of work per week during the semester. (F,Sp,Su)

HIST 6560 Professional Internship 2-4®
Directed internship involving participation in a historical research project for a government agency, corporation, municipality, or some other entity. (F,Sp,Su)

HIST 6580 Teaching Internship 2®
Involves working with the teacher of an upper-division undergraduate course. Intern prepares, explains, and grades one of the written assignments in the course, as well as completing work required of the undergraduates. Can be repeated once for credit. (F,Sp,Su)

HIST 6600 American Studies Theory and Method 3
Provides students with theory and method of graduate-level research in American Studies. Also taught as ENGL 6600. (F)

HIST 6610 Seminar on the American West 3-4®
Readings and research on topics in the American West. Interdisciplinary focus suitable for graduate students in History and American Studies. Also taught as ENGL 6610. (F)

HIST 6620 Seminar in Native American Studies 3-4®
Readings and research on topics in Native American history and culture. Interdisciplinary focus suitable for graduate students in History and American Studies. Also taught as ENGL 6620. (F)

HIST 6630 Studies in Film and Popular Culture 3®
Offered annually on a rotating basis by professors in folklore and English (Cultural Studies, Literature, British and Commonwealth). Topics and theoretical approaches vary, but the primary focus is on feature films. Also taught as ENGL 6630. (F)

HIST 6700 Folklore Theory and Method 3
Serves as orientation for new graduate students in folkore. Introduces students to comparative annotation, folklore indices, oral-formulaic theory, performance theory, contextual analysis, and other approaches. Also taught as ENGL 6700. (F)

HIST 6710 Space, Place, and Folklore 3
Study of expressive culture in relation to space and place in social theory. Perspectives range from ideas about landscape and region to globalization. Also taught as ENGL 6710. (Sp)

HIST 6720 Folklore Fieldwork 3
Basic methodology class for folklorists and oral historians. Students learn interviewing techniques and other methods for observing and recording the performance of tradition and traditional history. Also taught as ENGL 6720. (F,Sp)

HIST 6730 Public Folklore 3
Provides history and analysis of governmental involvement in protecting, promoting, and otherwise manipulating and utilizing cultural heritage. Also taught as ENGL 6730. (F,Sp)

HIST 6740 Folk Narrative 3
Covers principal narrative genres in folk tradition (myth, tale, legend, ballad) and the basic theories for their analysis and discussion. Also taught as ENGL 6740. (Sp)

HIST 6750 Advanced Folklore Workshop (the Fife Conference) 3
Intensive workshop focusing on a topic in folklore. Brings in nationally known experts as lecturers and discussants. Taught during one week, every day and all day. Also taught as ENGL 6750. (Su)

HIST 6760 Cultural and Historical Museums 3
Examines outdoor cultural and historical museums, examining their function in modern multi-cultural societies. Also taught as ENGL 6760. (Sp)

HIST 6770 Seminar in Folklore and Folklife 3®
Conducts close, professional-level study of major areas of folklore and folklife research. Also taught as ENGL 6770. (F,Sp,Su)

HIST 6800 Paleography 3
Skills course covering subjects such as technology of writing, interpretation of hands, and mastery of abbreviations. Useful to any student working with old manuscripts, it is essential for those writing theses in medieval or early modern European history.

HIST 6820 Writing Scholarly Reviews 3
Prepares students for writing, editing, and publishing reviews in their chosen discipline. Taught by book review editors at *Western American Literature* and *Western Historical Quarterly*.

HIST 6840 (dual listing 4945) Archives Management/ Archives Internship 3
Through a mixture of lecture, discussion, and hands-on activities, provides an introduction to archives and archival practices. Examines archival practices in the real world, and discusses how archival institutions interact with the public in general and with historians in particular. Drawing on his experience as a professional archivist, the instructor uses materials held in USU Special Collections and Archives to teach this course.

HIST 6860 Historical Criticism: Practicum 1-3
Preparation of critiques for student-presented projects entered into Utah History Fair state-wide competition. Operation of one-day workshop for History Fair finalists.

HIST 6880 Special Topics: Advanced History Workshop 1-3®
From teaching values of democracy in public school setting to writing publishable biographies, Department of History sponsors advanced credit workshops on a range of subjects.

HIST 6900 Directed Studies 1-3®
Directed readings in any special historical field. For each credit granted, a minimum of four books must be read. Instructor signature required. (F,Sp,Su)

HIST 6970 Thesis Research 1-6®
Graded Pass/Fail *only*. (F,Sp,Su)

HIST 6990 Continuing Graduate Advisement 1-6®
Graded Pass/Fail *only*. (F,Sp,Su)

*Taught 2010-2011.
**Taught 2009-2010.
® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Honors (HONR)

See Honors Program, page 310

Note: The following are general descriptions. For further details, see the Honors website at: **http://honors.usu.edu/**

HONR 1300 BAI U.S. Institutions 3
Interdisciplinary course providing basic understanding of history, principles, form of government, and economic system of the United States. Open only to students enrolled in USU Honors Program. (F)

HONR 1320 BHU Civilization: Humanities 3
Interdisciplinary course providing basic understanding of broad range of themes cutting across human history and continuing to be important in contemporary society. Covers both Western and non-Western civilization. Open only to students enrolled in USU Honors Program. (F,Sp)

HONR 1330 BCA Civilization: Creative Arts 3
Interdisciplinary course exploring questions such as: "What is art, and how do you judge it?" and "How does artistic expression vary across cultures?" Covers several forms of art. Students attend concerts, visit galleries, and attend theatrical performances. Open only to students enrolled in USU Honors Program. (F,Sp)

HONR 1340 BSS Social Systems and Issues 3
Interdisciplinary course that considers how a society of self-interested individuals can live together in peace and harmony. Topic explored from perspectives of different disciplines. Open only to students enrolled in USU Honors Program. (F,Sp)

HONR 1350 BLS Integrated Life Science 3
Interdisciplinary course focusing on basic concepts of life science. Demonstrates role of modeling, prediction, and observation in the process of scientific discovery, which occurs within an historical and social context. Open only to students enrolled in USU Honors Program. (F)

HONR 1360 BPS Integrated Physical Science 3
Interdisciplinary course focusing on basic concepts of physical science, including structure of matter and magnitude and character of the forces of nature. Demonstrates role of modeling, prediction, and observation in the process of scientific discovery, which occurs within an historical and social context. Open only to students enrolled in USU Honors Program. (F)

HONR 2000 Scholars Forum 1
Includes orientation to the Honors Program and to undergraduate research. Gateway to the Honors Program for entering first-year students. Taught online. (F)

HONR 2100 Honors Inquiry Seminar 1
Introduces students to the nature of inquiry in their field or major. Sections are major-specific. Assists students in planning their undergraduate education to enable them to graduate with Honors. Prerequisite: Admission to Honors Program. (Sp)

HONR 2200 Honors Enrichment 0.5®
Provides opportunity for Honors students to enhance their academic experience by attending and reflecting on a series of colloquia, as well as cultural and arts events. During the semester, students attend activities chosen from a menu prepared by the Honors Program. Each event affords an opportunity to react in writing, as well as orally during the bimonthly seminars. Grading based on attendance, participation, and written work. Prerequisite: Admission to Honors Program. (F,Sp)

HONR 3010 DSC Special Topics: Life and Physical Sciences 3®
Focuses on basic scientific concepts and methods of inquiry used by scientists. Considers science from a broad perspective, showing how various disciplines are related. Open only to students enrolled in USU Honors Program. (Sp)

HONR 3020 DHA Special Topics: Humanities/Creative Arts 3®
Humanities section focuses on important historical and contemporary cultural themes, both Western and non-Western. Creative Arts section examines one or more art forms across cultures. Covers several forms of art. Students attend concerts, visit galleries, and attend theatrical performances. Open only to students enrolled in USU Honors Program. (F)

HONR 3030 DSS Special Topics: Social Sciences 3®
Examines one or more social institutions and asks how we live within these structures from the perspectives of different disciplines. Open only to students enrolled in USU Honors Program. (Sp)

HONR 3900 Independent Study 1-3®
Independent research, library and/or laboratory work, or creative effort working in a one-to-one relationship with a faculty member. Limited to students actively pursuing an Honors degree. (F,Sp)

HONR 4000 Reading Seminar 1-3®
Opportunity to read, discuss, and write about books and current events. Open only to students enrolled in USU Honors Program. (F,Sp)

HONR 4700 Honors Fellows 0.5®
Junior or senior Honors students assist in leading Honors seminars and tutorials. (F,Sp)

HONR 4800 Thesis/Project Seminar 1
Oral presentation and discussion of Honors senior theses/projects. Guest presentations focus on essential contrasts and similarities in "ways of knowing" among various academic specialties. (F,Sp)

HONR 4900 Senior Thesis/Project 1-3®
All Honors students are required to submit a senior thesis/project for graduation with an Honors degree. Thesis/project may be in any area of student's choice, prepared in cooperation with an advisor drawn from the faculty at large. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Health Sciences (HS)

See Weber State University/Utah State University Nursing Program, pages 392-393

HS 2230 Introductory Pathophysiology 3
An introduction to the nature of disease and its effect on body systems. (Su)

Interior Design (ID)

See Interior Design Program, pages 316-318

ID 1700 Interior Design Professional Seminar 1®
Weekly seminars to provide an orientation to the professional aspects of interior design. Exploration of related careers and professional societies. Invited participation by outside speakers. Repeatable for up to eight credits. (F,Sp)

ID 1740 Computer Applications in Interior Design 3
Introduction to software specifically related to discipline of interior design. Computer techniques taught using personal computers and related peripherals. (F,Sp,Su)

ID 1750 BCA Design in Everyday Living 3
Investigation of the basic elements and principles of design related to everyday living experiences and the practical application of relevant theory. (F,Sp)

ID 1760 Rapid Visualization in Interior Design 3
Students develop and hone abilities in and understanding of various types of rapid visualization in interior design. (F,Sp,Su)

ID 1770 History of Interior Furnishings and Architecture I 3
Identification of historical architectural styles and elements in interior furnishings and materials, dating from ancients, middle ages, Italian renaissance, the Hispanic periods, and the French periods. (F)

ID 1780 History of Interior Furnishings and Architecture II 3
Identification of historical architectural styles and elements in interior furnishings and materials, including the English period and the American period, Victorian through the present. (Sp)

ID 1790 BCA Interior Design Theory 3
Explores basic philosophy of interior design. Analyzes design elements and principles when applied to interior spaces. Evaluation of contemporary design theories as factors influencing design trends. (Sp)

ID 2710 Architectural Graphics I 3
Competency development in use of drafting tools, symbols, and techniques used in interior design presentation. Includes communication skills related to techniques and approaches to graphic presentations of interior design solutions: floor plans, elevations, sections, axonometrics, details, and dimensioning. (F)

ID 2720 Architectural Graphics II 3
Introduction to three-dimensional drawing: isometric and perspective. Development of methods of rapid graphic communication techniques and approaches to complete professional presentations. Exploration of various types of media and presentation methods. Prerequisite: ID 2710. (Sp)

ID 2730 Interior Space Planning and Human Dimensions 3
Focuses on physical, psychological, and human factors influencing design of interior space. Includes research, programming, analysis, and design of residential and nonresidential spaces. Prerequisite: ID 2710. (Sp)

ID 2750 Computer Aided Drafting and Design I 3
Introduction to computer aided drafting and design for design students. Prerequisite: OSS 1400 or passing grade on Computer and Information Literacy (CIL) Exam. (F)

ID 2760 Computer Aided Drafting and Design II 3
Advanced exploration and study of computer aided design, creative applications, and proficiencies. Prerequisite: ID 2750. (Sp)

ID 3730 QI Interior Materials and Construction 3
Identification of current interior materials; their characteristics, use, and care. Experience in specification estimation, workroom procedures, and development of a working resource file. Prerequisite: ID 2730. (F)

ID 3760 Commercial Design Studio 4
Studio projects of various complexity and type, having commercial focus. May include hospitality, retail, medical, office, and other commercial and institutional design opportunities. Prerequisite: ID 2730. (F)

ID 3770 Residential Design Studio 4
Studio projects of various complexity and type, having residential focus. Analysis of various approaches to problem solving. Graphic and verbal presentation, emphasizing high-end design evaluation. Prerequisite: ID 3760. (Sp)

ID 3780 Design Detailing 3
Detailing of interior components. Preparation of detail drawings for use by the trades for interior components. Student develops construction documents and prepares scale model for senior exhibit. (Sp)

ID 3790 Architectural Systems 3
Study of architectural systems in contemporary buildings. Investigation of construction drawings and their interpretation. Includes related codes and professional terminology. (F)

ID 4700 Topics in Interior Design 3®
Current topics associated with interior design. Prerequisites: Approval of instructor and junior class standing. (F,Sp,Su)

ID 4710 Interior Design Advanced Internship I 1-12®
Placement experience in applying skills and knowledge in businesses and community agencies. One credit for each 50 hours of experience. Prerequisites: Approval of instructor and junior class standing. (F,Sp,Su)

ID 4720 Interior Design Advanced Internship II 1-12®
Placement experience in applying skills and knowledge in businesses and community agencies. One credit for each 50 hours of experience. Prerequisite: ID 4710. (F,Sp,Su)

ID 4740 CI Business and Professional Practices in Interior Design 3
Overview of business practices and principles for interior design, including: salesmanship, marketing, client and trade relationships, establishing an interior design practice, and fee structure. (Sp)

ID 4750 Senior Design Studio I 3
Interior design projects focusing on research, programming, schematics, space planning, project specifications, and presentation. Prerequisites: Senior ranking in Interior Design and ID 3780. (F)

ID 4760 Senior Design Studio II 3
Interior design projects include finish selections, specifications, construction document development, and project presentation. Prerequisite: ID 4750. (Sp)

ID 4770 Senior Exhibit 1
Analysis and review of student work in preparation for formal exhibition. (Sp)

ID 4780 Interior Design Travel Course 1-3®
Travel experiences geared toward the examination of design in various geographical locations, both within the United States and abroad. (F,Sp,Su)

ID 4900 Independent Study in Interior Design 1-5®
Focused independent activities. Students must identify a project or topic of interest and discuss with proposed instructor. Prerequisite: Junior class standing and approval of faculty. (F,Sp,Su)

ID 4910 Creative Projects 1-4®
Creative project or practicum conducted under direction of faculty member. Topic may be initiated by student or faculty. Prerequisites: Junior class standing and approval of faculty. (F,Sp,Su)

ID 6700 Graduate Topics in Interior Design 1-3®
(F,Sp,Su)

ID 6710 Graduate Internship in Interior Design 1-3®
(F,Sp,Su)

ID 6720 Research Methods in Interior Design 3
(F)

ID 6730 Interior Design Graduate Studio 1-6®
Requires research, analysis, and production of a given subject area, including its final planning, design, and documentation. Student plans project and executes it through individual initiative and scheduled consultation with the instructor. Prerequisite: Graduate standing. (F,Sp,Su)

ID 6750 Readings in Interior Design 1-3®
Readings about the creative process, post-occupancy evaluation, culture and environment, and design forecasting. Repeatable for up to 3 credits. (F,Sp)

ID 6760 Computer Applications of Modeling in Interior Design 3
Application of software to produce a model of interior spaces, using contemporary modeling software. Prerequisite: ID 2760. (Sp) DE

ID 6770 Facilities Planning and Management 3
Facilities management process in large-scale organizations. Formation of facilities policies, procedures, and standards. The facilities data base, space allocations, and management process. (Sp)

ID 6780 Design Methodologies in Interior Design 3
Identifies and defines various design methodologies, with regard to design solutions for interior environments. (F)

ID 6790 Master's Seminar in Interior Design 1-3®
Graded Pass/Fail *only*. (F,Sp)

ID 6900 Special Problems 1-3®
Selected problems to meet individual student interests and areas of concentration. Prerequisites: Graduate standing and permission of departmental faculty. (F,Sp,Su)

ID 6970 Master's Thesis Research in Interior Design 1-6®
Repeatable for up to 6 credits. (F,Sp,Su)

ID 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Intensive English Language Institute (IELI)

See Intensive English Language Institute, page 313

IELI 1120 Writing I 4
Develops writing skills. Focuses on description, narration, and canonical word order at sentence and paragraph levels. (F,Sp,Su)

IELI 1160 Reading I 4
Builds reading skills. Students read texts individually and collaboratively. Focuses on active reading (e.g., making use of background knowledge, predicting, and critically assessing reading passages). (F,Sp,Su)

IELI 1220 Writing from Sources 4
Focuses on sentence and paragraph writing. Students gather information from various sources, transform and organize it, and present it in both verbal and written form. (F,Sp,Su)

IELI 1230 Cross-Cultural Talk 3®
Multilevel course designed to improve oral communication through small group work and one-on-one conversation with American undergraduate teaching fellows. Emphasizes interactive language fluency. Repeatable for credit for students who place at the basic level on the IELI placement exam. (F,Sp,Su)

IELI 1240 Integrated Skills 3®
Multilevel speaking and listening course designed to develop basic to intermediate language skills through content-based instruction. Repeatable for credit for students who place at the basic level on the IELI placement exam. (F,Sp,Su)

IELI 1260 Reading II 4
Builds low intermediate to intermediate level reading skills. Students distinguish main ideas from supporting ideas. Extensive vocabulary work. Focuses on active reading, summarizing, and vocabulary attack skills. (F,Sp,Su)

IELI 2310 Comprehending Academic Discourse 3
Introduction to listening strategies and note-taking, focusing on organization and information. Develops strategies for listening to authentic passages, such as interviews, news broadcasts, and documentaries. (F,Sp,Su)

IELI 2320 Writing Authentic Texts 4
Assists students in developing more sophisticated writing skills, from more complex sentences to coherent paragraphs and various kinds of compositions. Students learn to use the library and the Internet to find resources for their writings. (F,Sp,Su)

IELI 2330 Spoken Discourse and Cultural Communication 3
Emphasizes interpersonal communication and academic tasks with American undergraduate classroom assistants. Focuses on the dynamics of assuming various roles in small group discussions and presentations. (F,Sp,Su)

IELI 2360 Reading Authentic Texts 4
Introduces strategies for reading several genres typical of university assignments, including excerpts from textbooks in several disciplines and popular magazine articles having academic value. Brief overview of scholarly journals. Introduction to strategies and exercises for vocabulary development. (F,Sp,Su)

IELI 2410 Comprehending Lecture Discourse 3
Develops techniques for understanding the planned and spontaneous academic discourse of university classrooms. Focuses on information processing. (F,Sp,Su)

IELI 2420 Writing from Academic Sources 4
Introduction to various academic writing demands. Students gather information from various sources, including interviews, surveys, and academic texts (textbooks, journals, etc.); analyze and summarize the information; and write documented essays and reports. (F,Sp,Su)

IELI 2440 Academic Discourse 3
Designed to assist students in developing oral competency, with emphasis on comprehensibility in individual and group academic presentations. (F,Sp,Su)

IELI 2450 Topics for ESL 4®
Introduction to contemporary topics in culture and language. Focuses on language development through content-based instruction. Repeatable for up to 12 credits. (F,Sp,Su)

IELI 2460 Reading from Academic Sources 4
Focuses on processes and strategies for a variety of academic and disciplinary genres; strategies for learning from lengthy and complex texts; and vocabulary, speed, and comprehension development. (F,Sp,Su)

IELI 2470 Cross-Cultural Perspectives of American Culture 4
Provides understanding of what culture is and how it influences behavior and beliefs. Provides cross-cultural perspectives on value systems and institutions. (F,Sp,Su)

IELI 7920 College Teaching Seminar 1-3®
Workshop designed for international students who will hold teaching assistantships at the University. To be accepted into the workshop, students must take a qualifying language test. Graded Pass/Fail *only*. (F)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Instructional Technology and Learning Sciences (INST)

See Department of Instructional Technology and Learning Sciences, pages 311-312

INST 1000 Information Literacy 3
Designed to develop ability to locate, evaluate, and use information. Develops competencies needed for lifelong pursuits of information through the use of libraries and electronic resources. (F,Sp)

INST 3500 Technology Tools for Secondary Teachers 1
Integration of technology into the teaching/learning environment. Practical, hands-on experience for pre-service secondary teachers. Use of a variety of technological tools. Introduction to current standards for teachers. Application of technology as both process and product. Prerequisite: Admittance to teacher education. (F,Sp,Su) DE

INST 4010 Principles and Practices of Technology for Elementary Teachers 3
Integrated experience for pre-service elementary teachers to apply instructional design principles in their instruction. Hands-on experience using a wide variety of technological tools in practical learning environments. Application of technology as both process and product. Prerequisite: Admittance to teacher education. (F,Sp,Su) DE

INST 4210 Information Access and Literacy Skills 2
Information problem-solving skills basic to lifelong information access in today's networked world. Used as part of the Engineering and Technology Education/ Instructional Technology minor program. Taught off campus through special programs. (Sp)

INS 4220 Introduction to Learning Theories 3
Detailed study of communication and learning theories as applied to instructional design process. Examines principles and research upon which instructional design and instructional technology are based. Used as part of the Engineering and Technology Education/Instructional Technology minor program. Taught off campus through special programs. (Sp)

INST 4230 Introduction to Adult Learning 3
Covers philosophical and theoretical foundations of adult education, as well as practical applications for incorporating them into current educational settings. Used as part of the Engineering and Technology Education/Instructional Technology minor program. Taught off campus through special programs. (Sp)

INST 4250 Instructional Design I 3
Guided experience in analysis, design, and development of instructional product development utilizing the ADDIE model. Used as the first project experience for the Engineering and Technology Education degree and the Instructional Technology undergraduate minor. Taught off campus through special programs. (Su)

INST 4260 Instructional Design II 3
Guided experience in development, implementation, and evaluation of instructional product development utilizing the ADDIE model. Used as the second project experience for the Engineering and Technology Education degree and the Instructional Technology undergraduate minor. Taught off campus through special programs. (Su)

INST 4290 Applying Instructional Design 3
Individual experience in instructional product development utilizing the ADDIE model. Used as the capstone experience for the Engineering and Technology Education degree and the Instructional Technology undergraduate minor. Taught off campus through special programs. (F)

INST 4300 Clinical Experience in School Library Media 1
School library media clinical observation experience. Students involved in observing management and assisting in middle and secondary library media centers, arranged by department. Minimum of 40 hours of observation experience required. (Sp)

INST 4500 Integration and Innovation of Technology in Education 1
Based on current educational standards, and using appropriate tools, students design and create an electronic/digital portfolio specific to content area(s) of their anticipated teaching license. Emphasizes integration of technology as both product and process. Prerequisite: Admittance to teacher education. (F,Sp,Su)

INST 4910 Undergraduate Research and Creative Opportunity 1-3®
Cooperative process of discovery, investigation, research, or creativity between faculty and one or more students. (F,Sp,Su)

INST 5000 (dual listing 6060) SLM Foundations and Information Management 3
Introduction to historical and philosophical foundations of library media programs. Examines role of library media programs in schools and their contributions to the curriculum. Explores circulation, cataloging, automation tools, technical services, policies, and techniques. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 5010 (dual listing 6110) Information Organization and Management 3
Explores functions of information technology including circulation, cataloging, automation tools, and technical services within school library media program. Also considers policies and techniques for facilitating access to information in a school library media center. Taught off campus through Utah Education Network. (F)

INST 5015 (dual listing 6015) SLM Collection Development and Literature 3
Focuses on building, maintaining, and evaluating collections for library media programs. Discusses policy development for selection, protecting intellectual freedom, and reviewing, evaluating, and maintaining materials in all formats. Explores children's and young adult literature. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 5025 (dual listing 6025) SLM Programs and Instructional Development 3
Presents a wide variety of activities which are integral to a school library media program, including reading guidance, instructional development, curriculum development, media skill instruction, and information literacy. Emphasizes collaboration within schools. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 5030 (dual listing 6030) Information Access, Literacy, and Technology 3
Introduction to finding information and resources using print and electronic sources. Emphasizes reference services, knowledge of basic reference/ information sources, and resource sharing; and teaching information retrieval strategies within a school library media program. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 5040 (dual listing 6040) SLM Center Administration and Leadership 3
Includes study of organization, personnel, budgets, programs, and management of a library media center. Students define their role within a school setting and in relation to that of the principal and teachers. Prerequisite: INST 5000/6060 and 5025/6025 or approval of instructor. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Su or Arr)

INST 5090 (dual listing 6090) School Library Media Practicum 1-6®
Observation and guided field experience in a library media center under professional library media specialists and instructional technology professionals. Bridge of theory into practice. Graded Pass/Fail *only*. Prerequisites: INST 5025/6025, 5040/6040; or approval of instructor. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su) DE

INST 5105 (dual listing 6105) Distance Education Tools 3
Focuses on issues and methods of teaching and learning in distance education. Students develop strategies for effectively integrating technologies and facilitating learning at a distance. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5120 Distance Education Projects 3
(dual listing 6120)
Application of theory, principles, and practice, providing instruction to learners separated from the instructor by distance and/or time. Addresses characteristics, technologies, and current issues of distance education. Prerequisite: INST 5105/6105. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 5130 Technology and its Role in the
(dual listing 6730) Transformation of Education 1-3
Explores the critical role of educational technology as one tool in the transformation of education. Involves students in change-related projects in the local environment. Also taught off-campus. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5140 Producing Distance
(dual listing 6140) Education Resources 3
Focuses on production of Internet-based instructional resources for use in distance, flexible, and open learning. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp) DE

INST 5160 Distance Learning—K-12 3
(dual listing 6160)
Designed for classroom teachers. Discusses technologies and applications of distance education to elementary and secondary school settings. Focuses on instructional strategies for effective teaching and learning at a distance. Taught off-campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 5195 Practicum in Distance Learning 3
(dual listing 6195)
Students demonstrate effective practice by applying instructional development principles for designing, implementing, and evaluating instruction for distant learners. Graded Pass/Fail *only*. Prerequisites: INST 5105/6105, 5120/6120. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 5200 Principles and Practices of
Technology for Secondary Teachers 2
Integrated experience for pre-service secondary teachers to apply instructional design principles in their instruction. Hands-on experience using a wide variety of technological tools in practical learning environments. Application of technology as both process and product. Prerequisite: Admittance to teacher education. (F,Sp)

INST 5205 Computer Applications for
(dual listing 6205) Instruction and Training 3
Introduction to use of computer applications, with special emphasis on software used in instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 5215 Digital Video Capture and Production 3
(dual listing 6215)
Fundamental theories and practice in design and development for camera and computer-based audio and video production, including recording, editing, and digitizing audio and video segments for education and training applications. To receive graduate-level credit, students must fulfill additional requirements. (F,Su)

INST 5225 Digital Audio 3
(dual listing 6225)
Explores basic concepts of digital audio, synthesis, and sign processing. Establishes proficiency with sound programs, as well as audio editing and sound design tools. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su)

INST 5230 Instructional Graphic Production 3
(dual listing 6230)
Fundamental practices of using the computer to design and produce a wide variety of instructional graphics and animations. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp)

INST 5235 DVD Design and Production 3
(dual listing 6235)
Fundamental theories and practice in the design and development of Digital Video Disc (DVD) based instructional resources. To receive graduate-level credit, students must fulfill additional requirements. (F,Su)

INST 5245 Interactive Multi-Media Production 3
(dual listing 6245)
Covers fundamental programming concepts, in addition to fundamentals of the interactive multi-media environment. Students finishing this course will have at least one completed fully-functional project for their portfolios. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su) DE

INST 5255 Computer-Based
(dual listing 6255) Instruction Authoring 3
Fundamentals of programming computer-based instruction utilizing current authoring systems. Overview of computer-based design issues, including interface/screen design, instructional strategy and interaction, and computer program logic. Prerequsite: Basic computer comptetencies. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su)

INST 5265 Internet Development 3
(dual listing 6265)
Teaches web publishing primarily using HTML (Hyper-Text Markup Language). Explores current web technologies and includes design, development, and evaluation. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su) DE

INST 5275 Multimedia Special Topic Studio I 3®
(dual listing 6275)
Selected special topics related to the development of multimedia products for instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 5285 Multimedia Special Topic Studio II 3®
(dual listing 6285)
Selected special topics related to the development of multimedia products for instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 5290 Multimedia Production for
(dual listing 6290) Instruction and Training 3
Geared toward assisting master's students in completing their degrees. Provides continuity from the first semester and encourages continued professional development in the discipline. Can be used as capstone experience for multimedia development minor. Prerequisites: INST 5215/6215, 5230/6230, 5255/6255, 5265/6265. To receive graduate-level credit, students must fulfill additional requirements. (Sp)

INST 5405 Educational Technology
(dual listing 6405) Tools Fundamentals 3
Designed for practicing classroom teachers. Guides teachers in using research-based principles to apply and teach using technology tools to support their classroom assessment and curriculum standards. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5410 Assessment and Educational Standards 3
(dual listing 6410)
Designed for practicing classroom teachers. Focuses on basic fundamentals of backward design and instructional practices. Also examines practice examples. Development of backward design unit applied to personal teaching situations. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5415 Implementatation of Technology
(dual listing 6415) in Education K-12 3
Designed for practicing classroom teachers. Examines educational value of project-based learning and the constructionist model of effective learning. Focuses on practical application of research. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5420 Educational Technology
(dual listing 6420) Tools Integration 3
Designed for practicing classroom teachers. Using their own classroom, participants do a class study on low-performance students, create a technology intervention to enhance student performance, and document changes in student behavior and attitudes. To receive graduate-level credit, students must fulfill additional requirements. (F)

INST 5425 Technology and Inquiry Based Lessons 3
(dual listing 6425)
Designed for practicing classroom teachers. Backward design model used to create powerful, inquiry-based lessons. Investigates role of technology in engaging students in meaningful educational experiences. To receive graduate-level credit, students must fulfill additional requirements. (F)

INST 5430 Educational Technology K-12 Practicum 3
(dual listing 6430)
Designed for practicing classroom teachers. Provides opportunities for teachers to work with small groups of children and a master teacher having experience in directing technology in a classroom setting. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 5750 Instructional Technology Workshop 1-4®
Special training and experience in latest concepts and innovations in instructional technology. Content changes to reflect most recent topics and problems facing the profession. (Su) DE

INST 5900 Independent Study 1-4®
Individually directed study and projects. Graded Pass/Fail *only*. Prerequisite: Departmental permission. (F,Sp,Su) DE

INST 6015 SLM Collection Development
(dual listing 5015) and Literature 3
Focuses on building, maintaining, and evaluating collections for library media programs. Discusses policy development for selection, protecting intellectual freedom, and reviewing, evaluating, and maintaining materials in all formats. Explores children's and young adult literature. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 6025 SLM Programs and
(dual listing 5025) Instructional Development 3
Presents a wide variety of activities which are integral to a school library media program, including reading guidance, instructional development, curriculum development, media skill instruction, and information literacy. Emphasizes collaboration within schools. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 6030 Information Access,
(dual listing 5030) Literacy, and Technology 3
Introduction to finding information and resources using print and electronic sources. Emphasizes reference services, knowledge of basic reference/ information sources, and resource sharing; and teaching information retrieval strategies within a school library media program. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 6040 SLM Center Administration
(dual listing 5040) and Leadership 3
Includes study of organization, personnel, budgets, programs, and management of a library media center. Students define their role within a school setting and in relation to that of the principal and teachers. Prerequisite: INST 6060/5000 and 6025/5025 or approval of instructor. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (Su or Arr)

INST 6060 SLM Foundations and
(dual listing 5000) Information Management 3
Introduction to historical and philosophical foundations of library media programs. Examines role of library media programs in schools and their contributions to the curriculum. Explores circulation, cataloging, automation tools, technical services, policies, and techniques. Also taught off campus. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 6090 School Library Media Practicum 1-6®
(dual listing 5090)
Observation and guided field experience in a library media center under professional library media specialists and instructional technology professionals. Bridge of theory into practice. Graded Pass/Fail *only*. Prerequisites: INST 6025/5025, 6040/5040; or approval of instructor. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su) DE

INST 6105 Distance Education Tools 3
(dual listing 5105)
Focuses on issues and methods of teaching and learning in distance education. Students develop strategies for effectively integrating technologies and facilitating learning at a distance. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6110 Information Organization
(dual listing 5010) and Management 3
Explores functions of information technology including circulation, cataloging, automation tools, and technical services within school library media program. Also considers policies and techniques for facilitating access to information in a school library media center. Taught off campus through Utah Education Network. (F)

INST 6120 Distance Education Projects 3
(dual listing 5120)
Application of theory, principles, and practice, providing instruction to learners separated from the instructor by distance and/or time. Addresses characteristics, technologies, and current issues of distance education. Prerequisite: INST 6105/5105. To receive graduate-level credit, students must fulfill additional requirements. (F) DE

INST 6140 Producing Distance
(dual listing 5140) Education Resources 3
Focuses on production of Internet-based instructional resources for use in distance, flexible, and open learning. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp) DE

INST 6160 Distance Learning—K-12 3
(dual listing 5160)
Designed for classroom teachers. Discusses technologies and applications of distance education to elementary and secondary school settings. Focuses on instructional strategies for effective teaching and learning at a distance. Taught off-campus. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 6195 Practicum in Distance Learning 3
(dual listing 5195)
Students demonstrate effective practice by applying instructional development principles for designing, implementing, and evaluating instruction for distant learners. Graded Pass/Fail *only*. Prerequisites: INST 6105/5105, 6120/5120. To receive graduate-level credit, students must fulfill additional requirements. (Sp) DE

INST 6205 Computer Applications for
(dual listing 5205) Instruction and Training 3
Introduction to use of computer applications, with special emphasis on software used in instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 6215 Digital Video Capture and Production 3
(dual listing 5215)
Fundamental theories and practice in design and development for camera and computer-based audio and video production, including recording, editing, and digitizing audio and video segments for education and training applications. To receive graduate-level credit, students must fulfill additional requirements. (F,Su)

INST 6225 Digital Audio 3
(dual listing 5225)
Explores basic concepts of digital audio, synthesis, and sign processing. Establishes proficiency with sound programs, as well as audio editing and sound design tools. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su)

INST 6230 Instructional Graphic Production 3
(dual listing 5230)
Fundamental practices of using the computer to design and produce a wide variety of instructional graphics and animations. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp)

INST 6235 DVD Design and Production 3
(dual listing 5235)
Fundamental theories and practice in the design and development of Digital Video Disc (DVD) based instructional resources. To receive graduate-level credit, students must fulfill additional requirements. (F,Su)

INST 6245 Interactive Multi-Media Production 3
(dual listing 5245)
Covers fundamental programming concepts, in addition to fundamentals of the interactive multi-media environment. Students finishing this course will have at least one completed fully-functional project for their portfolios. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su) DE

INST 6255 Computer-Based
(dual listing 5255) Instruction Authoring 3
Fundamentals of programming computer-based instruction utilizing current authoring systems. Overview of computer-based design issues, including interface/screen design, instructional strategy and interaction, and computer program logic. Prerequsite: Basic computer comptetencies. To receive graduate-level credit, students must fulfill additional requirements. (Sp,Su)

INST 6265 Internet Development 3
(dual listing 5265)
Teaches web publishing primarily using HTML (Hyper-Text Markup Language). Explores current web technologies and includes design, development, and evaluation. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su) DE

INST 6275 Multimedia Special Topic Studio I 3®
(dual listing 5275)
Selected special topics related to the development of multimedia products for instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 6285 Multimedia Special Topic Studio II 3®
(dual listing 5285)
Selected special topics related to the development of multimedia products for instruction and training. To receive graduate-level credit, students must fulfill additional requirements. (F,Sp,Su)

INST 6290 Multimedia Production for
(dual listing 5290) Instruction and Training 3
Geared toward assisting master's students in completing their degrees. Provides continuity from the first semester and encourages continued professional development in the discipline. Can be used as capstone experience for multimedia development minor. Prerequisites: INST 6215/5215, 6230/5230, 6255/5255, 6265/5265. To receive graduate-level credit, students must fulfill additional requirements. (Sp)

INST 6300 MEd Orientation 1
Geared toward assisting master's students in completing their degrees. Provides continuity from the first semester and encourages continued professional development in the discipline. Prerequisite: Matriculation into Instructional Technology MEd program. (Su)

INST 6310 Foundations of Educational Technology 3
Explores foundations, history, perspectives, and literature in the field. Enables students to think more critically about their efforts and career goals. Prerequisite: Matriculation into Instructional Technology MEd program. (F) DE

INST 6325 Communication, Instruction, and
the Learning Process 3
Examination of learning theory and communication theory, and their implications for instruction. Taught off-campus. Prerequisite: Matriculation into Instructional Technology MEd program. (Su)

INST 6350 Instructional Design Process I 3
Examines key techniques in design of instruction. Applies principles to specific design problems. Introduces techniques for developing instructional products according to completed designs. Taught off-campus. Prerequisite: Matriculation into Instructional Technology MEd program. (F) DE

INST 6355 Instructional Design Process II 3
Continued exposure to design models, principles, and techniques. Integrates project management skills with design procedures. Based on their situation, students design and develop an instructional product. Taught off-campus. Prerequisite: Matriculation into Instructional Technology MEd program. (Sp) DE

INST 6370 Design and Development of
Computer-Based Instruction 3
Overview of computer-based design issues, including interface/screen design, instructional strategy and interaction, and computer program logic. Includes hands-on experience with authoring systems. Taught off-campus through EDNET. (F)

INST 6390 Planning, Resources, and
Implementation for Technology 3
Principles and practice of implementing innovations into real-world settings and evaluating their effectiveness. Taught off-campus. Prerequisite: Matriculation into Instructional Technology MEd program. (Sp) DE

INST 6405 Educational Technology
(dual listing 5405) Tools Fundamentals 3
Designed for practicing classroom teachers. Guides teachers in using research-based principles to apply and teach using technology tools to support their classroom assessment and curriculum standards. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6410 Assessment and Educational Standards 3
(dual listing 5410)
Designed for practicing classroom teachers. Focuses on basic fundamentals of backward design and instructional practices. Also examines practice examples. Development of backward design unit applied to personal teaching situations. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6415 Implementatation of Technology
(dual listing 5415) in Education K-12 3
Designed for practicing classroom teachers. Examines educational value of project-based learning and the constructionist model of effective learning. Focuses on practical application of research. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6420 Educational Technology
(dual listing 5420) Tools Integration 3
Designed for practicing classroom teachers. Using their own classroom, participants do a class study on low-performance students, create a technology intervention to enhance student performance, and document changes in student behavior and attitudes. To receive graduate-level credit, students must fulfill additional requirements. (F)

INST 6425 Technology and Inquiry Based Lessons 3
(dual listing 5425)
Designed for practicing classroom teachers. Backward design model used to create powerful, inquiry-based lessons. Investigates role of technology in engaging students in meaningful educational experiences. To receive graduate-level credit, students must fulfill additional requirements. (F)

INST 6430 Educational Technology K-12 Practicum 3
(dual listing 5430)
Designed for practicing classroom teachers. Provides opportunities for teachers to work with small groups of children and a master teacher having experience in directing technology in a classroom setting. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6505 Foundations of Instructional Technology 3
Considers the present, past, and future of instructional technology, while helping individual student to develop personal understanding of and orientation to the field. Prerequisite: Matriculation into Instructional Technology MS program. (F)

INST 6510 Research and Evaluation in
Instructional Technology 3
Detailed study of methodologies for needs assessment, product evaluation, validation, and research. Includes methodological models, data collection, and data interpretation for both formative and summative evaluation. Prerequisite: Permission of instructor. (Sp)

INST 6520 Projects in Instructional Technology 3
Introduction to the process of Instructional Systems Design (ISD) using Analysis, Design, Development, Implementation, and Evaluation (ADDDIE). Includes introductory combination of theory and application to create an instructional product using the ISD process. Prerequisite: Matriculation into Instructional Technology MS program. (F)

INST 6530 Instructional Design and Development Studio 3®
Focuses on the utilization and critique of not only finished instruction, but also Instructional Design Theory, as well as a reverse-engineered look at Instructional Systems Design (ISD). Prerequisites: INST 6520 and matriculation into Instructional Technology MS program. (Sp)

INST 6540 Learning Theory 3
Detailed study of communication and learning theories as applied to the instructional design process. Examines principles and research upon which instructional design and instructional technology are based. Prerequisite: Matriculation into Instructional Technology MS program. (F)

INST 6570 Performance Systems 3
Application of theory, principles, and practice of organizational systems and human competence in designing performance support systems, job aids, and just-in-time instruction. (F)

INST 6630 Instructional Simulations 3
Application of theory, principles, and practice of instructional simulations for use within organizational systems and improvement of human performance. (F)

INST 6650 Research Seminar 1®
Provides opportunity for exchange of ideas by Instructional Technology master's students pursuing a Plan A option. Includes discussion of publications and products. (F,Sp,Su)

INST 6710 Instructional Development Tools 3
Detailed study of processes, tools, and techniques for guiding and aiding the instructional design process. Emphasizes tools for project management, analysis, and design. (F)

INST 6720 Instructional Technology in Adult Education 3
Application of theory, principles, and practice of instructional technology in providing instruction to adult learners. (Sp,Su)

INST 6730 (dual listing 5130) Technology and its Role in the Transformation of Education 1-3
Explores the critical role of educational technology as one tool in the transformation of education. Involves students in change-related projects in the local environment. Also taught off-campus. To receive graduate-level credit, students must fulfill additional requirements. (Su)

INST 6740 Instructional Evaluation 2
Examines theories and implementation of both formative and summative evaluation of instruction. Includes expert and learner feedback, rapid prototyping, and cost analysis. Prerequisite: Matriculation into Instructional Technology MS program. (Sp)

INST 6750 Instructional Technology Workshop 1-4®
Special training and experience in the latest concepts and innovations in instructional technology. Content changes reflecting the most recent topics and problems facing the profession. (Su) DE

INST 6760 Grant Writing 3
Introduction to the many facets of grant writing. Students write a grant proposal for submission to a funding agency and reflectively critique other proposals. (Sp) DE

INST 6770 Practicum in the Improvement of Instruction 1-4®
A field-based program focused upon characteristics of effective teaching methodologies, teaching performance, curriculum decision making, value guidelines, and the characteristics of the learner. Taught on demand.

INST 6775 Computers in Education for In-service Teachers 3
Introduction to microcomputer applications in education for in-service teachers. Includes hands-on experiences with range of software tools for design, production, and administration. Taught off-campus and on demand.

INST 6780 Instructional Technology Programs 1-3®
Designed primarily as an in-service experience for teachers, trainers, administrators, and instructional technology personnel to improve local programs and services. Taught on demand.

INST 6790 Instructional Technology in Education and Training 1-3®
Offered on request to instructional designers, teachers, administrators, and media personnel who have special needs related to instructional technology and seek assistance in improving their local programs. Taught on demand.

INST 6870 Current Issues Seminar 1-3®
Allows exploration of new cutting-edge topics in the field. Topics vary and are announced the semester prior to registration. Topics may be theory or practice based. (Arr)

INST 6900 Independent Study 1-6®
Individually directed study and projects. Graded Pass/Fail *only*. Prerequisite: Departmental permission. (F,Sp,Su) DE

INST 6910 Independent Research 1-6®
Individually directed research. Graded Pass/Fail *only*. Prerequisite: Departmental permission. (F,Sp,Su) DE

INST 6940 Internship 1-6®
An on-site experience in which the student applies knowledge and skills in a work environment. Used as culminating experience for the MS or MEd, Plan C. Graded Pass/Fail *only*. (F,Sp,Su) DE

INST 6960 Creative Project 1-6®
Individual experience in instructional product development. May be used as the culminating experience for the MEd and MS Plan C. Graded Pass/Fail *only*. (F,Sp,Su) DE

INST 6970 Thesis 1-6®
Individual work in MS thesis and Plan B report writing with guidance and criticism. Graded Pass/Fail *only*. (F,Sp,Su)

INST 6990 Continuing Graduate Advisement 1-8®
Allows students access to faculty and facilities to complete graduate thesis, project, and papers. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7000 Pro-seminar I in Instructional Technology 3
Lectures and discussions on advanced topics in instructional technology and related disciplines. Required for Instructional Technology EdS and PhD students. (F)

INST 7010 Pro-seminar II in Instructional Technology 3
Continuation of INST 7000. Lectures and discussions on advanced topics in instructional technology and related disciplines. Required for Instructional Technology EdS and PhD students. Prerequisite: INST 7000. (Sp)

INST 7150 Advanced Seminar in Instructional Technology 3®
In-depth study of various topics including learning theory, instructional design, instructional theory, instructional development tools, production techniques, and instructional applications in different cultures. Specific topics for each semester will be announced. (F,Sp,Su)

INST 7200 Quantitative and Design Research in Instructional Technology* 3
Examines current trends, applications, methods, and research questions that are appropriate to the use of quantitative and design research within the field of instructional technology. (F)

INST 7300 Research in Instructional Technology and Learning Sciences 3
Provides doctoral students with opportunities to achieve further depth in their research skills, as well as opportunities for obtaining additional knowledge by critiquing existing designs and approaches of instructional technology and learning sciences investigation. Emphasizes building research designs, with the intention of creating more exposure and experience regarding the role technology plays in the way people learn. (F)

INST 7450 Internship in Program Evaluation 1-4®
Experience in practical aspects of program evaluation through planned, supervised evaluation project. Participation must be approved by student's supervisory committee. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7460 Internship in Research 1-4®
Experience in conducting research through planned, supervised evaluation project. Participation must be approved by student's supervisory committee. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7820 Practicum in Instructional Technology 2®
Requires four practica selected from the following: funding proposal, product/research, review product development, evaluation, empirical investigation, and teaching. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. Enrollment limited to Instructional Technology EdS and PhD students *only*. (F,Sp,Su)

INST 7870 Current Issues Seminar 1-3®
Allows exploration of new cutting edge topics in the field. Topics vary and are announced the semester prior to registration. Topics may be theory or practice based. (Arr)

INST 7900 Independent Study 1-6®
Individually directed study and projects. Prerequisite: Departmental permission. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7910 Independent Research 1-6®
Provides for individually directed research. Graded Pass/Fail *only*. Prerequisite: Departmental permission. (F,Sp,Su)

INST 7920 College Teaching Seminar 1-3
Develops skills and knowledge necessary for college teaching. Activities are designed to help participants in a variety of areas, including instructional development and presentation skills development. (Arr) DE

INST 7960 Practicum, Educational Specialist 1-9®
Culminating project/externship in partial fulfillment of the Educational Specialist degree. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7970 Dissertation 1-18®
Individual work on research problems in the PhD program. Graded Pass/Fail *only*. (F,Sp,Su)

INST 7990 Continuing Graduate Advisement 1-9®
Allows graduate students access to faculty and facilities to complete graduate dissertation. Graded Pass/Fail *only*. (F,Sp,Su)

*Taught 2010-2011.
**Taught 2009-2010.
® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Italian (ITAL)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

ITAL 1010 Italian First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Native speaker instructor. Self-study with tutorial assistance. (F) DE

ITAL 1020 Italian First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Native speaker instructor. Self-study with tutorial assistance. Prerequisite: ITAL 1010 or equivalent. (Sp) DE

ITAL 2010 Italian Second Year I 4
Second-year overview of speaking, listening, reading, and writing, with exposure to cultures and customs. Native speaker instructor. Self-study with tutorial assistance. Prerequisite: ITAL 1020 or equivalent. (F) DE

ITAL 2020 Italian Second Year II 4
Second-year overview of speaking, listening, reading, and writing, with exposure to cultures and customs. Native speaker instructor. Self-study with tutorial assistance. Prerequisite: ITAL 2010 or equivalent. (Sp,Su) DE

DE This course is available online *only* through Regional Campuses and Distance Education (RCDE). Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Interdisciplinary Studies (ITDS)

See Interdisciplinary Studies Major, pages 314-315

ITDS 4900 Senior Thesis/Project 3
Students majoring in Interdisciplinary Studies are required to complete a 3-credit thesis or project as part of the major. The thesis or project must be *either* a research paper *or* a creative activity appropriate to the theme of the Interdisciplinary Studies major. Each student works with his or her faculty advisor to determine an appropriate topic of study or a project. The student and advisor outline the protocol and parameters of the thesis or project. Prerequisite: Instructor's permission. (F,Sp,Su) DE

DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Japanese (JAPN)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

JAPN 1010 Japanese First Year I 5
First course in beginning Japanese. Proficiency in the recognition of the basic Japanese sound system by learning Hiragana and Katakana. Communicative mastery of sentences having polite and plain forms of verbs, adjectives, and copula. Exposure to Japanese culture and customs. (F)

JAPN 1020 Japanese First Year II 5
Second course in beginning Japanese. Introduction to the basic 100 Kanji. Mastery of more complicated sentences, including conditional temporal, volitional, and potential expressions. Exposure to Japanese culture and customs. Prerequisite: JAPN 1010 or equivalent. (Sp)

JAPN 2010 Japanese Second Year I 5
First course in intermediate Japanese. Proficiency in reading and writing 150 additional Kanji. Mastery of the last basic grammar topics, such as passive, causative, passive causative, and giving/receiving expressions. Introduction to honorific/humble expression. Exposure to Japanese culture and customs. Prerequisite: JAPN 1020 or equivalent. (F)

JAPN 2020 Japanese Second Year II 5
Second course in intermediate Japanese. Proficiency in reading 150 additional Kanji and writing 200 additional Kanji. Mastery of frequently used idioms and expressions. Exposure to more authentic reading materials. Competency in writing short essays. Exposure to Japanese culture and customs. Prerequisite: JAPN 2010 or equivalent. (Sp)

JAPN 3010 Japanese Third Year I 4
First segment of the third-year Japanese reading/writing course. Proficiency in reading and writing an additional 500 Kanji. Prerequisite: JAPN 2020 or equivalent. (F)

JAPN 3020 Japanese Third Year II 4
Second segment of the third-year Japanese reading/writing course. Proficiency in reading and writing an additional 500 Kanji. Prerequisite: JAPN 3010 or equivalent. (Sp)

JAPN 3050 Japanese Calligraphy 1®
Study of Japanese writing system through practicing the art of calligraphy. No prerequisites. Also taught as ART 3050. (Sp)

JAPN 3100 Readings in Contemporary Japanese Culture 3
Introduction to contemporary Japanese culture through readings from newspapers and other source materials. Prerequisites: JAPN 3010 and 3020. (F)

JAPN 3510 Japanese for the Business Environment 3
Mastery of technical terms related to Japanese business and its environment. Communicative competency in contemporary Japanese society. Prerequisite: JAPN 3020. (Sp)

JAPN 3560 Studies in Japanese Film 3
Offers an introduction to the historical and theoretical study of Japanese cinema. Course screenings include some of the films made by well-known directors during the 1960s and 1970s, as well as the cutting-edge of contemporary films. (Sp)

JAPN 4250 Internship/Coop 3-9
Cooperative education through internship programs provided by companies in Japan. Intended for students participating in the U.S.-Japan internship program. Prerequisites: JAPN 3010, 3020, and 3510. (Su)

JAPN 4920 Japanese Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Journalism and Communication (JCOM)

See Department of Journalism and Communication, pages 322-326

JCOM 1130 Beginning Newswriting for the Mass Media 3
Techniques of writing news for various media. News values, philosophy, and practice. Elementary news-gathering and interviewing skills. Practice in various newswriting forms. Structures of the news industries and work place. Prerequisites: Fulfillment of Communications Literacy CL1 requirement through coursework or examination; English Proficiency Test offered through the Journalism and Communication Department; and passing scores on Computer and Information Literacy (CIL) exams. (F,Sp,Su) DE

JCOM 1500 BSS Introduction to Mass Communication 3
History, philosophy, structures, and functions of the mass media (newspapers, magazines, TV and radio, advertising, and public relations) and their intersection with other social institutions. Media economics and the impacts of new technologies on media institutions and society. (F,Sp)

JCOM 2010 BSS Media Smarts: Making Sense of the Information Age 3
Critical analysis of the roles and performance of mass media content and messages, and their influence on society. Emphasizes critical reading of news, entertainment, and advertising content regarding women, minorities, children, and other groups. Basic mass media ethics and law. Prerequisite: Fulfillment of Communications Literacy CL1 requirement through coursework or examination. (F,Sp)

JCOM 2160 CI Introduction to Online Journalism 3
Use of interactive computer networks, databases, and other electronic resources. Development of personal web pages for portfolio building. Practice in information evaluation for news gathering. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 2170 CI Reporting Public Affairs 3
Theory and practice of reporting public affairs, community news, and features. Emphasizes advanced news gathering techniques, understanding local political structures, news and feature writing skills, interviewing, media law, ethics, and cultural sensitivity. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 2180 Beginning Photojournalism 3
Theory and practice of photojournalism. Roles and functions of electronic photographic images in the news media. Practice in use of cameras and in software techniques. Students furnish cameras and some materials. (F,Sp)

JCOM 2220 Introduction to Video Media 3
Introduction to the theories and practice of video production and functions in broadcasting and the electronic mass media, including concepts, techniques, and impacts of various video approaches. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 2230 Writing for Electronic Media 3
Theory and practice of reporting public affairs for broadcast and electronic media. Emphasizes news gathering, understanding local political structures, news and feature writing, interviewing, media law, ethics, and cultural sensitivity. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F)

JCOM 2300 Introduction to Public Relations 3
Survey of theories and practice of public relations in a variety of business, corporate, governmental, and nonprofit organizational settings. Elements of promoting organizational messages and communicating with various publics. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 2310 CI Writing for Public Relations 3
Theory and practice of information-gathering for public relations, including basic news releases, features, speeches, annual reports, newsletters and brochures, broadcasting, and other forms. Emphasizes advanced news gathering techniques, interviewing, media law, ethics, and cultural sensitivity. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 3010 Communication Research Methods 3
Practical application of quantitative information and methods within journalism and public relations. Emphasizes using numbers to help media audiences and other publics make sense of issues and events. Prerequisites: JCOM 1130, 1500, and 2010. (F,Sp)

JCOM 3110 CI Beyond the Inverted Pyramid 3
Theory and practice of longer literary forms for newspapers and magazines. Feature writing, investigative and interpretive journalism, emphasizing advanced information-gathering and writing skills. Prerequisite: Minimum grade of *C* in JCOM 2170 or permission of instructor. (F,Sp)

JCOM 3120 CI Copy Editing and Publication Design 3
Editing and preparation of news stories and artwork for publication. Principles and practice of publication layout and design. Prerequisites: Minimum grades of *C* in JCOM 2170, 2230, or 2310; or permission of instructor. (F,Sp)

JCOM 3140 DSS Opinion Writing 3
Study and practice of persuasive editorial and opinion writing for the mass media. (F,Sp)

JCOM 3300 DSS Strategic Research Methods in Public Relations 3
Quantitative and qualitative research methods standard to real-life applications in public relations problems and campaigns, including survey methods, focus groups, case analysis, and strategic assessments. Prerequisite: Minimum grade of *C* in JCOM 2310 or permission of instructor. (F,Sp)

JCOM 3410 DSS Film as Cultural Communication 3
Analysis of the economic, ideological, political, and cultural constraints influencing film content. (F,Sp)

JCOM 4010 DSS Mass Communication Ethics 3 (dual listing 6440)
Study of ethical systems and philosophies and their applications to the practice of mass communication. Prerequisite: Junior standing. (Sp)

JCOM 4020 DSS Mass Media and Society 3
Study of theories and practice of the impact of mass media in conjunction with other social institutions: political, social, cultural, ideological, economic, and religious. Prerequisite: Junior standing.

JCOM 4030 DSS Mass Media Law 3
(dual listing 6430)
Principles and theories of constitutional and case law governing the mass media, including libel and privacy, copyright, press freedom, broadcast regulation, and press responsibility. Prerequisite: Junior standing or permission of instructor. (F,Sp)

JCOM 4100 Hard News Café 3®
Advanced reporting and writing for student news website. Includes advanced reporting techniques, photojournalism, and posting of news reports and materials to interactive website. Prerequisite: Minimum grade of *C* in JCOM 3110 or permission of instructor. (F,Sp,Su)

JCOM 4110 CI Computer-Assisted Reporting 3
Advanced computer-based investigative and in-depth information-gathering and newswriting, including intensive use of computer databases to collect and analyze data. Prerequisites: Minimum grades of *C* in JCOM 2170 or 2230 or 2310; or permission of instructor. (Sp)

JCOM 4120 CI Sports Writing 3
Information-gathering and writing of news and feature stories about sports for print and electronic mass media. Prerequisites: Minimum grades of *C* in JCOM 2170 or 2230 or 2310; or permission of instructor. (Sp)

JCOM 4150 Advanced Digital Photojournalism 3
Advanced lab work in the use of cameras and photographic production techniques, photo imaging, and manipulation. Concludes with student exhibition of work. Prerequisite: Minimum grade of *C* in JCOM 2180 or permission of instructor. (F,Sp)

JCOM 4210 CI Newscast I 4
Basics of electronic newsgathering and writing for electronic news media. Use of electronic video equipment for creation of on-air newscast and other visual news materials. Prerequisite: Minimum grade of *C* in JCOM 2220. (F,Sp)

JCOM 4220 CI Newscast II 4
Newsroom organization and practice in electronic and video news production, including directing and producing, writing for video news, use of studio equipment, use of video production equipment, staff management, and control room operations. Prerequisites: Minimum grades of *C* in JCOM 2230 and 4210. (F,Sp)

JCOM 4230 Corporate Video 3
Project-based lab work in studio video productions for real-world clients. Use of video field equipment and production facilities. Completion of video packages. Prerequisites: Minimum grades of *C+* in JCOM 1130, 1500, 2010, and 2220; or permission of instructor. (F,Sp)

JCOM 4300 Integrated Marketing Communication 3
Teaches the integrated marketing functions necessary to effectively position, brand, and market a company. Provides students with opportunity to help bridge the gaps existing among management, strategic, and creative players in the design field. Prepares students to better function as effective account managers or campaign leaders in a public relations, marketing, branding, or advertising culture. (F,Sp)

JCOM 4400 Mass Media Criticism 3
(dual listing 6400)
Critical analysis of mass media content, emphasizing the media's social, cultural, and political impacts. Use of advanced research techniques. Senior standing required for enrollment in JCOM 4400; permission of instructor required for enrollment in JCOM 6400. (Sp)

JCOM 4410 Gender and the Mass Media 3
(dual listing 6410)
Examines the nature of gender-based images in a variety of mass media, from advertising to magazines, television, and film. Analysis of gender stereotypes and portrayals in news and entertainment media, along with resulting social impacts. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; junior standing or instructor permission. Also taught as WGS 4410/6410. (F)

JCOM 4500 Projects in Communication 1-5®
Individualized directed study in communication topics, based upon student proposal to instructor. Prerequisite: Permission of instructor. Repeatable for up to 6 credits. (F,Sp,Su)

JCOM 4510 Communication Internship 1-3®
Supervised, real-world training and practice in communication work places, including news and business environments. Prerequisite: Permission of instructor. Maximum of 6 credits may count toward the student's major. (F,Sp,Su)

JCOM 4520 Senior Thesis 1-3
Planning and execution of an in-depth research paper or project, as approved by the instructor, culminating in a formal public presentation. Required of all journalism and communication students for graduation in Honors Program. Students must also complete HONR 4800. (F,Sp)

JCOM 4530 Special Topics in Communication 3®
Advanced study in specialized communication topic areas. A maximum of 5 credits may be applied toward the major. (F,Sp,Su)

JCOM 5010 Mass Media Historiography 3
(dual listing 6010)
Survey of the history and development of the mass media, and their influence on other social institutions. Theory and practice of historical research, with heavy emphasis on use of databases, archival, and other primary sources to conduct original historical research. (F,Sp)

JCOM 5020 Mass Communication Theory 3
(dual listing 6020)
Advanced study of major mass communication theories and issues, and their evidence in case studies. Application of theory to significant societal problems. (F)

JCOM 5030 International Communications Problems 3
(dual listing 6030)
Study of mass communication influences and effects within and between nations. Systems and techniques of mass communication as functions of national identity and development. (F,Sp)

JCOM 5110 CI Literary Journalism 3
(dual listing 6110)
In-depth analysis and practice of literary and stylistic elements of long-form journalistic and other nonfiction writers. (F)

JCOM 5210 Website Design and Production 3
(dual listing 6210)
Principles and practice of planning, designing, and programming professional Web pages, including Internet communication analysis and planning, graphic design, and development using industry-standard programming languages and design applications. Prerequisite: Permission of instructor. (F,Sp)

JCOM 5220 Advanced Video Production 3
(dual listing 6220)
Training and practice in advanced techniques of video production, including computer graphics generation, nonlinear video editing, and other specialized professional techniques for electronic video materials. Prerequisite: Minimum grade of *C* in JCOM 4220 or 4230; or permission of instructor. (F)

JCOM 5230 Advanced Video Documentary Production 3®
(dual listing 6230)
Advanced production of long-form video productions and packages, including writing scripts, directing and production, control room applications, and advanced video production techniques. Prerequisite: Minimum grade of *C* in JCOM 4220 or 4230; or permission of instructor. (Sp)

JCOM 5300 CI Case Studies in Public Relations 3
(dual listing 6300)
Advanced study and practice in public relations cases, processes, techniques, campaigns, and marketing communications strategies. Analysis of approaches to corporate reputation issues, organizational positioning, and use of mass media strategies. Prerequisite: Minimum grade of *C* in JCOM 3300. (F,Sp)

JCOM 5310 Mass Media Management 3
(dual listing 6310)
Examines theories, methods, and practice of management of mass media businesses, including personnel, marketing, and market positioning. Prerequisite: Permission of instructor. (F,Sp)

JCOM 5320 Public Relations Agency 3®
(dual listing 6320)
Advanced hands-on experience in real-world workings of professional public relations agency, including client communications needs analysis, communications planning, strategies, market positioning, publicity, and campaign execution. Prerequisite: Permission of instructor. (F,Sp)

JCOM 5420 The Mass Media and Politics 3
(dual listing 6420)
Examination of the role of the mass media in the political process, including both campaigns and governance. Examination of political advertising, news coverage, polling, opinion formation strategies, and politicians' use of new media technologies. Also taught as POLS 5420/6420. (F)

JCOM 6000 Introduction to Graduate Study in Mass Communication 3
Overview of mass communication theories and research methodologies designed to prepare the student for the graduate course of study and to assist in planning research agenda. (F)

JCOM 6010 Mass Media Historiography 3
(dual listing 5010)
Survey of the history and development of the mass media, and their influence on other social institutions. Theory and practice of historical research, with heavy emphasis on use of databases, archival, and other primary sources to conduct original historical research.

JCOM 6020 Mass Communication Theory 3
(dual listing 5020)
Advanced study of major mass communication theories and issues, and their evidence in case studies. Application of theory to significant societal problems. (F)

JCOM 6030 International Communications Problems 3
(dual listing 5030)
Study of mass communication influences and effects within and between nations. Systems and techniques of mass communication as functions of national identity and development. (F,Sp)

JCOM 6040 Seminar in Mass Media Research Methods 3®
Introduction to the major theoretical perspectives and methodologies in mass communication research. Repeatable for credit with departmental permission. (Sp)

JCOM 6050 Seminar in Mass Media Issues and Problems 3®
Variable topic seminar concerning research of issues and problems in mass media principles and practice. Repeatable for credit with departmental permission. (F,Sp)

JCOM 6110 Literary Journalism 3
(dual listing 5110)
In-depth analysis and practice of literary and stylistic elements of long-form journalistic and other nonfiction writers. (F)

JCOM 6210 Website Design and Production 3
(dual listing 5210)
Principles and practice of planning, designing, and programming professional Web pages, including Internet communication analysis and planning, graphic design, and development using industry-standard programming languages and design applications. Prerequisite: Permission of instructor. (F,Sp)

JCOM 6220 Advanced Video Production 3
(dual listing 5220)
Training and practice in advanced techniques of video production, including computer graphics generation, nonlinear video editing, and other specialized professional techniques for electronic video materials. Prerequisite: Minimum grade of *C* in JCOM 4220 or 4230; or permission of instructor. (F)

JCOM 6230 Advanced Video Documentary
(dual listing 5230) Production 3®
Advanced production of long-form video productions and packages, including writing scripts, directing and production, control room applications, and advanced video production techniques. Prerequisite: Minimum grade of *C* in JCOM 4220 or 4230; or permission of instructor. (Sp)

JCOM 6300 Case Studies in Public Relations 3
(dual listing 5300)
Advanced study and practice in public relations cases, processes, techniques, campaigns, and marketing communications strategies. Analysis of approaches to corporate reputation issues, organizational positioning, and use of mass media strategies. Prerequisite: Minimum grade of *C* in JCOM 3300. (F,Sp)

JCOM 6310 Mass Media Management 3
(dual listing 5310)
Examines theories, methods, and practice of management of mass media businesses, including personnel, marketing, and market positioning. Prerequisite: Permission of instructor. (F,Sp)

JCOM 6320 Public Relations Agency 3®
(dual listing 5320)
Advanced hands-on experience in real-world workings of professional public relations agency, including client communications needs analysis, communications planning, strategies, market positioning, publicity, and campaign execution. Prerequisite: Permission of instructor. (F,Sp)

JCOM 6400 Mass Media Criticism 3
(dual listing 4400)
Critical analysis of mass media content, emphasizing the media's social, cultural, and political impacts. Use of advanced research techniques. Permission of instructor required for enrollment in JCOM 6400; senior standing required for enrollment in JCOM 4400. (Sp)

JCOM 6410 Gender and the Mass Media 3
(dual listing 4410)
Examines the nature of gender-based images in a variety of mass media, from advertising to magazines, television, and film. Analysis of gender stereotypes and portrayals in news and entertainment media, along with resulting social impacts. Enrollment in JCOM 6410 limited to graduate students *only*. Also taught as WGS 6410/4410. (F)

JCOM 6420 The Mass Media and Politics 3
(dual listing 5420)
Examination of the role of the mass media in the political process, including both campaigns and governance. Examination of political advertising, news coverage, polling, opinion formation strategies, and politicians' use of new media technologies. Also taught as POLS 6420/5420. (F)

JCOM 6430 Mass Media Law 3
(dual listing 4030)
Principles and theories of constitutional and case law governing the mass media, including libel and privacy, copyright, press freedom, broadcast regulation, and press responsibility. (F,Sp)

JCOM 6440 Mass Communication Ethics 3
(dual listing 4010)
Study of ethical systems and philosophies and their applications to the practice of mass communication. (Sp)

JCOM 6500 Special Projects in Mass Communication Research and Practice 1-3®
Directed study into specified research or real-world problems in the mass media and mass communication industries. Prerequisite: Departmental permission. Repeatable for credit with departmental permission. (F,Sp,Su)

JCOM 6510 Directed Readings in Mass Communication 1-12®
Directed readings, tutorial or experiential learning/project in mass communication. Prerequisite: Instructor and department head approval. (F,Sp,Su)

JCOM 6600 Internship 1-6
Supervised training in selected communication work places. Prerequisite: Permission of graduate supervisory committee. (F,Sp,Su)

JCOM 6970 Thesis Research 1-3®
Prerequisite: Departmental permission. Graded Pass/Fail *only*. Repeatable for credit with departmental permission. (F,Sp,Su)

JCOM 6990 Continuing Graduate Advisement 1-3®
Prerequisite: Departmental permission. Graded Pass/Fail *only*. Repeatable for credit with departmental permission. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Korean (KOR)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

KOR 1010 Korean First Year I 5
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. (F)

KOR 1020 Korean First Year II 5
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: KOR 1010 or equivalent. (Sp)

KOR 2010 Korean Second Year I 5
Development of grammatical knowledge and writing skills. Prerequisite: KOR 1020 or equivalent. (F)

KOR 2020 Korean Second Year II 5
Development of advanced reading comprehension skill through discussions and summaries of a variety of texts. Prerequisite: KOR 2010 or equivalent. (Sp)

KOR 3010 Korean Third Year I 4
Development of advanced reading, writing, and conversational skills. Prerequisite: KOR 2020 or equivalent. (F)

KOR 3020 Korean Third Year II 4
Continuous development of advanced reading, writing, and conversational skills. Prerequisite: KOR 3010 or equivalent. (Sp)

KOR 3510 Business Korean 3
Designed to help students acquire a broad knowledge of business Korean and relevant Korean culture. Develops language skills and cultural knowledge useful for performing basic functions within the Korean business environment. Focuses on important business terms, phrases, and business etiquette. Prerequisite: KOR 2010 or equivalent language proficiency. (F) DE

KOR 4920 Korean Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Landscape Architecture and Environmental Planning (LAEP)

See Department of Landscape Architecture and Environmental Planning, pages 327-333

LAEP 1030 BCA Introduction to Landscape Architecture 3
Environment as a basis for land use and design decisions. Topics discussed include environmental awareness, the planning and design process, and design related to open space, communities, and the region. Three one-hour lectures per week. (F,Sp,Su) DE

LAEP 1200 Basic Graphics in Landscape Architecture 4
Graphic techniques for landscape architectural drawings, including plans, elevations, isometrics, perspective, and rendering. Various media explored for preparing drawings and sketches for presentation. Two three-hour studios per week. (F)

LAEP 1300 Computer Applications in Landscape Architecture 3
Includes instuction in three major areas of computer applications: computer-aided design, digital image editing and manipulation, and three-dimensional modeling. Focuses on AutoCAD, Photoshop, and Sketchup. (Sp)

LAEP 1350 Theory of Design 4
Basic elements of design with emphasis upon their relationship to landscape architecture. Form and spatial relationships are stressed through student development of two- and three-dimensional design models. Design theory applied to materials of landform, vegetation, water, and architecture. Two three-hour studios per week. Prerequisite: LAEP 1200. (Sp)

LAEP 2250 Internship and Cooperative Education 1-5®
Course credit for professional experience outside the classroom prior to graduation. A statement of professional goals and a summary report following the experience are required.

LAEP 2300 History of Landscape Architecture 3
An examination of landscape change in the context of its history from ancient to present times, with a primary emphasis on the visual qualities of designed landscapes. Three one-hour lectures per week. (F,Sp)

LAEP 2600 QI Landscape Construction I 4
Introduction to site engineering, grading, cut and fill calculation, stormwater drainage, and erosion control. Two one-hour lectures and two two-hour studios per week. Prerequisite: LAEP 1200 (may be taken concurrently). (F)

LAEP 2650 Architecture and the Built Environment 4
Exploration of architectural form and structure in exterior environments. Emphasis placed on space created by architectural forms and their relationship to the surrounding landscape. Energy and water conservation measures with respect to the built environment. Prerequisite: LAEP 1200. (Sp)

LAEP 2700 CI Site Analysis: Social, Behavioral, and Biophysical Dimensions 5
Site survey, analysis, and design synthesis. Focuses on human behavior and natural resources as design considerations for future land use planning. Introduces foundational site analysis methods and tools; and integrates Geospacial Information Systems (GIS) training for data interpretation. (F)

LAEP 2720 Site Planning and Design 5
Serves as a lower-division capstone course, synthesizing lower-division landscape architecture coursework and applying that knowledge to site scale design projects. Includes units on design methodology, site planning and circulation, and creative problem solving. Three three-hour studios per week. Prerequisite: LAEP 2700 or 6270. (Sp)

LAEP 3100 Recreation/Open Space 5
Focuses on regional and urban open space planning and design including project scale recreation design. Includes design seminars, field trips, and guest lecturers. Three three-hour studios per week. Prerequisites: Matriculation in Bachelor of Landscape Architecture (BLA) degree; LAEP 2720 or permission of instructor. (F)

LAEP 3120 Residential Planning and Design 5
Focuses on residential projects, planned unit developments, transit-oriented development, and community facilities. Introduction to theory and methods of community and neighborhood design and planning. Three three-hour studios per week. Prerequisite: LAEP 3100. (Sp)

LAEP 3300 Advanced Computer Applications in Landscape Architecture 4
Emphasizes the major analytical and technical components of resource planning and design using computer techniques. Two three-hour studios per week. Prerequisite: LAEP 2720 or instructor's permission. (F)

LAEP 3500 Planting Design 2-4
Emphasizes plant and environment relationships and plant community dynamics as they relate to planting design. In addition, basic planting design principles will be introduced. Involves application of planting design principles to a variety of project types. One segment will focus on land reclamation planting in nonirrigated landscapes. Two three-hour studios per week. Enrollment limited to students matriculated into the LAEP major. Prerequisites: LAEP 1200, 1300, 1350, PLSC 2620. (F)

LAEP 3600 Landscape Materials 2
Introduction to materials used in landscape design, including paving, walls, street furnishings, landscape lighting, decking, etc. Two one-hour lectures per week. (F)

LAEP 3610 Landscape Construction II 2
Design of landscape structures and surfaces, including wood construction, free-standing and retaining walls, pavement, etc. Must be taken in conjunction with PLSC 3420. Three two-hour studios per week, first half of semester only. Enrollment limited to students matriculated into the Landscape Architecture major. Prerequisites: LAEP 2600, 3600, MATH 1010. (Sp)

LAEP 3700 City and Regional Planning 3
Introduction to historic and current theory and methods of city and regional planning. Includes legislative, administrative, and implementation practices of the general comprehensive plan. Three lectures per week. (Sp)

LAEP 4100 Urban Theory, Systems, and Design 5
Focuses on urban environment for design expression and processes associated with the creation of cities. Explores different aspects of urban theories and design approaches (conceptual, perceptual, and analytical) as applied to large urban areas and site-specific spaces. Prerequisite: LAEP 3120. (F)

LAEP 4110 Construction Document Preparation 4
Methods and procedures necessary for transforming a design idea into a set of construction drawings that are accurate, precise, and clearly understood. Two three-hour studios per week. Prerequisites: LAEP 3120 and 3610. (F)

LAEP 4120 Emerging Areas in Landscape Architecture I 2
Exploration of new and emerging areas in the profession of landscape architecture. National and international issues in regional landscape planning, landscape restoration/bioengineering, and visual resource management are among several issues which may be examined. Three three-hour studios per week. Prerequisite: LAEP 3120. (F,Sp,Su)

LAEP 4130 Emerging Areas in Landscape Architecture II 2
Exploration of new and emerging areas in the profession of landscape architecture. National and international issues in regional landscape planning, landscape restoration/bioengineering, and visual resource management are among several issues which may be examined. Three three-hour studios per week. Prerequisite: LAEP 3120. (F,Sp,Su)

LAEP 4250 Internship and Cooperative Education 1-5®
Course credit for professional experience outside the classroom prior to graduation. Statement of professional goals and a summary report following the experience are required. (F,Sp,Su)

LAEP 4350 Travel Course 1-3®
(dual listing 6550)
Major field trip to examine a variety of projects in planning and design. (F,Sp,Su)

LAEP 4810 Tutorial 1®
Directed readings and discussions of landscape issues. Prerequisite: Instructor's permission. (F,Sp,Su)

LAEP 4900 Special Problems 1-5®
Selected problems to meet individual needs for students' completion of professional education. Hours arranged. Prerequisite: Instructor's permission. (F,Sp,Su)

LAEP 4910 Professional Practice I 1
(dual listing 6160)
Introduction to different modes of professional practice, portfolio development, and preparation for entry into a professional office. Graduate students required to develop a corporate structure and marketing plan for the mock company they established in LAEP 6100. (Sp)

LAEP 4920 CI Professional Practice II 1
(dual listing 6170)
Exposure to legal and corporate aspects of professional practice, business ethics, and business planning. Graduate students required to develop a corporate structure and marketing plan for the mock company they established in LAEP 6100. (Sp)

LAEP 4950 Seminar 1
Directed readings and reports on current and emerging areas of the profession. One recitation hour per week. (F,Sp,Su)

LAEP 5400 Low Water Landscaping 3
(dual listing 6400)
Examines arid ecosystems, emphasizing the Intermountain West, and recreating such ecosystems in a range of amenity landscapes. Also covers procurement, propagation, establishment, and maintenance of plants appropriate for low water landscapes. Also taught as PLSC 5400/6400. (F)

LAEP 6100 Regional Landscape Analysis and Planning 5
Focuses on the challenges and opportunities inherent in conducting landscape planning and analysis on a broad scale. Students integrate a variety of landscape planning project scales through literature review, selected case studies, and a major applied studio project. Prerequisites: LAEP 6740, 6750. (F)

LAEP 6110 Landscape Planning for Wildlife 3
Applications of principles of landscape ecology, conservation biology, and wildlife management to planning for wildlife in urban, suburban, and exurban landscapes. Discussion of restoration of disturbed habitats in these environments. Includes real-world projects and field trips. Addresses issues of landscape restoration and bioengineering. (Sp)

LAEP 6120 Regional Landscape Policy and Implementation 2
Case studies and/or implementation strategies for planning alternatives developed in LAEP 6100. (Sp)

LAEP 6160 Professional Practice I 1
(dual listing 4910)
Introduction to different modes of professional practice, portfolio development, and preparation for entry into a professional office. Graduate students required to develop a corporate structure and marketing plan for the mock company they established in LAEP 6100. (Sp)

LAEP 6170 Professional Practice II 1
(dual listing 4920)
Exposure to legal and corporate aspects of professional practice, business ethics, and business planning. Graduate students required to develop a corporate structure and marketing plan for the mock company they established in LAEP 6100. (Sp)

LAEP 6230 History of Landscape Architecture 3
Examination of historic landscape change from ancient to present times, with a primary emphasis on the visual qualities of designed landscapes. Three one-hour lectures and a one-hour seminar per week. (F)

LAEP 6250 Internship and Cooperative Education Program 1-5®
Course credit given for professional experience outside the classroom prior to graduation. Statement of professional goals and summary report following the experience are required. (F,Sp,Su)

LAEP 6270 Site Analysis: Social, Behavioral, and Biophysical Dimensions 5
Site survey, analysis, and design synthesis. Focuses on human behavior and natural resources as design considerations for future land use planning. Introduces foundational site analysis methods and tools; and integrates Geospacial Information Systems (GIS) training for data interpretation. Graduate students evaluate, adapt, and apply methods for specific project analysis, as well as use GIS to analyze and create new data sets. (F)

LAEP 6310 Recreation and Open Space Planning and Design 5
Focuses on planning and design of open space and recreational areas, as well as facilities of various types and scales. Students develop skills in analysis, research, planning strategy, and design technique to create functional spaces based on client needs and site limitations. Prerequisite: LAEP 2720 or permission of instructor. (F)

LAEP 6320 Residential Planning and Design 5
Studio course introducing methods for the planning and design of residential projects of various types and scales. Students develop skills in critical analysis, design technique, and planning strategy to create functional spaces based on client needs and site requirements. Prerequisite: LAEP 6310. (Sp)

LAEP 6350 Planting Design for Sustainability 4
Emphasizes plant/environmental relationships, as well as plant community dynamics, aesthetics, function, and sustainability. Includes lectures, readings, projects, and papers. (F)

LAEP 6370 City and Regional Planning 3
Introduction to historic and current theory and methods of city and regional planning. Includes legislative, administrative, and implementation practices within the planning process. Emphasizes public transportation and mobility issues. This course is not currently being taught. For information about when it may be taught, contact the department.

LAEP 6400 Low Water Landscaping 3
(dual listing 5400)
Examines arid ecosystems, emphasizing the Intermountain West, and recreating such ecosystems in a range of amenity landscapes. Also covers procurement, propagation, establishment, and maintenance of plants appropriate for low water landscapes. Also taught as PLSC 6400/5400. (F)

LAEP 6410 Redefining the Urban Landscape 5
Focuses on urban environment for design expression and processes associated with the creation of cities. Explores different aspects of urban design theories and design approaches (conceptual, perceptual, and analytical), as applied to large urban areas and site-specific spaces. (F)

LAEP 6550 Travel Course 1-3®
(dual listing 4350)
Major field trip to examine a variety of projects in planning and design. (F,Sp,Su)

LAEP 6740 Planning Theory and Implementation Issues 3
Explores theoretical underpinnings of planning and landscape theory, from the rational model to contemporary alternatives. Leads to discussions of issues of sprawl, sustainability, and transportation, including their effects on the built environment, agricultural lands, and open-space systems. (F)

LAEP 6750 Implementation and Regulatory Techniques in Planning 3
Review and analysis of the legal basis and techniques for land use and resource planning, including historic and visual resources at the federal, state, and local levels. Relies on readings in case law and specific case studies, as well as research focused on the evaluation of planning processes and strategies. Prerequisite: Graduate standing. (F,Sp)

LAEP 6860 Faculty/Interdisciplinary Seminar I 1
Landscape architecture and environmental planning program options and research potential presented by departmental faculty. Also introduces students to other interdisciplinary programs and faculty within the University. Prerequisite: Graduate standing. (F,Sp)

LAEP 6862 Faculty/Interdisciplinary Seminar II 1
Landscape architecture and environmental planning program options and research potential presented by departmental faculty. Also introduces students to other interdisciplinary programs and faculty within the University. Second seminar in a two-seminar series. Graded Pass/Fail *only*. Prerequisite: Graduate standing. (Sp)

LAEP 6890 Seminar on Thesis Proposals and Procedures 1
Explores preparation of thesis proposals and abstracts. Discussion of graduate degree completion requirements and procedures. Prerequisite: Graduate standing. (Sp)

LAEP 6900 Special Problems 1-5®
Selected problems to meet individual student interests and areas of concentration. Registration by permission of departmental faculty. Prerequisite: Graduate standing. (F,Sp,Su)

LAEP 6910 Reading Seminar I 1
Selected readings directed by department faculty. Prerequisite: Graduate standing. (F)

LAEP 6930 Reading Seminar II 1
Selected readings directed by department faculty. Prerequisite: Graduate standing. (Sp)

LAEP 6960 Master's Project 1-6®
Requires research, analysis, and production of a given subject area, including its final planning, design, and documentation. Prerequisite: Graduate standing. (F,Sp,Su)

LAEP 6970 Thesis Research 1-6®
Graded Pass/Fail *only*. Prerequisite: Graduate standing. (F,Sp,Su)

LAEP 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. Prerequisite: Graduate standing. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Language (LANG)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

LANG 3550 DHA Culture of East Asia 3
Helps students explore and appreciate the culture of three East Asian countries: China, Japan and Korea. Students gain sincere view and understanding of these East Asian cultures through readings, hands-on cultural activities, viewing video materials, writing, and discussions. Topics include: major historical and social events, customs and traditions, thoughts and beliefs, people, food, contemporary issues, art, literature, and film. Also taught as ANTH 3550 and HIST 3550. DE

LANG 3990 Special Topics 1-5®
Additional readings or research done beyond the material covered in other language courses. May be repeated for credit if different topic is covered. Prerequisite: Instructor's permission.

LANG 4200 Senior Honors Seminar 1
Credit for completing and presenting a senior honors thesis project. Requirement may be fulfilled by publishing the thesis in an academic journal, defending the thesis before a faculty committee, presenting the thesis at an academic conference, or presenting the thesis in the languages session during Scholar's Day.

LANG 4210 Senior Honors Thesis 1-4®
Independent study research credits for preparation of a senior honors thesis to fulfill requirements for a degree in languages with departmental honors. Prerequisite: Permission of instructor prior to enrollment.

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Latin (LATN)

See Department of History, pages 304-309

Also see Classics Minor, page 211

LATN 1010 Beginning Latin I 5
Basics of Latin grammar and vocabulary. Beginning readings. (F)

LATN 1020 Beginning Latin II 5
Intermediate concepts of grammar and vocabulary. Intermediate readings. Prerequisite: Minimum grade of *B* in LATN 1010. (F)

LATN 3100 Intermediate Latin Prose 3
Readings in Latin prose. Prerequisite: Minimum grade of *B* in LATN 1020. (F)

LATN 3130 Intermediate Latin Poetry 3
Readings in Latin poetry. Prerequisite: Minimum grade of *B* in LATN 3100 (F).

LATN 4100 Advanced Latin Readings 3®
Readings in Latin poetry and/or prose. Prerequisites: Minimum grades of *B* in LATN 3100 and 3130. (F)

LATN 4860 Latin Pedagogy 3
Prepares students to teach Latin at the secondary level. Students survey the most important issues in Latin pedagogy, and discuss the best teaching practices. Students also translate selections from core Latin authors, focusing on authors not previously studied. Prerequisites: LATN 3100 and 3130 with minimum grades of *B* or better. Taught during alternate years. (Sp)

LATN 4930 Directed Readings in Latin Poetry and Prose Authors 1-3
Directed readings in advanced Latin poetry and prose authors. Prerequisite: Successful completion of at least three semesters of Latin. (F,Sp,Su)

LATN 6100 Special Topics: Latin 1-3®
Intensive readings and group discussions of selected Latin texts. Prerequisite: Minimum grade of *B* in LATN 4100 or permission of instructor. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Latin American Studies (LATS)

See Latin American Studies Minor, page 347

LATS 2200 Introduction to Latin America 3
Interdisciplinary course examining Latin American geography, culture, history, literature, music, society, politics, and economics. (Sp)

Linguistics (LING)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

LING 2250 Cooperative Education 1-3®
Course credit for professional experience outside the classroom. Statement of professional goals and a summary report following the experience are required.

LING 3300 Clincial Experience I 1
First clinical practicum in middle and secondary schools. Arranged by special methods instructor. Required at Level I. Graded Pass/Fail *only*. Corequisite: LING 4400 or 6400. Prerequisites set by Secondary Education Department. (F)

LING 4100 The Study of Language 3
Investigates ways in which human languages are structured, how they change, how they reflect the cultures in which they are used, and how they are learned. Also taught as ANTH 4100. (F,Sp) DE

LING 4250 Cooperative Education 1-3®
Course credit for professional experience outside the classroom. Statement of professional goals and a summary report following the experience are required.

LING 4300 Clincial Experience II 1
Second clinical practicum in middle and secondary schools. Arranged by special methods instructor. Required at Level II. Graded Pass/Fail *only*. Corequisite: LING 4400 or 6400. Prerequisites set by Secondary Education Department. (F)

LING 4400 Teaching Modern Languages 3
Methods course for teaching majors or minors in any of the modern languages. Considers the context of the present secondary language classroom, effective teaching techniques that can be used in that context, and significant trends in teaching and learning languages. Taken concurrently with LING 4300. Prerequisite: Permission of instructor. (F)

LING 4520 Technology for Language Teaching 3**
(dual listing 6520)
Web- and disk-based technology for developing electronic course modules for the language learning classroom. (Su)

LING 4900 Analysis of Cross-Cultural Difference 3
Develops awareness of what culture is and how it shapes perceptions and attitudes. Through interactive student-centered activities, students learn to analyze cultural differences. This course is not currently being taught. For information about when it may be taught, contact the Department of Languages, Philosophy, and Speech Communication.

LING 4920 Practicum in Language Tutoring 1®
Allows language students to develop tutoring skills by assisting professors daily in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated for up to a maximum of 3 credits.

LING 5500 Student Teaching Seminar 2
Capstone seminar focused upon student teaching issues, professional development, and principles of effective instruction, with emphasis on reflective teaching. Graded Pass/Fail *only*. (F,Sp)

LING 5630 Student Teaching in Secondary Schools 10
Thirteen-week culminating practicum experience in which students assume full-time teaching responsibilities under direction of cooperating teachers in their major and minor fields. Graded Pass/Fail *only*. Prerequisites set by Secondary Education Department. (F,Sp)

LING 6010 Research in Second Language Learning 3
Readings in current SLL literature evaluated in terms of their implications for classroom practice. (F)

LING 6300 Clincial Experience I 1
First clinical practicum in middle and secondary schools for Master of Second Language Teaching students. Arranged by special methods instructor. Required at Level I. Corequisite: LING 6400. Prerequisites set by Secondary Education Department.

LING 6310 Clincial Experience II 1
Second clinical practicum in middle and secondary schools for Master of Second Language Teaching students. Arranged by special methods instructor. Required at Level II. Corequisite: LING 6400. Prerequisites set by Secondary Education Department.

LING 6400 Second Language Teaching: Theory and Practice 3
Survey of theories about memory, assigning meaning to recall, and methods L2 teachers and learners use to apply meaning to their teaching and learning. Central to all course topics are social dynamics in the L2 classroom and issues of schooling students of diverse backgrounds. (Sp)

LING 6410 Teaching Modern Languages 3
Methods course for graduate students seeking teacher licensure in any of the modern languages. Considers the context of the present secondary language classroom, effective teaching techniques that can be used in that context, and significant trends in teaching and learning languages. Taken concurrently with LING 6310. Prerequisite: Permission of instructor. This course is not currently being taught. For information about when it may be taught, contact the department.

LING 6510 Linguistic Analysis 3
Comparative study of linguistic patterns across languages. Linguistic structures and language typology for teachers of modern languages. (Sp)

LING 6520 Technology for Language Teaching 3**
(dual listing 4520)
Web- and disk-based technology for developing electronic course modules for the language learning classroom. (Su)

LING 6800 Topics in Second Language Acquisition 3®
Advanced seminar in the acquisition and teaching of languages. (Sp)

LING 6900 Culture Teaching and Learning: Theory and Practice 3
Examines culture learning and connection between development of communicative and cultural competence in the second language learner. Reviews theory, research, and practice in the field of intercultural communication as relating to second language learning and teaching. (Sp) DE

LING 6910 Exploring the Portfolio 1
Investigation of the portfolio process, including distinguishing qualities of superior portfolios. Students write their teaching philosophy and gather artifacts for their portfolio. Must be taken during the first semester of the Master of Second Language Teaching program. First of a sequence of three required courses. (F,Sp)

LING 6920 Developing the Portfolio 1
Further development of the portfolio including revision of the student's teaching philosophy, given insights from courses taken. Reexamination and revision of artifacts gathered, as well as addition of new artifacts. Prerequisite: LING 6910. (F,Sp,Su)

LING 6930 Finishing the Portfolio 1
Further work toward completion of the portfolio, including careful development of main themes in the teaching philosophy and artifacts; addition of final artifacts; and revision for coherence, clarity, and brevity. Must be taken during the final semester of the Master of Second Language Teaching program. Prerequisite: LING 6920. (F,Sp,Su)

LING 6940 Independent Study 1-3®
Individually directed readings and conference. Departmental permission required before registration. Prerequisite: Approval of instructor. (F,Sp,Su)

LING 6990 Continuing Graduate Advisement 1-9®
Allows students access to faculty and facilities to complete graduate thesis, project, and papers. Graded Pass/Fail *only*. (F,Sp,Su)

**Taught 2009-2010.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Mechanical and Aerospace Engineering (MAE)

See Department of Mechanical and Aerospace Engineering, pages 369-375

MAE 1200 Engineering Graphics 2
Introduction to technical sketching, solid modeling, and engineering graphics. Concurrent engineering design process applied to a project. Students start with hand sketches, then move through variational geometry solid models, with tolerance analysis and control, until they have produced a complete set of manufacturing drawings conforming to the ASME standard. Prerequisite: MATH 1060 or ACT score of 27 or higher or AP Calculus score of 3 or higher. (F,Sp) DE

MAE 2160 Material Science 3
Study of atomic and microscopic structures of metals, polymers, ceramics, and composite materials, and how these structures affect material properties. Prerequisites: CHEM 1210 and ENGR 2140 (both may be taken concurrently). (F,Sp)

MAE 2200 Engineering Numerical Methods I 2
Introduction to computational methods, emphasizing software development using FORTRAN 95. Prerequisite: MATH 1220. (F)

MAE 2250 Cooperative Practice 3
Planned work experience in industry. Detailed program must have prior approval. Written report required. (F,Sp,Su)

MAE 2300 Thermodynamics I 3
First and second laws of thermodynamics; analysis of open and closed systems; equations of state; power and refrigeration cycles; and problem solving methodology. Prerequisites: MATH 1220; MATH 2210 (may be taken concurrently). (Sp,Su) DE

MAE 2450 Engineering Numerical Methods II 3
Explores basic tools of numerical analysis, solution to ordinary and partial differential equations, software development using FORTRAN 95, and applications using computer algebra packages. Prerequisites: MAE 2200; MATH 2210, 2250 (may be taken concurrently). (Sp)

MAE 2650 Manufacturing Processes 3
Introduction to manufacturing processes and CAD/CAM. Material forming, machining, finishing, and joining. Integration of manufacturing and CAD, plus the fundamentals and application of statistical process control. (Sp)

MAE 3040 Mechanics of Solids 3
Stress, strain, and deflection due to flexure and shear. Combined stresses, instability, nonsymmetric bending, torsion, and energy methods. Prerequisite: ENGR 2140. (F)

MAE 3320 Advanced Dynamics 3
Particle and rigid body dynamics. Work and kinetic energy, conservation of energy, impulse-momentum, conservation of linear and angular momentum. Kinematics and kinetics in 2-D and 3-D. Newtonian and Lagrangian Mechanics. Prerequisites: ENGR 2030; MAE 2200 (may be taken concurrently). (F)

MAE 3340 Instrumentation and Measurements 3
Principles and application of mechanical instrumentation and experimentation. Sensing elements, signal conditioning, data acquisition, statistical analysis of data, and instrumentation system design. Prerequisites: ENGR 2140, ETE 2210, MAE 3400, 3420. (Sp)

MAE 3400 Thermodynamics II 3
Second law analysis, power and refrigeration cycles, property relations, gas mixtures, psychrometrics, chemical reactions, chemical equilibrium, introduction to heat transfer, steady state and transient conduction. Prerequisites: MAE 2300; MAE 2200 (may be taken concurrently). (F)

MAE 3420 Fluid Mechanics 3
Application of fluid dynamic theory to inviscid and viscous, incompressible and compressible, and external and internal fluid flows, with emphasis on laminar and turbulent boundary layers. Prerequisites: ENGR 2030, MAE 2200, 2300 (MAE 2200 may be taken concurrently). (F)

MAE 3440 QI Heat and Mass Transfer 3
Introduction to convection, external flow, internal flow, free convection, boiling and condensation, heat exchangers, radiation and diffusion mass transfer. Includes design project. Prerequisites: MAE 3400, 3420; MAE 2450 (may be taken concurrently). (Sp)

MAE 3800 Design I 2
First course in senior design sequence. Design process, teaming skills, engineering economics, project selection and management, proposal writing, technical writing, and technical presentations. Prerequisite: ENGR 2140. (Sp)

MAE 4300 Machine Design 3
Computer-aided design and synthesis of mechanisms, mechanical linkages, cams, fasteners, welds, gears, bearings, power transmission components, and lubrication. Component failure analysis based on metal fatigue related to dynamic loading. Prerequisite: MAE 3040. (Sp)

MAE 4400 CI Fluids/Thermal Laboratory 2
Laboratory experiences in observation and measurement of fundamental fluid and thermal phenomena. Prerequisites: MAE 3340, 3440. (F)

MAE 4800 CI Design II 3
Senior design project, including a technical presentation and a critical design review. Prerequisites: MAE 3440, 3800, 4300. (F,Sp)

MAE 5020 Finite Element Methods in Solid Mechanics I 3
Introduction to finite element methods and their application to the analysis and design of mechanical engineering systems. Prerequisite: MAE 3040. Also taught as CEE 5020. (F)

MAE 5060 Mechanics of Composite Materials I 3
Stress-strain relations for nonisotropic composites, such as fiber-reinforced plastic laminates, properties and their uses, strength and life determination, and methods for design using composite materials. Prerequisite: MAE 3040 or CEE 3010. Also taught as CEE 5060. (Sp)

MAE 5300 Vibrations 3
Vibration of single and multiple degree of freedom, and discrete mass systems. Natural frequencies and mode shapes for free, damped, and undamped sytems. Forcing functions and transient responses. Matrix methods, numerical solution, and random vibrations. Applications and design. Prerequisites: ENGR 2030, 2140. (F)

MAE 5310 Dynamic Systems and Controls 3
Study of continuous-time systems, classical and modern systems design methods, transfer function models, state space, dynamics of linear systems, and frequency domain analysis and design techniques. Introduction to controllability and observability, and full-state pole placement controller design. Laboratory work required. Prerequisite: MAE 3340. (F)

MAE 5410 Design and Optimization of Thermal Systems 3
Discussion of the basic considerations that occur in the design of thermal systems, including problem formulation, appropriate modeling and solution methodologies, optimization techniques, and economic analysis. Prerequisite: MAE 3440. (F)

MAE 5420 Compressible Fluid Flow 3
Application of conservation of mass, momentum, and energy to the design and analysis of compressible fluid systems. Prerequisites: MAE 3400, 3420. (F) DE

MAE 5440 Computational Fluid Dynamics 3
Introduction to computational fluid dynamics and heat transfer using the finite-volume method. Extensive code development. Application of a commercial CFD solver to a problem of interest. Prerequisites: MAE 3420 and 3440. (Sp)

MAE 5470 Internal Combustion Engines 3
Thermodynamics of internal combustion engines; idealized cycles, fuels, fuel metering, engine characteristics, pressure measurement, and engine testing. This course is not currently being offered. For information about when it may be offered, contact the department.

MAE 5500 Aerodynamics 3
Fundamentals of incompressible, inviscid flow; aerodynamic forces and moments; airfoil characteristics; incompressible flow around two-dimensional airfoils and finite wings; three-dimensional incompressible flow; and introduction to aircraft performance. Prerequisite: MAE 3420. (F)

MAE 5510 Dynamics of Atmospheric Flight 3
Aircraft equations of motion; aerodynamic forces and moments; aircraft stability and control in roll, pitch, and yaw; aircraft motion with six degrees of freedom; aircraft performance and design; and design project. Prerequisite: MAE 5500. (Sp)

MAE 5520 Elements of Space Flight 3
Introduction to astrodynamics and orbital design. Spacecraft systems engineering including spacecraft subsystems (e.g., attitude control, communications, power, structures). Introduction to propulsion and launch vehicles. Prerequisites: MAE 3320 or PHYS 3550; or both ECE 2250 and 2700. (F)

MAE 5530 Space System Design 3
Students in teams perform a space system design involving all aspects, including technical, cost, and schedule. Class is linked to national design competitions and/or current USU spacecraft design projects. Prerequisite: ECE 5230 or MAE 5520. Also taught as ECE 5240. (Sp)

MAE 5540 Propulsion Systems 3
Fundamentals of rocket and air breathing propulsion, including space flight dynamics, nozzle theory, combustion processes, and flight performance. Rocket propulsion systems, including solid, liquid, hybrid, and combined cycles. Air breathing propulsion systems, including ramjet, scramjet, turbojet, and turbofan engine concepts. Prerequisite: MAE 5420 or consent of instructor. (Sp) DE

MAE 5560 Dynamics of Space Flight 3
Fundamentals of spacecraft dynamics, including Keplerian orbits, orbital position as a function of time, three-dimensional orbits, orbital determination, orbital maneuvers, satellite attitude dynamics, and rocket vehicle dynamics. Prerequisite: MAE 3320 or permission of instructor. (F) DE

MAE 5580 Aircraft Design 3
Design and optimization of aircraft systems. Students work in teams to design and optimize an aircraft to satisfy a specific set of mission requirements, including mission effectiveness, cost, and scheduling. Class is linked to national design competitions and/or current USU aircraft design projects. Prerequisite: Permission of instructor. (F)

MAE 5600 (dual listing 6600) Reliability and Quality of Engineering Systems 3
Develops and refines students' knowledge of engineering systems, statistical process control (SPC), and reliability of systems. Introduces principles of quality and reliability. Presents different types of probability and application of the distributions. Discusses applications of reliability and quality data. Introduces different types of testing and screening techniques for qualification and quality assurance. Students learn how to plot reliability distributions. Prerequisites: MATH 4700 and minimum grade of *C*- in MAE 2650. (F)

MAE 5610 Hydraulics and Pneumatics 3
Hydraulic and pneumatic circuit theory, components, and systems analysis and design. Efficiency and performance evaluation, based on steady and transient flow principles and force and energy transfer concepts. Introduction to electrohydraulic control systems. Prerequisite: MAE 3420. This course is not currently being offered. Contact department for information about when it may be offered.

MAE 5620 Manufacturing Automation 3
Principles of automation technology as applied to manufacturing systems. Topics include motion control, PLC, robotics, CNC, and system integration. Prerequisite: MAE 2650. This course is not currently being offered. Contact department for information about when it may be offered.

MAE 5630 Machining Theory and Applications 3
Introduces fundamental metal cutting theory (such as chip formation, cutting forces and temperatures, and tool wear) and its applications, including high-speed machining of aerospace and other difficult-to-machine alloys. Prerequisites: MAE 2650 and 3040. This course is not currently being offered. Contact department for information about when it may be offered.

MAE 5640 Design for Manufacturability 3
Product design for economic production. Manufacturing processes (especially primary processes), associated tooling cost and design, and resultant product design requirements. Prerequisites: MAE 2650 and 3800. (F)

MAE 5650 Nontraditional and Additive Manufacturing Processes 3
Introduction to nontraditional and additive manufacturing processes, including rapid prototyping, laser processing, and electrical discharge machining. Prerequisites: MAE 2160, 2650, and 3440. MAE 3440 may be taken concurrently. (Sp)

MAE 5670 Fracture Mechanics 3
Covers linear elastic and elastic-plastic fracture mechanics; micro-mechanisms of fracture in metals, polymers, ceramics, composites, and concrete; and failure analysis of engineering. Enrollment limited to students accepted into College of Engineering. Prerequisites: Grade of *C*- or better in MAE 2160 and grade of *D* or better in MAE 3040. (F)

MAE 5680 Manufacturing Planning and Simulation 3
Explores planning and simulation methods for process design issues in electronics manufacturing (EM) and discrete parts manufacturing. Students learn planning, modeling, and simulation methods at the process and system level. Prerequisite: MAE 5600. This course is not currently being offered. Contact department for information about when it may be offered.

MAE 5900 Cooperative Practice 3
Planned work experience in industry. Detailed program must have prior approval. Written report required. Student must be in professional program. (F,Sp)

MAE 5930 Special Problems 1-3®
Formulation and solution of practical or theoretical problems. Prerequisite: Permission of department head. (F,Sp,Su)

MAE 6010 Finite Element Methods in Solid Mechanics II* 3**
Advanced theory and applications of finite element methods to both static and dynamic solid mechanics problems. Prerequisite: MAE 5020. (Sp)

MAE 6040 Continuum Mechanics and Elasticity 3
Mechanics of continuous media; tensors, stress, strain, deformation, rate equations, and constitutive equations. Plane stress, plane strain, torsion, and bending theories, as well as problem solutions, investigated for linear elastic materials. Prerequsites: MAE 3040 or CEE 3010; MATH 2210, 2250. (F) DE

MAE 6070 Mechanics of Composite Materials II* 3**
Second course in composite materials. Stress-strain states of laminated composite structures, including interlaminar stresses, failure criteria, and hygrothermal stresses. Prerequisite: MAE 5060. Also taught as CEE 6070. (F)

MAE 6080 Boundary Element Method 3
Presents introduction to boundary element method to solve fluid and solid mechanics problems. Prerequisites: FORTRAN programming skills, MAE 3040, 5020. (Sp)

MAE 6090 Theory of Plates and Shells 3
Introduction to plate and shell theories. Development of bending and buckling of plates and shells through classical theory. Prerequisite: MAE 3040 or CEE 3010. Also taught as CEE 6090. (F)

MAE 6130 Structural Dynamics and Seismic Design 3
Development and solutions for equations of motion for single- and multi-degree of freedom systems. Dynamic analysis by Modal Superposition and Response Spectra. Design of structures for seismically active areas. Also taught as CEE 6130. (Sp)

MAE 6180 Dynamics and Vibrations* 3**
Fundamentals of two-dimensional and three-dimensional rigid body dynamics, including Newtonian, Lagrangian, and Leavit Energy Methods. Equations of motion, mode shapes, and natural frequencies for continuous media and multi degree-of-freedom systems. Prerequisite: MAE 5300 or CEE/MAE 6130. Also taught as CEE 6180. (Sp)

MAE 6320 Linear Multivariable Control 3
Modeling, analysis, and design of multi-input, multi-output control systems, including both state space and transfer matrix approaches, with an emphasis on stability. Prerequisite: ECE 5310 or MAE 5310. Also taught as ECE 6320. (F)

MAE 6340 Spacecraft Attitude Control* 3**
Spacecraft attitude dynamics and controls. Spin stabilized, three axis, and dual spin modes. Attitude determination techniques. Prerequisite: ECE 5310 or MAE 5310. Also taught as ECE 6340. (Sp) DE

MAE 6350 Robotics 3
Fundamentals of robotic systems, including kinetics, kinematics, sensors, actuators, control algorithms, motion planning, and computer systems. Integration of critical design components to develop complete systems. Robotic manipulator analysis and design. Applications in manufacturing. Mobile rockets, including wheeled, legged, and alternative locomotion robots. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as ECE 6350. (Sp)

MAE 6410 Fluid Dynamics 3
Basic laws of fluid motion, Navier Stokes equations, kinematics of the flow field, fundamental exact solutions of viscous flow, and elements of turbulence. Prerequisite: MAE 3420 or CEE 3500. (F)

MAE 6420 Mechanical Engineering Experiments 3
Topics include experimental design, digital data acquisition, Fourier transforms, uncertainty analysis, writing and presentation, and some specific measurement techniques of interest to mechanical engineers. Prerequisite: MAE 3340. (Sp)

MAE 6430 Boundary Layer Theory and Convection Heat Transfer 3
Derivation of the boundary layer equations. Exact, approximate, and numerical solution techniques. Boundary layers in compressible flow. Separation. Unsteady boundary layers. Stability and transitition. Turbulent boundary layers. Integral, differential, and numerical methods for solving problems associated with transfer of heat in a viscous fluid. Prerequisites: MAE 3440, 6410. (Sp)

MAE 6440 Advanced Computational Fluid Dynamics 3
Advanced topics in computational fluid dynamics using the finite-volume method, compressible flow algorithms including body-fitted nonorthogonal grids, linear solvers, turbulence modeling, and parallel computing. Includes extensive code development. Prerequisite: MAE 5420. (F) DE

MAE 6450 Thermodynamics* 3**
Topics in classical and statistical thermodynamics, including distribution functions, free molecular flow, electron and photon gas modeling, derived properties of solids, and thermodynamic applications in areas of current research interest. Prerequisite: MAE 3400. (F)

MAE 6460 Conduction Heat Transfer* 3**
Integral, differential, and numerical methods for solving engineering problems associated with the diffusion of heat in a rigid solid. Prerequisite: MAE 3440. (Sp)

MAE 6480 Radiation Heat Transfer* 3**
Radiation theory and applications. Includes utilization of computer software. Prerequisite: MAE 3440. (F)

MAE 6490 Turbulence* 3**
Fundamentals of turbulent fluid flow, with emphasis on providing student with sufficient physical and mathematical background to critically evaluate current literature and make original research contributions. Topics include stochastic tools, the governing equations, transition to turbulence, isotropic turbulence, measurement techniques, and free and wall bounded turbulent shear flows. Prerequisite: MAE 6410 or instructor's consent. (Sp)

MAE 6500 Potential Flow* 3**
Inviscid, irrotational fluid flow with emphasis on aircraft analysis and design. Exact solutions with complex variables and conformal mapping; perturbation methods; singularity elements and influence coefficients; lifting-line method; numerical vortex lattice method; numerical panel methods; and software design and development. Prerequisite: MAE 5500. (F)

MAE 6510 Aircraft Dynamics and Flight Simulation 3**
Aircraft control and maneuverability, control response and transfer functions, nonlinear dynamics with gyroscopic and aerodynamic coupling, Euler angle formulations, direction cosine formulation, quaternion formulation, numerical integration methods, software design and development. Prerequisite: MAE 5510. (F)

MAE 6530 Propulsion Systems 3
Fundamentals of turbine and rocket propulsion, including nozzle theory and thermodynamic relations, combustion processes, and flight performance. Rocket propulsion topics, including solid, liquid, and hybrid rocket engines; and advanced engine concepts. Turbine engine propulsion systems, including turbojets, turbofans, afterburners, and advanced unducted fan concepts. Prerequisite: MAE 5420. (Sp)

MAE 6540 Advanced Astrodynamics* 3**
Advanced topics in astrodynamics to include: general and special perturbations, universal variables, methods of orbit determination, Lambert's theorem, the restricted three-body problem, and space mission planning. Prerequisite: MAE 5560. (F) DE

MAE 6550 Advanced Structural Analysis 3
Explores advanced structures in modern civil, mechanical, and aerospace systems. Emphasizes concepts through problem solving, and fosters an in-depth understanding of the subject. Provides understanding of the fundamental principles to analyze and design advanced structures. Prerequisite: MAE 6040. (Sp) DE

MAE 6560 Spacecraft Navigation 3
Fundamentals of aircraft and spacecraft navigation systems. Techniques in celestial and inertial navigation. Global Positioning System (GPS) principles. Least squares estimation and Kalman filtering for optimal estimation of stochastic

systems. Prerequisite: MAE 5310 or ECE 5310 or equivalent. Also taught as ECE 6560. (Sp) [DE]

MAE 6600 (dual listing 5600) Reliability and Quality of Engineering Systems 3
Develops and refines students' knowledge of engineering systems, statistical process control (SPC), and reliability of systems. Introduces principles of quality and reliability. Presents different types of probability and application of the distributions. Discusses applications of reliability and quality data. Introduces different types of testing and screening techniques for qualification and quality assurance. Students learn how to plot reliability distributions. Prerequisites: MATH 4700 and minimum grade of *C-* in MAE 2650. (F)

MAE 6620 Advanced Topics in Metal Cutting 3
Advanced topics in metal cutting mechanics, tool wear and tool life, chip control and breaking, high-speed and dry machining, surface roughness and integrity, and the optimization and monitoring of machining operations. Prerequisites: MAE 3800, 5630. (Sp)

MAE 6630 Transport Phenomena in Materials Processing 3
Analysis of various engineering processes through the development of physically-based mathematical models and associated experimental descriptions. Diffusion mass transfer, heat transfer, and fluid flow. Quantitative analysis and simulation of materials processing. Prerequisites: MAE 3420, 3440. (Sp)

MAE 6800 Advanced Machine Design* 3**
Advanced topics in fluid film and boundary lubrication. Dynamics and vibration consideration in design of machine systems and fatigue failure theories. Prerequisite: MAE 4300. (Sp)

MAE 6900 Seminar 0.5®
Overview of graduate program requirements, current research, and research opportunities. Presentations from graduate students, faculty, and outside speakers. Master's degree candidates must include 1 credit and doctoral degree candidates must include 2 credits of MAE 6900 in an approved program of study. Prerequisite: Graduate standing or approval of department head. (F,Sp)

MAE 6930 Special Problems 1-3®
Independent or group study of engineering problems not covered in regular course offerings. (F,Sp,Su)

MAE 6950 Design Project 3
Individual projects involving the design, development, and/or testing of components, devices, or systems. Formal report required. Taught Pass/Fail *only*. (F,Sp,Su)

MAE 6970 Thesis Research 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

MAE 6990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

MAE 7040 Elasticity* 3**
Energy theorems, variational techniques, complex variable solutions, and three-dimensional solutions for linear elastic materials. Prerequisite: MAE 6040 or instructor's consent. (Sp)

MAE 7050 Plasticity* 3**
Analysis of stresses, deformation, and collapse in devices constructed of plastic material. Prerequisite: MAE 6040 or CEE 6080/5080 or instructor's consent. Also taught as CEE 7050. (Sp)

MAE 7080 Advanced Plate and Shell Theory 3
Analysis of plate and shell structures by classical and numerical methods. Emphasis on numerical solutions. Prerequisite: Instructor's consent. Also taught as CEE 7080. (F)

MAE 7330 Nonlinear and Adaptive Control 3
Methods of nonlinear and adaptive control system design and analysis. Includes qualitative and quantitative theories, graphical methods, frequency domain methods, sliding surface design, linear parameter estimation methods, and direct and indirect adaptive control techniques. Prerequisite: ECE/MAE 6320. Also taught as ECE 7330. (Sp)

MAE 7350 Intelligent Control Systems* 3**
Intelligent control strategies, including neural network, fuzzy logic, associated memory networks, and rule-based control systems. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as ECE 7350. (Sp)

MAE 7360 Optimal and Robust Control 3
Advanced methods of control system analysis and design. Operator approaches to optimal control, including LQR, LQG, and L1 optimization techniques. Robust control theory, including QRT, H-infinity, and interval polynomial approaches. Prerequisite: ECE/MAE 6320 or instructor approval. Also taught as ECE 7360. (F)

MAE 7380 Advanced Dynamics and Vibrations* 3**
Advanced techniques in dynamics and vibrations. Prerequisite: CEE/MAE 6180. (F)

MAE 7580 Advanced Finite Element Analysis in Fluid Mechanics 3
Application of the finite element method of analysis to problems in fluid mechanics. Use of higher order element to two- and three-dimensional flows. Prerequisites: CEE 3510 or MAE 3420, CEE/MAE 5020. Also taught as CEE 7580. (Sp)

MAE 7750 Distributed Control Systems* 3
Design and implementation issues concerning distributed control systems. Real-time processing, distributed stability methods, network techniques and standards, system development and management, smart sensors, and control actuators. Survey of current literature. Prerequisite: ECE/MAE 6320. Also taught as ECE 7750. (Sp)

MAE 7930 Special Problems 1-3®
Independent or group study of engineering problems not covered in regular course offerings. (F,Sp,Su)

MAE 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

MAE 7990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
***Taught alternate years. For further information, consult department.

Mathematics (MATH)

See Department of Mathematics and Statistics, pages 359-368

MATH 0900 Elements of Algebra 3
Review of elementary algebra in preparation for MATH 1010. Remedial class not carrying USU or transfer credit. Remedial fee required. Graded Pass/Fail *only*. (F,Sp,Su) [DE]

MATH 1010 Intermediate Algebra 4
Linear equations and inequalities, polynomials and exponents, rational expressions, roots and radicals, quadratic equations, lines and systems of linear equations. Prerequisite: One of the following within the Math prerequisite acceptability time limit: (1) *C-* or better in MATH 0900, (2) Math ACT score between 18 and 22 (Math SAT score between 480 and 530) and satisfactory Math Placement Test score, (3) Math ACT score of at least 23 (Math SAT score of at least 540), or (4) satisfactory score on Math Placement exam. Course fee required. (F,Sp,Su) [DE]

MATH 1030 QL Quantitative Reasoning 3
Exploration of contemporary mathematical thinking, motivated by its application to problems in modern society. Emphasizes development of skill in analytical reasoning. Prerequisite: *C* or better in MATH 1010, or Math ACT score of at least 23 (Math SAT score of at least 540), or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. (F,Sp)

MATH 1050 QL College Algebra 4
Functions: graphs, transformations, combinations, and inverses. Polynomial, rational, exponential, logarithmic functions, and applications. Systems of equations and matrices. Partial fractions. Graphing calculator required. Prerequisite: *C* or better in MATH 1010, or Math ACT score of at least 23 (Math SAT score of at least 540), or AP calculus score of at least 3 on the AB exam, or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. (F,Sp,Su) DE

MATH 1060 Trigonometry 2
Trigonometric functions, equations, identities, and applications. Graphing calculator required. Prerequisite: *C* or better in MATH 1010 (or MATH 1050), or Math ACT score of at least 23 (Math SAT score of at least 540), or AP calculus score of at least 3 on the AB exam, or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. May be taken concurrently with MATH 1050. (F,Sp,Su) DE

MATH 1100 QL Calculus Techniques 3
Techniques of elementary calculus, differentiation, integration, elementary optimization, and introduction to partial derivatives. Applications in business, social science, and natural resources. Graphing calculator required. Prerequisite: *C*- or better in MATH 1050 or Math ACT score of at least 25 (Math SAT score of at least 580) or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. (F,Sp,Su) DE

MATH 1210 QL Calculus I 4
Analytic geometry, differential and integral calculus, transcendental functions, and applications. Graphing calculator required. Prerequisite: *C*- or better in MATH 1050 and 1060, or Math ACT score of at least 27 (Math SAT score of at least 620), or AP Calculus score of at least 3 on AB exam or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. (F,Sp,Su) DE

MATH 1220 QL Calculus II 4
Integration, infinite series, introduction to vectors, and applications. Graphing calculator required. Prerequisite: *C*- or better in MATH 1210, or AP score of at least 4 on Calculus AB exam or at least 3 on Calculus BC exam. (F,Sp,Su) DE

MATH 2020 QI Introduction to Logic and Geometry 3
Logic; introduction to algebraic geometry and Euclidean geometry. MATH 2020 is a mathematics content course, not a methods course. Prerequisite: *C*- or better in MATH 1050 or Math ACT score of at least 25 (Math SAT score of at least 580) or satisfactory score on Math Placement Test within the Math prerequisite acceptability time limit. Course fee required. (F,Sp,Su) DE

MATH 2210 QI Multivariable Calculus 3
Vector calculus, multiple integration, partial derivatives, line and surface integrals. The theorems of Green, Gauss, and Stokes. Prerequisite: *C*- or better in MATH 1220 or AP Calculus score of 5 on BC exam. (F,Sp,Su) DE

MATH 2250 QI Linear Algebra and Differential Equations 4
Linear systems, abstract vector spaces, matrices through eigenvalues and eigenvectors, solution of ode's, Laplace transforms, first order systems. Prerequisites: *C*- or better in MATH 1220; or AP Calculus score of 5 on BC exam and *C*- or better in MATH 2210. (F,Sp,Su) DE

MATH 2260 Internship and Cooperative Studies 1-6®
Lower-division internship/cooperative work experience. (F,Sp,Su)

MATH 2270 QI Linear Algebra 3
Solutions of linear systems, matrix operations, matrix factorization, vector spaces, subspaces, linear independence, bases, linear transformations, eigensystems, orthogonality, Gram-Schmidt orthogonalization, and projections. Prerequisites: *C*- or better in MATH 1220; or AP Math score of 5 on calculus BC exam and *C*- or better in MATH 2210. (F,Sp)

MATH 2280 QI Ordinary Differential Equations 3
Analytic solution techniques for ordinary differential equations. Initial value and boundary value problems and applications. Higher-order scalar equations, first-order linear systems, and Laplace transforms. Prerequisite: *C*- or better in MATH 2270. (F,Sp)

MATH 2910 Directed Reading and Conference 1-3®
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su) DE

MATH 3110 Modern Geometry 3
Euclidean and non-Euclidean geometry, with emphasis on historical significance of parallel postulate. Axiomatic development of geometry and theorems. Prerequisite: *C*- or better in MATH 1220. (Sp) DE

MATH 3300 School Laboratory for Mathematics Teachers Level I 1
Provides preservice mathematics teachers with supervised experiences working with teachers and students in middle and secondary schools. Activities coordinated with other Level I professional education courses. Graded Pass/Fail *only*. (F,Sp) DE

MATH 3310 Discrete Mathematics 3
Logic and axiomatics, sets, functions, counting methods, recurrence relations, graph theory, Boolean algebras, combinatorical circuits, automata, grammars, and languages. Prerequisite: *C*- or better in MATH 1220. (F,Sp,Su) DE

MATH 4200 CI Foundations of Analysis 3
Fundamental concepts of analysis studied from a rigorous point of view. Rigorous development of the real number system and calculus. Emphasis on learning how to construct proofs. Prerequisites: *C*- or better in MATH 2210, 2250; or *C*- or better in MATH 2210, 2270, 2280. (F,Sp) DE

MATH 4230 QI Applied Mathematics in Biology* 3**
Formulation, analysis, and experimental tests of mathematical models in biology. Combines mathematics, computing, experimental design, and statistical analysis while applying the scientific method to biological systems. Lectures, recitations, and a laboratory. Prerequisites: *C*- or better in BIOL 1620 and MATH 2250; or permission of instructor. Programming experience recommended. Also taught as BIOL 4230. (Sp)

MATH 4250 Advanced Internship/Co-op 1-6®
An internship/cooperative work experience which has been determined by the department to be at the 4000-level. (F,Sp,Su)

MATH 4300 School Laboratory for Mathematics Teachers Level II 1
Provides preservice mathematics teachers with supervised experiences working with teachers and students in middle and secondary schools. Activities coordinated with other Level II professional education courses. Graded Pass/Fail *only*. (F,Sp) DE

MATH 4310 CI Introduction to Algebraic Structures 3
First course in theory of algebraic structures. Topics include elementary group and ring theory. Prerequisites: *C*- or better in MATH 2210, 2270, 2280; or *C*- or better in MATH 2210, 2250. (F,Sp) DE

MATH 4400 History of Mathematics and Number Theory 3
Chronological parallel of math history with cilvilization, evolution of mathematical thought, historical foundations of numbers, computation, geometry, algebra, trigonometry, and calculus. Introduction to number theory. Prerequisites: At least one of MATH 4200 and 4310 with a *C*- or better, and concurrent enrollment in the other. (Sp) DE

MATH 4500 Methods of Secondary School Mathematics Teaching 3
A teaching methods course required of all prospective secondary school mathematics teachers. Prerequisites: *C*- or better in MATH 3110; and one of MATH 4200 or 4310 with a *C*- or better. (F,Sp) DE

MATH 4700 Engineering Mathematics and Statistics 3
Advanced engineering mathematics and statistics including: random variables; distributions; central limit theory; hypothesis testing; Anova; quality control; Fourier series; introductory analytic and numerical methods for elliptic, parabolic, and hyperbolic PDEs; and modern software packages. Prerequisites: *C*- or better in MATH 2210; *C*- or better in MATH 2250 or 2280. (F,Sp)

MATH 4910 Directed Reading and Conference 1-3®
Registration requires prior arrangement with specific instructor. (F,Sp,Su) DE

MATH 5010 Capstone Mathematics, Statistics, and Technology for Teachers 3
Builds on competencies gained from prior courses and incorporates technologies available for teaching and learning mathematics to analyze and interrelate mathematical concepts. Applications in secondary school mathematics curricula. Prerequisites: *C*- or better in MATH 3310; and successful completion of, or concurrent enrollment in, MATH 3110, 4200, 4310, 4400, and 5710. (F) DE

MATH 5110 Differential Geometry 3
Introduction to geometry of curves and surfaces in three dimensions, using graphic and symbolic software. Prerequisites: *C*- or better in MATH 2210, 2250; or *C*- or better in MATH 2210, 2270, 2280. (Alt F)

MATH 5210 Introduction to Analysis I 3
One and several variable calculus from an advanced point of view. Proofs of all main theorems in calculus. Prerequisite: *C*- or better in MATH 4200 or 5510. (F)

MATH 5220 Introduction to Analysis II 3
Continuation of MATH 5210. Rigorous development of multivariable advanced calculus. Prerequisite: *C*- or better in MATH 5210. (Sp)

MATH 5270 Complex Variables 3
Basic theory and applications of complex variables for mathematics, physics, and engineering students. Topics include analytic functions, contour integration, and residue theorem conformal mappings. Prerequisites: *C*- or better in MATH 2210, 2250; or *C*- or better in MATH 2210, 2270, 2280. (Sp) DE

MATH 5310 Introduction to Modern Algebra* 3**
Continuation of MATH 4310. Topics include: Sylow theory for finite groups, factorization theory for commutative rings, and Galois theory. Prerequisite: *C*- or better in MATH 4310. (Sp)

MATH 5340 Theory of Linear Algebra 3**
Vector space theory, linear transformations and matrices, eigenvalues and eigenvectors, inner product spaces, orthogonality, canonical forms, and Hermitian matrices. Prerequisite: *C*- or better in MATH 2250 or 2270; or consent of instructor. (F)

MATH 5410 Methods of Applied Mathematics 3
Basic modeling and qualitative understanding, including dimensional analysis (Buckingham Pi theorem). Asymptotic solutions, perturbation approaches, boundary layers in differential equations, variational calculus, Hamilton's principle, and conservation of energy. Emphasizes practical approaches to science and engineering problems. Prerequisites: *C*- or better in MATH 2210, 2250; or *C*- or better in MATH 2210, 2270, 2280. (F)

MATH 5420 Partial Differential Equations 3
Modeling with partial differential equations, diffusion, and wave equations. Classical solution techniques including: maximum principles, separation of variables (eigenfunctions), method of characteristics, Fourier and Laplace transforms, and singularity methods (Green's Functions). Emphasizes understanding and solving physical equations. Prerequisite: *C*- or better in MATH 2250 or 2280. (Sp)

MATH 5460 Introduction to the Theory and Application of Nonlinear Dynamical Systems 3
Qualitative behavior of nonlinear maps and ordinary differential equations. Stability of solutions, bifurcation theory, chaos, and applications. Prerequisite: *C*- or better in MATH 2250 or 2280. (Sp)

MATH 5510 Introduction to Topology 3
Elementary point-set topology, topological spaces, separation axioms, metric spaces, compactness, connectedness, order topology, countability axioms, continuity, and homeomorphisms. Prerequisite: *C*- or better in MATH 4200. (Alt F)

MATH 5570 Actuarial Math I* 3**
Introduction to theory of risk and its application to construction and analysis of models for insurance systems. Prerequisites: *C*- or better in MATH 5710, STAT 3000, and permission of instructor. (F)

MATH 5580 CI Actuarial Math II* 3**
Continuation of MATH 5570. Prerequisite: *C*- or better in MATH 5570. (Sp)

MATH 5610 Computational Linear Algebra and Solution of Systems of Equations 3
Numerical solutions of systems of linear and nonlinear equations, methods for eigensystems, least squares problems, finding roots of functions and nonlinear systems, constrained and unconstrained optimization. Prerequisites: *C*- or better in MATH 2210, *C*- or better in MATH 2250 or 2270, and a high-level programming language. (F)

MATH 5620 Numerical Solution of Differential Equations 3**
Numerical solution of differential equations, initial and boundary value problems, finite difference, finite element, and spectral methods (FFT) applied to ODEs and PDEs. Prerequisites: *C*- or better in MATH 2210; *C*- or better in MATH 2250 or 2270; *C*- or better in MATH 2280; and a high-level programming language. (Sp)

MATH 5640 Optimization* 3**
One-semester introductory survey of optimization, including both continuous and combinatorial problems. Topics include: linear programming, constrained and unconstrained optimization, network models, dynamic programming, and integer programming. Prerequisites: *C*- or better in MATH 2210; *C*- or better in MATH 2250 or 2270; and a high-level programming language. (Sp)

MATH 5710 Introduction to Probability 3
Discrete and continuous probability, random variables, distribution and density function, joint distributions, conditional probabilities and expectations, Bayes' theorem, moments, moment generating functions, inequalities, convergence in probability and distribution, and central limit theorem. Prerequisites: *C*- or better in MATH 2210; and *C*- or better in MATH 2250 or 2270. (F,Sp)

MATH 5720 Introduction to Mathematical Statistics 3
Basic theory of point and interval estimation and hypothesis testing. Topics include: sufficiency and completeness; method-of-moments, best unbiased, maximum likelihood, Bayes', and empirical Bayes' estimators; Neyman-Pearson lemma; and likelihood ratio tests. Prerequisite: *C*- or better in MATH 5710. (Sp)

MATH 5740 Actuarial Financial Mathematics 3**
Introduces fundamental concepts of financial mathematics, focusing on applications to non-life insurance. Topics include interest theory, cash flows and yield rates, annuities, portfolio insurance, and derivatives. Also includes discussion of probability models for underlying assets. Prerequisites: MATH 1220 and STAT 3000. (Sp)

MATH 5760 Stochastic Processes* 3
Application of stochastic processes to engineering and science. Topics include Markov chains, Poisson processes, renewal theory, and Brownian motion. Prerequisite: *C*- or better in MATH 5710. (F)

MATH 5810 Topics in Mathematics 1-3®
MATH 5820 Topics in Mathematics 1-3®
Prerequisite: Permission of instructor. (F,Sp,Su) DE (F,Sp,Su)

MATH 5910 Directed Reading and Conference 1-3®
Prerequisite: Prior arrangement with a specific instructor. (F,Sp,Su)

MATH 5950 Honors Senior Project 1-4
A senior project required for completion of the departmental honors program. Prerequisite: Permission of instructor. (F,Sp,Su)

MATH 6110 Differential Geometry* 3
MATH 6120 Differential Geometry* 3
Topics include manifolds, calculus on manifolds, tensor calculus and differential forms, Lie groups, Riemannian geometry, deRham's Theorem, and Hodge theory. Prerequisite: *C*- or better in MATH 5110 or 5220; MATH 6110 must be completed prior to MATH 6120. (F) (Sp)

MATH 6210 Real Analysis* 3
MATH 6220 Real Analysis* 3
Measure theory, abstract integration, differentiation, introduction to functional analysis, Hilbert and Banach spaces. Prerequisite: *C*- or better in MATH 5210; MATH 6210 must be completed prior to 6220. (F) (Sp)

MATH 6250 Graduate Internship/Cooperative Studies* 1-6®
Graduate internship/cooperative work experience. (F,Sp,Su)

MATH 6270 Complex Variables* 3
Analytic functions, singular points, conformal maps, harmonic functions, analytic continuation, Residue theory. Prerequisite: *C*- or better in MATH 5210 or 5270. (Sp)

MATH 6310 Modern Algebra* 3
MATH 6320 Modern Algebra* 3
Algebraic structures, including vector spaces, groups, rings, algebras, and modules. Topics include: category theory, elementary commutative ring theory, and algebraic geometry. Prerequisite: *C*- or better in MATH 5310; MATH 6310 must be completed prior to 6320. (F) (Sp)

MATH 6340 Multilinear Algebra and Matrix Theory* 3
MATH 6350 Multilinear Algebra and Matrix Theory* 3
Permutation groups and representations, tensor spaces, symmetry classes of tensors, generalized matrix functions, matrices and graphs, and combinatorial matrix algebra. Prerequisite: *C*- or better in MATH 5340; MATH 6340 must be completed prior to 6350. (F) (Sp)

MATH 6410 Ordinary Differential Equations I* 3
Existence-uniqueness theory, linear equations and systems, nonlinear equations, and stability. Prerequisite: *C*- or better in MATH 5210. (F)

MATH 6420 Partial Differential Equations I* 3
Introduction to the theory of partial differential equations, including existence and uniqueness. Prerequisite: *C*- or better in MATH 5220 or 6410. (Sp)

MATH 6440 Ordinary Differential Equations II* 3
Asymptotic behavior, periodicity, boundary value problems, and perturbation methods. Prerequisite: *C*- or better in MATH 6410. (Sp)

MATH 6450 Partial Differential Equations II* 3
Advanced existence and uniqueness theorems, behavior of solutions, Sobolev spaces. Prerequisites: *C*- or better in MATH 6210; and *C*- or better in MATH 5420 or 6420. (Sp)

MATH 6470 Advanced Asymptotic Methods* 3
Theory of asymptotics and perturbations. Boundary layers for ordinary and partial differential equations. Free boundary problems, shocks, multiple-scale methods, and WKB methods. Prerequisite: *C*- or better in MATH 5420. (Sp)

MATH 6510 Topology* 3
MATH 6520 Topology* 3
Homotopy theory, fundamental groups, covering spaces, singular homology with applications to spheres and Euclidean spaces, CW complexes, cohomology ring, and Poincare duality. Prerequisites: *C*- or better in MATH 4310, 5510; and *C*- or better in MATH 5310 or consent of instructor. MATH 6510 must be completed prior to 6520. (F) (Sp)

MATH 6610 Numerical Analysis* 3
Linear and nonlinear equations, large scale problems, and eigenvalues. Prerequisites: *C*- or better in MATH 5210, 5610, or consent of instructor. (F)

MATH 6620 Numerical Analysis* 3
Numerical solution of ordinary and partial differential equations. Prerequisite: *C*- or better in MATH 6610 or consent of instructor. (Sp)

MATH 6640 Optimization* 3
Unconstrained problems, smooth function methods, linearly constrained problems, linear and quadratic programming, nonlinearly constrained methods, and practicalities. Prerequisite: *C*- or better in MATH 5220 or consent of instructor. (Sp)

MATH 6750 Probability Theory* 3
MATH 6760 Probability Theory* 3
Probability spaces, random variables, distribution functions, expectations, independence, modes of convergence, limit theorems, and applications. Prerequisite: *C*- or better in MATH 5210; MATH 6750 must be completed prior to 6760. (F) (Sp)

MATH 6810 Topics in Mathematics (Topic)* 3®
MATH 6820 Topics in Mathematics (Topic)* 3®
Prerequisite: Consent of instructor. (F) (Sp)

MATH 6910 Directed Reading and Conference* 1-3®
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su)

MATH 6970 Thesis 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

MATH 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

MATH 7110 Geometry (Topic)* 3®
MATH 7120 Geometry (Topic)* 3®
(F) (Sp)

MATH 7210 Analysis (Topic)* 3®
MATH 7220 Analysis (Topic)* 3®
(F) (Sp)

MATH 7310 Algebra (Topic)* 3®
MATH 7320 Algebra (Topic)* 3®
(F) (Sp)

MATH 7410 Differential Equations (Topic)* 3®
MATH 7420 Differential Equations (Topic)* 3®
(F) (Sp)

MATH 7510 Topology (Topic)* 3®
MATH 7520 Topology (Topic)* 3®
(F) (Sp)

MATH 7610 Numerical Analysis (Topic)* 3®
MATH 7620 Numerical Analysis (Topic)* 3®
(F) (Sp)

MATH 7750 Probability (Topic)* 3®
MATH 7760 Probability (Topic)* 3®
(F) (Sp)

MATH 7810 Topics in Mathematics (Topic)* 3®
MATH 7820 Topics in Mathematics (Topic)* 3®
(F) (Sp)

MATH 7910 College Teaching Internship 3®
(F,Sp,Su)

MATH 7970 Dissertation Research 1-15®
Graded Pass/Fail *only*. (F,Sp,Su)

MATH 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*This course will be taught as needed. For information about availability, contact the Department of Mathematics and Statistics.
**Taught 2010-2011.
***Taught 2009-2010.

Management (MGT)

See Department of Management, pages 349-355

Note: Effective Fall Semester 2009, the courses previously listed under the Management and Human Resources (MHR) prefix will be listed under the MGT prefix. Also, some of the courses previously listed under the Business Adminisration (BA) prefix will be taught under the MGT prefix, while other courses previously listed under the BA prefix will be taught under the Finance (FIN) prefix. (FIN courses are shown on pages 565-566.) Students registering for Summer Semester 2009 Management and Human Resources *or* Business Administration courses can find them under the MHR *or* BA prefix by logging into Access at: **http://www.usu.edu/myusu/**

MGT 1160 Developing Self-Management Skills 1
A practical course designed to provide basic self-management skills contributing to personal effectiveness. For freshmen and sophomores *only*. (F,Sp,Su)

MGT 1350 Introduction to Business 3
Investigation of the role of business in contemporary society, including an introduction to the general problems of business operation. (F) DE

MGT 2050 Legal and Ethical Environment of Business 3
Surveys the legal and ethical environment of business. Introduction to elementary legal research and writing and critical thinking techniques. Lecture and laboratory. Prerequisites: STAT 1040 or MATH 1030 or 1050 (MATH 1050 or equivalent is required for Huntsman School of Business majors); and GPA of 2.5 or higher. (F,Sp,Su) DE

MGT 2160 Student Applied Leadership Training 1-3®
Available to students involved in structured leadership training provided as part of their role and responsibility at the University. For details, contact the Office of University Advising (TSC 304). Prerequisite: Approval of course coordinator. (F,Sp,Su)

MGT 2350 Small Business Management 3
Provides practical overview of management principles and practices as they apply to the small business enterprise. For nonbusiness majors.[1]

MGT 3080 QI Operations Research 3
Quantitative methods for resource allocation: linear programming, queuing theory, simulation, project management, etc. Prerequisites: STAT 2300 or 3000; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

MGT 3110 DSS Managing Organizations and People 3
Overview of the role of management, and an introduction to leadership theory and practice. Includes defining of mission and goals, organizing work, and managing human performance. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp,Su) DE

MGT 3300 Contemporary Issues in International Trade 3
Examines interrelated economic, political, and social issues faced by institutions and individuals at various points in the trade process. Prerequisite: Admission to Huntsman Scholars Junior Year Program. Also taught as ECN 3300. (F)

MGT 3500 Fundamentals of Marketing 3
Overview of marketing function, emphasizing concepts and terminology. Includes basic marketing activities of product management, pricing, distribution, promotion, marketing research, and consumer behavior. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp,Su) DE

MGT 3510 Fundamentals of Entrepreneurship 3
Introduction to entrepreneurship and the processes of new ventures. The objective is to help students become familiar with entrepreneurship and ascertain the degree to which it represents a viable career path. Focuses on identifying, analyzing, and developing business opportunities. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

MGT 3520 Relationship and Organizational Competencies for Entrepreneurs 3
Development of the relationship and organizational competencies for entrepreneurs. Focuses on the development of persuasion, delegation, and organizational skills for individuals who launch businesses and/or play a key role in their growth. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

MGT 3550 Entrepreneurial Executive Lecture Series 3®
Discussion of the discovery, evaluation, and exploitation of entrepreneurial opportunities. Each week, an active or harvested entrepreneur is invited to share his or her story of new venture creation. Through discussion and a question and answer session, students interact with the entrepreneurs. (Sp)

MGT 3700 Operations Management 3
Covers the concepts and tools related to managing a business operation. Topics include demand forecasting, operations strategy and resource planning, process layout, lean systems, inventory and quality, and project management. Prerequisites: STAT 2300 or 3000; MATH 1100; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp,Su) DE

MGT 3710 Developing Team and Interpersonal Skills 3
Experientially-driven course focusing on the role of teams in organizations and on developing skills which individuals and teams need to be effective. Topics include self-awareness, supportive communication, problem solving, and conflict management. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

MGT 3720 DSS Leading Organization Change 3
Explores the topic of organizational change and transformation, with special emphasis on the role of leadership, vision, and organization culture in change programs. Extensive use of case studies and experiential exercises. Also covers the history of organization development, change facilitation, and dealing with resistance to change. Prerequisites: MGT 3110; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits.[1]

MGT 3810 DSS Employment Law and Policy Development 3
Examines laws related to employment, labor relations, civil rights, compensation, safety, health, and retirement. Provides hands-on experience in drafting and reviewing human resource policies in a business setting. Addresses implementing and influencing public policy. Prerequisites: MGT 2050; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)[1]

MGT 3820 DSS International Management 3
Exploration of international culture and context of management, the impact of globalization on businesses today, and the pressures and complexities of operating in global markets, including the processes of managing multi-cultural human resources. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

MGT 4050 International Retailing 3
(dual listing 6050)
Issues related to retailing in international markets, such as motivations, cultural influence on consumer behavior, and entry strategies. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (Prerequisites *do not apply* to students taking MGT 6050.)

MGT 4070 CI Retail Management 3
(dual listing 6070)
Basic issues related to retail management, such as merchandising, location, promotion, store management, and retail image. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (Prerequisites *do not apply* to students taking MGT 6070.) (Sp)

MGT 4240 Merchandise Planning and Control 3
Issues related to pricing, budgeting, open-to-buy, and planning inventory. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits.

MGT 4510 Buyer Behavior 3
Marketing analysis of the decision processes of individuals, households, businesses, and not-for-profit institutions. Builds on concepts from psychology, sociology, anthropology, and economics. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; PSY 1010 or SOC 1010 or USU 1340; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp) DE

MGT 4520 New Venture Planning 3
Theoretical and practical aspects of starting or buying a business. Includes development of a business plan, as well as conducting due diligence for buying a business or extensive consulting with a start-up or growth business. Prerequisites: MGT 3510, 3520; admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F)

MGT 4530 Marketing Research 3
Management of marketing research function. Basic vs. decisional research, survey research, cost vs. value of information, research design, experimentation, and analysis techniques. Prerequisites: Grade of *B-* (2.67) or better MGT 3500; choose one of the following statistics courses: STAT 1040, 2300, 3000, or PSY 2800; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

MGT 4540 Marketing Institutions 3
Examination of strategic decision-making by institutions involved in the marketing channel. Primary emphasis on retail institutions. Explores types of marketing intermediaries, vertical integration, channel member power and conflict, and international channel management issues. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F) DE

MGT 4550 Promotion Management 3
Examines role of promotion concepts in development of a communication strategy. Based on an introduction to the nature of communications, course covers advertising, personal selling, and sales promotion, emphasizing the competitive and strategic value of communications in both the marketplace and society. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

MGT 4590 Global Marketing Strategy 3
Analytical approach to strategic marketing problems facing the firm competing in global markets. Emphasizes key analytical and decision-making frameworks concerning the global marketing environment and the marketing mix and their impact on the firm's performance. Prerequisites: Grade of *B-* (2.67) or better in MGT 3500; MGT 4540, 4550; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

MGT 4630 Human Resource Management 3
Introduces the process of managing human resources, including human resource planning, recruitment, selection, training, performance evaluation, compensation, career management, and labor relations. Also discusses diversity, human resource strategy, and related ethical issues. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits. (F,Sp)

MGT 4710 Senior Leadership Project 3
Students plan and complete advanced leadership projects, present results, and document accomplishments. Students gain practical experience and demonstrate ability to manage complex projects, contributing to organizational goals and their own career objectives. Prerequisite: Permission of instructor.[1]

MGT 4720 Production Planning and Control 3
Examines concepts and tools used in the planning and control of production activity and material flow. Topics include production scheduling, capacity analysis, and push versus pull production. Prerequisites: Grade of *B-* (2.67) or better in MGT 3700; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (Sp)

MGT 4730 Business and Society 3
Examines the relationship of business enterprises with their external environment and helps students to develop an analytical framework for addressing the business and society relationship over one's career in business or government. Helps students recognize, formulate, and analyze moral issues, as well as trace decisions forward to personal, cultural, and societal consequences. Prerequisites: Admittance to a USU major; cumulative GPA of 2.67 or higher; and completion of at least 40 credits.[1]

MGT 4750 Production Simulation 3
Computer simulation of production environment, including scheduling, routing, labor capacity, inventory, and delivery. Emphasizes just-in-time concepts. Prerequisites: Grade of *B-* (2.67) or better in MGT 3700; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (Sp)

MGT 4790 Supply Chain Management 3
Analysis of the concept of supply chains and how managing them supports operations strategy and organizational competitiveness. Topics include supply management, supply chain alliances, distribution planning, and logistics systems design. Prerequisites: Grade of *B-* (2.67) or better in MGT 3700; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits. (F,Sp)

MGT 4800 Independent Research and Readings 1-3®
Provides opportunity for student to pursue special interests under tutorship of faculty. Prerequisite: Approval of faculty member and department head. (F,Sp,Su) DE

MGT 4880 CI Business Strategy in an Entrepreneurial Context 3
Integrative capstone course dealing with processes, methods, and steps involved in starting and growing small to mid-size business ventures. Emphasizes cross-functional challenges of market entry, finance, operations, managing business growth, and entrepreneurs' responsibilities to society. Prerequisites: Senior standing; FIN 3400; MGT 3110, 3500, 3700; admittance to a USU major; cumulative GPA of 2.67 or higher. (F,Sp,Su)

MGT 4890 CI Business Strategy in a Global Context 3
Integrative capstone course dealing with challenges and strategies associated with international business. Students develop global business judgment and perspective through addressing problems related to global market entry and growth, finance, operations, strategic alliances, social responsibility, and business-government relationships. Prerequisites: Senior standing; FIN 3400; MGT 3110, 3500, 3700; admittance to a USU major; cumulative GPA of 2.67 or higher. (F,Sp,Su)

MGT 4950 Senior Honors Thesis/Project 3
Creative project that will then be written up, and presented, as a Senior Thesis as required for an Honors Plan. (Sp)

MGT 5640 (dual listing 6640) Selected Topics in Management and Human Resources 1-3®
Selected topics in management and/or human resources are pursued in depth. Topics and instructor may vary.[1]

MGT 5730 (dual listing 6730) Continuous Improvement 3
Application of continuous improvement concepts, systems, and techniques throughout the organization. Analysis of contemporary methods of management and continuous improvement. Topics include: continuous flow, scientific thinking and the continuous improvement cycle, value stream mapping, root cause analysis, mistake proofing, and creative problem-solving. Prerequisites: STAT 2300 or 3000; admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 90 credits. (Prerequisites *do not apply* to students taking MGT 6730.) (F)

MGT 6010 Advanced Business Law 3
Detailed investigation of business law, including law of contracts, torts, property, secured transactions, commercial paper, and business organizations. Prerequisite: MGT 2050.[1]

MGT 6050 (dual listing 4050) International Retailing 3
Issues related to retailing in international markets, such as motivations, cultural influence on consumer behavior, and entry strategies.

MGT 6055 Management Principles 1.5
Introduction of management principles for students entering a master's degree program in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

MGT 6070 (dual listing 4070) Retail Management 3
Basic issues related to retail management, such as merchandising, location, promotion, store management, and retail image. (Sp)

MGT 6075 Fundamentals of Business Law 1.5
Introduction of business law principles for students entering a master's degree program in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

MGT 6180 Intrasession MBA Workshop 0.5-1®
Intensive workshops designed to enhance the MBA experience.

MGT 6300 Leadership and Operational Excellence 3
Introduces the principles of leadership consistent with the philosophy of operational excellence. Presents a framework for leading balanced and comprehensive efforts toward achieving organizational objectives. Topics include: humility in leadership, respect for the individual and ethics, continuous improvement as a strategy, corporate culture as a control mechanism, and measurement principles. (F)

MGT 6310 Career and Professional Development 1-3®
Explores theory and literature of careers, including orientation, as well as early-, mid-, and late-career issues. Students evaluate interests and capabilities, implement a personal development plan, get feedback on career development, and receive an objective outsider assessment of career readiness. (F,Sp,Su)

MGT 6330 Applied Human Resources Research 3
Provides applied research for selected human resource topics. (F)

MGT 6370 Project Management 3
Teaches concepts of project management, while intensively involving students in production and operations related projects. Requires integrative organizational and industry research and a professional report.[1]

MGT 6410 New Venture Creation 3
Focuses on development of new ventures, including entrepreneurial competencies, venture teams, recognizing business opportunities, gathering resources, new venture finance, entry strategies, legal structure, licensing and regulatory requirements, patents, copyrights, and product liability.[1]

MGT 6430 New Venture Growth and Expansion 3
Analyzes the growth phase of business development. Topics include organizational competencies and systems, growth strategies, growth finance and staging, cash-flow, franchising, estate and family business issues, harvest strategies including buyouts and public offerings, and employment law for small employers.[1]

MGT 6470 Entrepreneurship Project 3
Teaches concepts of project management, while intensively involving students in entrepreneurship-related projects such as initiating a start-up or consulting with management of an emerging business. Requires integrative organizational and industry research and a professional report.[1]

MGT 6500 Managing Individuals and Groups 3
Focuses on development of interpersonal and team skills. Includes development of organizational systems supporting effective use of human resources, including performance management, motivation, selection, training, rewards, and career development. (F) DE

MGT 6510 Marketing Techniques 1.5
Introduction of marketing principles for students entering a master's degree program in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

MGT 6520 Marketing Strategy 3
Advanced case approach to current marketing management problems. Emphasizes concepts, research, techniques, decision making, and marketing strategy development. (Sp) DE

MGT 6540 Special Topics in Marketing 3
Selected topics in marketing pursued in depth. Topics and instructors vary semester to semester. Current topics include: Marketing Communications and Supplemental Aspects of Electronic Commerce, The Changing Environment of Marketing Institutions, and Buyer Behavior. Prerequisite: MGT 6520. (Sp)

MGT 6550 Talent Acquisition and Retention 3
Focuses upon creation of competitive advantage through strategic human resources planning and staffing. Topics include job analysis, preparing candidate specifications, recruitment, assessment, and placement. Also covers pertinent laws/regulations and applicable descriptive/inferential statistics. (F)

MGT 6560 Market Analysis and Decision Making 3
Develops skills necessary to plan and implement an effective marketing strategy. Focuses on role of marketing information in managerial decision making. Uses marketing cases and/or simulation games throughout the course. (F,Sp)

MGT 6620 Training and Organizational Development 3
Provides advanced treatment of employee, management, and organizational development. Specific topics include: historical background, needs assessment, program design and implementation, outcomes evaluation, and how individuals and organizations change. (Sp)

MGT 6630 Total Rewards and Employee Performance 3
Strategic analysis and design of compensation, benefits, and performance management systems. Key topics include performance assessment; employee motivation, discipline, and performance improvement; and design and implementation of compensation and benefit systems to attract and retain talent, while facilitating achievement of the strategic objectives of the organization. (Sp)

MGT 6640 Selected Topics in Management (dual listing 5640) and Human Resources 1-3®
Selected topics in management and/or human resources are pursued in depth. Topics and instructor may vary.[1]

MGT 6650 Team and Interpersonal Effectiveness 3
Experiential course designed to develop team effectiveness, and specific managerial and leadership skills contributing to interpersonal competence and effectiveness in work groups and organizations. (F)

MGT 6670 Employee Relations and the Labor Movement 3
Comprehensive survey of union-management relationships, including labor markets and the labor movement, labor history and law, union organization and government, and contract negotiation and administration. Includes exercises and cases in negotiations and grievance processes. (Sp)

MGT 6680 Human Capital Management 3
Introduction to human capital management practices. Specific objectives include developing a working understanding of the links between HRM and firm outcomes, gaining a working knowledge of HR database technologies, and achieving an ability to develop and use fundamental HR costing techniques.[1]

MGT 6690 Human Resource Strategy 3
Capstone course in Human Resource Management, designed to integrate concepts learned in specialized courses to the management of a total Human Resource function, with integration from both strategic and tactical perspectives. Covers domestic and international issues, as well as organizational change and development. (F)

MGT 6710 Essentials of Operations Management 1.5
Introduction of operations management principles for students entering a master's degree program in the Huntsman School of Business. Prerequisite: Acceptance into a Huntsman School of Business master's degree program. (Su)

MGT 6720 Operations Management 3
Study of basic process functions in managing a production or service organization, such as inventory control, production control, procurement, quality control, production planning, forecasting, etc. (F)

MGT 6730 Continuous Improvement 3 (dual listing 5730)
Application of continuous improvement concepts, systems, and techniques throughout the organization. Analysis of contemporary methods of management and continuous improvement. Topics include: continuous flow, scientific thinking and the continuous improvement cycle, value stream mapping, root cause analysis, mistake proofing, and creative problem-solving. (F)

MGT 6740 Decision Making in Operations Management 3
Selected topics in operations management pursued in depth. Topics and instructors vary from semester to semester. Prerequisite: MGT 6720. (Sp)

MGT 6760 Employment Law 3
Examines laws related to employment, labor relations, civil rights, compensation, safety, health, and retirement. Provides experience in dispute resolution techniques in a nonunion employment setting, including negotiation, mediation, and arbitration. (F)

MGT 6770 Ethics for the Business Professional 1.5
Taking a stakeholder perspective on business, this course introduces students to several moral and ethical frameworks. Current case analyses and experiential activities allow students to confront ethical dilemmas and work through acceptable alternatives. (F)

MGT 6780 The Role of Business in Society 1.5
Considers relationship between business and its societal context, including a discussion of how business enterprises maintain their legitimacy and mandate. Helps students develop an analytical framework for addressing issues at the intersection of business and society, including the personal, cultural, and societal consequences of business decisions. (F,Sp,Su)

MGT 6860 Business Research Methods 3
Explores the fundamentals of qualitative and quantitative data collection and analysis. Students design and implement small, integrated research activities, then use the results to make business strategy recommendations. (Sp)

MGT 6890 Global Business Strategy 3
Integrative capstone course, taking a CEO's perspective, addressing global competitiveness, strategic assessment, policy development, and strategy execution. Must be taken at end of advanced MBA program. (Su) [DE]

MGT 6900 Independent Research and Readings 1-3®
Provides opportunity for students to pursue special interests under tutorship of the faculty. Prerequisite: Approval of faculty member and department head. (F,Sp,Su) [DE]

MGT 6960 Professional Paper 3
Preparation of paper of professional quality, designed to demonstrate ability to complete a major project and effectively present the results.

MGT 6970 Thesis 1-4®
Designed for students preparing a master's degree thesis. Graded Pass/Fail *only*. (F,Sp,Su)

MGT 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

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[1]This course will be taught as needed. For information about availability, check with the Management Department.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Management and Human Resources (MHR)

See Department of Management, pages 349-355

Note: Effective Fall Semester 2009, the courses previously listed under the Management and Human Resources (MHR) prefix will be listed under the Management (MGT) prefix. (MGT courses are shown on pages 603-607.) Students registering for Summer Semester 2009 Management and Human Resources courses can find them under the MHR prefix by logging into Access at: **http://www.usu.edu/myusu/**

Management Information Systems (MIS)

See Department of Management Information Systems, pages 356-358

MIS 2100 Principles of Management Information Systems 3
Covers principles of management information systems including how to use and manage information technology to improve business processes, improve decision making, and gain competitive advantage. Includes MIS concepts and vocabulary, as well as information technology. (F,Sp,Su) [DE]

MIS 2200 CI Business Communication 3
Development and application of effective oral and written business communication skills. Language/mechanics, grammar, and document formatting. Prerequisites: STAT 1040 or MATH 1030, 1050, or 1100 (or Math ACT score of at least 25 *or* Math SAT score of at least 580); GPA of 2.5 or higher, and one of the following: (1) passing score on Huntsman School of Business English Usage Exam, (2) ACT English Section score of at least 25, (3) English AP score of 3 or better, or (4) completion of OSS 1550 with a *B* or better grade. (F,Sp,Su) [DE]

MIS 3330 Database Management 3
Theory and application of designing, developing, and maintaining database systems. Principles of management of data resources to support effective information systems in organizations. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, and MIS 2100 or OSS 2450. (F,Sp)

MIS 3450 Designing Graphical User Interfaces for Electronic Commerce 3
Application of current web standards, techniques, and web design principles to develop graphical user interfaces using an integrated development environment (IDE). Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, and MIS 2100 or OSS 2450. (F)

MIS 3500 Introduction to Business Applications Programming 3
Creation of applications to solve business problems or support business functions related to financial, personnel, sales, and information systems management. Students create working systems using widely used Windows software and standard programming principles. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. (F,Sp)

MIS 3800 Information Technology Hardware and System Software 3
Principles and application of computer hardware and software. Includes topics related to theoretical underpinnings, setup, installation, configuration, and management of computer hardware and system software. Prerequisites: MIS 2100, admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. (F,Sp)

MIS 4330 Database Implementation 3
(dual listing 6330)
Application of advanced database concepts using enterprise-wide database products. Includes advanced structured query language (SQL) development, database programming development, database administration basics, integration of database tools within a project context, introduction of data mining and data warehousing, reporting tools, and database and XML integration. Prerequisite: MIS 3330 or equivalent. (F,Sp)

MIS 4350 Introduction to Performance
(dual listing 6350) Improvement Projects 3
Introductory course in performance improvement projects. Includes analysis of current business processes in order to devise appropriate training and development programs or information systems applications. Students learn the systems approach to designing and implementing programs or applications in business. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. (Sp)

MIS 4550 CI Principles of International Business Communications 3
Culture-general and culture-specific study of business communication in the diverse world of international business from both theoretical and applied perspectives. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. (Sp)

MIS 4800 Security of Business 3
(dual listing 6800) Information Systems
In-depth exploration of security issues in business information systems. Includes workstation, work-groups, intranet, and wide-area network security. Covers development of security policies and procedures. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, and MIS 2100 or OSS 2450. (Sp)

MIS 4950 Senior Honors Thesis/Project 3
Creative project that will then be written up and presented as a Senior Thesis as required for an Honors Plan. (Sp)

MIS 5050 (dual listing 6050) Advanced Web-Based Management Information Systems Development 3
Students learn how to design, develop, and implement an Internet commerce website. Includes instruction in modeling and building an advanced management website system. Prerequisites: CS 1400 or MIS 3500; and MIS 3330. (F)

MIS 5150 Special Topics: Emerging Technologies in Management Information Systems 3®
Special topics in Management Information Systems not covered in regular course offerings. Course is repeatable for credit *only* when students enroll for a topic for which they have not previously received credit. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, and MIS 3330. (F)

MIS 5300 Advanced Data Communications 3
Principles of data communications, local and wide-area networks, hardware, software, media standards, management, and business applications. Management and strategic use of local-area networks (LANs) and wide-area networks (WANs) to solve business problems. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, and MIS 2100 or OSS 2450. (F)

MIS 5350 Quantitative Financial Modeling and Applications 3
Introduction to quantitative methods and computer applications applicable in financial modeling. Covers financial statement modeling, asset allocation, risk analysis, scenario generation, and option pricing through the introduction and proper uses of spreadsheet modeling, decision analysis, simulation, and optimization techniques. Prerequisites: FIN 3400 and MIS 2100. Also taught as FIN 5350. (Sp)

MIS 5650 (dual listing 6650) Advanced Website Development 3
Creating e-commerce websites using a combination of the following technologies: XHTML, PHP, JavaScript, and DBMSs such as Oracle, MySQL, SQL server 2005, etc. This technical course maintains a business focus as a transaction-oriented commercial site. Prerequisites: CS 1400 or MIS 3500; and MIS 3330. (Sp)

MIS 5700 DSS Internet Management and Electronic Commerce 3
Familiarizes students with concepts and technologies relating to business and the Internet. Focuses on the new business environment that has evolved through the Internet, as well as associated technologies and strategies. Prerequisites: OSS 1400 or Computer and Information Literacy (CIL) Exam, admittance to a USU major, cumulative GPA of 2.67 or higher, and completion of at least 40 credits. Some programming experience is helpful. (Sp) DE

MIS 5900 Systems Design and Implementation 3
Management, evaluation, documentation, maintenance, and reengineering of business information systems projects. Prerequisites: Admittance to a USU major, cumulative GPA of 2.67 or higher, completion of at least 40 credits, MIS 3330, and MIS 3500 or CS 1400. (F,Sp)

MIS 5910 Systems Design Laboratory 1
Required laboratory for MIS 5900, allowing students to complete assigned team projects. Must be taken concurrently with MIS 5900. (F,Sp)

MIS 5950 Independent Readings 1-5®
Designed for individual student projects as approved by the department. (F,Sp,Su)

MIS 6050 (dual listing 5050) Advanced Web-Based Management Information Systems Development 3
Students learn how to design, develop, and implement an Internet commerce website. Includes instruction in modeling and building an advanced management website system. Prerequisites: CS 1400 or MIS 3500; and MIS 3330. (F)

MIS 6110 Workshop 1-3®
Intensive workshops. (F,Sp,Su)

MIS 6120 Business Information Systems Development 3
Business information systems development, including analysis, design, and implementation. Students develop a working prototype to solve a real-world information systems problem. (Sp)

MIS 6150 Communication for Business 3
In-depth study of the process for preparing written business communications and related oral presentations. Preparation of reports relevant to student's major. Prerequisite: MIS 2200 or equivalent. (F)

MIS 6180 Intrasession MBA Workshop 0.5-1®
Intensive workshops designed to enhance the MBA experience.

MIS 6200 Business Data Communication Systems 3
Introduction to business data communications, including concepts, network architecture, data communication software and hardware, distributed information systems, and business communication system services. (F)

MIS 6230 Management of Database Systems 3
Theory and application of designing, developing, and maintaining database systems. Principles of management of data resources to support effective information systems in organizations. (F,Sp)

MIS 6250 Graduate Internship 1-6®
Graduate-level internship in business, industry, or government position approved by department. Requires written learning objectives, performance evaluation, and a final internship written report. Requires 75 hours internship per 1 semester credit. (F,Sp,Su)

MIS 6330 (dual listing 4330) Database Implementation 3
Application of advanced database concepts using enterprise-wide database products. Includes advanced structured query language (SQL) development, database programming development, database administration basics, integration of database tools within a project context, introduction of data mining and data warehousing, reporting tools, and database and XML integration. Prerequisite: MIS 3330 or equivalent. (F,Sp)

MIS 6350 (dual listing 4350) Introduction to Performance Improvement Projects 3
Introductory course in performance improvement projects. Includes analysis of current business processes in order to devise appropriate training and development programs or information systems applications. Students learn the systems approach to designing and implementing programs or applications in business. (Sp)

MIS 6400 Local Area Network Management for Business 3
Application of networking concepts related to the management of local area networks. Includes topics related to setup, management, and maintenance of local area networks and installation of electronic mail-handling systems. (F,Sp)

MIS 6410 Human-Computer Interface Design 3
Integrates aspects of industrial psychology, work physiology, human environments, job analysis, and hardware/software engineering in the study of designing effective, efficient input/output interfaces for business information systems.

MIS 6440 Information and Decision Making 3
Case-based approach to learning role of information technology when making quantitative and qualitative analyses, including statistical techniques to solve business problems through the use of information technology. Prerequisite: At least one graduate or undergraduate class in statistics. (Sp,Su)

MIS 6450 Human-Computer Interface Design 3
Application of human-computer interface design principles for e-commerce projects using an integrated development environment (IDE). (F)

MIS 6500 Developing Business Information Systems with Advanced Software Concepts 3
Creation of custom applications to solve typical business problems or support common functions using Visual Basic programming and OLE Automation with MS Office software. Prerequisite: Knowledge of database and spreadsheet software.

MIS 6510 Information Systems for Business 3
Introduction to information systems at general management level. Includes strategic look at needs of an organization and how the function of information systems can help the organization become more effective. (Su) [DE]

MIS 6550 International Business Communication 3
Culture-general and culture-specific study of business communication in the diverse world of international business from both theoretical and applied perspectives.

MIS 6640 E-Commerce Data Interchange Using XML 3
Designed to build e-commerce applications using XML (Extensible Markup Language) as the underlying technology. Students will also learn to parse XML documents, use Extensible Style Sheet language, and use XSQL (an Oracle technology) to tie XML with its database. Prerequisites: MIS 3100, 3330, and 3500.

MIS 6650 Advanced Website Development 3
(dual listing 5650)
Creating e-commerce websites using a combination of the following technologies: XHTML, PHP, JavaScript, and DBMSs such as Oracle, MySQL, SQL server 2005, etc. This technical course maintains a business focus as a transaction-oriented commercial site. Prerequisites: CS 1400 or MIS 3500; and MIS 3330. (Sp)

MIS 6660 The Adult Business Learner 3
Focuses on the adult business learner, the concept of the "learning organization," and the different types of postsecondary institutions that provide adult training and education in business.

MIS 6700 Information Systems Strategies for Electronic Commerce 3
A management-oriented treatment of general information systems principles and topics relating to information systems strategies for electronic commerce, such as business models, mass customization, market research, security and assurance, entrepreneurship, intelligent agents, virtual corporations, electronic payments, and customer service. (Sp)

MIS 6750 Business Process Reengineering Using Information Technology 3
Examines methodologies and state-of-the-art thinking in the area of business process reengineering. Designed to help students understand how organizations manage change in contemporary global business environments by utilizing the latest information systems and technology techniques.

MIS 6770 Competency-based Instruction 3
Business teachers learn how to develop competency-based instruction by completing a CBI project.

MIS 6800 Security of Business 3
(dual listing 4800) Information Systems
In-depth exploration of security issues in business information systems. Includes workstation, work-groups, intranet, and wide-area network security. Covers development of security policies and procedures. Includes information necessary to pass Certified Information Systems Security Professionals exam. Prerequisite: MIS 3500 or graduate admission. (Sp)

MIS 6810 Introduction to the Research Process 3®
Essential scientific research concepts of theory development and data collection and the technology of research, including writing and funding proposals, experimental and study design, and project management. Includes a hands-on research project conducted by the student. (F)

MIS 6950 Independent Readings 1-3®
Specialized projects for graduate students. (F,Sp,Su)

MIS 6970 Master's Paper 1-6®
Master's-level thesis or Plan B research credit. Graded Pass/Fail *only*. (F,Sp,Su)

MIS 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

MIS 7250 Graduate Research Internship 1-3®
For doctoral students desiring to improve their research capability. Prior approval required. Repeatable to a maximum of six credits. (F,Sp,Su)

MIS 7600 Historical Foundations of Information Systems 3
Provides in-depth analysis and review of foundation literature, important topics, latest results, and emerging areas of information systems research. (Sp)

MIS 7610 Critical Analysis of Issues 3
Examines critical analysis/thinking techniques, creative problem solving, and the identification of issues and trends in the field.

MIS 7950 Independent Readings 1-3®
Independent readings for graduate students. Repeatable to a maximum of 6 credits. (F,Sp,Su)

MIS 7970 Doctoral Dissertation 1-12®
Doctoral-level dissertation research credit. Graded Pass/Fail *only*. (F,Sp,Su)

MIS 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. Enrollment restricted to doctoral-level students only. Signature of department head required. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Military Science Leadership (MSL)

See Department of Military Science, pages 376-377

Basic Course

MSL 1010 Leadership and Personal Development 2®
Presents students with personal challenges and competencies that are critical for effective leadership. Students learn how personal development of life skills, such as goal setting, time management, physical fitness, and stress management, relate to leadership, officership, and the Army profession. Focuses on developing basic knowledge of Army Leadership Dimensions, while gaining a big-picture understanding of the ROTC program, its purpose in the Army, and its advantages for students. (F,Sp,Su)

MSL 1020 Foundation in Leadership 2®
Overview of leadership fundamentals, such as setting direction, problem-solving, listening, presenting briefs, providing feedback, and using effective writing skills. Explores dimensions of leadership values, attritutes, skills, and actions in context of practical, hands-on, and interactive exercises. Promotes building of stronger relationships among cadets through common experiences and practical interaction. (F,Sp,Su)

MSL 2010 Innovative Tactical Leadership 2®
Explores dimensions of creative and innovative tactical leadership strategies and styles by studying historical case studies and engaging in interactive student exercises. Students practice aspects of personal motivation and team building. Focuses on continued development of knowledge of leadership values and attributes through understanding of rank, uniform, customs, and courtesies. Leadership case studies provide tangible context for learning the Soldier's Creed and Warrior Ethos. (F,Sp,Su)

MSL 2020 Leadership in Changing Environments 2®
Examines challenges of leading in complex contemporary operational environments. Highlights dimensions of cross-cultural challenges as applied to practical Army leadership tasks and situations. As they practice communication and team-building skills, students should develop greater self-awareness. (F,Sp,Su)

MSL 2110 BSS Foundations of Leadership 3
Considers functional and dysfunctional behavior in leadership roles. Focuses on ethical/moral, historical, and social influences. Examines outlook, styles, skills, and behavior essential for providing successful leadership. (F,Sp)

MSL 2400 Physical Readiness 1®
Physical conditioning course employing U.S. Army principles of fitness. Subjects include: body composition, nutrition, cardiorespiratory fitness, muscle endurance and strength, circuit training, and drills. (F,Sp,Su)

MSL 2420 Ranger Preparation 2®
Participation in Army ROTC Ranger Challenge program. Advanced military training with practical application of skills taught in MSL 1010 and 4020. (F,Sp)

MSL 2430 Air Assault 2
Two-week course conducted at an Army installation in the continental U.S. Provides students with training in helicopter operations, including sling loading and rappelling. Prerequisite: Instructor's approval. (F,Su)

MSL 2440 Airborne Operations 2
Three-week course conducted at Fort Benning, Georgia. Provides students with training in military skydiving techniques with practical applications. Prerequisite: Instructor's approval. (F,Su)

MSL 2510 Leader's Training Course 1-6
Four-week training held at Fort Knox, Kentucky. Combines intense classroom learning with hands-on field training. This course is an accelerated version of the two years of leadership development training cadets receive in the Basic Course. Students completing this course qualify for enrollment in the Advanced Course. Prerequisites: Passing score on APFT exam and instructor's approval. (F,Sp,Su)

Advanced Course

MSL 3010 Adaptive Team Leadership 3
Cadets study, practice, and evaluate leadership skills as they are presented with the demands of the ROTC Leader Development Assessment Course (LDAC). Challenging scenarios related to small-unit tactical operations are used to develop self-awareness and critical thinking skills. Cadets receive systematic and specific feedback on their leadership abilities. Cadets begin to analyze and evaluate their own leadership values, attributes, skills, and actions. Primary attention given to preparation for LDAC. (F,Sp)

MSL 3020 Leadership Under Fire 3
Cadets experience increasingly intense situational leadership challenges. Skills in decision-making, persuading, and motivating team members when "under fire" are explored, evaluated, and developed. Aspects of military operations are reviewed as a means of preparing for LDAC. Cadets are expected to apply basic principles of the Law of Land Warfare, Army training, and motivation to troop leading procedures. Empasizes conducting military briefings and developing proficiency in Garrison operations orders. (F,Sp)

MSL 3110 Staff Organization and Operations 1-3®
Special project staff work for joint Army/Air Force campus ceremonies, leadership labs, field training exercises, and training camps. Prerequisite: Instructor's approval. (F,Sp,Su)

MSL 3210 Independent Study 1-3®
Students select advanced topics of interest and arrange credit under program advisor supervision in areas related to military science. Prerequisite: Instructor's approval. (F,Sp,Su)

MSL 4010 Developing Adaptive Leaders 3
Cadets develop proficiency in planning, executing, and assessing complex operations; functioning as a member of a staff; and in providing leadership-performance feedback to subordinates. They analyze, evaluate, coach, and instruct less-experienced cadets. Both their classroom and battalion leadership experiences are designed to prepare them for their first unit of assignment. Cadets identify responsibilities of key staff, coordinate staff roles, and use situational opportunities to teach, train, and develop subordinates. (F,Sp)

MSL 4020 Leadership in a Complex World 3
Explores dynamics of leading in complex situations of current military operations. Examines customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism. Significant emphasis placed on preparing cadets for their first unit of assignment. Case studies, scenarios, and "What Now, Lieutenant?" exercises used to prepare cadets to face complex ethical and practical demands of leading as commissioned officers in the United States Army. (F,Sp)

MSL 4110 Advanced Staff Operations 1-3®
Special project staff work for joint Army/Air Force campus ceremonies, leadership labs, field training exercises, and training camps. Students in this course provide mentoring and guidance to students in MSL 3110. Prerequisite: Instructor's approval. (F,Sp,Su)

MSL 4400 Advanced Physical Readiness 1®
Provides advanced instruction in physical fitness employing Army techniques and procedures. Students assist Military Science faculty in the planning/conduct of physical fitness training activities performed by lower-division students. Prerequisite: Instructor's approval. (F,Sp)

MSL 4510 ROTC Leader Development and Assessment Course 1-10®
The most important training event for an Army ROTC cadet, this 33-day training event incorporates a wide range of subjects designed to develop and evaluate leadership ability. The challenges are rigorous and demanding, both mentally and physically. Warrior Forge tests intelligence, common sense, ingenuity, and stamina. These challenges provide a new perspective on an individual's ability to perform exacting tasks and make difficult decisions in demanding situations. Prerequisite: Successful completion of basic course requirements and instructor's approval. (F,Sp,Su)

MSL 4520 Cadet Troop Leadership Training 2
Two-week course conducted at an Army installation in the continental U.S. or overseas. Provides firsthand experience in an Army unit. Students learn about military life and the duties of a lieutenant. Prerequisites: MSL 3010, 3020, 4510, and instructor's approval. (F,Sp,Su)

MSL 4610 DHA Military History Seminar 1-3®
In this class, students research, travel to, and report on significant Civil War sites in the Eastern United States. Students also become familiar with joint operations. Class is available to all students. Purchase of airfare and some meals is required. Prerequisite: Instructor's approval. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Music (MUSC)

See Department of Music, pages 378-385

MUSC 1010 BCA Introduction to Music 3
Nontechnical course to develop understanding and enjoyment of music. Through study of musical elements, as well as historical, cultural, and social influences, an awareness of the relationship between techniques and aesthetic values in world music can be developed. (F,Sp,Su) DE

MUSC 1100 BCA Fundamentals of Music 3
In-depth look at the basic elements of music. Notes, rhythm, scales, intervals, key signatures, chords, cadences, and chord progressions. Includes basic ear training. (F,Sp) DE

MUSC 1110 Music Theory I 3
Fundamentals of music. Traditional diatonic harmony in four parts, using triads in root position, first inversion, and second inversion. Prerequisite: Knowledge of music notation. (F)

MUSC 1120 Music Theory II 3
Traditional harmony in four parts, using nonchord tones, seventh chords, and secondary dominant functions. Prerequisite: MUSC 1110. (Sp)

MUSC 1130 Aural Skills I 1
First in a four-semester sequence of aural skills (ear training) courses which develop the skills of sight singing, dictation, and the composite skill of critical listening. (F)

MUSC 1140 Aural Skills II 1
Second in a four-semester sequence of aural skills (ear training) courses which develop the skills of sight singing, dictation, and the composite skill of critical listening. Prerequisite: MUSC 1130. (Sp)

MUSC 1150 Beginning Group Piano 1
Group piano instruction for nonmusic majors. (Sp)

MUSC 1160 Intermediate Group Piano 1
Group piano instruction for nonmusic majors. (Sp)

MUSC 1170 Keyboard Harmony I 1
Development of keyboard skills, in conjunction with MUSC 1110, for music majors and minors. (F)

MUSC 1180 Keyboard Harmony II 1
Development of keyboard skills, in conjunction with MUSC 1120, for music majors and minors. Prerequisite: Completion of MUSC 1170 with a *C*- or better, or faculty authorization. (Sp)

MUSC 1200 Teaching Piano I 3
Shows pianist how to set up an independent studio, acquire and set up equipment, schedule students, set fees, bill parents, and keep the books. Students learn how to write a studio policy and how to audition and interview prospective students. Survey of different methods and piano series affords opportunity for students to evaluate teaching materials. Includes teaching of basic music concepts to beginning piano students. (F,Sp) DE

MUSC 1220 Individual Harp Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private harp instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1310 Introduction to Music Therapy 2
Introduces students to the field of music therapy through lectures, readings, and experiential work. Prerequisite: Enrollment in a pre-music major. (F)

MUSC 1320 Music Therapy Ensemble 1®
Intended for music therapy majors. Designed to help students increase their performance skills in the areas of accompanying, improvisation, and popular music styles. (F,Sp)

MUSC 1420 Pedagogy Practicum 3®
Provides piano students with actual teaching situations for the practical application of principles studied in piano pedagogy. Supervised planning, presentation, and evaluation of lessons. (F,Sp)

MUSC 1430 Piano Pedagogy I 3
Designed to prepare qualified pianists to teach piano effectively and to acquaint them with new materials and techniques from the beginning to intermediate levels. (F)

MUSC 1440 Piano Pedagogy II 3
Designed to prepare qualified pianists to teach piano effectively and to acquaint them with new materials and techniques from the intermediate to early advanced levels. (Sp)

MUSC 1460 CI Organ Literature I 3**
Examines the history of the organ, as well as composers and literature from the Romantic Period through the end of the Twentieth Century. (F)

MUSC 1470 CI Organ Literature II 3**
Examines the history of the organ, as well as composers and literature from the Middle Ages through the Baroque Period. (Sp)

MUSC 1480 Individual Piano Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private piano instruction at any and all stages of advancement. (F,Sp,Su) DE

MUSC 1490 Individual Organ Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private organ instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1500 String Techniques I 1
Designed to give prospective music teachers a basic playing experience and theoretical understanding of the string instruments. (F,Sp)

MUSC 1520 Individual Viola Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private viola instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1530 Individual Violin Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private violin instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1540 Individual String Bass Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private string bass instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1550 Beginning Group Guitar 1
Fundamentals of guitar; basic chords, note reading, tablature reading, and accompaniment styles, including strumming and fingerpicking. (F,Sp) DE

MUSC 1560 Intermediate Group Guitar 1
Intermediate-level strumming and fingerpicking techniques, barre chords, and solos written in standard notation and tablature will be presented. (F,Sp)

MUSC 1580 Individual Guitar Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private guitar instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1600 Voice Techniques 1
Acquaints the nonvocal major with the vocal instrument; its mechanism, terminology, and techniques. (F,Sp)

MUSC 1610 Introduction to Musical Theatre 2
Survey course dealing with history, evolution, influence, practice, and production of the American Musical Theatre. (Sp)

MUSC 1620 Introduction to Opera 2
Survey course tracing history and style of opera from Peri and Caccini's "Eurdice" of 1594 to contemporary works of John Eaton and Phillip Glass. (F) DE

MUSC 1630 Individual Vocal Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private vocal instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1700 Individual Flute Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private flute instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1710 Individual Oboe Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private oboe instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1720 Individual Clarinet Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private clarinet instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1730 Individual Bassoon Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private bassoon instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1740 Individual Saxophone Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private saxophone instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1800 Percussion Techniques 1
Provides basic playing experience and theoretical understanding of percussion instruments. Designed for music majors. (F)

MUSC 1810 Individual Trumpet Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private trumpet instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1820 Individual Trombone Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private trombone instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1830 Individual French Horn Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private French horn instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1840 Individual Tuba/Euphonium Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private tuba/euphonium instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 1850 Individual Percussion Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private percussion instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 2110 Music Theory III 3
Traditional chromatic harmony in four parts, using modulation, mode mixture, and neapolitan and augmented sixth chords. Prerequisites: MUSC 1110 and 1120. (F)

MUSC 2120 Music Theory IV 3
Study of Twentieth Century tonal, atonal, and avante guarde harmonies and compositional techniques. Prerequisites: MUSC 3110 and 3120. (Sp)

MUSC 2130 Aural Skills III 1
Third in a four-semester sequence of aural skills (ear training) courses which develop the skills of sight singing, dictation, and the composite skill of critical listening. Prerequisites: MUSC 1130 and 1140. (F)

MUSC 2140 Aural Skills IV 1
Fourth in a four-semester sequence of aural skills (ear training) courses which develop the skills of sight singing, dictation, and the composite skill of critical listening. Prerequisites: MUSC 1130, 1140, and 2130. (Sp)

MUSC 2210 Instrumental Conducting Ensemble 1®
Lab group for MUSC 4240. Music and nonmusic majors play major and secondary instruments in two concerts per semester. (F)

MUSC 2220 Individual Harp Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private harp instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2310 Introduction to Observational and Behavioral Methods in Music Therapy 2
Basic behavioral terminology and methods, including systematic observations and recording methods for use in music therapy. Students conduct observations in clinical settings in the community. (F)

MUSC 2320 Music Therapy Methods and Materials 2
Music interventions and techniques appropriate for a wide range of patient populations, including hospitalized children, older adults, and individuals with orthopedic handicaps. Prerequisites: MUSC 1310 and 2310. (Sp)

MUSC 2350 Conducting 2
Designed to provide students with basic conducting techniques. Prerequisites: MUSC 2110 and must be a premusic or music major. (F)

MUSC 2410 Individual Organ Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private organ instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2420 Piano Literature I 3**
Acquaints pianists with the standard piano composers and keyboard literature from the 14th Century to the Classical Period. (F)

MUSC 2430 Piano Literature II 3**
Acquaints pianists with the standard piano composers and keyboard literature from the Classical Period to the Romantic Period. (Sp)

MUSC 2440 Piano Literature III* 3
Acquaints pianists with the standard piano composers and keyboard literature from the Romantic Period to Impressionism. (F)

MUSC 2450 Piano Literature IV* 3
Acquaints pianists with the standard piano composers and keyboard literature from the Impressionist Period to the present day. (Sp)

MUSC 2460 Individual Jazz Piano Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private jazz piano instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 2470 Individual Jazz Piano Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private jazz piano instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2490 Individual Piano Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private piano instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2500 Individual String Bass Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private string bass instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2510 Individual Cello Instruction for Nonmusic Majors 1-2®
Variable credit offered, depending upon lesson time (1 credit equals 30 minutes). Designed to give nonmusic majors private cello instruction at any and all stages of advancement. (F,Sp,Su)

MUSC 2520 Individual Cello Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private cello instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2530 Individual Viola Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private viola instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2540 Individual Violin Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private violin instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2550 Guitar Styles (Blues/Bluegrass)* 2
Designed to teach students to play blues and bluegrass guitar styles. Presentation of musical form and repertoire. Prerequisite: Knowledge of basic chords and some standard notation and/or tablature reading. (F)

MUSC 2560 Guitar Styles (Jazz/Classical)* 2
Designed to teach students to play jazz and classical guitar styles. Presentation and analysis of pieces which have become "standard" repertoire. Prerequisite: Knowledge of basic chords and some experience reading standard notation and/or tablature. (Sp)

MUSC 2570 Fingerboard Theory I 2
Basic music theory course in which students use the guitar as a tool for learning the fundamentals of music. (F)

MUSC 2580 Fingerboard Theory II 2
Follow-up to MUSC 2570. Examination of theoretical concepts of music and how they can be visualized and played on the guitar. (Sp)

MUSC 2590 Individual Guitar Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private guitar instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2600 Women's Choir 1®
Performance of choral works in a large choral organization open to all women without auditions. (F,Sp)

MUSC 2610 American Festival Chorus 1®
Large select mixed choir performing major works for chorus and orchestra. Admission by audition only. (F,Sp)

MUSC 2640 Individual Vocal Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private vocal instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2660 Italian Diction for Singers 2
Study of singing diction in Italian using International Phonetic Alphabet in spoken, sung, and written drills. (Sp)

MUSC 2670 German Diction for Singers 2
Study of singing diction in German using International Phonetic Alphabet in spoken, sung, and written drills. (F)

MUSC 2680 French Diction for Singers 2
Study of singing diction in French using International Phonetic Alphabet in spoken, sung, and written drills. (Sp)

MUSC 2700 Woodwind Techniques I: Flute, Clarinet 1
Provides music education major with an introduction to performance and pedagogy of the flute and clarinet. Enrollment limited to majors, or with permission of instructor. (F)

MUSC 2710 Woodwind Techniques II: Saxophone, Oboe, Bassoon 1
Provides music education major with an introduction to performance and pedagogy for the saxophone, oboe, and bassoon. Enrollment limited to majors or with permission of instructor. Prerequisite: MUSC 2700. (Sp)

MUSC 2720 Marching Band 2®
Preparation of musical entertainment and marching drills for football games. Prerequisite: Consent of director. (F)

MUSC 2730 Basketball Band 1®
Preparation of "pops" type music for basketball games. Audition necessary. Prerequisite: MUSC 2720. (Sp)

MUSC 2740 Recorder Techniques 1
Provides music majors with introduction to performance and pedagogy of the recorder, including solo repertoire and ensembles. (Sp)

MUSC 2750 Individual Flute Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private flute instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2760 Individual Oboe Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private oboe instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2770 Individual Clarinet Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private clarinet instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2780 Individual Bassoon Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private bassoon instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2790 Individual Saxophone Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private saxophone instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2800 Brass Techniques I: Trumpet, French Horn 1
Designed to give prospective music teachers a basic playing experience and theoretical understanding of the high brass instruments. (F)

MUSC 2810 Brass Techniques II: Trombone, Tuba, Euphonium 1
Designed to give prospective music teachers a basic playing experience and theoretical understanding of the low brass instruments. (Sp)

MUSC 2850 Individual Trumpet Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private trumpet instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2860 Individual Trombone Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private trombone instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2870 Individual French Horn Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private French horn instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2880 Individual Tuba/Euphonium Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private tuba/euphonium instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 2890 Individual Percussion Instruction (Second Instrument) for Music Majors 1®
Designed to give music majors private percussion instruction at any and all stages of advancement. One credit given for 30-minute lessons. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3010 DHA Masterpieces of Music 3
Acquaints students with great masterpieces of music representing all periods of music history. Examines lives and times of various composers. (F,Sp)

MUSC 3020 DHA History of Jazz 3
Designed to give students an understanding of the development of jazz, popular music, and contemporary idioms, and their contributions to music and culture. (Sp)

MUSC 3100 Motivation and Classroom Management Strategies in Secondary Classroom Music 3
Provides experience in current materials, methods, and management of general music education program in secondary (grades 6-12) public schools. Designed for music education majors. (Sp)

MUSC 3110 Music History I: Origins through Baroque 3
History and literature of early, Renaissance, and Baroque periods. Prerequisite: MUSC 2110. (Sp)

MUSC 3120 Music History II: Classical and Romantic Periods 3
History and literature of the music of the classical and romantic periods. Prerequisites: MUSC 3110 and 3140. (F)

MUSC 3140 Musical Form and Analysis 3
Study of imitative, cantus firmus, ostinato, and free contrapuntal procedures of Western music. Explores techniques of Sixteenth Century counterpoint. Also includes study of phrase and period structure, small part fonts, theme and variations, rondo and sonata forms, and vocal forms. Prerequisite: MUSC 2110. (Sp)

MUSC 3160 World Music 2
Explores music traditions of non-Western cultures throughout the world. Prerequisites: MUSC 2110. (Sp)

MUSC 3180 Scoring and Arranging 2
Theoretical and practical study of scoring for orchestral instruments in various combinations, ranging from small ensembles to full orchestra. Prerequisite: MUSC 2140 or permission of instructor. (F,Sp)

MUSC 3190 CI Music History III: Music of the Twentieth Century 3
Explores historical and cultural context of important composers and works of the modern and postmodern eras, including the influence of non-Western musical traditions. Prerequisites: MUSC 3110 and 3120. (Sp)

MUSC 3210 Individual Harp Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private harp instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3220 Choral Methods and Materials 2
Investigates factors relating to administration and teaching of choral music in middle and secondary schools. (F)

MUSC 3230 Choral Literature 2
Survey of choral music from the Renaissance, Baroque, Classical, Romantic, and Twentieth Century suitable for middle and secondary school choirs. (Sp)

MUSC 3240 Instrumental Methods and Materials 2
Examination of teaching methods and materials related to wind and percussion pedagogy. Study of literature, organization and administration, and teaching techniques. (Sp)

MUSC 3260 Elementary School Music 2
Methods and materials in singing, rhythms, creating music, listening, using classroom instruments, fundamentals of music, and movement skills, with emphasis on contemporary approaches to music education. Recommended: MUSC 1010. Enrollment limited to students who have earned at least 45 credits and who have been accepted into one of the following majors: Pre-music, music education, music therapy, pre-early childhood education, pre-elementary education, early childhood education, special education, composite early childhood education/special education, composite early childhood education/ elementary education, communicative disorders and deaf education, composite early childhood education/deaf education, elementary education, composite elementary education/special education, composite elementary education/ early childhood education, or composite elementary education/deaf education. (F,Sp,Su) DE

MUSC 3310 Music Therapy and the Exceptional Child 3
Effects of music on physical, social, cognitive, and communication skills of children with disabilities. (F)

MUSC 3320 Psychology of Music I 2**
Psychological foundations of musical behavior, including psychoacoustics, rhythmic, melodic, and harmonic foundations; affective behaviors and music; musical preferences; functional music; musical ability; and music learning. (Sp)

MUSC 3330 Music Therapy Practicum 1-3®
Supervised practicum experience in a community setting with disabled adults, children, older adults, or individuals in a medical setting. Prerequisite: MUSC 2320. (F,Sp)

MUSC 3360 MIDI Studio Techniques 2
Elements of synthesizer sound production and basic studio techniques. (Sp)

MUSC 3370 Sound Recording and Reinforcement Techniques 2®
Explores techniques of studio recording, including microphones, mixing, and signal processing. (Sp)

MUSC 3400 Individual Piano Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private piano instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3410 Ensemble and Accompanying 1-2®
Accompanying vocal and instrumental works. Ensemble music for two pianos and four hands. Sight reading and repertoire development. Admission by audition only, with 16 students per section. (F,Sp)

MUSC 3420 Keyboard Skills I 3
Study of sightreading, transposing, improvising, figured bass, scales, chords, and score rendering. (F)

MUSC 3430 Keyboard Skills II 3
Continuation of MUSC 3420, with further study of sightreading, transposing, improvising, figured bass, scales, chords, and score reading. (Sp)

MUSC 3440 Individual Jazz Piano Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private jazz piano instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3460 Church Music for Organists I* 3
Teaches students to read open scores, transpose hymns, and read scores using alto and tenor clefs. Explores history of hymnody, as well as history of church worship services. (F)

MUSC 3470 Church Music for Organists II* 3
Teaches students to read open scores, transpose hymns, and read scores using alto and tenor clefs. Explores history of hymnody, as well as history of church worship services. (Sp)

MUSC 3480 Individual Organ Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits. Number of credits granted depends upon practice time and extent of literature required. Flexible course of study leading to enhanced musical and technical skills on the instrument. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3500 DHA Symphony Orchestra 1®
Provides experience in performing standard orchestral literature. Admission by audition only. (F,Sp)

MUSC 3510 Orchestra Literature 2
Survey of materials, methods, and literature appropriate for elementary school, junior high/middle school, or high school level orchestra programs. (Sp)

MUSC 3520 String Pedagogy and Solo Literature 2®**
For qualified string players whose interest is primarily in teaching stringed instruments. Materials and teaching techniques via actual teaching experience. Prerequisite: Permission of instructor. (F,Sp)

MUSC 3530 Cache Chamber Orchestra 1®
Provides experience for nonmusic majors in performing standard orchestral literature. (F,Sp)

MUSC 3540 Guitar Performance Practicum 1®
On a weekly basis, students required to perform for other class members. Repertoire selected in consultation with the instructor. Community performances also required. (F,Sp)

MUSC 3550 Individual Guitar Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private guitar instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3560 Guitar History and Literature 3**
Development of guitar from its earliest ancestors to the present, including study of composers of music for guitar, guitarists, and changes to the instrument itself. (Sp)

MUSC 3570 Guitar Pedagogy I 2**
Prepares qualified guitarists to teach beginning and intermediate level students. Familiarizes participants with "business" aspects of teaching, how to set up a private studio, available materials, and teaching techniques. (F)

MUSC 3580 Guitar Pedagogy II 2**
Instruction in teaching various guitar styles. Experience in teaching class guitar and in private instruction. Review of available methods and materials. (Sp)

MUSC 3590 Electric Guitar Ensemble 1®
Offers opportunity for guitarists to rehearse and perform ensemble music written for electric guitar. Ensemble includes bass and drums. (F,Sp)

MUSC 3600 Opera Theatre Production 1-3®
Techniques of musical theater, including participation as cast or crew in musical or operatic stage productions or excerpts. (F,Sp)

MUSC 3610 Vocal Repertory I* 2
Survey of German Lieder and French Melodie, including styles, history, and performance practice. (F)

MUSC 3620 CI Vocal Repertory II* 2
Survey of Italian, American, and British song, including styles, history, and performance practice. (Sp)

MUSC 3630 Vocal Pedagogy I 2**
Theoretical course studying anatomy and function of the voice, methods for teaching techniques, respiration, phonation, articulation, and support and health of the voice. (F)

MUSC 3640 Vocal Pedagogy II 2**
Application of vocal theory to teaching of young, post-pubescent, and mature male and female voices, including challenges of teaching each particular type. Includes practicum in which students teach individual vocal lessons under instructor's supervision. (Sp)

MUSC 3660 Opera by Children 3
Creative process of developing opera in a classroom for fine-arts and language-arts core instruction. Instruction in opera history, music, drama, art and dance elements, and necessary facilitation skills to build on individual's natural curiosity and creativity utilized in the process. (F,Sp,Su) DE

MUSC 3670 Individual Vocal Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private vocal instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3700 Woodwind Ensemble 1-2®
Helps students gain knowledge and understanding of literature for woodwind ensemble, to gain knowledge of rehearsal techniques for perfecting chamber music, and to demonstrate mastery of these skills through performance. Prerequisite: Permission of instructor. (F,Sp)

MUSC 3710 Individual Flute Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private flute instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3720 Individual Oboe Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private oboe instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3730 Individual Clarinet Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private clarinet instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3740 Individual Bassoon Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private bassoon instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3750 Individual Saxophone Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private saxophone instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3760 Jazz Ensemble 1®
Select ensemble performing big band jazz music. Admission by audition only. (F,Sp)

MUSC 3770 Jazz Orchestra 1®
Preparation and performance of big band jazz music. Admission by audition only. (F,Sp)

MUSC 3780 Flute Ensemble 1®
Helps students gain knowledge and understanding of flute ensemble, to gain knowledge of rehearsal techniques for perfecting chamber music, and to demonstrate mastery of these skills through performance. Enrollment limited to music majors and music therapy majors *only*. (F)

MUSC 3790 DHA Symphonic Band 1®
Performance of significant works from symphonic band repertoire. Admission by audition or consent of instructor. (F,Sp)

MUSC 3800 Trombone Ensemble 1®
Intended for trombone majors and nonmajors interested in performing music specifically written and/or arranged for four to twelve trombones. (F,Sp)

MUSC 3810 Individual Trumpet Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private trumpet instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp)

MUSC 3820 Individual Trombone Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private trombone instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp)

MUSC 3830 Individual French Horn Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private French horn instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp)

MUSC 3840 Individual Tuba/Euphonium Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private tuba/euphonium instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp)

MUSC 3850 Brass Ensemble 1®
Helps students gain knowledge and understanding of brass ensemble, gain knowledge of rehearsal techniques for perfecting chamber music, and demonstrate mastery of these skills through performance. Prerequisite: Permission of instructor. (F,Sp)

MUSC 3860 Individual Percussion Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private percussion instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 3870 Percussion Ensemble 1®
Provides opportunity for percussionists to perform select percussion literature in a chamber music setting. (F,Sp)

MUSC 3900 Jazz Improvisation 2
Study of techniques of jazz improvisation applicable to all instruments. Prerequisites: MUSC 2110 and 2130; or permission of instructor. (F,Sp)

MUSC 3910 Individual Composition Instruction 1-12®
Individual study of techniques and procedures of music composition, emphasizing assistance in completing individual compositional projects, building composition portfolio, and preparing for composition recitals. Prerequisite: Permission of instructor. (F,Sp)

MUSC 3920 Marching Band Techniques 2
Reviews methods and materials necessary for directing high school marching bands, including administration, music selection, drill design, and computer-assisted instruction. Prerequisite: Instructor's permission. (F)

MUSC 3930 Band Literature 2
Study of literature appropriate for beginning, intermediate, and advanced level band programs. Prerequisite: Instructor's permission. (F)

MUSC 3950 Jazz Choir 1®
Emphasizes vocal ability, harmonic ear training, and rhythmic understanding. Ability to vocally improvise is helpful, though not a necessary prerequisite. Auditions held during the first week of fall semester. (F,Sp)

MUSC 4210 Advanced Music Form and Analysis 3
Expands the contents and helps further develop the skills acquired in MUSC 3140, Musical Form and Analysis. Large and small sectional forms and contrapuntal procedures are further explored in works from the Classical, Romantic, and Modern eras. (F)

MUSC 4240 Advanced Conducting 2
Covers techniques, procedures, materials, and philosophies appropriate to the motor skill of conducting and the pedagogy of rehearsal techniques with a band/choir/string ensemble. Students will be able to demonstrate techniques in music selection, score analysis, conducting gesture, and pedagogy. (F—instrumental) (Sp—Choral)

MUSC 4310 Music Therapy with Adult Populations 3
Music therapy methods for adults with major mental illness. Overview of DSM-IV criteria. Psychotherapy models, including cognitive-behavioral and person-centered approaches to treatment. (F)

MUSC 4320 CI Psychology of Music II 2
Research and laboratory course, emphasizing design, methods, and statistical procedures appropriate to research in music education and music therapy. Prerequisites: STAT 1040 and permission of instructor. (Sp)

MUSC 4330 Clinical and Professional Issues in Music Therapy 3
Ethical considerations and issues related to private practice, marketing, and reimbursement, as well as continued exploration of psychotherapeutic models and MT methods with adults, specifically anxiety disorders and personality disorders. Prerequisites: MUSC 4310 and 4320. (Sp)

MUSC 4340 Internship in Music Therapy 2
Six-month resident internship in affiliated, approved clinical setting. Graded Pass/Fail *only*. Prerequisite: Successful completion of senior year in music therapy. (F,Sp,Su)

MUSC 4410 Advanced Piano Pedagogy I 1-2®
Continuation of MUSC 1430 and 1440, with analysis, performance, and teaching of basic repertoire at intermediate to advanced levels. Prerequisites: MUSC 1430, 1440. (F)

MUSC 4420 Advanced Piano Pedagogy II 1-2®
Continuation of MUSC 4410, with analysis, performance, and teaching of basic repertoire at intermediate to advanced levels. Prerequisite: MUSC 4410. (Sp)

MUSC 4500 String Ensemble 1®
Offers opportunity for capable string players to study and perform music written for variety of small ensemble combinations. Prerequisite: Enrollment in music or pre-music major, or special permission of instructor for nonmajors. (F,Sp)

MUSC 4510 Individual Violin Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private violin instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 4520 Individual Viola Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private viola instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 4530 Individual Cello Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private cello instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 4540 Individual String Bass Instruction for Music Majors 1-2®
Provides 60-minute lessons, for either 1 or 2 credits, for music majors only. Number of credits granted depends upon practice time and extent of literature required. Designed to give music majors private string bass instruction at any and all stages of advancement. Must be a pre-music major, music major, music education major, or music therapy major. (F,Sp,Su)

MUSC 4550 Acoustic Guitar Ensemble 1®
Offers opportunity for guitarists to rehearse and perform intermediate and advanced music written for acoustic guitar. (F,Sp)

MUSC 4600 DHA University Chorale 1®
Select mixed choir performing a wide range of choral literature. Admission by audition only. (F,Sp)

MUSC 4610 National Standards Choir 1®
Choral ensemble focusing on music education through choral performance. Explores methods for teaching music through performance to middle and high school students. Special attention paid to National Standards in Music. This course is not currently being offered. For information about when it may be offered, contact the department.

MUSC 4620 Choral Conducting Practicum 1®
Application of principles of choral music education in public school setting. (F,Sp)

MUSC 4650 DHA Chamber Singers 1®
Select small ensemble performing a wide range of choral literature. Admission by audition only. (F,Sp)

MUSC 4700 DHA Wind Orchestra 1®
Highly-selective group, performing important traditional and contemporary works from the wind band repertoire. Entrance by audition only. (F,Sp)

MUSC 4710 Jazz Combo 1-2®
Study and performance of the finest literature for the small jazz ensemble. Prerequisites: Audition and permission of instructor. (F,Sp)

MUSC 4720 Saxophone Quartet 1-2®
Study and performance of the finest classical, jazz, and popular music for the saxophone quartet. Prerequisites: Audition and permission of instructor. (F,Sp)

MUSC 4730 CI Directed Project in Instrumental Pedagogy 2®
Acquaints students with curricular and business issues of private music teaching. Through written assignments, reviews of literature, and interviews with professionals, students develop strategies for setting up, marketing, and maintaining a private studio. (F,Sp,Su)

MUSC 4900 Baroque Counterpoint 2
Writing and analysis of tonal counterpoint in two, three, and four parts. Prerequisites: MUSC 1110, 1120, 2110, 3140. (F)

MUSC 4910 Music Composition 2®
Instruction in principles of music composition, and guidance in completing individual composition projects. Also, analysis of selected Twentieth Century masterworks. Prerequisites: MUSC 1110, 1120, 2110, 3140. (Sp)

MUSC 4920 Individual Recital 1-6®
Performance of pieces selected by the student and approved by the instructor, for performance in accordance with specific music area requirements. (F,Sp,Su)

MUSC 4930 Readings and Conference 1-6®
Undergraduate course designed to provide special interest study. (F,Sp,Su)

MUSC 4940 Senior Thesis 1-6®
As partial fulfillment of Honors Program requirements, students design and complete a major paper/project. Examples of projects include performance, composition, and musical analysis. (F,Sp,Su)

MUSC 5420 Piano Literature I 2
Provides comprehensive examination of piano literature, the history of the instrument, and performance practice. (F,Sp)

MUSC 5980 Introduction to Music Research 3
Acquaints graduate students with music research, information science, and technical writing. Topics addressed include print and electronic resources, historical editions, manuscripts and holographs, period recordings, performance practice resources, writing styles, and bibliographic resources. (F,Sp)

MUSC 6100 Graduate Performance Ensemble 1-2®
Designed to give students opportunity for a high-level music experience in choral and instrumental performance ensembles. (F,Sp)

MUSC 6110 Advanced Conducting 2
Students master manual technique of conducting and improve score study procedures, resulting in analysis and communication of musical ideas. (F,Su)

MUSC 6120 Advanced Rehearsal Techniques 2®
Provides students with conducting experience within their major performance areas; i.e., chorale, band, orchestra. This is accomplished through observation of rehearsal techniques and procedures, and by conducting rehearsals at the instructor's discretion. (F,Sp) DE

MUSC 6130 Music History Seminar 3®
Close study and discussion of a special topic in music history, emphasizing individual research and presentation. Since content differs each semester, course may be repeated for credit. Prerequisite: MUSC 5980. (F,Sp)

MUSC 6140 Music Theory Seminar 3®
Close study and discussion of a special topic in music theory, emphasizing individual analysis and presentation. Since content differs each semester, course may be repeated for credit. Prerequisite: MUSC 5980. (F,Sp)

MUSC 6410 Collaborative Artistry 3®
Helps graduate pianists to develop the skills needed for vocal and instrumental accompaniment. Addresses techniques in score analysis, transposition, ensemble skills, etc. Students receive coaching from piano, voice, and instrumental faculty. (F,Sp)

MUSC 6420 Pedagogy Practicum 2®
Observation of master instructors, practice teaching (private and classroom), and supervised studio instruction. (F,Sp)

MUSC 6430 Advanced Piano Pedagogy 2
Pedagogy of beginning, intermediate, and advanced methods of teaching piano, as well as strategies for developing a private studio. (F,Sp)

MUSC 6440 Piano Literature II 2
Provides comprehensive examination of piano literature, the history of the instrument, and performance practice. (F,Sp)

MUSC 6610 Practicum in Choral Performance 1-4®
Provides the graduate student with insight into advanced choral techniques and methods of preparing choirs for performance by rehearsing one of the University choirs on assigned choral selections while being critiqued by the ensemble director. (F,Sp)

MUSC 6620 Seminar in Choral Literature 2
Designed to study and internalize principal forms of choral music through discussion of historical evolution and stylistic characteristics of the periods of music. Embraces significant choral functions of every style period. (Sp,Su)

MUSC 6630 Individual Instruction for Graduates 1-2®
Includes 60-minute lessons for either 1 or 2 credits. Number of credits granted depends upon practice time and extent of literature required. Designed to give graduate students private instruction at any and all stages of advancement. Prerequisite: Instructor's permission. (F,Sp)

MUSC 6900 Independent Study 1-6®
Advanced course designed to meet specific problems of the music educator and the applied music specialist. (F,Sp,Su)

MUSC 6910 Individual Recital 1-3®
Preparation and presentation of graduate recital, under supervision of major professor. (F,Sp,Su)

MUSC 6970 Research and Thesis 2-6®
Individual work in thesis writing with guidance and criticism. Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Navajo (NAV)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

NAV 3040 Navajo Literacy and Grammar for Native Speakers 3
Designed to develop advanced skills in the grammar, comprehension, reading, and writing of Navajo. Integrates Diné holistic teaching concepts in accordance with the "Hózhóogo liná" four-direction Diné philosophy of learning paradigm. Prerequisite: Permission of instructor. (Sp)

NAV 3050 Navajo Descriptive and Narrative Writing 3
Presents reading and writing in the genres of Navajo narrration and description. Prepares students to take the Navajo Language Proficiency Exam, and integrates holistic teachings in accordance with the "Hózhóogo liná" four-direction Diné philosophy of learning paradigm. Prerequisite: Permission of instructor. (F)

NAV 4400 Teaching Navajo as a Second Language 3
Addresses major issues in the teaching/learning of second languages, with emphasis on Navajo as taught in the public schools. Integrates Diné holistic teaching concepts in accordance with the "Hózhóogo liná" four-direction Diné philosophy of learning paradigm. Prerequisite: Permission of instructor. (Sp)

NAV 4410 Teaching Navajo to Native Speakers 3
Addresses major issues and methods in teaching Navajo literacy and Navajo language arts to native speakers of Navajo. Integrates Diné holistic teaching concepts in accordance with the "Hózhóogo liná" four-direction Diné philosophy of learning paradigm. Prerequisite: Permission of instructor. (F)

National Environmental Policy Act (NEPA)

See Certificate Program in National Environmental Policy Act (NEPA), pages 386-387

NEPA 6200 How to Manage the NEPA Process and Write Effective NEPA Documents 2
Introduction to National Environmental Policy Act (NEPA) and the Council on Environmental Quality regulations. Explores various levels of NEPA documentation and the skills necessary to identify the actions needed for a thorough environmental analysis. DE

NEPA 6210 Clear Writing for NEPA Specialists 2
Teaches how to identify the writing and editing requirements unique to NEPA documents, including making graphics, writing chapters, and reviewing documents for accuracy. DE

NEPA 6220 Reviewing NEPA Documents 2
Focuses on how to review the full range of NEPA documents, including Environmental Impact Statements (EISs), Environmental Assessments (EAs), Findings of No Significant Impacts (FONSIs), and Records of Decisions (RODs). DE

NEPA 6230 Risk Communication for NEPA Specialists: Strategies and Implementation 2
Explains meaning and application of risk communication. Explores full range of response communication, including development of a communication plan and strategy, standing before an audience, and responding to comments in writing.

NEPA 6260 Cultural and Natural Resource Management 2
Teaches how to manage cultural and natural resources on public lands. Addresses pertinent laws and associated executive orders and regulations pertaining to the preservations of these resources and budget issues. DE

NEPA 6270 Environmental Compliance Overview 1
Explores why environmental compliance is not only desirable and necessary, but is also a personal responsibility. Identifies key laws and regulations, with associated penalties affecting environmental compliance.

NEPA 6280 Interdisciplinary Team Building 1
Teaches general principles of interdisciplinary team building. Explores how information flows and how this can impact the success of a team. Students work as a team to apply the principles learned to scenarios of day-to-day actions. DE

NEPA 6300 Effective Environmental Contracting 1
Presents a systematic approach to the writing and reviewing of environmental Statements of Works (SOWs). Providing hands-on experience, course includes case studies and examples applying to actual environmental projects.

NEPA 6310 NEPA Writing for Technical Specialists 1
Designed to teach students how to use a "document management process" to become more efficient writers of NEPA documents.

NEPA 6320 NEPA: Cumulative Impacts 1
Explores scoping and public involvement strategies leading to sound cumulative impact analysis. Students assess various impact methodologies and learn to record cumulative impact information in ways that support clear, legally sufficient EAs/EISs. DE

NEPA 6330 Conflict Management in the NEPA Process 1
Trains students in NEPA conflict negotiation and management. Includes introduction to the nature of public conflict and management styles, along with environmental negotiation techniques.

NEPA 6340 Content Analysis and Public Response Management 1
NEPA regulations require public participation on environmental documents. In this course, students learn how to establish a comprehensive database of respondents and a systematic method of sending and receiving documents. They also learn how to establish a coding structure reflecting demographic catagories and subcategories. Since this course is not currently required for the Certificate Program in National Environmental Policy Act (NEPA), it may not be offered in the forseeable future. For further information, contact the director of the NEPA Certificate Program.

NEPA 6350 Socio-economic Impact Analysis for NEPA Specialists 1
Provides students with necessary tools (templates, checklists, and materials) and knowledge (including data analysis) for conducting an effective socio-economic impact analysis, as required by NEPA and CEQ regulations.

NEPA 6360 Overview of the Endangered Species Act 1
Explores history of the Endangered Species Act and various components of the Act. Examines requirements and procedures for complying with the Act. DE

NEPA 6370 NEPA Capstone Experience 1
Consists of a project, internship, or comprehensive examination to be negotiated by the student, based upon opportunities available at the time and preferences of the student. Helps USU to certify that students receiving the certificate have basic mastery of the material presented in the program coursework. DE

NEPA 6380 NEPA Process Management 1
Focuses on teaching students to be effective team leaders by understanding how to control the process of project and plan development. Introduces students to various models on time management, project management, team management, and decision-making methods. Students also learn how to frame problems in such a way that they can more clearly identify alternative solutions and develop cause-and-effect models showing how their actions impact resources. [DE]

NEPA 6390 NEPA Climate Change Analysis 1
Introduction to climate change in the NEPA analysis process. Discussion of science of climate change and impacts in regard to greenhouse gas emissions. Takes into account the effects of climate change on projects, as well as the resources that projects may impact. Students learn to use various methods for analyzing impacts and are exposed to several case studies and court decisions. Also includes guidance on preparation of legally adequate climate change analysis documents. [DE]

[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Nutrition and Food Sciences (NFS)

See Department of Nutrition and Food Sciences, pages 394-405

NFS 1000 Food Science from Farm to Fork 3
Explores the science and technology of food, including careers, disciplines, food commodities, food product development, and the future of food science. (F) [DE]

NFS 1020 BLS Science and Application of Human Nutrition 3
Role of dietary choices in providing nutrients and their relationship to the social, mental, and physical well-being of people. How to evaluate nutritional status with personal data using computer diet analysis program. (F,Sp,Su) [DE]

NFS 1050 Food Safety Manager Certification 0.5
Covers food safety information required by the Utah Food Safety Manager Certification Act. Includes role of food handlers in controlling food-borne disease, time-temperature, employee hygiene, sanitation methods, preventing contamination from time of purchase to time of serving, food service facilities/ equipment, and HACCP. Graded Pass/Fail *only*. (F,Sp,Su) [DE]

NFS 1240 Culinary Basics 3®
Develops fundamental skills specific to culinary arts. Investigates principles of ingredients and preparation methods. Practice provided in knife skills and cooking methods. Explores the effects of cooking on food quality. Enrollment limited to Nutrition and Food Sciences majors, Family and Consumer Sciences majors, and Family and Consumer Sciences Education majors *only*. (F,Sp)

NFS 1250 Sanitation and Safety 3
Principles of sanitation and safety applied to food operations. Emphasizes personal hygiene habits and food handling practices that protect the health and safety of employees and consumers. (Sp) [DE]

NFS 2020 Nutrition Throughout the Life Cycle 3
Application of nutrition principles to the human life cycle: nutrient functions, needs, sources, and alterations during pregnancy, lactation, growth, development, maturation, and aging. Prerequisite: NFS 1020. (Sp)

NFS 2040 Introduction to Biotechnology 1
Introduces freshmen to the emerging field of biotechnology and the impact this technology has on society. Also taught as ADVS 2040, BIOL 2040, and PSC 2040. (Sp)

NFS 3020 Nutrition and Physical Performance 2
Includes information on macro/micronutrient metabolism during exercise, specific problems experienced by athletes or highly active persons, myths, ergogenic aids, and current interests. Prerequisite: NFS 1020. (F)

NFS 3070 Science of Food Preparation 4
Science principles underlying modern food theory and practice. Relation of physical and chemical properties of food components and their systems to food preparation. Prerequisite: CHEM 1120 or 2300 or 2310. (Sp)

NFS 3100 QI Sensory Evaluation of Food 3
Design and implementation of sensory testing of foods. Emphasizes physiology of senses, testing methods, statistical analysis, and taste panel experience. Prerequisite: STAT 3000. (Sp)

NFS 3110 DSC Food, Technology, and Health 3
Impact of food technology on food spoilage, food preservation, food quality, and foodborne diseases. Basic processing operations and regulations ensuring a safe food supply. Prerequisite: University Studies Breadth Life Sciences (BLS) course. (F) [DE]

NFS 3600 Medical Terminology for Health Care Professionals 1
Internet-based course teaches medical terminology by focusing on medical word-building rules, prefixes, suffixes, and whole-body terminology related to human body systems. Also includes coverage of anatomy, pathological conditions, and diagnostic treatments and procedures. (F,Sp) [DE]

NFS 4020 Advanced Nutrition 3
Structures, properties, and metabolism of protein, lipids, carbohydrates, vitamins, and minerals. Includes digestion, absorption, hormonal control, cellular biochemistry, metabolic interrelationships, excretion, etc. Prerequisites: NFS 1020, CHEM 3700, BIOL 2420. (F)

NFS 4040 Dairy Foods 4
Explores manufacture of various dairy foods, including pasteurized milk, UHT milk, cream, cheddar cheese, cottage cheese, process cheese, yogurt, butter, and milk and whey powders. Three lectures and one lab. Prerequisite: Enrollment in Animal, Dairy and Veterinary Sciences major. (F)

NFS 4050 CI Education and Counseling Methods in Dietetics I 2
Principles of education, counseling, and communication as applied to the field of nutrition education and clinical dietetics practice. Prerequisite: Junior level in Coordinated or Didactic Program in Dietetics. Corequisite: NFS 4550. (F)

NFS 4060 CI Education and Counseling Methods in Dietetics II 2
Continuation of NFS 4050. Prerequisite: NFS 4050. Corequisite: NFS 4560. (Sp)

NFS 4250 Culinary Skills and Management Rotation 3-9®
Internship experience in various food service settings. Specific locations and durations to be arranged by instructor. Prerequisite: Junior standing. Will not be offered after Summer 2009. (F,Sp,Su)

NFS 4420 QI Nutrition Research Methodology 2
Development of experimental design, data collection, statistical analysis, interpretation, and presentation of results. Clinical, community, and management data analysis. Interpretation and presentation, including bench marking, cost/ benefit analysis, and continuous quality improvement projects. Enrollment limited to seniors within the Coordinated Program in Dietetics (CPD) or Didactic Program in Dietetics (DPD). Prerequisites: STAT 1040, MATH 1050. (Sp)

NFS 4440 QI Fundamentals of Food Engineering 4
Engineering concepts taught in a fundamental sense and applied to food processing. Concepts include: general problem solving techniques, material and energy balances, fluid dynamics, heat transfer, refrigeration, and kinetics of common biological processes used in food preparation. Prerequisite: PHYS 2110. (F)

NFS 4450 Clinical Nutrition I Lab 1
Supplement to NFS 4550. Explores application of nutrition care process to medical case studies. (F)

NFS 4460 Clinical Nutrition II Lab 1
Supplement to NFS 4560. Explores application of nutrition care process to medical case studies. (Sp)

NFS 4480 Community Nutrition 3
Introduction to public health nutrition, food programs, and national nutrition monitoring. Prerequisite: NFS 1020. (F)

Course Descriptions

NFS 4550 Nutrition Assessment/Clinical Nutrition I 4
Introduction to the profession of dietetics, assessment of nutrition status, and nutrition care planning. Pathophysiology of disease states and applied medical nutrition therapy. Prerequisite: CHEM 3700. Enrollment restricted to Nutrition and Food Sciences majors *only*. (F)

NFS 4560 CI Clinical Nutrition II 4
Continuation of NFS 4550. Prerequisite: NFS 4550. (Sp)

NFS 4570 Clinical Nutrition Experience I 1
Practical experience in health care facilities. Integration and application of material learned in NFS 4550. Corequisite: NFS 4550. Prerequisite: Acceptance into Coordinated Program in Dietetics. (F)

NFS 4580 Clinical Nutrition Experience II 2
Continution of NFS 4570. Corequisite: NFS 4560. Prerequisite: NFS 4570. (Sp)

NFS 4660 CI Medical Dietetics 12
In-depth study of nutrition relationships in disease development and treatment with clinical experience in medical facilities in Salt Lake City. Prerequisites: NFS 4550, 4560, 4570, 4580. (F)

NFS 4710 Quantity Food Preparation 2
Principles of food preparation applied to large quantity production, menu planning, food selection, storage, and equipment. Prerequisites: NFS 1240, 1250, and 3070. (F)

NFS 4720 QI Food Service Organization and Management 2
Principles of organization, management theory, financial controls, human and labor relations, employee training, layout, and sanitation. Prerequisite: NFS 4710. (Sp)

NFS 4730 Quantity Food Preparation Lab 2
Practical experience in quantity food preparation. Integration and application of NFS 4710. Corequisite: NFS 4710. Prerequisites: NFS 1240 and acceptance into Coordinated Program in Dietetics. (F)

NFS 4740 Food Service Organization and Management Lab 2
Practical experience in food service management. Integration and application of NFS 4720. Prerequisite: NFS 4730. Corequisite: NFS 4720. (Sp)

NFS 4750 Management of Dietetics 3
Principles of management in dietetics and current practice issues. Prerequisite: Must be enrolled in final year in Coordinated Program in Dietetics (CPD) or Didactic Program in Dietetics (DPD). (Sp)

NFS 4780 CI Maternal and Child Nutrition 3-4
Normal and clinical nutritional requirements in pregnancy, lactation, and pediatrics. To be taken in Salt Lake City in conjunction with NFS 4660 or by Didactic Program in Dietetics (DPD) students in their final year. (F)

NFS 4900 Special Problems 1-4®
Individual problems and research problems in Nutrition and Food Sciences. (F,Sp,Su)

NFS 4990 Nutrition and Food Sciences Seminar 1
Senior student paper and presentation on current topics in nutrition and food sciences. Prerequisite: Senior in NFS. (Sp)

NFS 5020 Meat Technology and Processing 4
(dual listing 6020)
Emphasizes understanding the conversion of muscle to meat, fabrication of carcasses into primal and retail cuts, and principles underlying manufacture of processed meats. (F)

NFS 5030 Dairy Technology and Processing 4
(dual listing 6030)
Covers biochemistry, microbiology, and technology of milk processing. Includes heat processing, fat separation, homogenization, concentration, drying, fermentation, freezing, and manufacture of dairy foods such as pasteurized milk, UHT milks, ice cream, cheeses, and yogurt. Prerequisites: NFS 5110/6110, 5560/6560. (F)

NFS 5110 CI Food Microbiology 4
(dual listing 6110)
Microorganisms in food spoilage, poisoning, preservation, and sanitation. Prerequisite: BIOL 2060 or 3300. (Sp)

NFS 5150 Clinical Nutrition Practice 1
Reinforces principles of medical nutrition therapy for preparation of dietetic internships. Includes detailed discussion of nutrition care process and its application in clinical settings. Reviews charting methods, education techniques, and various disease states commonly treated. Prerequisites: NFS 4550, 4560. Taught Pass/Fail *only*. (Sp)

NFS 5160 Methods in Biotechnology: Cell Culture 3
Techniques and fundamental knowledge for culturing mammalian and insect cells. Students will learn maintenance, growing, genetic engineering of cells, cytotoxicity, hybridoma creation, cloning, etc. Extensive laboratory experience is provided. Also taught as ADVS 5160, BIOL 5160, and PSC 5160. (Sp)

NFS 5170 Principles of Food Safety and
(dual listing 6170) Food Quality Assurance 3
Explores modern issues and programs of safety and quality assurance used in the food industry, including Good Manufacturing Practices (GMP), sanitation, Hazard Analysis and Critical Control Points (HACCP), and Safe Quality Food (SQF). Prerequisite: NFS 5110. (Su)

NFS 5200 Nutritional Epidemiology 2
(dual listing 6200)
Introduction to epidemiologic methods and their application to the study of nutrition, human health, and disease. Useful for students with career interests in nutrition, food sciences, dietetics, human health sciences, veterinary sciences, biology, public health, anthropology, social work, and public policy. Prerequisites: STAT 1040, NFS 1020. (F)

NFS 5210 Advanced Public Health Nutrition 2
(dual listing 6210)
Effects of diet on development and prevention of disease. Conditions of public health significance, including birth defects, coronary heart disease, hypertension, stroke, Alzheimer's disease and other causes of dementia, cancer, osteoporosis, diabetes, and international health problems. Discussion of health concerns of minority populations, cross-cultural studies, government policy, and establishment of dietary recommendations. Prerequisites: STAT 1040 or higher, CHEM 3700 or higher. (Sp)

NFS 5220 Endocrine Aspects of Nutrition 2
(dual listing 6220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as ADVS 5220/6220 and BIOL 5220/6220. (Sp)

NFS 5240 Methods in Biotechnology: Protein Purification Techniques 3
Reviews basic methods of protein purification, including scaled-up use of 100L fermenter, large-scale centrifugation, diafiltration, chromotography, and use of BioCAD. Prerequisite: CHEM 3700. Also taught as ADVS 5240, BIOL 5240, and PSC 5240. (Sp)

NFS 5250 Occupational Experiences in Nutrition and Food Sciences 1-3®
On-the-job training. (F,Sp,Su)

NFS 5260 Methods in Biotechnology: Molecular Cloning 3
Laboratory-oriented course designed to teach molecular biology techniques such as DNA cloning, genetic probes, polymerase chain reaction, and DNA sequencing. Prerequisite: CHEM 3700 or 5710; or BIOL 3060; or permission of instructor. Also taught as ADVS 5260, BIOL 5260, and PSC 5260. (F)

NFS 5300 Advanced Micronutrient Nutrition 3
(dual listing 6300)
Explores the function, interaction, and practical significance of micronutrients in human metabolism and the ability of the diet to meet these needs. Relates nutrient biochemical functions to specific deficiency symptoms. Prerequisite: NFS 4020. (Sp)

NFS 5410 Nutrient Gene Interactions 3
(dual listing 6410)
Focuses on molecular interactions between nutrients and mechanisms of gene expression, including transcriptional regulation, post-transcriptional regulation, and epigenetics. Emphasizes nutrient/gene interactions involved in the etiology or prevention of chronic disease, such as cancer, cardiovascular disease, and metabolic syndrome. Prerequisite: CHEM 3700. (Sp)

NFS 5420 Molecular Nutrition Laboratory 2
(dual listing 6420)
Explores modern molecular nutrition techniques for determining the influence of nutrients on gene regulation. Focuses on modern techniques commonly used in the field of molecular nutrition, including cell culture, mRNA isolation and quantification, western blotting, promoter cloning/mutation, and nutrient/trans factor interactions. (Sp)

NFS 5500 QI Food Analysis 4
(dual listing 6500)
Application and theory of physical, chemical, and instrumental techniques for determination of composition and quality of food. Prerequisite: NFS 5560/6560. (Sp)

NFS 5510 Food Laws and Regulations 2
(dual listing 6510)
Provides background of federal/state laws and regulations and case law history affecting food production, processing, packaging, marketing, and distribution of food products. (Sp)

NFS 5560 Food Chemistry 4
(dual listing 6560)
Chemical structure, properties, reactions, and interactions of the important chemical constituents of food. Prerequisites: CHEM 3700 and 3710, or NFS 3070. (F)

NFS 5610 Food and Bioprocess Engineering 3
(dual listing 6610)
Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Prerequisite: BIE 3200. Also taught as BIE 5610/6610. (F)

NFS 5750 Advanced Dietetics Practicum 1-6
(dual listing 6750)
Advanced dietetics practicum in clinical nutrition, community nutrition, food service management, or research. Prerequisite: Must be enrolled in final year in Coordinated Program in Dietetics (CPD) or Didactic Program in Dietetics (DPD). (F,Sp,Su)

NFS 5830 International Nutrition: Macronutrients 3
(dual listing 6830)
Explores principles and roles of macronutrients in causing malnutrition influencing health, survival, and developmental capacity of populations, especially in developing societies. Discussion of approaches implemented at household, community, national, and international levels to improve nutritional status. (F)

NFS 5920 CI Food Product Development 3
Capstone course that incorporates and unifies the principles of food chemistry, microbiology, engineering, processing, nutrition, sensory analysis, and statistics. Prerequisite: Senior standing. (F)

NFS 6020 Meat Technology and Processing 4
(dual listing 5020)
Emphasizes understanding the conversion of muscle to meat, fabrication of carcasses into primal and retail cuts, and principles underlying manufacture of processed meats. (F)

NFS 6030 Dairy Technology and Processing 4
(dual listing 5030)
Covers biochemistry, microbiology, and technology of milk processing. Includes heat processing, fat separation, homogenization, concentration, drying, fermentation, freezing, and manufacture of dairy foods such as pasteurized milk, UHT milks, ice cream, cheeses, and yogurt. Prerequisites: NFS 6110/5110, 6560/5560. (F)

NFS 6050 Community Public Health Internship I 3
Supervised school nutrition education internship in elementary and secondary public schools developing child nutrition programs. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

NFS 6060 Community Public Health Internship II 3
Supervised public health nutrition internship with state and district supplemental food program for women, infants, and children. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

NFS 6100 Sensory Evaluation of Foods 3
Methods and practice in the sensory evaluation of foods. Testing facilities/ environment, statistical design, testing method selection, and data interpretation. Prerequisite: STAT 3000 or permission of instructor. (Sp)

NFS 6110 Food Microbiology 4
(dual listing 5110)
Microorganisms in food spoilage, poisoning, preservation, and sanitation. Prerequisite: BIOL 2060 or 3300. (Sp)

NFS 6170 Principles of Food Safety and
(dual listing 5170) Food Quality Assurance 3
Explores modern issues and programs of safety and quality assurance used in the food industry, including Good Manufacturing Practices (GMP), sanitation, Hazard Analysis and Critical Control Points (HACCP), and Safe Quality Food (SQF). Prerequisite: NFS 5110. (Su)

NFS 6200 Nutritional Epidemiology 2
(dual listing 5200)
Introduction to epidemiologic methods and their application to the study of nutrition, human health, and disease. Useful for students with career interests in nutrition, food sciences, dietetics, human health sciences, veterinary sciences, biology, public health, anthropology, social work, and public policy. Prerequisites: STAT 1040, NFS 1020. (F)

NFS 6210 Advanced Public Health Nutrition 2
(dual listing 5210)
Effects of diet on development and prevention of disease. Conditions of public health significance, including birth defects, coronary heart disease, hypertension, stroke, Alzheimer's disease and other causes of dementia, cancer, osteoporosis, diabetes, and international health problems. Discussion of health concerns of minority populations, cross-cultural studies, government policy, and establishment of dietary recommendations. Prerequisites: STAT 1040 or higher, CHEM 3700 or higher. (Sp)

NFS 6220 Endocrine Aspects of Nutrition 2
(dual listing 5220)
Provides physiological background into hormones involved in nutrient regulation, as well as mechanisms of hormone action at the cellular and molecular levels. Includes action of steroids in the nucleus and membrane-based signal transduction pathways. Course includes lectures and literature reviews/ presentations. Prerequisite: CHEM 3700 or permission of instructor. Also taught as ADVS 6220/5220 and BIOL 6220/5220. (Sp)

NFS 6250 Clinical Nutrition Internship I 4
Supervised clinical nutrition experience including medical, geriatric, long-term care, and oncology. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

NFS 6260 Clinical Nutrition Internship II 4
Supervised clinical nutrition experience including nutrition support, renal, pediatrics, intensive care units, outpatient care, and clinical staff experience. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

Course Descriptions

NFS 6300 Advanced Micronutrient Nutrition 3
(dual listing 5300)
Explores the function, interaction, and practical significance of micronutrients in human metabolism and the ability of the diet to meet these needs. Relates nutrient biochemical functions to specific deficiency symptoms. Prerequisite: NFS 4020. (Sp)

NFS 6350 Food Service Systems Management Internship I 6
Supervised school food service internship. Includes purchasing, inventory control, food service, and food production. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

NFS 6360 Food Service Systems Management Internship II 6
Supervised school food service internship. Includes administration and food service staff supervision experience. Prerequisite: Acceptance into USU Extension Dietetic Internship Program. (F,Sp,Su) DE

NFS 6410 Nutrient Gene Interactions 3
(dual listing 5410)
Focuses on molecular interactions between nutrients and mechanisms of gene expression, including transcriptional regulation, post-transcriptional regulation, and epigenetics. Emphasizes nutrient/gene interactions involved in the etiology or prevention of chronic disease, such as cancer, cardiovascular disease, and metabolic syndrome. Prerequisite: CHEM 3700. (Sp)

NFS 6420 Molecular Nutrition Laboratory 2
(dual listing 5420)
Explores modern molecular nutrition techniques for determining the influence of nutrients on gene regulation. Focuses on modern techniques commonly used in the field of molecular nutrition, including cell culture, mRNA isolation and quantification, western blotting, promoter cloning/mutation, and nutrient/trans factor interactions. (Sp)

NFS 6500 Food Analysis 4
(dual listing 5500)
Application and theory of physical, chemical, and instrumental techniques for determination of composition and quality of food. Prerequisite: NFS 6560/5560. (Sp)

NFS 6510 Food Laws and Regulations 2
(dual listing 5510)
Provides background of federal/state laws and regulations and case law history affecting food production, processing, packaging, marketing, and distribution of food products. (Sp)

NFS 6560 Food Chemistry 4
(dual listing 5560)
Chemical structure, properties, reactions, and interactions of the important chemical constituents of food. Prerequisites: CHEM 3700 and 3710, or NFS 3070. (F)

NFS 6610 Food and Bioprocess Engineering 3
(dual listing 5610)
Standardization and compounding of biomaterials and food products; preservation processing using heat, refrigeration, concentration, and dehydration. Basic unit operations in the bioprocessing industry. Prerequisite: BIE 3200. Also taught as BIE 6610/5610. (F)

NFS 6620 Microbiology of Fermented Dairy Foods 1**
Explores the microbiology and physiology of dairy starter and nonstarter bacteria. Particular emphasis placed on important metabolic functions and biochemical pathways used by these microorganisms in food fermentations and their influence on product attributes. (Sp)

NFS 6640 Food Proteins 1**
Covers topics in protein structure, folding, functional properties, allergens, and purification. (F)

NFS 6650 Meat Science* 2
Structure of muscle tissue, chemistry of contraction and relaxation, factors affecting meat tenderness, and postmortem changes and their effect on meat quality. Prerequisite: CHEM 3700. (Su)

NFS 6660 Cheese Science 2**
Studies application of chemistry and microbiology to the manufacture of cheese. (Su)

NFS 6670 Food Biosecurity and Crisis Management* 1
Food biosecurity addresses the intentional contamination of a food product. Crisis management focuses on how a food company deals with a crisis situation; including product recalls, dealing with the media, and damage control. (F)

NFS 6680 Food Enzymes 2**
Covers topics in food enzymes, including enzyme classification and nomenclature, reaction kinetics, food applications, and immobilization technology. (F)

NFS 6690 Genetics of Lactic Acid Bacteria 1**
Describes structural and functional characteristics of four major genetic elements described in lactic acid bacteria: plasmid DNA, transposable elements, bacteriophages, and the chromosome. Prerequisites: BIOL 3300 and CHEM 5700. (Sp)

NFS 6700 Dairy Chemistry* 1
Students gain an understanding of the chemical structure, properties, biosynthesis, and reactions of the main constituents in milk. Students apply this knowledge to the development and processing of dairy foods. (Sp)

NFS 6720 Lipid Analysis and Metabolism* 1
Focuses on lipid analysis and metabolism. Discusses biological roles of lipid classes, as well as appropriate methods for their analysis. Additionally, covers biological role lipids play in health and disease. (F)

NFS 6730 Understanding Crystallization in Food Systems* 1
Introduces basic concepts of crystallization mechanisms, including theories governing the crystallization process and their applications in food systems. Emphasizes the importance of controlling crystallization and its influence on final product quality and stability. (Sp)

NFS 6740 Waste and Energy Management* 1
Explores energy and waste management, including waste treatment methods and ways to reduce energy, or substitute with less-costly energy, in the food processing industry. Students learn through lectures, cooperative learning, site visits, and example problems. (F)

NFS 6750 Advanced Dietetics Practicum 1-6
(dual listing 5750)
Advanced dietetics practicum in clinical nutrition, community nutrition, food service management, or research. Prerequisite: Must be enrolled in final year in Coordinated Program in Dietetics (CPD) or Didactic Program in Dietetics (DPD). (F,Sp,Su) DE

NFS 6760 Special Topics in Nutrition and Food Science 1-3
Selected topics in nutrition and food science, based on individual faculty interests. (F,Sp,Su)

NFS 6780 Advanced Institutional Food Service Management 3
Principles of management applied to institutional food services and advanced professional certification curriculum. To enroll, student must be an MS candidate in dietetics or be eligible to take the national SFNS (School Food and Nutrition Service) exam. (Sp)

NFS 6830 International Nutrition: Macronutrients 3
(dual listing 5830)
Explores principles and roles of macronutrients in causing malnutrition influencing health, survival, and developmental capacity of populations, especially in developing societies. Discussion of approaches implemented at household, community, national, and international levels to improve nutritional status. (F)

NFS 6900 Special Problems 1-4®
Individual problems and research problems for upper-division students in Nutrition and Food Sciences. (F,Sp,Su) DE

NFS 6910 Teaching Experiences in Nutrition and Food Sciences 1-2®
Students work with faculty in the Nutrition and Food Sciences Department to gain experience in teaching. (F,Sp,Su)

NFS 6970 Thesis Research 1-12®
For students working on MS research. Graded Pass/Fail *only*. (F,Sp,Su) DE

NFS 6990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

NFS 7800 Seminar 1®
Reports and discussion on research and current literature. (F,Sp) DE

NFS 7970 Dissertation Research 1-12®
For students working on PhD research. Graded Pass/Fail *only*. (F,Sp,Su)

NFS 7990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Natural Resources (NR)

See College of Natural Resources, pages 138-140

NR 1010 BSS Humans and the Changing Global Environment 3
Introduction to historical nature and extent of human environmental transformation at global and regional levels. Examination of how socio-economic, political, and scientific factors influence past and current perceptions, use and conservation of natural environments in Western and other cultures, and future options available. For availability, check with the College of Natural Resources Dean's Office.

NR 2220 General Ecology 3
Study of the interrelationships among organisms, humans, and their environments, addressing where and how organisms live. Adaptation, population growth, species interactions, biodiversity, and ecosystem function are explored for a wide variety of organisms and ecosystems. Prerequisites: BIOL 1610 and 1620. Also taught as BIOL 2220. (F,Sp)

NR 6430 Natural Resource and Environmental Policy Cornerstone Seminar 3
Interdisciplinary, team-taught cornerstone course for the Natural Resource and Environmental Policy Graduate Certificate Program. Introduces different disciplinary perspectives for analyzing natural resource and environmental policies and decision-making processes. Helps students understand the role of science in policy-making and how to integrate information from contentious perspectives. (Sp)

NR 6450 Natural Resource and Environmental Policy Presentation 1
In their last year of graduate school, certificate candidates make a presentation on policy dimensions of thesis or dissertation, as part of this student seminar series. Students receive one semester credit for this presentation. For availability, check with the College of Natural Resources Dean's Office.

NR 6510 Biophysical and Human Dimensions of Ecosystems 4
Intensive two-week course introducing key biophysical and socio-economic concepts through exploration of important concepts central to ecosystem management. Examines how ecosystem management differs from traditional approaches to the management of natural resources. Prerequisite: Instructor's permission. (F,Sp,Su) DE

NR 6520 Structure and Function of Ecological and Social Systems 4
Two-week course examining specific processes of landscape development. Establishes the relationship of landscape structure to vegetation and watersheds. Scale and pattern of ecosystems and classification studied at several scales. Prerequisite: Instructor's permission. (F,Sp,Su)

NR 6530 Integrated Inventory, Analysis, and Assessment of Ecosystems 4
Course participants develop techniques and skills for assessing the biophysical and socio-political environment. Participants gain an understanding of measurement, predicting future conditions, and decision-making techniques in ecosystem management. Prerequisite: Instructor's permission. (F,Sp,Su) DE

NR 6535 Leadership for Natural Resources Professionals 2
Online course for students pursuing the professional Master of Natural Resources (MNR) degree. Primary objective is to develop knowledge of leadership techniques in the context of natural resources management through readings, discussions, and position papers. (Sp)

NR 6540 Ecosystem Management Implementation 4
Participants develop an integrated ecosystem assessment of a landscape unit in a capstone exercise. Assessment conducted with an interdisciplinary team during a two-week period in the field. Prerequisite: Instructor's permission. (F,Sp,Su)

NR 6550 Intensive Silviculture 3
Topics for this two-week comprehensive course in silviculture include: stand development and density management; growth and yield; silvicultural systems and reproduction methods; economic evaluation of systems; and relationships between practices and forest health, harvest systems, and forest soils. (F,Sp,Su)

NR 6560 Fire and Fuels Management 4
Two-week course evaluating fire and fuels management programs, which incorporate realistically projected changes in vegetation, fuels, and fire behavior over time. Participants inventory fuels and vegetation, predict fire behavior, and predict change in vegetation structure. (F,Sp,Su) DE

NR 6600 Natural Resources Integrative Experience 1-6®
Under the direction of the student's supervisory committee, student completes an integrative capstone experience in his or her specialty. During their program of study, students *not allowed* to take this course for *more than 6 credits*. (F,Sp,Su) DE

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Nursing (NURS)

See Weber State University/Utah State University Nursing Program, pages 392-393

NURS 1030 Foundations of Nursing Practice 3
Nursing concepts introduced which are built upon throughout the nursing curriculum as students care for clients. (F)

NURS 1031 Foundations of Nursing Practice Clinical 3
Companion course taught in concert with NURS 1030. Clinical experience running concurrently with NURS 1030. (F)

NURS 1040 Women's Health and the Childbearing Family 2
Theory focuses on meeting basic human needs of the family and newborn throughout the childbearing cycle. (Sp)

NURS 1041 Women's Health and the Childbearing Family Clinical 1
Companion course taught in concert with NURS 1040. (Sp)

NURS 1045 Nursing Care of Adults and Children 3
Focused theory with emphasis on physiological and psychosocial needs of clients across the lifespan. (Sp)

NURS 1046 Nursing Care of Adults and Children Clinical 2
Companion course taught in concert with NURS 1045. (Sp)

NURS 1050 Treatment Modalities 3
Basic treatments and pharmacological agents used by nurses to promote health across the lifespan. (F)

NURS 2050 Treatment Modalities 2
Advanced treatments and pharmacological agents used by nurses to promote health across the lifespan. (F)

NURS 2060 Psychiatric/Mental Health Nursing 2
Students explore caring strategies for promoting mental health and preventing illness across the lifespan. (Sp)

NURS 2061 Psychiatric/Mental Health Nursing Clinical 1
Companion course taught in concert with NURS 2060. Clinical application of psychiatric/mental health nursing taught in NURS 2060. (Sp)

NURS 2070 Nursing Care of Adults and Children II 3
Theory with emphasis on more complex physiological and psychosocial needs of clients across the lifespan. (F)

NURS 2071 Nursing Care of Adults and Children II Clinical 4
Companion course taught in concert with NURS 2070. Clinical application of medical-surgical concepts learned in NURS 2070. (F)

NURS 2080 Patient Care Management 2
Theory focuses on the synthesis of nursing knowledge and skills necessary for entrance into registered nursing practice. (Sp)

NURS 2081 Patient Care Management Clinical 3
Companion course taught in concert with NURS 2080. Clinical synthesis of nursing knowledge and skills necessary for entrance into registered nursing practice. (Sp)

NURS 2283 Directed Readings and Projects 1-3
Prerequisite: Instructor's approval. (F,Sp)

Office Systems Support (OSS)

See Office Systems Support AAS Degree, pages 406-407

OSS 1110 Keyboarding 2
For students with no previous keyboarding experience. Designed so student can touch type and learn basic concepts related to word processing and document formatting.

OSS 1400 Microcomputer Applications 3
Introduction to operating systems, word processing, Internet, graphics, database, and spreadsheet applications. Includes preparation for University Studies Computer and Information Literacy (CIL) examination. Prerequisite: Ability to keyboard at a minimum of 25 wpm. DE

OSS 1410 Special Topics 1-3®
Selected topics related to using computers.

OSS 1420 Word Processing Applications 3
Word processing software instruction designed for office applications. Emphasizes creating business documents and improving keyboarding skills. Assumes ability to keyboard by touch at a minimum of 50 wpm. DE

OSS 1550 CI Business Correspondence 3
Development and application of effective business writing skills, emphasizing business correspondence. Includes thorough review of grammar, spelling, and punctuation related to business correspondence. DE

OSS 2300 Data Communications and Networking 3
Emphasizes data communications in a LAN and WAN networking environment. Includes network protocols, cable technology, telecommunications standards, security issues, and general telecommunications management issues. Prerequisite: OSS 1400 or Computer and Information Literacy (CIL) Exam.

OSS 2400 Web Design Applications 3
Design, development, and evaluation of documents for electronic media utilizing the wordwide web. Prerequisite: OSS 1400 or Computer and Information Literacy (CIL) Exam. DE

OSS 2450 Spreadsheets and Databases 3
Use of spreadsheets and databases to accomplish application development. Prerequisite: OSS 1400 or Computer and Information Literacy (CIL) Exam. DE

OSS 2500 Visual Basic Applications 3
Designed to teach nontechnical students to develop application solutions using Visual Basic. Features of Microsoft Access requiring knowledge of Visual Basic are introduced. Prerequisite: OSS 2450.

OSS 2520 Integrating Office Technology 3
Advanced applications of office technology for production of business documents, emphasizing efficient use of word processing, graphics, and desktop publishing. Prerequisite: OSS 1400 or passing scores on University Studies Computer and Information Literacy (CIL) exams. DE

OSS 2600 Office Procedures 3
Finishing course which integrates office knowledge and skills. Applies administrative activities which are part of the office process. Prerequisites: OSS 2520; OSS 1550 or MIS 2200.

OSS 2800 Principles of Selling 2
Focuses on the sales process, including prospecting, qualifying customers, planning and delivering the sales presentation, overcoming objections, closing the sale, and satisfying the customer's needs. DE

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Physical Education Activity (PE)

See Department of Health, Physical Education and Recreation, pages 296-303

PE 1010 Aerobics 1®
Fitness program, primarily designed to improve cardiovascular fitness, muscular endurance, and flexibility. Graded Pass/Fail *only*. (F,Sp) DE

PE 1016 Spinning 1®
Intense cardiovascular conditioning class performed on stationary bikes. Graded Pass/Fail *only*. (F,Sp)

PE 1030 Aerobic Kickboxing 1®
Designed as a fitness program to improve cardiovascular fitness, muscular endurance, and flexibility through a combination of aerobic exercise and kickboxing. Emphasis placed on safety, fitness, and enjoyment. Graded Pass/Fail *only*. (F,Sp)

PE 1046 Jog/Walk 1®
Provides students with opportunity to achieve and maintain personal fitness through jogging and/or walking. Graded Pass/Fail *only*. (F,Sp,Su) DE

PE 1055 Pilates 1®
Provides a mind-body exercise program designed to strengthen core stability, increase flexibility, and increase muscle tone. Graded Pass/Fail *only*. (F,Sp)

PE 1057 Yoga 1®
Practice of yogic exercises to improve flexibility, range of motion, strength, and muscle tone. Instruction in proper alignment. Exploration of breathing and relaxation techniques. Development of greater self-awareness. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1063 Conditioning 1®
Designed to improve overall flexibility, strength, and endurance capacity of the body. Graded Pass/Fail *only*. (F,Sp) DE

PE 1085 Weight Training 1®
Demonstration of proper weight training techniques. Helps students understand basic concepts related to weight training, in order to gain strength, improve muscle tone, and start or continue a healthy lifestyle. Graded Pass/Fail *only*. (F,Sp,Su) DE

PE 1090 Resistance and Stabilization Training 1®
Provides students with combination of strength and stabilization training, including agility, balance, and coordination work. Some plyometrics may also be incorporated. Taught Pass/Fail *only*. (F,Sp)

PE 1100 Tennis I Beginning 1®
Designed for students desiring a basic understanding of tennis. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1101 Tennis II Intermediate 1®
Designed for students with a basic knowledge of tennis who desire to learn intermediate skills. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1103 Table Tennis 1®
Designed for students desiring a basic understanding of table tennis. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1105 Badminton 1®
Through active participation, students learn basic skills, rules, and strategies of singles and doubles badminton. Graded Pass/Fail *only*. (F,Sp)

PE 1110 Racquetball I Beginning 1®
Designed to help students understand the general rules and strategies of racquetball, improve competitive skills, and play safely and effectively. Graded Pass/Fail *only*. (F,Sp)

PE 1111 Racquetball II Intermediate 1®
Designed for students with a basic knowledge of racquetball who desire to learn intermediate skills. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1112 Racquetball III Advanced 1®
Designed for students with proficient skills and knowledge of racquetball who desire to learn advanced skills. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1120 Handball 1®
Provides skills and knowledge in the fundamentals of handball. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1130 Golf Beginning 1®
Designed for the beginning and novice golfer. Basics of individual grip, set-up, posture, and swing. Includes putting, chipping, weight transfer, and balance. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1131 Golf Intermediate 1®
Designed for students with basic golf skills who desire to learn more about golf and improve their golf skills. Improvement of strategies and skills through active participation. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1145 Bowling 1®
Provides students with the knowledge, skills, and strategies for successful participation and enjoyment. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1146 Bowling Intermediate 1®
Designed for students with basic bowling skills who desire to learn intermediate skills. Improvement of strategies and skills through active participation and games. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1150 Billiards Beginning 1®
Designed to develop basic knowledge and concepts for playing a variety of games. Focuses on stroke mechanics, shot selection, and strategy. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1151 Billiards Intermediate 1®
Designed for students with basic billiards skills who desire to learn intermediate skills. Improvement of strategies and skills through active participation and games. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1152 Billiards Advanced 1®
Designed for students with proficient skills and knowledge of billards who desire to learn and improve their skills. Improvement of strategies and skills through active participation and games. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1155 Fencing 1®
Introduction to basic techniques of fencing. Graded Pass/Fail *only*.

PE 1170 Gymnastics 1®
Designed to enhance current abilities and teach skills according to the individual student's abilities. Skills taught through drill work and lecture. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1200 Basketball 1®
Designed to help the recreational player become more familiar with the basic skills involved in the game of basketball. During the course, games and/or a "mini" tournament will be played. Graded Pass/Fail *only*. (Sp)

PE 1210 Volleyball Beginning 1®
Designed to help students understand the general rules and strategies and enjoyment of the game through active participation. Graded Pass/Fail *only*. (F,Sp)

PE 1211 Volleyball Intermediate 1®
Designed for students with basic knowledge of volleyball who desire to learn intermediate skills. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1212 Volleyball Advanced 1®
Designed for students with proficient skills and knowledge of volleyball who desire to learn new skills and improve their skills. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1225 Softball 1®
Designed to help students develop and understand the skills and strategies of recreational softball through active participation. Graded Pass/Fail *only*. (Sp)

PE 1230 Soccer 1®
Designed to help students develop and understand the skills and strategies of soccer through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1235 Flag Football 1®
Designed to help students develop and understand the skills and strategies of recreational flag football through active participation. Graded Pass/Fail *only*. (F)

PE 1245 Ultimate Frisbee 1®
Designed to enhance each student's skills and abilities in ultimate frisbee. Emphasizes cardiovascular and muscular fitness. Course is progressive, with increase in intensity as the individual improves abilities. Graded Pass/Fail *only*. (F,Sp)

PE 1246 Ultimate Frisbee Intermediate 1®
Designed to enhance the skills and abiltities of students desiring to learn intermediate skills in ultimate frisbee. Emphasizes cardiovascular and muscular fitness. Improvement of skills and strategies through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1260 Ice Hockey Beginning 1®
Designed for students desiring a basic understanding of ice hockey. Conditioning and skill development achieved through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1261 Ice Hockey Intermediate 1®
Designed for students with a basic understanding of ice hockey who would like to learn intermediate skills and techniques. Conditioning and skill development achieved through active participation in drills and games. Graded Pass/Fail *only*. (F,Sp)

PE 1265 Officiating Ice Hockey 1®
Development of skating skills, positioning, and rules knowledge. Students officiate at scrimmages and games, and are evaluated on their performance. Course leads to USA Hockey levels 1, 2, and 3 certification. Taught Pass/Fail *only*. (F)

PE 1300 Swimming Beginning 1®
Designed for swimmers and nonswimmers desiring to improve swimming skills and enhance cardiovascular and muscular fitness. Emphasizes swimming safety and enjoyment in a variety of water activities. Beginning and intermediate swim sections offered. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1301 Lap Swimming 1®
Designed for swimmers desiring to improve swimming skills and enhance cardiovascular and muscular fitness. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1315 Water Aerobics 1®
Provides students with opportunity to maintain personal fitness, with an emphasis on non-weight-bearing cardiovascular activity in water. Graded Pass/Fail *only*. (F,Sp)

PE 1400 Self-Defense 1®
Covers skill development in terms of defensive capability, environment assessment, situation management, and the legal ramifications of the use of force. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1407 Rape Aggression Defense 1®
Designed to develop and enhance the options of self-defense, so they may become viable considerations to the woman who is attacked. Students learn how to use personal weapons against abduction. Graded Pass/Fail *only*. (F,Sp)

PE 1410 Tai Chi Chuan 1®
Designed to give participants entry-level experience in the art of Tai Chi Chuan. Participants explore the physical, meditational, yogic, metaphysical, and martial foundations of the art. Graded Pass/Fail *only*. (F,Sp)

PE 1430 Karate 1®
Designed to develop and enhance the options of self-defense for students with little or no background in martial arts (Eastern or Western) with the rudimentary skills of self-defense. Graded Pass/Fail *only*. (F,Sp)

PE 1440 Aikido 1®
Students learn Aikido self-defense techniques through blending with the energy of an attacker, physical exercises for mind-body coordination, and forms of breathing to improve concentration and relaxation. Graded Pass/Fail *only*. (F,Sp)

PE 1445 Tae Kwon Do 1®
Students learn Tae Kwon Do self-defense techniques through blending with the energy of an attacker, physical exercises for mind-body coordination, and forms of breathing to improve concentration and relaxation. Graded Pass/Fail *only*. (F,Sp)

PE 1505 Kayaking 1®
Provides basic skills and knowledge in kayaking. Graded Pass/Fail *only*. (F,Sp)

PE 1510 Fly Fishing 1®
Provides students with the opportunity to develop the skills, knowledge, and strategies for successful participation and enjoyment. Classes are offered in beginning and intermediate fly tying, rod building, and casting. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1511 Fly Tying Beginning 1®
Provides students with an introduction to fly tying, including knots, flies, casting, fishing, and understanding trout streams. Graded Pass/Fail *only*. (F,Sp)

PE 1512 Fly Tying Intermediate 1®
Designed for students with basic fly tying skills who are interested in learning intermediate skills. Graded Pass/Fail *only*. (F,Sp)

PE 1513 Fly Casting 1®
Designed for students desiring a basic understanding of fly casting techniques and strategies. Graded Pass/Fail *only*. (F,Sp)

PE 1514 Fly Rod Building 1®
Designed for students desiring a basic understanding of fly rod building. Students will build a fly rod for their own personal use. Graded Pass/Fail *only*. (F,Sp)

PE 1515 Sailing 1®
Provides skills and knowledge in the fundamentals of sailing and water safety. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1520 Hiking 1®
Provides skills and knowledge in hiking, with an emphasis on leave no trace techniques and safe operations in an outdoor environment. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1523 Orienteering 1®
Provides skills and knowledge in the fundamentals of orienteering with an emphasis on wilderness travel techniques and safety in the outdoors. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1527 Rock Climbing: Basic 1®
Provides skills and knowledge in basic rock climbing, teaching safe judgment and proper techniques in a climbing gym. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1532 Outdoor Survival 1®
Provides skills and knowledge in the fundamentals of outdoor survival and developing a wilderness ethic to allow for safe participation in wilderness activities. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1538 Yurt Camping 1®
Provides skills and knowledge for safe winter camping using a yurt for shelter. Assists in the development of high outdoor ethics. Graded Pass/Fail *only*. (F,Sp)

PE 1543 Wilderness First Aid 1®
Provides outdoor leaders with an introduction to wilderness first aid. Upon completion of course, students may receive a two-year wilderness first aid certification. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1550 Mountain and Road Biking 1®
Introduction to road safety principles, various riding techniques, and cycle maintenance. Sections of road and mountain biking offered. Beginning and intermediate classes offered for both road and mountain biking. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1570 National Outdoor Leadership School Course 3-18®
Provides students with the opportunity to earn USU credit for attending National Outdoor Leadership (NOLS) courses. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1600 Winter Exploration 1®
Provides skills and knowledge for safe winter camping using backpacking equipment. Assists in the development of high outdoor ethics. Graded Pass/Fail *only*. (F,Sp)

PE 1605 Skiing 1®
Alpine ski instruction for all students. Offered for beginning, intermediate, and advanced levels. Focuses on knowledge, techniques, equipment, and safety necessary for participating in and enjoying alpine skiing, snowboarding, and telemark skiing. Graded Pass/Fail *only*. (Sp)

PE 1615 Snowboarding 1®
Provides opportunity for students of all skill levels and experience to develop their riding techniques. Emphasizes versatility and efficiency in varied snow and terrain conditions. Graded Pass/Fail *only*. (Sp)

PE 1625 Cross Country Skiing 1®
Focuses on knowledge, techniques, equipment, and safety necessary to participate in and enjoy winter recreational activities, including cross country ski touring and snowshoeing. Graded Pass/Fail *only*. (Sp)

PE 1635 Telemark Skiiing 1®
Provides opportunity for students of all skill levels and experience to develop their telemark skiing skills. Emphasizes versatility and efficiency in varied snow and terrain conditions. Graded Pass/Fail *only*. (Sp)

PE 1655 Snowshoeing 1®
Provides skills and knowledge of snowshoeing, with an emphasis on leave no trace techniques and development of safe winter activity skills. Graded Pass/Fail *only*. (F,Sp)

PE 1670 Figure Skating Beginning 1®
Designed for students desiring to learn basic figure skating skills. Conditioning and skill development achieved through active participation. Graded Pass/Fail *only*. (F,Sp)

PE 1671 Figure Skating Intermediate 1®
Designed for students with basic figure skating skills who are interested in becoming more proficient skaters and learning new techniques and skills. Conditioning and skill development achieved through active participation. Graded Pass/Fail *only*. (F,Sp)

PE 1680 Curling 1®
Designed for students desiring to learn the rules, skills, strategies, and etiquette of curling. Graded Pass/Fail *only*. (F,Sp)

PE 1700 Dance 1®
Designed to help students enhance their basic skills and enjoyment of dance through the following forms: jazz, modern, ballet, ballroom, social, Latin, western swing, etc. Graded Pass/Fail *only*. (F,Sp)

PE 1701 Introduction to Modern Dance 1®
Designed for individuals to gain basic dance experience through a wide variety of modern and post-modern dance techniques and choreographic exercises. Graded Pass/Fail *only*. (F,Sp)

PE 1702 Modern Dance Intermediate 1®
Designed for individuals to expand their dance experience through a wide range of modern and post-modern dance techniques and choreographic exercises. Graded Pass/Fail *only*. (F,Sp)

PE 1710 Western Swing 1®
Designed to help students enhance their basic skills and enjoyment of country western swing dance (e.g., western swing, two-step, waltz, cowboy cha-cha, line dancing, etc.). Graded Pass/Fail *only*. (F,Sp)

PE 1711 Western Swing Intermediate 1®
Designed for students who have basic western swing dancing skills and would like to develop and improve their techniques. Graded Pass/Fail *only*. (F,Sp)

PE 1720 Social and Ballroom Dance 1®
Designed to provide knowledge and experience in ballroom and social dance. Graded Pass/Fail *only*. (F,Sp)

PE 1745 Big Band Swing Level I 1®
Designed to provide students with basic knowledge and experience in Big Band Swing dance (e.g., lindy hop, boogie woogie, etc.). Graded Pass/Fail *only*. (F,Sp)

PE 1746 Big Band Swing Level II 1®
Designed for students with basic knowledge and experience in Big Band Swing dance (e.g., lindy hop, boogie woogie, etc.) to learn new techniques and enhance their skills. Graded Pass/Fail *only*. (F,Sp)

PE 1760 Jazz Technique 1®
Designed for students who want to learn basic jazz technique. Includes center floor work, as well as across floor progressions. Improves strength and endurance levels through dancing. Graded Pass/Fail *only*. (F,Sp)

PE 1765 Hip Hop Beginning/Intermediate 1®
Advanced, up-beat, energetic class designed to increase coordination, improve rhythm, and increase stamina. Graded Pass/Fail *only*. (F,Sp)

PE 1900 Club Sports 1®
Designed for students desiring to participate in extramural competition against other colleges and universities in the following sports: ballroom dance, baseball, bowling, cycling, disc golf, hockey, men's lacrosse, racquetball, rodeo, rugby, men's soccer, ultimate frisbee, men's volleyball, waterpolo, and wrestling. Graded Pass/Fail *only*. (F,Sp)

PE 1905 Aggiettes 1®
Designed for students who audition for and are accepted into the Aggiette dance program to represent Utah State University at sporting events. Graded Pass/Fail *only*. (F,Sp)

PE 1910 African Dance 1®
Introduces students to African dance using live drummers. Each class incorporates a series of warm-up exercises, followed by specific dances inspired by traditional African ceremonies and events, all accompanied by a traditional African drum ensemble. Graded Pass/Fail *only*. (F,Sp,Su)

PE 1915 Cheer Squad 1®
Designed for students who audition for and are accepted into the Cheer Squad program to represent Utah State University at sporting events. Graded Pass/Fail *only*. (F,Sp)

PE 2000 Personal Instruction and Conditioning 1®
Designed for students and prospective members of varsity teams, as well as for the student/athlete requiring a personalized program. Graded Pass/Fail *only*. (F,Sp,Su)

PE 2010 Varsity Cross Country 1®
Designed to meet the needs of varsity student/athletes in cross country. Graded Pass/Fail *only*. (F)

PE 2020 Varsity Football 1®
Designed to meet the needs of varsity student/athletes in football. Graded Pass/Fail *only*. (F)

PE 2030 Varsity Soccer 1®
Designed to meet the needs of varsity student/athletes in soccer. Graded Pass/Fail *only*. (F)

PE 2040 Varsity Volleyball 1®
Designed to meet the needs of varsity student/athletes in volleyball. Graded Pass/Fail *only*. (F)

PE 2050 Varsity Indoor Track and Field 1®
Designed to meet the needs of varsity student/athletes in indoor track and field. Graded Pass/Fail *only*. (Sp)

PE 2060 Varsity Basketball 1®
Designed to meet the needs of varsity student/athletes in basketball. Graded Pass/Fail *only*. (Sp)

PE 2070 Varsity Gymnastics 1®
Designed to meet the needs of varsity student/athletes in gymnastics. Graded Pass/Fail *only*. (Sp)

PE 2080 Varsity Track and Field 1®
Designed to meet the needs of varsity student/athletes in track and field. Graded Pass/Fail *only*. (Sp)

PE 2090 Varsity Softball 1®
Designed to meet the needs of varsity student/athletes in softball. Graded Pass/Fail *only*. (Sp)

PE 2100 Varsity Golf 1®
Designed to meet the needs of varsity student/athletes in golf. Graded Pass/Fail *only*. (F,Sp)

PE 2110 Varsity Tennis 1®
Designed to meet the needs of varsity student/athletes in tennis. Graded Pass/Fail *only*. (F,Sp)

PE 2120 Varsity Weight Training 1®
Designed for varsity athletes. Emphasizes strength development. Graded Pass/Fail *only*. (F,Sp,Su)

PE 3000 Dynamic Fitness 3®
Designed to develop positive health practices in the areas of physical activity, diet, rest, and relaxation of living through classroom, laboratory, and activity experiences. Also taught as PEP 3000. (F,Sp,Su) DE

PE 4000 Lifeguard Training 2®
Designed to prepare students as pool or nonsurf open water lifeguards. Presents knowledge and skills necessary for lifeguard functions. American Red Cross certification available. Graded Pass/Fail *only*. (F,Sp)

PE 4050 Water Safety Instructor 2®
Attention given to methods of teaching swimming and lifesaving. Presents knowledge and skills necessary for lifeguard functions. American Red Cross certification available. Graded Pass/Fail *only*. (F,Sp)

PE 4200 Athletic Transition 2
Life skills course designed to meet the needs of fourth-year and fifth-year student athletes. Provides personal and career assistance. (F,Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Physical Education Professional (PEP)

See Department of Health, Physical Education and Recreation, pages 296-303

PEP 2000 Introduction and History of Physical Education 2
Acquaints P.E. students with four areas of physical education, including: the department, with respect to the University and the College of Education and Human Services; the history of physical education; the effects of sociology on physical education; and future employment opportunities in the fields of physical education. (F,Sp)

PEP 2020 Introduction to Physical Therapy 2
Introduces prephysical therapy students to the discipline of physical therapy and familiarizes them with its associated spectrum of opportunities and responsibilities. (F)

PEP 2050 Sport Rules and Regulations of the Utah High School Athletic Association 1
Knowledge of the rules and mechanics of officiating all Utah high school sports. (Sp)

PEP 2100 Skills 1 (Swimming, Volleyball, Football) 1
Provides physical education majors and minors with the knowledge, skills, practice, and understanding of swimming, volleyball, and football needed for successful participation. Exposes students to a variety of teaching methods for these three sports. (F,Sp)

PEP 2200 Skills 2 (Lifetime Activities) 1
Provides physical education majors and minors with the knowledge, skills, practice, and understanding of lifetime activities needed for successful participation. Exposes students to a variety of teaching methods for these activities. (F,Sp,Su)

PEP 2300 Skills 3 (Softball, Basketball, Soccer) 1
Provides physical education majors and minors with the knowledge, skills, practice, and understanding of softball, basketball, and soccer needed for successful participation. Exposes students to a variety of teaching methods for these three sports. (F,Sp)

PEP 2400 Skills 4 (Tennis, Badminton, Track and Field) 1
Provides physical education majors and minors with the knowledge, skills, practice, and understanding of tennis, badminton, and track and field needed for successful participation. Exposes students to a variety of teaching methods for these three sports. (F,Sp)

PEP 2500 Rhythms and Movement 1
Focuses on fundamental motor skills, mixers, aerobic, line, folk, ballroom, and square dance. Provides opportunities to practice rhythms and movement, as well as opportunities to practice teaching. Designed for physical education majors and minors. (F,Sp)

PEP 3000 Dynamic Fitness 3®
Designed to develop positive health practices in the areas of physical activity, diet, rest, and relaxation of living through classroom, laboratory, and activity experiences. Also taught as PE 3000. (F,Sp,Su) DE

PEP 3050 Physical Education in the Elementary School 3
Prepares students to teach elementary physical education. Focuses on developmentally appropriate activities, locomotor and manipulative skills, fitness, games, rhythms, motor learning, and lesson planning. Students will teach physical education lessons in the elementary school. Prerequisite: Completion of 45 credits prior to registration. (F,Sp,Su) DE

PEP 3100 Athletic Injuries 3
Care and prevention of common athletic injuries and standard taping techniques. Emphasizes recognition, first aid, and referral for these injuries. Taping techniques taught in a lab setting. (F,Sp)

PEP 3200 CI Motor Learning and Technology in Skill Analysis 3
Exploration of materials, methods, mechanisms of learning, practicing, and performing motor skills. A variety of sport skills taught where students give and receive feedback. Students teach and analyze sport skills with a presentation using computer technology with video and slides. (F,Sp,Su)

PEP 3250 Anatomical Kinesiology 3
Study of the anatomical bases of human movement. Laboratory provides application of principles. (Sp)

PEP 3300 Clinical Experience I 1
Public school clinical experience in physical education. Prerequisite: Admission into Teacher Education program. Graded Pass/Fail *only*. (F,Sp)

PEP 3550 Strategies for Teaching Physical Education 3
Designed to provide future physical education teachers with sound strategies and methods for teaching lifetime activities including fitness, as well as team, individual, and dual sports (F,Sp)

PEP 3600 Elementary Physical Education Practicum 3
Prepares teachers to teach elementary physical education as a support minor. Prerequisite: PEP 3050. (Arr)

PEP 3650 Movement Exploration for Elementary Teachers 2
Covers creative movement and international folk dance. Experiences range from classroom management and curriculum development to large open-space activities and performance. Includes art and sound activities. (F)

PEP 4000 Mental Aspects of Sports Performance 3
Provides current knowledge of sport psychology. Applies this knowledge to teaching sports and coaching in public schools. Also taught as PSY 4000. (F,Sp,Su)

PEP 4100 CI Exercise Physiology 4
Designed to expose students to theory and application of exercise physiology and principles of training and conditioning. Laboratory experience provides hands-on practicum for concepts taught in the classroom. Prerequisites: BIOL 2320, 2420; and MATH 1050 or ACT score of 25 or higher. (F,Sp,Su)

PEP 4150 Advanced Care and Prevention of Athletic Injuries 3
Final preparation and competency demonstration of knowledge and skills prior to taking the national certification exam for the Athletic Training credential. Prerequisites: PEP 3100, instructor approval, and NATABOC certification eligibility.

PEP 4200 QI Biomechanics 4
Understanding and application of human anatomical kinesiology and biomechanical principles fundamental to efficient human movement. In required concurrent one-hour lab, students obtain hands-on application of principles of anatomical kinesiology and biomechanics. Prerequisites: BIOL 2320, 2420; and MATH 1050 or ACT score of 25 or higher. (F,Sp,Su)

PEP 4250 Advanced Cooperative Work Experience 1-10®
Cooperative education work experience offers student opportunity to work in related field work of the major. Graded Pass/Fail *only*. Prerequisite: Instructor approval. (F,Sp,Su)

PEP 4300 Clinical Experience II 1
Public school clinical experience in physical education. Graded Pass/Fail *only*. Prerequisite: Admission into Teacher Education program. (F,Sp)

PEP 4350 Administration and Classroom Management of Physical Education 2
Designed for students to develop a philosophy toward the development and implementation of quality physical education programming. Effective classroom management techniques presented and discussed. Reviews budget, personnel, facilities management, programs, and activities. (F,Sp)

PEP 4400 QI Evaluation in Physical Education 3
Focuses on the nature and use of a variety of tests in physical education. Practical application, interpretation, and use of test results are stressed. Prerequisite: Enrollment in major within Health, Physical Education and Recreation Department. (F,Sp,Su)

PEP 4500 Motivational Strategies for Physical Education and Coaching 3
Addresses issues related to development of coaching philosophy, administration, and reviewing motivational strategies to develop and encourage positive behavior toward sport. Intrinsic motivation, goal setting, team building, and discipline discussed. Provides opportunity to work with local youth sports. (Sp)

PEP 4600 Methods of Coaching Football and Soccer 1
Outlines the methods, strategies, and techniques for coaching scholastic football and soccer. Emphasizes young player skill development and high school coaches' administration of these sports. Prerequisite: PEP 4500 (may be taken concurrently). (Arr)

PEP 4700 Methods of Coaching Volleyball, Track and Field 1
Outlines the methods, strategies, and techniques for coaching scholastic volleyball, as well as track and field. Emphasizes young player skill development and high school coaches' administration of these sports. Prerequisite: PEP 4500 (may be taken concurrently). (Arr)

PEP 4800 Methods of Coaching Basketball, Baseball, and Softball 1
Outlines methods, strategies, and techniques of coaching scholastic basketball, baseball, and softball. Emphasizes young player skill development and high school coaches' administration of these sports. Prerequisite: PEP 4500 (may be taken concurrently). (Arr)

PEP 4850 Methods of Teaching and Coaching Women's Gymnastics 3
Instructs students in required coaching methods for women's gymnastics from the beginning to advanced levels. Also includes section on judging. (Arr)

PEP 4900 CI Methods of Physical Education 3
Designed to prepare physical education majors and minors to teach physical education in the schools. Emphasizes planning, teaching, strategies, and methods. Admission to the Teacher Education program is required. Must be taken concurrently with either PEP 3300 or 4300. Prerequisite: PEP 3550. (F,Sp,Su)

PEP 4950 Honors Senior Thesis 1-6
Culminating experience within the department for honors students. Student works closely with faculty mentor in an extensive project in the student's area of interest. (F,Sp)

PEP 5050 (dual listing 6050) Psychological Aspects of Sports Performance 3
Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, and personality and sports performance. Also taught as PSY 5050/6050. (Arr)

PEP 5070 Sport Sociology 3
Develops understanding of the social significance of sport. Applies the sociological perspective to a variety of contemporary issues, enabling students to better understand how sport affects and reflects American culture. (Sp)

PEP 5100 Fitness Assessment and Exercise Programs 4
Application of physiologic principles, assessment techniques, and exercise prescription for developing quality fitness programs that impact health. Students gain experience in a personal fitness program and in the use and interpretation of fitness tests. Prerequisite: PEP 4100. (F)

PEP 5430 CI The History and Philosophy of Physical Education 3
Designed to familiarize physical education majors (or nonmajors) with history of physical education and sport, as well as philosophical influences which have contributed to development of contemporary physical education and sport. Considers historical development of yesterday's pastimes into today's complex, institutionalized forms of sport and physical education. (F)

PEP 5500 Student Teaching Seminar 2
Capstone seminar focused upon student teaching issues, professional development, and principles of effective instruction. Prerequisites: PEP 4900, completion of Level I and II field experiences. (F,Sp)

PEP 5560 Practicum in Improving School System Programs 1-4®
In-service seminar for experienced teachers, emphasizing improvement in instruction. (F,Sp,Su)

PEP 5630 Student Teaching in Secondary Schools 10
A 13-week culminating experience in which students assume full-time teaching responsibilities under the direction of cooperating teachers in physical education. Graded Pass/Fail *only*. Prerequisites: PEP 4900, completion of Level I and Level II field experiences. (F,Sp)

PEP 5700 (dual listing 6700) Special Topics in Physical Education 1-6®
In-depth review and discussion of special topics in physical education. (F,Sp,Su) DE

PEP 5900 Independent Study 1-3®
Provides opportunity for undergraduate or graduate students to participate in independent inquiry under guidance of a professor. (F,Sp,Su)

PEP 5910 Independent Research 1-3
Allows undergraduate students to pursue personal research interest by formalizing an independent project under the guidance of a professor. (F,Sp,Su)

PEP 6000 Administration of Athletics 3
Prepares students to organize and administer interscholastic and intercollegiate sports at the public school or university level. Consideration is given to both the challenges and standards associated with such programs. (Arr) DE

PEP 6010 Leadership in Health, Physical Education, and Recreation 3
Group approach to improvement and innovation in leadership and supervisory skills. (Sp) DE

PEP 6050 (dual listing 5050) Psychological Aspects of Sports Performance 3
Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, and personality and sports performance. Also taught as PSY 6050/5050. (Arr) DE

PEP 6070 Sport in Society 3
Introduces students to complex role and social significance of sport in contemporary society. Familiarizes students with aims, scope, and potential contributions of sport in society. (Sp) DE

PEP 6250 Graduate Cooperative Work Experience 1-10®
Professional level of educational work experience in a cooperative education position for graduate students. (F,Sp,Su)

PEP 6290 Corporate Wellness Marketing 3
Reviews history of corporate fitness in America, as well as common organizational and management practices. Emphasizes marketing practices promoting individual and business involvement. (Sp)

PEP 6400 Exercise in Health, Fitness, and Sport 4
Emphasizes physiological and health benefits of exercise. Discusses role of exercise in disease prevention, along with medications given to treat illness and disease. (F)

PEP 6420 Curriculum in Physical Education 3
Curriculum development studied in terms of student needs in relation to present-day society. Includes current practices and trends in the area of curriculum. (Arr) DE

PEP 6430 History and Philosophy of Physical Education and Sport 3
History of physical education; philosophical influences which have contributed to contemporary physical education; and methods of educational instruction using the primary philosophical positions. (F) DE

PEP 6450 Fitness Assessment and Exercise Testing 3
Exposure to fitness assessment in clinical cardiac settings, as well as in corporate wellness settings. Exercise testing and interpretations, using different testing protocols in emphasized variant electrocardiograms, studied as part of the disease process. Prerequisite: PEP 6400. (Sp)

PEP 6500 Practicum in Corporate Wellness 1-10®
Experiences designed for the practical implementation of coursework. Involves random populous rehabilitation, as well as executive and industry, senior citizen centers, and rest homes. (F,Sp,Su)

PEP 6540 Wellness Programming 3
Emphasizes exercise prescription writing and exercise prescription implementation. Students test prescriptions in laboratory setting. Prerequisites: PEP 6400, 6450. (Sp)

PEP 6550 Athletic Training Clinical Orthopedics I 3
Provides graduate student athletic trainers with opportunity to learn sports medicine from a sports medicine physician's perspective. Concepts provide real-life examples. (F)

PEP 6560 Athletic Training Clinical Orthopedics II 3
Provides graduate student athletic trainers with opportunity to learn sports medicine from a sports medicine physician's perspective. Concepts provide real-life examples. (Sp)

PEP 6570 Athletic Training Clinical Orthopedics III 3
Provides students in athletic training services with an opportunity to understand the role of the athletic trainer, in conjunction with the team physician, in providing care, evaluation, and treatment for sport-related injuries. (F)

PEP 6580 Athletic Training Clinical Orthopedics IV 3
Provides students in athletic training services with an opportunity to understand the role of the athletic trainer, in conjunction with the team physician, in providing care, evaluation, and treatment for sport-related injuries. (Sp)

PEP 6690 Analysis of Teaching Physical Education 3
Designed to provide graduate students with practicum experiences in the analysis of physical education, via micro teaching and observation of physical education classes. (Arr)

PEP 6700 Special Topics in Physical Education 1-6®
(dual listing 5700)
In-depth review and discussion of special topics in physical education. (F,Sp,Su)

PEP 6730 Worksite Guidance and Counseling 3
Provides cardiac rehabilitation/corporate wellness graduate students with basic understanding of exercise and health psychology. (Arr)

PEP 6800 Biomechanics and Ergonomics of Health, Industry, and Sport 3
Understanding and application of biomechanical and ergonomic principles fundamental to efficient human movement in health, industry, and sport. (Sp)

PEP 6810 Research Methods in Health Sciences 3
Explores basic to advanced concepts contained in research and statistical design, as applicable to health sciences. (F) DE

PEP 6820 Wellness Certification and Technology 2
Provides instruction and experience in wellness technology and wellness certification. Students learn use of current technology in the fitness industry and obtain certain wellness certifications. (Arr)

PEP 6830 Motor Learning 3
Comprehensive review and analysis of research in the area of motor skills which bears upon the teaching of physical education activities. (Arr) DE

PEP 6900 Independent Study 1-3®
Student conducts independent projects under direction of one or more professors. Provides student with opportunity for individualized study. (F,Sp,Su)

PEP 6910 Independent Research 1-3
Allows graduate students to pursue personal research interests by formalizing an independent project under the guidance of a graduate professor. (F,Sp,Su)

PEP 6960 Master's Project 3
Allows students opportunity to develop creative and applicable educational project. (F,Sp,Su) DE

PEP 6970 Thesis 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

PEP 6990 Continuing Graduate Advisement 1-9®
Provides graduate students with continued support and advisement. Usually taken following completion of all coursework required for the degree. Graded Pass/Fail *only*. (F,Sp,Su)

PEP 7550 Practicum in the Evaluation of Instruction 1-6®
Field-based experience involving supervision of student teachers in Department of Health, Physical Education and Recreation. (F,Sp,Su) DE

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Personal Financial Planning (PFP)

See School of Accountancy, pages 143-146

PFP 1050 Introduction to Personal Financial Planning 1-3
Introduction to concepts of financial planning for individuals. Taught only as a special extension course as requested. DE

PFP 3460 Fundamentals of Personal Investing 3
Examination of investment vehicles available to personal investor. Principal emphasis on corporate and government securities. Credit cannot be used toward requirements for finance major. (Sp) DE

PFP 5060 Personal Financial Planning and Advising 3
(dual listing 6060)
Fundamental concepts and principles of personal financial planning for individuals. (F) DE

PFP 5070 Retirement Planning 3
(dual listing 6070)
Concepts and principles of retirement planning, including retirement and benefit plans, deferred compensation, and investments. (Sp) DE

PFP 5080 Estate Planning 3
(dual listing 6080)
Concepts and principles of estate planning for individuals, including goal identification, data gathering, forms of property ownership, documents, probate, and transfer taxes. (Sp) DE

PFP 5090 Personal Financial Plans 3
(dual listing 6090)
Capstone course in personal financial planning. Knowledge from other financial planning courses used to prepare comprehensive personal financial plans. Prerequisites (may be taken concurrently): ACCT 3410; PFP 3460 or FIN 4460; PFP 5060/6060, 5070/6070, 5080/6080.

PFP 6060 Personal Financial Planning and Advising 3
(dual listing 5060)
Fundamental concepts and principles of personal financial planning for individuals. (F)

PFP 6070 Retirement Planning 3
(dual listing 5070)
Concepts and principles of retirement planning, including retirement and benefit plans, deferred compensation, and investments. (Sp)

PFP 6080 Estate Planning 3
(dual listing 5080)
Concepts and principles of estate planning for individuals, including goal identification, data gathering, forms of property ownership, documents, probate, and transfer taxes. (Sp)

PFP 6090 Personal Financial Plans 3
(dual listing 5090)
Capstone course in personal financial planning. Knowledge from other financial planning courses used to prepare comprehensive personal financial plans. Prerequisites (may be taken concurrently): ACCT 3410; PFP 3460 or FIN 4460; PFP 6060/5060, 6070/5070, 6080/5080.

PFP 6560 Business Law and Professional Responsibilities 3
Examines the ethical and legal responsibilities of business professionals. Includes the application of law to business organizations, contracts, government regulation of business, and the uniform commercial code. (F,Sp)

[DE] This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Philosophy (PHIL)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

PHIL 1000 BHU Introduction to Philosophy 3
Introduction to philosophical questions regarding truth, knowledge, reality, mind, God, morality, and meaning. Examination of various philosophical responses to these questions. (F,Sp)

PHIL 1120 BHU Social Ethics 3
Examination of principles and arguments underlying current debate in American law and politics. Topics may include abortion, euthanasia, capital punishment, discrimination and affirmative action, sexual harassment, freedom of expression, welfare, and duties to help the poor in other nations. (F) [DE]

PHIL 1200 BHU Practical Logic* 3
Recognition of arguments and diagramming their logical structure. Study of valid argument forms, as well as formal and informal fallacies. Evaluating categorical syllogisms using rules and Venn diagrams. Basic propositional logic. (Sp)

PHIL 2200 QI Deductive Logic 3
Study of deductive arguments and techniques for evaluating their validity, including construction of proofs. Recognizing formal fallacies in reasoning. Symbolizing English sentences and arguments to make their meanings precise. Propositional logic. Study of quantifiers and relations. Prerequisite: MATH 1030 or STAT 1040. (F,Sp)

PHIL 2400 BHU Ethics 3
Study of judgments concerning what is good or bad, right or wrong. How judgments are justified and related to action. Relativism, subjectivism, absolutism, freedom, and responsibility. (Sp)

PHIL 3100 CI Ancient Philosophy 3**
Development of philosophical thought in the Ancient Greek world. Readings from the pre-Socratics, Plato, Aristotle, the Stoics, and Epicureans.

PHIL 3110 Medieval Philosophy 3**
Neo-Platonism with stress on Plotinus, St. Augustine, and early Christian philosophy; early medieval thought; St. Thomas Aquinas and the rise of scholasticism; and philosophical thought in the Renaissance.

PHIL 3120 CI Early Modern Philosophy 3
Philosophers and philosophical disputes in Western Europe from 1400-1750. Figures and topics may include: Bacon, Hobbes, Descartes, Locke, Hume, nominalism, empiricism, rationalism, religion, politics, and morals.

PHIL 3150 CI Kant and His Successors 3
Philosophers and philosophical disputes in Western Europe from 1750-1900. Study of Kant, Hegel, Bentham, Mill, Marx, Schopenhauer, and Nietzsche. Examination of critcal idealism, philosophy of history, utilitarianism, communism, and origins of existentialism.

PHIL 3160 CI Contemporary Philosophy 3**
Twentieth century philosophical thought, including existentialism, logical positivism, analytic philosophy, and postmodernism, as expressed in the works of Heidegger, Husserl, Wittgenstein, Carnap, Russell, Quine, Sartre, Derrida, and others.

PHIL 3180 CI Contemporary European Philosophy* 3
Study of twentieth-century philosophical movements originating and developing on the European continent. Movements to be considered may include: existentialism, phenomenology, hermeneutics, and post-metaphysical philosophy.

PHIL 3500 Medical Ethics 3
Key issues in medicine, including: consent, competency, confidentiality, euthanasia, abortion, and the justification of health care. (F)

PHIL 3510 DHA Environmental Ethics 3
Key issues in the treatment of nature, such as: the value of wilderness, animal rights, comparative views of nature, and moral issues in economic approaches to the wilderness. (Sp)

PHIL 3520 DHA Business Ethics 3
Key issues in business, including: foreign bribery, corporate responsibility, corporate culture, ethical theories, justice, and preferential treatment. [DE]

PHIL 3700 DHA Philosophy of Religion 3
Problems in defining "religion" and the existence of God; the problem of evil; the immortality of the soul; religious experience; faith; alternatives to theism; religious language. (F)

PHIL 3710 Philosophies of East Asia* 3
Study of Confucianism, Buddhism, Zen Buddhism, and Taoism. Focus on appreciating the merits of each system of thought. Emphasis on class discussion. Includes much assigned reading every week. (F)

PHIL 3720 Philosophical Theology After Kant* 3
Explores attempts to reconstruct the reasonable basis of religion in the two centuries after the Enlightenment. (F)

PHIL 3730 CI Philosophy of the New Testament 3
Historical and intellectual context of the development of the New Testament. Character, ideas, and historical setting of the various documents.

PHIL 3750 Religion and Science in the Modern World* 3
Study of problems addressing the relation of religion to science in the modern world (e.g., evolution, Big Bang, origin of life). (F)

PHIL 3800 DHA Philosophy in Literature 3
Study of philosophical concepts, problems, and issues as they have been presented and dramatized in works of literature and cinema. Discussion of issues concerning ethics, epistemology, ontology, and logic. Students read or view works from a variety of media, including novels, short stories, and films.

PHIL 3810 DHA Aesthetics 3
Analysis of traditional theories of aesthetics and art criticism. Theories are applied to illustrative examples, including music, painting, photography, sculpture, dance, literature and cinema. (Sp)

PHIL 4300 Epistemology 3
Study of foundations of knowledge and belief systems, and related topics in epistemology, including perception, certainty, and skepticism.

PHIL 4310 DHA Philosophy of Science 3
Study of different views of the nature of science: the classical traditions of Hempel and Popper, Kuhn's subjectivism, and Feyerabend's anarchism. Topics include confirmation, induction, scientific realism, reductionism, and the growth of scientific knowledge.

PHIL 4320 DHA History of Scientific Thought 3
Examination of key episodes in the history of science and associated ideas about the nature of scientific knowledge and how this knowledge may be acquired. Also taught as HIST 4320.

PHIL 4400 Metaphysics 3
Study of fundamental problems of existence. Topics include: mind and its relation to the body, determinism and human freedom, fatalism, idealism and realism, truth, and our knowledge of the world. (F)

PHIL 4410 Philosophy of Mind 3
Beginning with the context of Cartesian mind/body dualism, a thorough examination of Cartesian privacy, privileged access, and the problem of other minds is conducted. Ancillary topics may include the mind/machine controversy and animal intelligence.

PHIL 4420 Philosophy of Language 3
Nature and uses of language, concepts of meaning, reference, truth, syntax, semantics, pragmatics, metaphors, ambiguity, vagueness, and definition. Application in linguistics, psychology, anthropology, and literary criticism.

PHIL 4500 Contemporary Ethical Theory 3
Careful examination of one or more topics playing a central role in current moral philosophy. Focus on work produced in philosophical literature within last twenty years.

PHIL 4530 DSC Ethics and Biotechnology 3
(dual listing 6530)
Interdisciplinary examination of key issues such as: cloning, human genetic screening and therapy, and transgenic animals and food.

PHIL 4540 DHA Human Values and Information
(dual listing 6540) Technology 3
Philosophical investigation of relations between technological change, human values, and the good life. Emphasis on growth of computer-mediated communication and its impact on values such as autonomy and privacy.

PHIL 4600 Philosophy of Law 3
Examines the nature of law, relations between law and morality, the obligation to obey law, ways to interpret law, the justification of legal punishment, and appropriate conditions for civil and criminal liability.

PHIL 4610 DHA Social and Political Philosophy 3
Explores the nature of a just society, political obligation, and justification and proper limits of political power.

PHIL 4900 Special Topics 3®
Detailed consideration of a particular philosopher or philosophical problem. Instructor approval required. Course may be repeated when a different topic is discussed. (F,Sp)

PHIL 4910 Readings and Research 1-4®
Independent study of a particular philosopher or philosophical topic. Consent of instructor required. Course may be repeated when a different topic is discussed. (F,Sp)

PHIL 4920 Senior Honors Seminar 1
Credit for completing and presenting a senior honors thesis project. Requirement may be fulfilled by publishing the thesis in an academic journal, defending the thesis before a faculty committee, presenting the thesis at an academic conference, or presenting the thesis in the philosophy session during Scholar's Day. (Sp)

PHIL 4930 Senior Honors Thesis 1-4®
Independent study research credits for preparation of a senior honors thesis to fulfill requirements for a degree in philosophy with departmental honors. Prerequisite: Permission of instructor prior to enrollment. (F,Sp,Su)

PHIL 4990 Philosophy Seminar 3®
Advanced study of recent work in philosophy. Topic will vary by instructor. Especially appropriate for students planning to go on to graduate or professional school.

PHIL 5200 Symbolic Logic 3
Study of the metatheory for truth functional and predicate logic. Examination of systems employing modal, epistemic, and deontic operators. Set theory, fuzzy logic, and Godel's undecidability theorem may also be considered. If time permits, applied logic will be considered. Prerequisite: PHIL 2200 or instructor's approval.

PHIL 5510 Ethics and the Environment 3
Study and analysis of both individualistic and holistic approaches to environmental ethics, with emphasis on contemporary debates within the field and their implications for the formation of public policies. Prerequisite: PHIL 3510 or graduate standing.

PHIL 5600 Legal Ethics 3
Study and analysis of major issues arising in the practice of law within the context of the American adversarial system of justice. Prerequisite: PHIL 4600, graduate standing, or permission of instructor.

PHIL 6420 Philosophy of Language 3
(Sp)

PHIL 6530 Ethics and Biotechnology 3
(dual listing 4530)
Interdisciplinary examination of key issues such as: cloning, human genetic screening and therapy, and transgenic animals and food. To receive graduate credit, extra readings and a 25-30 page paper will be required.

PHIL 6540 Human Values and Information
(dual listing 4540) Technology 3
Philosophical investigation of relations between technological change, human values, and the good life. Emphasis on growth of computer-mediated communication and its impact on values such as autonomy and privacy. To receive graduate credit, extra readings and a 25-30 page paper will be required.

PHIL 6890 Philosophy of Science 3
(Sp)

PHIL 6900 Independent Study 1-4®
(F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
*This course is taught during alternate years. For information about when this course will be taught, contact department.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Physics (PHYS)

See Department of Physics, pages 408-414

PHYS 1020 BPS Energy 3
Study of energy resources, utilization, conversion, and conservation, including energy balance and flow in biological and geological systems. Social impacts of energy resource development, including public policy and planning. Prerequisites: At least one university-level mathematics or statistics course, and completion of University Studies Computer and Information Literacy (CIL) examination.

PHYS 1040 BPS Introductory Astronomy 3
Exploration of solar system and universe. Laws of motion, fundamental interactions, structure of matter, electromagnetic radiation, and conceptual models of celestial motions. Conceptual and quantitative homework problems and exams, along with writing assignments and observation reports, are required. Facility with high school mathematics is expected.

PHYS 1080 BPS Intelligent Life in the Universe 3
Study of the likelihood of extraterrestrial intelligence and its probable locations. Nature and evolution of life on Earth, as well as stellar evolution and planetary environments. Discussion of psychology of UFO phenomena. Prerequisites: At least one university-level mathematics or statistics course, and completion of University Studies Computer and Information Literacy (CIL) examination.

PHYS 1100 BPS Great Ideas in Physics 3
Descriptive introduction to the principles underlying contemporary physics. Great ideas will include relativity and quantum mechanics and such consequences and applications as the twin paradox, black holes, nuclear energy, magnetic imaging, lasers, superconductivity, and the paradox of Schrodinger's cat. Facility with high school algebra is expected.

PHYS 1200 BPS Introduction to Physics by Hands-on Exploration 4
Overview of physics concepts important in today's society. Explores structure of matter, electricity and magnetism, light and sound, forces, energy, momentum, thermodynamics, and modern physics. Required laboratory emphasizes hands-on, inquiry-based activities. DE

PHYS 1800 BPS Physics of Technology 4
Overview of the classical physics on which industrial technology is based. Elements of kinematics, forces, energy, momentum, thermodynamics, electric and magnetic fields, waves, and optics. Required laboratory. Prerequisites: MATH 1050 and 1060.

PHYS 2110 The Physics of Living Systems I 4
Study of kinematics and dynamics of particles and systems of particles. Introduction to Newton's Laws of motion, momentum and energy conservation, rotations, and thermodynamics, with applications in biology and biotechnology. Required recitation and lab. Prerequisite: MATH 1100 or 1210.

PHYS 2120 BPS The Physics of Living Systems II 4
Introduction to electromagnetism, optics, and quantum phenomena—including the microscopic structure of matter, with applications in biology and biotechnology. Required recitation and lab. Prerequisite: MATH 1100 or 1210, PHYS 2110.

PHYS 2200 Elements of Mechanics 2
Calculus-based introduction to particle mechanics. Kinematics, Newton's laws of motion, momentum, work and energy, and angular momentum. Required recitation and lab. Prerequisite: MATH 1210.

PHYS 2210 QI General Physics—Science and Engineering I 4
Calculus-based introduction to Newton's Laws of motion, momentum and energy conservation, rotations, oscillations, and thermodynamics, with applications in the physical sciences and technology. Required recitation and lab. Prerequisite: MATH 1210. DE

PHYS 2220 BPS/QI General Physics—Science and Engineering II 4
Calculus-based introduction to electromagnetism, waves, optics, and modern physics, with applications in the physical sciences and technology. Required recitation and lab. Prerequisites: MATH 1210; PHYS 2200 *or* 2210, or a minimum score of 4 on the AP B exam, *or* a minimum score of 3 on the AP C (mechanics) exam. DE

PHYS 2400 Introductory Topics in Physics (Topic) 1-3®
Explores issues in contemporary physics at an introductory level. Prerequisite: Approval of instructor.

PHYS 2500 Introduction to Computer Methods in Physics 2
Topics include: (1) use of numerical, graphical, and symbolic manipulation software to solve physics problems; and (2) interfacing computers to instrumentation for control and data acquisition. Prerequisite: PHYS 2110 or 2210 or 2220.

PHYS 2710 Introductory Modern Physics 3
Overview of the origins, principles, and practical applications of quantum mechanics. Atomic structure and periodic table, molecular bonding, solids, electronic properties of metals and semiconductors, and superconductivity. Prerequisites: MATH 1220, PHYS 2120 or 2220.

PHYS 3010 DSC/QI Space Exploration from Earth to the Solar System 3
Comparative introduction to the Earth and other planets in our solar system, including geological structure and atmosphere. Emphasis on space exploration methods, including spacecraft and detection instrumentation. Examines latest results of Mars missions, Jupiter and Saturn exploration, etc. Prerequisites: Completion of University Studies Quantitative Literacy (QL) and Breadth Physical Sciences (BPS) requirements.

PHYS 3020 DSC Great Scientists 3
Lives and work of men and women responsible for scientific revolution: Maxwell (loved children), Einstein (despised authority), Curie (suffered discrimination against women), Schrodinger (fled from Hitler), Watson and Crick (the DNA story), Feynman (lock picker), Rubin (as a young girl built her own telescope), and others. Prerequisite: Fulfillment of University Studies Breadth Physical Sciences (BPS) or Breadth Life Sciences (BLS) requirement. DE

PHYS 3030 DSC/QI The Universe 3
Study of properties and origin of the universe, based on Einstein's theory of gravity. Topics include curved space-time; black holes, white holes, and worm holes; the big bang; multiple universes; and the births of stars, galaxies, heavy atoms, and planets. Prerequisite: Completion of University Studies Quantitative Literacy (QL) requirement and PHYS 1040.

PHYS 3040 QI Space Weather—Dangers to the High-Tech World 3
Space weather can be as destructive to high technology as ordinary weather is to property and crops. Examines increasing vulnerability of society to events in space resulting from changes on the Sun and from human activity. Explores how we learn about space weather with satellites, radars, lidars, and numerical models. Prerequisites: Completion of University Studies Quantitative Literacy (QL) and Breadth Physical Sciences (BPS) requirements.

PHYS 3500 Topics in Physics (Topic) 1-3®
Introduces and explores issues in contemporary physics at an intermediate undergraduate level. Focuses on phenomena and experimental methods. Prerequisite: PHYS 2710 and approval of instructor.

PHYS 3550 Intermediate Classical Mechanics 3
Newton's laws of motion, work and energy, systems of particles, Lagrange's and Hamilton's equations, accelerated reference frames, central force problem, harmonic oscillations, and rigid body rotations. Prerequisites: PHYS 2710, MATH 2210; MATH 2250 (may be taken concurrently).

PHYS 3600 Intermediate Electromagnetism 3
Electrostatics, electric potential, current, magnetostatics, induction, AC curcuits, Maxwell's equations, and electromagnetic waves. Prerequisites: PHYS 2710, MATH 2210; MATH 2250 (may be taken concurrently).

PHYS 3700 Thermal Physics 3
Rigorous treatment of laws of thermodynamics and statistical mechanics. Concepts of work, temperature, heat, energy, and entropy; and their application to reversible and irreversible processes. Criteria for equilibrium. Prerequisite: PHYS 2710.

PHYS 3710 Intermediate Modern Physics 3
Introduction to the principles and applications of special and general relativity. Space-time, relativistic kinematics and dynamics, gravity and geometry, black holes, Big Bang, nuclei, radioactivity, and nuclear reactions. Interconnections between modern cosmology and elementary particle physics. Prerequisites: MATH 1220, PHYS 2120 or 2220.

PHYS 3750 Foundations of Wave Phenomena 3
Survey of wave phenomena in physics, with emphasis on application of mathematical techniques to the wave equation, Schrodinger equation, and Maxwell equations. Prerequisites: PHYS 2710, MATH 2210; MATH 2250 (may be taken concurrently).

PHYS 3870 CI Intermediate Laboratory I 2
Modern experimental techniques, data and error analysis, experimental design, and communication skills. Exercises complement upper-level theory courses, and include some experiments of historical importance. Prerequisite: PHYS 2500.

PHYS 3880 CI Intermediate Laboratory II 2
Continuation of PHYS 3870. Prerequisite: PHYS 3870.

PHYS 3900 Projects in Physics 1-3®
Individual study pursued under direction of staff member. Prerequisite: Approval of instructor.

PHYS 4010 DSC/QI Chaos Under Control 3
Introduction to principles and applications of new sciences of fractals, chaos, and complexity. Importance of describing physical, geological, biological, and natural resource structures with fractals. Practical benefits of understanding and controlling erratic behavior in physical and living systems. Technological consequences of self-organized, adaptive behavior. Prerequisites: Completion of University Studies Quantitative Literacy (QL) and Breadth Physical Sciences (BPS) requirements.

PHYS 4020 DSC/QI Science, Art, and Music 3
Explores how science constrains production and appreciation of visual and auditory art. Relevance to art of: physics of sound and light, perspective and observer in relativity and quantum mechanics, symmetry, fractals, chaos, complex adaptive behavior, and self-organization. Prerequisites: Completion of University Studies Computer and Information Literacy (CIL) examination, Quantitative Literacy (QL), and Physical or Life Sciences breadth (BPS or BLS) requirements.

PHYS 4250 CI Cooperative Work Experience 1-6®
Planned work experience in industry or national laboratories. A detailed plan and the purpose of the experience must have prior approval. A written report is required. Prerequisite: PHYS 2710.

PHYS 4550 Advanced Classical Mechanics 3
Lagrange's equations, Liouville's theorem, continua, Euler's equations, small vibrations, and special relativity. Prerequisites: PHYS 3550, 3750.

PHYS 4600 Advanced Electromagnetism 3
Potential formulations of electrodynamics, energy and momentum, waves and boundary conditions, waves in dielectrics and conductors, guided waves, dipole radiation, and relativistic electrodynamics. Prerequisites: PHYS 3600 or ECE 3870; PHYS 3550, 3750.

PHYS 4650 Optics I 3
(dual listing 6650)
Topics include mathematics of wave motion, electromagnetic theory of light, light propagation, geometrical optics, and superposition of waves. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Also taught as ECE 4650/6650. Prerequisite: ECE 3870.

PHYS 4680 Optics II 3
(dual listing 6680)
Topics include polarization, interference, diffraction, Fourier optics, coherence theory, and the quantum nature of light. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Prerequisite: PHYS/ECE 4650 or PHYS/ECE 6650. Also taught as ECE 4680/6680.

PHYS 4700 Quantum Mechanics I 3
Principles of quantum mechanics, operators in Hilbert space, matrix mechanics, angular momentum, spin, perturbation theory, and applications. Prerequisites: PHYS 3550, 3600, 3750.

PHYS 4710 Quantum Mechanics II 3
Continuation of PHYS 4700. Prerequisite: PHYS 4700.

PHYS 4900 CI Research in Physics 1-3®
Research experience pursued with faculty mentor. Prior to registration, student must make arrangements with the Physics Department's undergraduate research advisor. Prerequisite: PHYS 2710.

PHYS 5340 Methods of Theoretical Physics I 3
Physics applications of vector calculus and differential geometry, group theory, infinite series, complex analysis, differential equations, Sturm-Liouville theory, orthogonal functions, integral equations, and the calculus of variations.

PHYS 5350 Methods of Theoretical Physics II 3
Continuation of PHYS 5340. Prerequisite: PHYS 5340.

PHYS 5500 Intermediate Topics in Physics (Topic) 1-3®
Explores issues in contemporary physics at the advanced undergraduate and beginning graduate level.

PHYS 5800 Physics Colloquium 1®
A series of invited lectures on specialized topics in physics and related subjects. Graded Pass/Fail *only*.

PHYS 5870 CI Advanced Laboratory 3
Experimental experience with such modern techniques as scanning tunneling microscopy, LEED, Auger spectroscopy, and Fourier transform infrared spectroscopy. Prerequisite: PHYS 2710.

PHYS 6010 Classical Mechanics I 3
Lagrange's equations, Hamilton's principle, Hamilton's equations, canonical transformations, Hamilton-Jacobi theory, central forces, noninertial reference frames, rigid body motion, small oscillations, relativistic mechanics, canonical perturbation theory, continuum mechanics. Prerequisite: PHYS 4550 or equivalent.

PHYS 6020 Classical Mechanics II 3
Continuation of PHYS 6010. Prerequisite: PHYS 6010.

PHYS 6110 Electrodynamics I 3
Fundamental laws of electrostatics and magnetostatics; dielectric media, Maxwell's equations, time varying fields, and electromagnetic waves. Waveguides and radiation by moving charges. Prerequisite: PHYS 4600 or equivalent.

PHYS 6120 Electrodynamics II 3
Continuation of PHYS 6110. Prerequisite: PHYS 6110.

PHYS 6210 Quantum Mechanics I 3
Advanced quantum mechanics stressing the formalism of states and operators in the study of quantum dynamics, angular momentum, symmetry and group theory, perturbation theory and scattering. Prerequisite: PHYS 4710 or equivalent.

PHYS 6220 Quantum Mechanics II 3
Continuation of PHYS 6210. Prerequisite: PHYS 6210.

PHYS 6240 Space Environment and Engineering 3
Study of space environment and models used for engineering analysis. Topics include considerations for engineering in the space environment such as plasma interactions, debris, chemical reactions, radiation effects, and thermal issues. Prerequisites: MATH 2270, 2280. Corequisite: ECE 5230. Also taught as ECE 6240.

PHYS 6250 Cooperative Work Experience 1-6®
Allows students to register for credit when working in a physics-related position. Prerequisite: Permission of department head prior to enrollment.

PHYS 6310 Solar-terrestrial Physics I 3
Study of solar-terrestrial physics, including planetary magnetic fields, the interaction of the sun with planetary properties (magnetic fields and atmospheres), and an overview of ionospheric measurement techniques. Study of the upper atmosphere and the physics occurring in each of the layers and zones, including the equatorial and polar ionosphere. Prerequisite: PHYS 4600 or equivalent.

PHYS 6320 Solar-terrestrial Physics II 3
Continuation of PHYS 6310. Prerequisite: PHYS 6310.

PHYS 6330 Plasma Physics I 3
Characteristics of the plasma state and plasma generation; velocity distribution functions, collisions and Boltzmann's equation; wave modes in a plasma; transport theory; plasma devices. Prerequisite: PHYS 4600 or equivalent.

PHYS 6340 Plasma Physics II 3
Continuation of PHYS 6330. Prerequisite: PHYS 6330.

PHYS 6410 Statistical Mechanics I 3
Review of thermodynamics. Discussion of foundation of statistical mechanics and applications to ideal classical and quantum gases, blackbody radiation, ideal crystals, interacting classical gases and liquids, phase transitions, and critical phenomena.

PHYS 6420 Statistical Mechanics II 3
Continuation of PHYS 6410. Prerequisite: PHYS 6410.

PHYS 6530 Solid State Physics I 3
Development of the modern theory of the solid state. Emphasis placed on understanding the bulk properties of the solids, including crystal structure, cohesive properties, electronic structure, and lattice dynamics. Explores response to added stimuli, such as electric, magnetic, and optical fields. Prerequisites: PHYS 4600 and 4710; PHYS 6410 (can be taken concurrently).

PHYS 6540 Solid State Physics II 3
Continuation of PHYS 6530. Prerequisite: PHYS 6530.

PHYS 6550 Physics of Materials I 3
Application of microscopic (quantum) and macroscopic (classical) physics to study materials properties (e.g., bonding, structure, atomic dynamics, electrical, magnetic, thermal, optical), characterization methods, and a survey of materials. Prerequisites: PHYS 3700, 4710.

PHYS 6560 Physics of Materials II 3
Continuation of PHYS 6550. Prerequisite: PHYS 6550.

PHYS 6650 Optics I 3
(dual listing 4650)
Topics include mathematics of wave motion, electromagnetic theory of light, light propagation, geometrical optics, and superposition of waves. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Also taught as ECE 6650/4650. Prerequisite: ECE 3870.

PHYS 6680 Optics II 3
(dual listing 4680)
Topics include polarization, interference, diffraction, Fourier optics, coherence theory, and the quantum nature of light. For graduate (6000-level) credit, additional reading, recitation, use of optical-design software, and/or writing will be required. Prerequisite: PHYS/ECE 4650 or PHYS/ECE 6650. Also taught as ECE 6680/4680.

PHYS 6910 Relativity I 3
Foundations of spacetime physics. Survey of the basics of special and general relativity, including kinematics, mechanics, and electrodynamics in flat spacetime, the description of curved spacetime, and the Einstein equations. Exact solutions, applications, tests, and the mathematical techniques of general relativity. Prerequisites: PHYS 6020, 6120.

PHYS 6920 Relativity II 3
Continuation of PHYS 6910. Prerequisite: PHYS 6910.

PHYS 6930 Quantum Field Theory I 3
Detailed study of the relativistic quantum description of scalar, spinor, and vector fields in spacetime. Topics include gauge theories, canonical and path integral quantization, and interactions.

PHYS 6940 Quantum Field Theory II 3
Continuation of PHYS 6930. Prerequisite: PHYS 6930.

PHYS 6970 Thesis Research 1-10®
Advanced research under guidance of one or more faculty members. Graded Pass/Fail *only*.

PHYS 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*.

PHYS 7210 Spacecraft Instrumentation 3
Theory, engineering, and data reduction techniques of spacecraft instrumentation for space science and spacecraft systems. Prerequisite: PHYS/ECE 6240. Also taught as ECE 7210.

PHYS 7500 Advanced Topics in Physics (Topic) 3®
Explores issues in contemporary physics at the advanced graduate level.

PHYS 7510 Seminar 1-3®

PHYS 7970 Dissertation Research 1-15®
Graded Pass/Fail *only*.

PHYS 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*.

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Plant Science (PLSC)

See Department of Plants, Soils, and Climate, pages 415-423

Note: Effective Spring Semester 2010, courses listed with the PLSC prefix will use the Plants, Soils, and Climate (PSC) prefix.

PLSC 2100 BLS Introduction to Horticulture 3
Introduction to production of nursery, greenhouse, fruit, and vegetable crops. Explores residential and commercial landscape construction and management. Students also learn about interior plants, arboriculture, turf science, landscape plant materials, and home gardening. (F) DE

PLSC 2200 Pest Management Principles and Practices 3
Overview of pest control considerations, procedures, and principles. Topics include integrated pest management, organic and chemical pest control, environmental considerations, safety, life cycles of pests, and commercial pesticide licensing. (Sp) DE

PLSC 2250 Occupational Experience in Agronomy and Horticulture 1-4®
Provides credit for on-the-job training in jobs related to plants or soils. (F,Sp,Su) DE

PLSC 2600 Annual and Perennial Plant Materials 3
Identification, culture, and utilization of herbaceous ornamental plants in the landscape, including annual and perennial flowering plants, herbaceous ground covers, ornamental grasses, and herbs. (F)

PLSC 2620 Woody Plant Materials: Trees and Shrubs for the Landscape 3
Identification, culture, and utilization of woody ornamental plants in the landscape, including shade trees, flowering trees and shrubs, hedge plants, and vines. Review of native plants commonly used in the landscape. (F) DE

PLSC 2900 Special Problems in Plant Science 1-4®
Student-selected practical problems in horticulture and/or agronomy. (F,Sp,Su) DE

PLSC 3010 Basic Flower Arranging 2
Principles of basic flower design using fresh, dried, and artificial flowers. Proper care of cut flowers and foliages. Basic plant physiology behind such principles. Lab fee required. Offered through Distance Education *only*. (F) DE

PLSC 3050 Greenhouse Management and Crop Production 4
Design and management of commercial greenhouse facilities. Production requirements of primary greenhouse crops. (Sp) DE

PLSC 3300 Residential Landscapes 3
Functional and aesthetic relationships of plants and structures in the landscape in connection with installation considerations. Prerequisite: PLSC 2620. Recommended: PLSC 2600. (Sp) DE

PLSC 3310 Advanced Residential Landscape Design 3
Advanced course in residential landscape design. Uses industry-standard and computer-aided design software for small-scale designs. (F)

PLSC 3400 Landscape Management Principles and Practices 3
Principles and practices of landscape management, including plant site analysis, pruning, soil and irrigation management, pest management, equipment considerations, cost estimating, and sustainability. Prerequisites: PLSC 2600, 2620. (Sp) DE

PLSC 3420 Landscape Irrigation Design 2
Introduction to design of sprinkler and drip irrigation systems for residential and commercial landscapes. (Sp) DE

PLSC 3430 Landscape Business Practices 3
Explores small business approach to managing landscape construction companies and using techniques of bidding and estimating. (Sp)

PLSC 3440 Construction Methods for Residential Landscape Installation 2
Introduction to methods and equipment used in landscape installation, such as techniques of layout, pavers, water features, planting, sod installation, sprinkler and drip irrigation installation, and equipment operation. (F)

PLSC 3500 The Structure and Function of Economic Crop Plants 3
Environmental effects on plant structure and function. Control of plant development for enhanced production of marketable goods. Introduction to principles using examples from horticulture and agronomy. Applications in these fields emphasized. Prerequisites: Integrated Science or comparable breadth course, BIOL 1010 or 1610. (Sp)

PLSC 3700 Plant Propagation 4
Propagation of plants by sexual and asexual means. Covers fundamental physiology of propagation, as well as cultural practices and techniques used in crop production. Recommended: BIOL 1610. (F) DE

PLSC 3800 Turfgrass Management 3
Fundamentals of turfgrass science: species adaptation, identification, and cultural requirements; turfgrass growth and development; establishment; primary cultural practices (fertilization, irrigation, mowing); secondary cultural practices; pest management; integrated management planning for turfgrass systems. Prerequisite: BIOL 1010 or 1610. (F)

PLSC 4100 Landscape Water Conservation 2
Explains why water conservation is important, and how water can be conserved through precision irrigation and conversion to low-water-use landscapes. Not currently being taught. Contact department for further information.

PLSC 4280 Field Crops 3
Economic importance, use, distribution, origin, history, classification, identification, botanical nature, marketing, processing, storage, certification, grading, diseases, insects, commercial production, and improvement of cereal, root, and oilseed crops. Two lectures, one lab per week. (F)

PLSC 4300 World Food Crops and Cropping Systems: The Plants That Feed Us 3
Climatic, geographic, and management requirements of the world's plants that provide food for humans, including botanical relationships. Systems used to produce these crops and processes for turning them into food. Prerequisite: Integrated Science or comparable breadth course. Not currently being taught. Contact department for further information.

PLSC 4320 Forage Production and Pasture Ecology 3
Cultivation and management of legumes and grasses used throughout the world for grazing, stored feed, soil improvement, and conservation. Forage plant growth and development, nutrient and water utilization, and responses to environmental stress. Prerequisite: Integrated Science or comparable breadth course. (F even)

PLSC 4400 Modern Vegetable Production 3
Principles and practices underlying scientific vegetable culture. Discussion of production of important vegetables, focusing on the physiological processes influencing their culture. Explores crop performance in research and commercial applications. Prerequisite: BIOL 1010 or 1610. (F) DE

PLSC 4500 Fruit Production 3
Cultivars, physiology, anatomy, propagation, sites, soils, climate, culture, irrigation, fertilizers, insects, diseases, integrated management, plant and fruit growth and development, harvesting, storage, pruning, orchard architecture, environmental protection, and economics for both tree and small fruits. Prerequisite: BIOL 1010 or 1610. (Sp) DE

PLSC 4600 DSC/QI Cereal Science 3
Introduction to principles involved in cereal chemistry and processing. Covers starch chemistry, dry milling, wet milling, decortication, malting, and extrusion. Processing of all major cereals also covered. Prerequisite: MATH 1030 or STAT 1040 or completion of University Studies Quantitative Literacy (QL) requirement. (Sp even)

PLSC 4800 Professional Turfgrass Management 2
Fertilization, irrigation, and cultivation practices for managed landscapes. Construction issues, including compaction, soil modification, and specialized construction practices for golf courses and sports turf. Prerequisites: SOIL 3000, PLSC 3800. (Sp)

PLSC 5100 Landscape Irrigation Management 3
(dual listing 6100)
Explores how principles of evapotranspiration, soil and plant properties, and urban landscape sprinkler irrigation systems can be combined for proper irrigation scheduling. Evaluating and analyzing landscape water demand. (Sp)

PLSC 5200 Environmental Plant Physiology 2
(dual listing 6200)
Quantitatively analyzes the relationship between physiological processes and growth of whole plants. Energy balance and water use efficiency. Light interception and canopy geometry. Canopy photosynthesis and respiration. Carbon partitioning and source/sink relationships. Prerequisites: BIOL 4400, MATH 1050, or consent of instructor. (Sp)

PLSC 5300 Principles of Cytogenetics 3
Examination and analysis of variation in chromosome structure, behavior, and number. Includes discussions of developmental and evolutionary effects of this variation, and practical applications in plant and animal genetics. Prerequisite: BIOL 3060. (Sp odd)

PLSC 5400 Low Water Landscaping 3
(dual listing 6400)
Examines arid ecosystems, emphasizing the Intermountain West, and recreating such ecosystems in a range of amenity landscapes. Also covers procurement, propagation, establishment, and maintenance of plants appropriate for low water landscapes. Also taught as LAEP 5400/6400. (F)

PLSC 5420 CI Forest and Shade Tree Pathology 3
Nature, cause, and management of forest diseases. Also taught as BIOL 5420 and WILD 5420. (Sp)

PLSC 5430 Plant Nutrition 2
(dual listing 6430)
Mechanisms of nutrient acquisition, rhizosphere interactions, root morphology and distribution, short- and long-distance transport, nitrogen fixation, and biochemical function of essential and beneficial elements. (F even)

PLSC 5440 Plant Molecular, Cellular, and
(dual listing 6440) Developmental Biology I 3
Examines background and recent advances. Students analyze and discuss structure, genome, molecular development, and photosynthesis topics from a research perspective. Prerequisites: BIOL 3060, 5210; CHEM 3700 or 5710. Also taught as BIOL 5440/6440. (Sp even)

PLSC 5450 Plant Molecular, Cellular, and
(dual listing 6450) Developmental Biology II 3
Examines background and recent advances. Students analyze and discuss cell wall, growth regulator, and environmental response topics from a research

perspective. Prerequisites: BIOL 3060, 5210, CHEM 3700 or 5710. Also taught as BIOL 5450/6450. (Sp odd)

PLSC 5550 Weed Biology and Control 4
(dual listing 6550)
Management strategies for undesirable plant species in native and agroecosystems. Interference and allelopathy, undesirable plant invasion and spread, noxious weed eradication principles and practices, integrated plant management strategies, herbicide interactions with weeds and crops, and economics of management emphases. (F)

PLSC 5600 Plant Water Relations 2
(dual listing 6600)
Explores basic concepts such as the soil-plant-atmosphere continuum. Explains how water affects the physiological processes that control the quantity and quality of growth. Includes discussion of crop physiology and plant physiology. (F)

PLSC 5650 Urban/Community Forestry 3
Social, biological, and administrative aspects of managing urban/community forests, including field and classroom exercises and a management planning project. Also taught as WILD 5650. (Sp)

PLSC 5700 Principles of Plant Breeding 3
Principles of plant breeding. Breeding techniques for self-pollinated, cross-pollinated, and asexually reproducing crops. Real-life breeding problems solved, showing that resource identification and allocation are the critical points in developing a successful program. Prerequisite: Fulfillment of General Education Breadth Life Sciences (BLS) requirement. (Sp odd)

PLSC 5750 Crop Biotechnology 2
Genetic and cellular approaches to crop improvement. Emphasizes cell culture, transformation, markers, marker-assisted selection, mapping simple and quantitatively inherited traits, fine mapping, gene cloning, mutagenesis, expression profiling, and bioinformatics. Prerequisite: BIOL 3060. (Sp odd)

PLSC 5760 Crop Ecology 2
Features of agroecosystems compared with natural ecosystems; input of energy and materials to manipulate agroecosystems and produce maximum, sustained quality and yield of agricultural products. Prerequisites: BIOL 4400, PLSC 5200/6200, or instructor's consent. (Sp)

PLSC 6100 Landscape Irrigation Management 3
(dual listing 5100)
Explores how principles of evapotranspiration, soil and plant properties, and urban landscape sprinkler irrigation systems can be combined for proper irrigation scheduling. Evaluating and analyzing landscape water demand. (Sp)

PLSC 6200 Environmental Plant Physiology 2
(dual listing 5200)
The relationship between physiological processes and growth of whole plants. Energy balance and water use efficiency. Light interception and canopy geometry. Canopy photosynthesis and respiration. Carbon partitioning and source/sink relationships. Prerequisites: BIOL 4400, MATH 1050, or consent of instructor. (Sp)

PLSC 6220 Professional Experience in Water Efficient Landscaping 6
Internship component of water efficient landscaping master's program. Summer employment with water purveyors, consulting firms, and businesses involved in landscape irrigation. (Su)

PLSC 6230 Readings in Landscape Water Conservation 1
Background topics in water development and policy in the West. Current topics on various aspects of water conservation in urban landscapes. (Sp even)

PLSC 6240 Water Efficient Landscaping Seminar 2
Students develop skills in public speaking by presenting their summer internship experience to the Plants, Soils, and Climate faculty. Students also work on a culminating academic endeavor for the program. (F)

PLSC 6400 Low Water Landscaping 3
(dual listing 5400)
Examines arid ecosystems, emphasizing the Intermountain West, and recreating such ecosystems in a range of amenity landscapes. Also covers procurement, propagation, establishment, and maintenance of plants appropriate for low water landscapes. Also taught as LAEP 6400/5400. (F)

PLSC 6430 Plant Nutrition 2
(dual listing 5430)
Mechanisms of nutrient acquisition, rhizosphere interactions, root morphology and distribution, short- and long-distance transport, nitrogen fixation, and biochemical function of essential and beneficial elements. (F even)

PLSC 6440 Plant Molecular, Cellular, and
(dual listing 5440) Developmental Biology I 3
Examines background and recent advances. Students analyze and discuss structure, genome, molecular development, and photosynthesis topics from a research perspective. Prerequisites: BIOL 3060, 5210; CHEM 3700 or 5710. Also taught as BIOL 6440/5440. (Sp even)

PLSC 6450 Plant Molecular, Cellular, and
(dual listing 5450) Developmental Biology II 3
Examines background and recent advances. Students analyze and discuss cell wall, growth regulator, and environmental response topics from research perspective. Prerequisites: BIOL 3060, 5210, CHEM 3700 or 5710. Also taught as BIOL 6450/5450. (Sp odd)

PLSC 6550 Weed Biology and Control 4
(dual listing 5550)
Management strategies for undesirable plant species in native and agroecosystems. Interference and allelopathy, undesirable plant invasion and spread, noxious weed eradication principles and practices, integrated plant management strategies, herbicide interactions with weeds and crops, and economics of management emphases. (F)

PLSC 6570 Herbicide Physiology and Mode of Action 3
Entrance, movement, and metabolism of major herbicides; and a critical study of the physiological processes affected by them. Prerequisites: BIOL 4400, PLSC 6550/5550 or instructor's consent. (Sp odd)

PLSC 6600 Plant Water Relations 2
(dual listing 5600)
Explores basic concepts such as the soil-plant-atmosphere continuum. Explains how water affects the physiological processes that control the quantity and quality of growth. Includes discussion of crop physiology and plant physiology. (F)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Political Science (POLS)

See Department of Political Science, pages 424-428

POLS 1100 BAI United States Government and Politics 3
U.S. Constitution, political parties and elections, interest groups, Congress, president, bureaucracy, courts, and civil rights and liberties. This course meets the Americanization requirement. (F,Sp) DE

POLS 2100 Introduction to International Politics 3
Analysis of the nation-state system as well as interdependence of the global community. (F,Sp)[1]

POLS 2200 BSS Comparative Politics 3
Comparisons of differences in political culture, institutions, and processes, including authoritarian and democratic systems, violence and corruption, political development, and public policy. (F,Sp)[1] DE

POLS 2300 Introduction to Political Theory 3
A survey course covering ancient and modern political theory. (F,Sp)

POLS 3000 QI Introduction to Political Research 3
Methodology, methods, and approaches used to study and analyze political events and relationships, including the use of library resources. Prerequisite: STAT 1040 or MATH 1030. (F,Sp)[2]

POLS 3100 Global Issues* 3
The origins and consequences of conflict and cooperation in an interdependent global community are examined in order to analyze how transnational, as well as competing national, interests and institutions affect economic, political, and environmental choices and outcomes. (F)

POLS 3110 DSS Parties and Elections 3**
Political parties, campaigns, and elections. (Sp)

POLS 3115 Electoral Behavior 3
Considers the factors influencing citizens to become involved in politics. Explores how voters decide which candidates or issues to support, how candidates might act on that support, and whether or not reforms are needed to ensure greater participation. (Sp)

POLS 3120 DSS Law and Politics 3
Examines history, processes, and theories underlying American law and politics. Makes selective comparison of the American legal system with other legal systems. (F)

POLS 3130 DSS United States Legislative Politics 3
Legislative process. (Sp)

POLS 3140 DSS The Presidency* 3
Examines the origins, purposes, and scope of the executive power in the American constitutional system. (F)

POLS 3150 State and Local Government 3
Includes state and local politics, in addition to metro-urban politics. (Sp)

POLS 3160 Practicing American National Government 3
Includes survey of legislative, executive, and judicial governing. Offers academic basis for Washington, DC experience. (F,Sp,Su)

POLS 3170 Law and Economics 3
Explains legal and political rules, the organization of government, and other institutional processes. Uses standard microeconomic tools and concepts, such as scarcity, choice, preferences, incentives, and supply and demand. Prerequisite: POLS 1100. Also taught as ECN 3170. (Sp) DE

POLS 3180 Introduction to Public Administration 3
Overviews management of United States governmental affairs. Helps students understand how the government is structured to accomplish the execution and implementation of public policy. Prerequisite: POLS 1100. (F)

POLS 3190 DSS Gender, Power, and Politics 3
Examines the question of gender inequality in politics, focusing on contemporary political issues cross-culturally and in different political systems. (F)[4]

POLS 3210 DSS Western European Government and Politics 3**
Britain, France, Germany, Scandinavia, and the European Union. (F)

POLS 3220 DSS Russian and East European Government and Politics* 3
(F)

POLS 3230 Middle Eastern Government and Politics 3**
General overview of political cultures and political developments in the Middle East. (F)

POLS 3250 DSS Chinese Government and Politics 3
(F)

POLS 3270 DSS Latin American Government and Politics 3
Survey of most of the governments and politics of Latin America, emphasizing events, policies, and governmental actions of the past decade. (F)

POLS 3310 DSS American Political Thought 3
Survey of American political thought from colonial times to the present. (F)

POLS 3320 The Foundations of American Constitutionalism 3
Introduces students to debate over constitutions, constitutionalism, and constitution-making which occurred during the period (roughly) from the Revolution to the election of 1800.

POLS 3400 DSS United States Foreign Policy 3
Formulation, execution, and impact of United States foreign policy. (F,Sp)[3]

POLS 3430 Political Geography 3
The relationship between earth and state. World political phenomena studied from a geographic point of view, including international boundaries, territorial seas, and landlocked states. Also taught as GEOG 3430. (Sp)

POLS 3700 Terrorism and Counterterrorism* 3
Explores dynamics, causes, characteristics, and consequences of those acts labeled "terrorist." Also explores counter measures to such acts. (F)

POLS 3810 DSS Introduction to Public Policy 3
Examines different approaches to the study of public policy and different value dimensions in the design of policies. (F)

POLS 4000 Political Analysis 3
Political data, quantitative and analytical techniques. Prerequisite for majors: POLS 3000. (F)[4]

POLS 4120 American Constitutional Law 3
Analyzes the separation of powers, checks and balances, federalism, the Bill of Rights, and other constitutional amendments. (F,Sp)

POLS 4130 Constitutional Theory 3
Introduces students to constitutional theory, with particular emphasis on American constitutional theory. Prerequisite: POLS 1100. (Sp)

POLS 4140 Political Organizations 3
Focuses on formal and informal constitutional rules, examining how different sets of rule structures impact the collective decisions of individuals in society and how individuals can influence or shape the rules structuring their lives. Prerequisite: POLS 1100.

POLS 4150 The Supreme Court and the Shaping of America 3
Exposes students to the most important Supreme Court decisions in U.S. history. Outlines how such decisions impact American citizens and policy. (Sp)

POLS 4160 The First Amendment 3
Provides an in-depth examination of the first amendment of the U.S. Constitution, based on case law of the Supreme Court and interpretations made within government agencies. (Sp)

POLS 4210 European Union Politics 3**
Explores creation and ongoing development of the European Union. Examines governing institutions, and internal and external politics of the European Union across a number of issues areas. (Sp)

POLS 4220 CI Ethnic Conflict and Cooperation 3
Examines origins of ethnic groups and the causes of ethnic conflicts, as well as different strategies for preventing or resolving such conflict. Explores conditions facilitating interethnic cooperation, the more common form of ethnic group interaction. (Sp)[4]

POLS 4230 Issues in Middle East Politics 3
Contemporary Middle Eastern political movements, regional conflicts, and state-level political change. (Sp)[4]

POLS 4260 Southeast Asian Government and Politics* 3
(Sp)

POLS 4280 Politics and War* 3
Examines causes and implications of war. Study of wars from general to limited, including case studies such as the Vietnam War. (Sp)

POLS 4310 CI History of Political Thought I 3
Issues and thinkers in ancient and medieval political thought. (Sp)

POLS 4320 DSS History of Political Thought II* 3
Issues and thinkers in modern and contemporary political thought. (Sp)

POLS 4330 Political Theory and Literature 3
Utilizes works from the field of literature, partly in order to discuss issues in politics and political philosophy, and partly as examples of political thought at its best. (F,Sp)

POLS 4350 Public Policy and Democratic Theory 3
Examines the nature of the American Republic. Focuses on the tension between our republican form of government and the tendency toward democratization. Considers how this balance has changed over time. (F)

POLS 4410 Global Negotiations* 3
Creates an awareness of international issues and other cultures. Utilizes a computer simulation program in which negotiating teams of students from around the world are linked in a negotiation simulation. (Sp)

POLS 4450 CI United States and Latin America 3
Study and analysis of foreign relations of Latin American nations among themselves and with the rest of the world. (Sp)

POLS 4460 National Security Policy* 3
How intelligence systems function, fit within the policymaking systems of free societies, and are managed and controlled. (Sp)

POLS 4470 Foreign Policy in the Pacific* 3
Analysis of contemporary foreign policies of major countries surrounding the North Pacific. (Sp)

POLS 4800 The Supreme Court and American Constitutional History 3
Examines many of the major arguments made about the Constitution, which were presented before the Supreme Court of the United States. Also taught as HIST 4800.

POLS 4810 Politics and Public Policy 3
Explains public policies as rational expressions of political self-interest and explores the relationship between self-interest and values such as "equity" and "efficiency" in policy. (F)

POLS 4820 DSS Natural Resources and Environmental Policy: Political Economy of Environmental Quality 3**
Causes of environmental and natural resources problems and evaluation of political and private responses to them. Study of economics and politics applied to the environment. Production, protection, and allocation of scarce resources by markets and political systems. (Sp)

POLS 4890 Special Topics 1-5®
Credit arranged. Instructor's permission required. (F,Sp) DE

POLS 4910 Readings and Conference 1-5®
Individually directed study in subjects of special interest to students. Credit arranged. Instructor permission required. (F,Sp,Su)

POLS 4990 CI Senior Research Seminar 3®
Introduces students to the research process by having them complete a major research project in the topic area of the particular professor. (F,Sp) DE

POLS 5110 Social Policy 3**
Examines health, education, and welfare policies in U.S. contexts and in comparative context. (F)

POLS 5120 Economics of Russia and Eastern Europe, 9th Century to 21st Century 3
Development of the economics of Russia and Eastern Europe from earliest times to the present, emphasizing the interaction between economic forces and policies of the state. Prerequisite: APEC/ECN 2010. (F)

POLS 5130 Law and Policy 3
Analyzes the relationship between law and the formation and implementation of policy. (Sp)

POLS 5140 Law, Politics, and War 3
Examines relationship between law, politics, and war, with particular emphasis on the American experience since 1787. (F)

POLS 5180 Natural Resource Policy 3
Political and economic theory applied to the analysis of natural resource allocation conflicts and U.S. policies enacted to resolve such conflicts. (Sp)[4]

POLS 5200 Global Environment 3
Examines different strategies for resolving global resource and environmental problems. This course is not currently being offered. For information about when it may be offered, contact the department.

POLS 5210 Comparative Political Change/Development* 3
Emphasis on approaches and theories in the field of comparative politics, with a focus on political change/development. (F)

POLS 5230 Development in the Middle East 3
Study of Middle Eastern regimes, political cultures, and political developments. (Sp)[4]

POLS 5270 Latin American Politics and Development 3
Focuses on special contemporary issues of selected Latin American nations, such as democratization, the role of the military, and elections. (Sp)[4]

POLS 5290 Development in Europe 3
Emphasizes political and economic development in Europe. (Sp)[4]

POLS 5350 DSS Evolution, Conflict, and Cooperation* 3
Intensively examines human cooperation as a fundamental problem of development and human conflict as the major obstacle to development. (Sp)

POLS 5420 The Mass Media and Politics 3
(dual listing 6420)
Examination of the role of the mass media in the political process, including both campaigns and governance. Examination of political advertising, news coverage, polling, opinion formation strategies, and politicians' use of new media technologies. Also taught as JCOM 5420/6420. (F)

POLS 5440 DSS Gender and World Politics 3
Examines the role gender inequality plays in the construction of international relations, using a variety of feminist approaches. Central theme of gendered critique is global security, defined in terms of economic, ecological, political, and military dimensions. (Sp)[4]

POLS 5480 International Trade Policy 3**
Examines governance and politics of international trade relations, focusing in particular on cooperation, conflict, and dispute resolution in the GATT/WTO, European community, NAFTA, and Asian cooperative regimes. (Sp)

POLS 5910 Campaign Internship 1-12®
A semester campaign internship. Instructor approval required. (F,Sp,Su)

POLS 5920 Washington Internship 1-12®
A semester congressional, administrative, or legal internship in Washington, D.C. Graded Pass/Fail *only*. Instructor approval required. (F,Sp,Su)

POLS 5930 State Government Internship 1-12®
A semester legislative, lobbying, or administrative internship in the state government of Utah or those of any other state government. Graded Pass/Fail *only*. Instructor approval required. (F,Sp,Su)

POLS 5940 Administrative Internship 1-12®
A semester administrative internship at the local or state level. Graded Pass/Fail *only*. Instructor approval required. (F,Sp,Su)

POLS 5950 International Internship 1-12
Prerequisite: Enrollment in International Studies major. (F,Sp,Su)

POLS 6010 Research Design 3
A graduate survey of the philosophy and methods of political analysis. Topics ranging from the methodology of inquiry to elementary statistical methods will be covered. (F)

POLS 6020 Public Policy Analysis 3
Examines and reviews leading theories of policy analysis and the policy-making process at an advanced level. (Sp)

POLS 6030 Political Theory, Political Economy, and Capitalism 3
Provides an introduction to the study of political economy by considering the connections among political theory, political economy, and capitalism. This course is not currently being offered. For information about when it may be offered, contact the department.

POLS 6040 Public Choice 3
Introduction to applying the microeconomic theory of markets to political processes. This course is not currently being offered. For information about when it may be offered, contact the department.

POLS 6100 Introduction to Public Administration 3
Introduction to issues of public and nonprofit management. Provides overview of macro and micro forces influencing public and nonprofit management.

POLS 6110 Budgeting and Finance 3
Surveys all major activities concerning allocation, investment, and control of public funds, as well as budgeting and revenues in context of fiscal policy making (Alt Sp)

POLS 6120 Program Assessment and Evaluation 3
Practical guidelines for conducting evaluation studies. Dissussion of performance measurement, social indicators, quantitative and qualitative methods, and experimental and quasi-experimental designs as used in applied policy and program research. (Alt F)

POLS 6130 Law and Administration 3
Exploration and analysis of constitutional and legal basis in which American Public Administration is set, including separation of powers, checks and balances, delegation of discretionary authority, and common law and equity. (Alt Su)

POLS 6140 Leadership in Public Organizations 3
Analysis of leadership behavior and managerial activities. Examination of major theories of leadership and motivation, including leadership vs. management, leadership qualities and characteristics, and leadership skills. (Alt Su)

POLS 6210 Conflict and Security 3
Explores the many causes of conflict at different levels. Identifies the means by which resolution can be achieved, as well as the challenges and barriers associated with such efforts. (Sp)

POLS 6220 International Relations Theory 3
Reading seminar on theory and method in the interplay of politics and economics in international relations. This course is not currently being offered. For information about when it may be offered, contact the department.

POLS 6230 Terrorism and Counter-Terrorism 3**
Explores the history, causes, and consequences of terrorism, as well as its impact on the global arena. Teaches students why understanding of terrorism is crucial, in order to allow effective, intelligent responses. (Sp)

POLS 6240 Democratic Theories and Practice 3
Explores the many different perspectives and theories on the concept of democracy, ranging from the 18th Century to writings of the 21st Century. (F)

POLS 6250 Theories of War and Peace 3
Examines the "classic" alternative understanding, in the history of political thought, regarding the reasons people go to war. Explores consequent proposals to erase the sources or alleviate the results of armed conflicts. (F,Sp)

POLS 6400 United States Foreign Policy 3
Explores contemporary U.S. foreign policy in the context of international relations theory and global realities. Utilizing theoretical perspectives as analytical models, course examines how policy makers formulate and attempt to achieve U.S. foreign policy goals in the global arena. Taught during alternate years.

POLS 6420 The Mass Media and Politics 3
(dual listing 5420)
Examination of the role of the mass media in the political process, including both campaigns and governance. Examination of political advertising, news coverage, polling, opinion formation strategies, and politicians' use of new media technologies. Also taught as JCOM 6420/5420. (F)

POLS 6810 Graduate Seminar 1-4®
American politics; comparative politics; political theory; international politics; public law; public administration. (F,Sp,Su)

POLS 6910 Graduate Tutorial 1-3®
Prerequisite: instructor's consent. (F,Sp,Su)

POLS 6920 Internship 1-15®
Internship in a public administration agency. Instructor approval required. (F,Sp,Su)

POLS 6970 Thesis Research 1-9®
Graded Pass/Fail *only*. Prerequisite: admission to candidacy. (F,Sp,Su)

POLS 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
[1]Taught Spring 2010.
[2]Taught Spring 2011.
[3]Taught Spring 2010 and 2012.
[4]Not taught 2009-2010 or 2010-2011.

Portuguese (PORT)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

PORT 1010 Portuguese First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. (F)

PORT 1020 Portuguese First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: PORT 1010 or equivalent. (F,Sp)

PORT 1050 Intensive Portuguese for Spanish Speakers 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Intensive course for Spanish speakers. (Sp)

PORT 2010 Portuguese Second Year I 4
Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: PORT 1020 or equivalent. (F)

PORT 2020 Portuguese Second Year II 4
Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: PORT 2010 or equivalent. (Sp)

PORT 2880 Individual Readings 1-4®
Individual study of selected readings in Portuguese. Instructor's permission required. (F,Sp)

PORT 3040 CI Advanced Portuguese Grammar and Composition 3
Review of the more complex Portuguese grammatical points and development of writing skills through composition. Prerequisite: PORT 2020 or equivalent. (F,Sp)

PORT 3570 DHA Brazilian Culture and Civilization 3
Historical, social, political, economic, and cultural conditions and institutions of Brazil. Prerequisite: PORT 3040 or permission of instructor. (F)

PORT 3630 DHA Survey of Brazilian Literature 3
Selected readings and discussions of major works and authors in Brazilian literature. Prerequisite: PORT 3040. (Sp)

PORT 3800 Portuguese III Study Abroad 1-4
Intense review of selected problematic areas of Portuguese grammar for students with advanced language skills. Prerequisite: PORT 2020 or equivalent. Taught *only* in USU's overseas Portuguese program. (Su)

PORT 4880 Individual Readings 1-4®
Readings in Brazilian and/or Portuguese literature. Prerequisite: Instructor's permission. (F,Sp)

PORT 4920 Portuguese Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Parks and Recreation Professional (PRP)

See Department of Health, Physical Education and Recreation, pages 296-303

PRP 1000 Introduction to Recreation Services 3
Introduces the conceptual foundations of play, recreation, and leisure, as well as the history and current trends of the profession. Provides insight into the careers offered within the recreation services industry. (F,Sp)

PRP 2500 Outdoor Recreation Management 3
Explores philosophy, meaning, and value of outdoor recreation in society. Gives management agency overview. Emphasizes organizing and leading outdoor recreation pursuits. This course is not currently being taught. For information about when it may be taught, contact the Department of Health, Physical Education and Recreation.

PRP 3000 Designing Recreation Experiences 3
Introduces aspects of designing theory-based recreation experiences, utilizing methods, models, marketing, budgets, and evaluation. (F,Sp)

PRP 3025 Techniques of Experiential Recreation 3
Explores the foundations behind and techniques utilized in leading recreation experiences. Emphasizes practical experience with planning recreation activities. Prerequisites: PRP 1000, 3000. (F)

PRP 3050 Evaluation of Recreation Services 3
Examines methods and practical applications of evaluation utilized in recreation services. Prerequisites: PRP 1000, 3000; PRP 3025 (may be taken concurrently); and MATH 1030 or STAT 1040 or a higher MATH or STAT course. (F)

PRP 3075 Applications of Experiential Recreation 3
Applies the management aspects of recreation services. Culminating course emphasizing design, implementation, and evaluation of recreation experiences. Prerequisites: PRP 1000, 3000, 3025, 3050, 4500, 4550. PRP 4550 may be taken concurrently. (Sp)

PRP 3500 CI Community Recreation Administration 3
Examines community recreation organization with emphasis on administrative skills and functions, including budgeting, personnel management, and grantsmanship. Prerequisites: PRP 1000 and 3000. This course is not currently being taught. For information about when it may be taught, contact the Department of Health, Physical Education and Recreation.

PRP 3750 Commercial Recreation and Tourism 3
Examines history, organization, and management of commercial recreation and tourism enterprises. Studies entrepreneurship, feasibility, marketing, and management of projects. This course is not currently being taught. For information about when it may be taught, contact the Department of Health, Physical Education and Recreation.

PRP 3900 Diverse Populations 3
Examines participation and management aspects of recreation experiences for diverse clientele. Explores settings, cultures, and contexts within the recreation services industry. Prerequisite: PRP 1000 (may be taken concurrently). (F)

PRP 4100 CI History of Leisure 3
Explores historical, behavioral, scientific, and philosophical foundations of leisure and recreation. Prerequisites: PRP 1000 and fulfillment of Communications Literacy CL2 requirement. (Sp)

PRP 4250 Cooperative Work Experience 1-12®
Provides practical and educational work and/or voluntary opportunities to gain professional experience prior to PRP 4750. Graded Pass/Fail *only*. Prerequisites: PRP 1000, 3000 (both of which may be taken concurrently). (F,Sp,Su)

PRP 4500 Management of Recreation Services I 3
Provides entry-level knowledge of current management practice, specializing in human resources, finance, budget, and marketing. Prerequisites: PRP 1000, 3000. (F)

PRP 4550 Management of Recreation Services II 3
Provides entry-level knowledge of infrastructure management, risk management, and legal aspects of the recreation services industry. Prerequisites: PRP 1000, 3000, 4500. (Sp)

PRP 4700 Pre-Internship Seminar 3
In preparation for PRP 4750, focuses on resume building, interview skills, internship selection, and career planning. Graded Pass/Fail *only*. Prerequisites: PRP 1000, 3000, 3025, 3050, 3075, 3900, 4500. PRP 4500 may be taken concurrently. (F)

PRP 4725 CI Senior Seminar 3
Focuses on current issues and trends in recreation services through analysis, papers, presentation, and discussion with professionals. Prerequisites: PRP 1000, 3000, 3025, 3050, 3075, 3900, 4500, 4550. PRP 3075 and 4550 may be taken concurrently. (Sp)

PRP 4750 Internship in Recreation Services 6
Fulfills professional practice requirement of a minimum of 400 hours with a cooperating recreation service agency. Prerequisites: PRP 1000, 3000, 3025, 3050, 3075, 3900, 4100, 4500, 4550, 4700, 4725; INST 5205. (F,Sp,Su)

PRP 4970 Honors Senior Thesis 1-6
Culminating experience within the department for honors students. Student works closely with faculty mentor in an extensive project in the student's area of interest. (F,Sp,Su)

PRP 5900 Independent Study 1-3®
Students work on special projects and/or research out of the classroom, with approval and guidance of instructor. (F,Sp,Su)

PRP 5910 Independent Research 1-3®
Students work on research out of the classroom, with approval and guidance of instructor. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
*This course is taught alternating years. Check with department for information about when course will be taught.

Plants, Soils, and Climate (PSC)

See Department of Plants, Soils, and Climate, pages 415-423

Note: Effective Spring Semester 2010, courses listed with the PLSC, SOIL, and CLIM prefixes will use the Plants, Soils, and Climate (PSC) prefix.

PSC 1050 Plants, Soils, and Climate Orientation 1-2
Orientation to the teaching, research, and extension programs of the department, and to career opportunities. Optional orientation to a specific major: Horticulture, Crop Science, or Environmental Soil/Water Science. (F) DE

PSC 2040 Introduction to Biotechnology 1
Introduces freshmen to the emerging field of biotechnology and the impact this technology has on society. Also taught as ADVS 2040, BIOL 2040, and NFS 2040. (Sp)

PSC 2800 Fundamentals of Organic Agriculture 3
Organic agriculture uses a holistic systems approach for maintaining plant, animal, and soil health. In this course, animal and crop production approaches and disease, as well as insect and weed management strategies, are scientifically assessed, critically compared, and used in decision making and problem solving exercises. (Sp)

PSC 3890 CI Preparation for Careers in Plants, Soils, and/or Climate 1
Discussion of education at land-grant universities, role of Plants, Soils, and Climate graduates in society, preparation for careers, familiarization with placement processes, and career/graduate school opportunities in Plants, Soils, and Climate. (F) DE

PSC 4250 Internship in Plants, Soils, and/or Climate 1-4®
Professional internship in crop science, horticulture, environmental soil/water science, and/or climate. (F,Sp,Su) DE

PSC 4890 CI Senior Seminar 1®
Capstone course for senior Plants, Soils, and Climate majors. Focuses on individual presentations of current scientific papers, and collaborative production of a white paper and professional presentation recommending a science-based solution to a current issue related to plants, soils, or climate. Includes experiences in team building. (F,Sp) DE

PSC 4900 Special Problems 1-4®
Special topics and problems in crop science, horticulture, environmental soil/water science, and/or climate. Subject, time, and credit arranged individually as needed. Department approval required. (F,Sp,Su) DE

PSC 5000 Environmental Instrumentation 2
(dual listing 6000)
Discusses physics of signal transduction underlying all sensors. Basic electronics necessary to link sensors with dataloggers. Programming dataloggers to maximize measurement accuracy and to summarize data. (F odd)

PSC 5160 Methods in Biotechnology: Cell Culture 3
Techniques and fundamental knowledge for culturing mammalian and insect cells. Students will learn maintenance, growing, genetic engineering of cells, cytotoxicity, hybridoma creation, cloning, etc. Extensive laboratory experience is provided. Also taught as ADVS 5160, BIOL 5160, and NFS 5160. (Sp)

PSC 5200 Site-Specific Agriculture and Landscape/Horticultural Management 3
Integration of site-specific management technology, such as computers, GPS, yield monitors, variable rate controllers, mechanized samplers, and postharvest processing controllers with planning, tillage, planting, chemical applications, and harvesting to optimize off-site inputs and environmental/economical sustainability in crop or landscape management. Taught during second half of semester. (Sp)

PSC 5240 Methods in Biotechnology: Protein Purification Techniques 3
Reviews basic methods of protein purification, including scaled-up use of 100L fermenter, large-scale centrifugation, diafiltration, chromotography, and use of BioCAD. Prerequisite: CHEM 3700. Also taught as ADVS 5240, BIOL 5240, and NFS 5240. (Sp)

PSC 5260 Methods in Biotechnology: Molecular Cloning 3
Laboratory-oriented course designed to teach molecular biology techniques such as DNA cloning, genetic probes, polymerase chain reaction, and DNA sequencing. Prerequisite: CHEM 3700 or 5710; or BIOL 3060; or permission of instructor. Also taught as ADVS 5260, BIOL 5260, and NFS 5260. (F)

PSC 6000 Environmental Instrumentation 2
(dual listing 5000)
Discusses physics of signal transduction underlying all sensors. Basic electronics necessary to link sensors with dataloggers. Programming dataloggers to maximize measurement accuracy and to summarize data. (F odd)

PSC 6700 Integrative Topics in Plants, Soils, and Climate 1-3®
Team-taught special topics course encouraging interdisciplinary analysis of a research or policy area from the current literature, encompassing the three departmental subdisciplines. Emphasis on written and oral student presentations. Not currently being taught. Contact department for further information.

PSC 6870 Ecology Seminar 1®
The Ecology Center schedules regular seminars throughout the school year with ecological scientists from other institutions participating. Ecology majors are required to attend a minimum of 10 such lectures. Graded Pass/Fail *only*. Students should register for fall semester, but attend through spring semester. Also taught as BIOL 6870, ENVS 6870, WATS 6870, and WILD 6870. (F)

PSC 6890 Plants, Soils, and Climate Graduate Seminar 1®
Review and critique of presentations. Communication practice in extemporaneous, extension, research, poster, and lecture presentations. Graded Pass/Fail *only*. PSC graduate students must enroll during both fall and spring semesters. (F,Sp)

PSC 6900 Special Problems in Plants, Soils, and/or Climate 1-8®
(F,Sp,Su)

PSC 6960 Graduate General Ecology 4
General concepts, history, and issues in all major areas of the science of ecology including: environmental biophysics; and physiological, behavioral, evolutionary, community, ecosystem, and applied ecology in both terrestrial and aquatic environments. Also taught as BIOL 6960, ENVS 6960, WATS 6960, and WILD 6960. (F)

PSC 6970 Research and Thesis 1-18®
Graded Pass/Fail *only*. (F,Sp,Su)

PSC 6990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

PSC 7890 Plants, Soils, and Climate Graduate Seminar 1®
Review and critique of presentations. Communication practice in extemporaneous, extension, research, poster, and lecture presentations. Graded Pass/Fail *only*. PSC graduate students must enroll during both fall and spring semesters. (F,Sp)

PSC 7900 Special Problems in Plants, Soils, and/or Climate 1-8®
(F,Sp,Su)

PSC 7970 Research and Thesis 1-18®
Graded Pass/Fail *only*. (F,Sp,Su)

PSC 7990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Psychology (PSY)

See Department of Psychology, pages 429-437

Note: Prerequisites for Psychology courses are *strictly enforced*. In the course listings below, prerequisites are indicated at the end of course descriptions. A student must be admitted as a psychology major or must complete *at least* 45 semester credits with a GPA of 3.0 or higher prior to taking psychology courses numbered 3000 or above. However, students who have been admitted to the Teacher Education program may take PSY 3660, provided they have met the prerequisites. A student must be admitted as a psychology major or must complete *at least* 60 semester credits with a GPA of 3.0 or higher prior to taking psychology courses numbered 4000 or above.

PSY 1010 BSS General Psychology 3
Explores basic areas of psychology, and how each explains human thought and behavior at the individual, familial, and cultural levels. (F,Sp,Su) DE

PSY 1100 Developmental Psychology: Infancy and Childhood 3
Introduction to psychological development with emphasis on perceptual, language, cognitive, and social development in children. Prerequisite: PSY 1010. (F,Sp) DE

PSY 1210 Psychology of Human Adjustment 3
Examination of life situations affecting human adjustment to everyday living, with emphasis on practical applications. Prerequisite: PSY 1010. (F,Sp) DE

PSY 1220 Career and Life Planning 3
Students assess and clarify their interests, values, skills, and temperaments. Emphasizes discovering relationships between these personal characteristics and the realities of educational and employment opportunities. Explores setting goals, creating action plans, and coping with change. (F,Sp) DE

PSY 1400 Analysis of Behavior: Basic Principles 3
A laboratory course about the scientific methods used in the study of animal and human behavior. Prerequisite: PSY 1010. (F,Sp,Su) DE

PSY 1410 Analysis of Behavior: Basic Principles Lab 1
Laboratory experience accompanying PSY 1400. Prerequisite: PSY 1010. (F,Sp,Su) DE

PSY 1730 Strategies for Academic Success 1-3
Orients students to the systems, tools, and resources unique to higher education that are needed to maximize academic success (e.g., library, computer lab use, etc.). Also helps students develop critical thinking, study, and learning strategies necessary for college success. (F,Sp) DE

PSY 1740 Academic Literacy and College Reading Skills 3
Helps students understand and adapt reading skills to fit their learning needs. Philosophy of the class is for students to discover new reading strategies and test them by practicing and applying them to college reading material. Also emphasizes reading comprehension and understanding a variety of texts. (F,Sp,Su)

PSY 1750 Comprehension Strategies for College Reading 1
Practical course emphasizing application of strategies and development of critical thinking skills needed to comprehend and distill meaning from college-level texts. (F,Sp)

PSY 2100 Developmental Psychology: Adolescence 3**
Characteristics of adolescents and their psychological, educational, and adjustment problems are discussed in detail. Prerequisite: PSY 1010. (Sp) DE

PSY 2250 Introductory Cooperative Work Experience 1-6®
Educators and employers cooperate to provide opportunities for students to apply classroom theory and principles in job environments, thereby gaining practical experience in their field. Prerequisite: Approval of Psychology Department coop education counselor. (F,Sp,Su) DE

PSY 2800 QI Psychological Statistics 3
Elementary study of statistical procedures in handling test scores and other data, and of the concepts needed for each current type of educational and psychological literature. Prerequisite: STAT 1040. (F,Sp) DE

PSY 2950 Orientation to Psychology as a Career and Profession 2
Overview of the field and major. Students clarify career goals, identify steps necessary to achieve goals, prepare a vita, and gain major-relevant skills (e.g., APA-style writing, ethics, and library usage). Prerequisites: PSY 1010 and consent of Psychology Advising Office. (F,Sp,Su) DE

PSY 3110 Health Psychology* 3**
Introduction to "biopsychosocial model" of health and well-being. Focuses on reciprocal interactions among biological, psychological, and social factors in human functioning and disease. Explores cultural approaches to health, illness, and treatment. Prerequisite: PSY 1010. (Sp) DE

PSY 3120 DSS Abuse, Neglect, and the Psychological Dimensions of Intimate Violence 3
Overview of child maltreatment, animal abuse, dating, courtship, domestic violence, and abuse of the elderly. Stresses the psychological factors related to the causes, consequences, and treatment of abuse and neglect. Presents multidisciplinary perspectives, including historical, legal, medical, psychiatric, and psychological approaches. Prerequisite: PSY 1010. (F,Su) DE

PSY 3210 DSS Abnormal Psychology 3
Introduction to "abnormal" human behavior. Covers characteristics, etiology, and treatment of a variety of psychological disorders. Prerequisite: PSY 1010. (F,Sp) DE

PSY 3400 DSS Analysis of Behavior: Advanced 4
In-depth examination of principles introduced in PSY 1400. Considers principles governing more complex human and animal behavior, as well as emotional and motivational factors in behavior. Lab included as part of credit. Prerequisites: PSY 1400 and 1410. (F,Sp) DE

PSY 3450 Perception and Psychophysics 3
Analysis of how sensory processes and principles help determine behavior. Introduction to methods used to measure sensory-determined behavior. Methods, results, and principles of sensory communication. Lab required as part of 3 credits. Prerequisite: PSY 1010. (F) DE

PSY 3460 Physiological Psychology 3
Introductory course examining relationship between central system anatomy and physiology, and behavior and emotional functioning. Also considers neural and biochemical substrates of behavior. Lab required as part of 3 credits. Prerequisite: PSY 1010. (Sp) DE

PSY 3500 CI/DSS Scientific Thinking and Methods in Psychology 3
Provides introduction to reasearch methods and scientific thinking. Teaches students to understand, analyze, and evaluate existing behavioral research. Includes defining and measuring variables; selecting research participants; experimental, quasi-experimental, and nonexperimental research designs; and conducting ethical research. Prerequisite: PSY 1010. (F,Sp) DE

PSY 3510 DSS Social Psychology 3
Study of the individual in society; problems, theories, and methods of social psychology; will relate reading assignments to current social issues. Prerequisite: PSY 1010. (F,Su) DE

PSY 3660 Educational Psychology for Teachers 2
Principles and practices for development of conditions for effective learning. Lab required. Prerequisite: PSY 1100 or 2100. (F,Sp) DE

PSY 3720 Behavior Modification 3
Approaches to behavior modification in a variety of settings. Students required to complete an individual project. Prerequisites: PSY 1010, 1400, 1410, 3400. (Sp) DE

PSY 4000 Mental Aspects of Sports Performance* 3**
Provides an understanding of theory and applications in the specialty area of sports psychology, including enhancement of motivation and performance, stress, anxiety, aggression and time management, and the relation of these issues to physical development and coaching styles. Also taught as PEP 4000. (F,Sp,Su)

PSY 4210 DSS Personality Theory 3
Explanatory study of various personality theories, their origin, and approaches to the understanding of human behavior. Prerequisites: PSY 1010 and 2800. (Sp) DE

PSY 4230 DSS Psychology of Gender* 3**
Critical analysis of evidence for sex differences, gender roles, the effect of gender on traditional psychology, and other topics, including parenthood, cultural influence, and sexual orientation. (Sp) DE

PSY 4240 DSS Multicultural Psychology 3
Explores cultural influences on basic psychological processes, including perception, cognition, language, emotion, intelligence, attitudes, values, and intergroup relations. Prerequisite: PSY 1010. (F) DE

PSY 4250 Advanced Cooperative Work Experience 1-12®
Cooperative education work experience position; increased level of complexity and a more professional level of experience as student advances toward completion of the program. Prerequisite: Approval of Psychology Department cooperative education coordinator. (F,Sp,Su) DE

PSY 4420 DSS Cognitive Psychology 3
In-depth study of basic concepts, methods, and theories involved in perception, memory, and thinking. Lab required. Prerequisite: PSY 1010. (Sp) DE

PSY 4430 Cognitive Psychology Laboratory 1
Required laboratory, designed to accompany PSY 4420. Focuses on conducting cognitive experiments via computer simulations and sampling data collection. Designed to increase skills in designing data collection and interpreting experimental data. (Sp) DE

PSY 4510 CI Effective Social Skills Interventions 3
Examination of theory and practice of social skills training with children, adolescents, and adults. Prerequisites: PSY 1010, 1100, and either PSY 3210 or 3510. (Sp) DE

PSY 4790 (dual listing 6790) Psychological Principles and Individuals who are Deaf and Hard of Hearing 3
Psychological theories and research used to describe the deaf and hard of hearing. Exploration of principles that can be used in helping these individuals achieve emotional well-being. Also taught as COMD 4790/6790. (Sp)

PSY 4910 Undergraduate Research Creative Opportunity 1-3®
A cooperative process of discovery, investigation, research, or creativity between faculty and one or more students. Prerequisite: Approval of Psychology Department URCO coordinator. (F,Sp,Su) DE

PSY 4920 Practicum 1-3®
Field work in applied psychological setting at BS level. (F,Sp,Su) DE

PSY 4950 CI Undergraduate Apprenticeship 3
Students plan and execute their apprenticeship experience in a research setting (with faculty members) and an applied setting (e.g., community service agency or school). Students are encouraged to take this course three or more semesters prior to graduation. Prerequisite: PSY 2950. (F,Sp,Su) DE

PSY 4960 CI Advanced Undergraduate Apprenticeship 3
Students continue their apprenticeship experiences from PSY 4950. Students complete a major written assignment that can take the form of a literature review or complete research report. Students are encouraged to take this course one or more semesters prior to graduation. Prerequisite: PSY 4950. (F) DE

PSY 5020 (dual listing 6020) Multicultural Issues in Psychology 3
Examines role of culture in human development, with emphasis on understanding relations between culture, ethnicity, and identity and how images of "cultural selves" and "cultural others" are produced and "naturalized." (F)

PSY 5050 (dual listing 6050) Psychological Aspects of Sports Performance 3
Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, personality and sports performance. Also taught as PEP 5050/6050. (Sp) DE

PSY 5100 (dual listing 6100) History and Systems of Psychology 3
Theoretical and historical developments in psychology with primary emphasis on nineteenth and twentieth century developments, although earlier precursors are also considered. Prerequisite: PSY 1010. (Sp) DE

PSY 5200 CI Introduction to Interviewing and Counseling 3
Theory, models, and practice in basic principles of interviewing and counseling, including listening skills, facilitation of verbal interaction, gathering information, attending to nonverbal behavior, interpersonal dynamics, and promoting helping relationships. Prerequisites: Psychology major or minor, matriculation in master's program requiring PSY 5200, or consent of instructor. (F) DE

PSY 5330 (dual listing 6330) Psychometrics 3
Overview of measurement development principles and statistics. Evaluation, interpretation, and uses of standardized tests of aptitude, intelligence, achievement, personality, and adjustment. Prerequisites: PSY 1010, 2800. (F) DE

PSY 5500 Interdisciplinary Workshop 1-3®
(F,Sp,Su)

PSY 5720 Behavior Analysis Practicum 3
Students receive supervised training in applying behavior analysis principles in community, school, and institutional settings. Either SPED 5050 or PSY/SPED 5720 fulfill part of practicum requirement for Behavior Analysis track. Prerequisite: Permission of instructor. Also taught as SPED 5720. (F)

PSY 5900 Independent Study 1-3®
Individual discussion and intensive study of a particular problem or area. Prerequisite: Instructor's consent. (F,Sp,Su) DE

PSY 5910 Independent Research 1-3®
Experiments and demonstration projects are conducted and reported. Prerequisite: Instructor's consent. (F,Sp,Su) DE

PSY 5930 Instructional Apprenticeship in Psychology 1-3®
Didactic and applied experience in course preparation and instructional techniques applicable to the teaching of psychology. Intended for students planning careers as instructors at the secondary and postsecondary levels. Prerequisite: Instructor's consent. (F,Sp,Su) DE

PSY 6010 Introduction to Program Evaluation: Evaluation Models and Practical Guidelines 3
Alternative approaches and practical guidelines for conducting evaluation studies. Through case studies and simulations, addresses impact of social, political, and ethical issues on evaluation. Also taught as EDUC 6010. (F,Sp) DE

PSY 6020 (dual listing 5020) Multicultural Issues in Psychology 3
Examines role of culture in human development, with emphasis on understanding relations between culture, ethnicity, and identity and how images of "cultural selves" and "cultural others" are produced and "naturalized." (F)

PSY 6050 (dual listing 5050) Psychological Aspects of Sports Performance 3
Psychological theory and principles applied to sports. Includes motivational techniques, psychological evaluation, stress and anxiety in sports, personality and sports performance. Also taught as PEP 6050/5050. (Sp)

PSY 6100 History and Systems of Psychology 3
(dual listing 5100)
Theoretical and historical developments in psychology with primary emphasis on nineteenth and twentieth century developments, although earlier precursors are also considered. Prerequisite: PSY 1010. (Sp) DE

PSY 6150 Evidence-Based Practice I: Children and Adolescents 2
Introduction to application of evidence-based practice in psychology, focusing on child and adolescent populations. (F) DE

PSY 6220 Group Counseling 3
Introduction to theory of group counseling with illustrative experiences to show how theory may be applied. Prerequisite: PSY 6350. (Sp) DE

PSY 6240 Introduction to School Counseling and Guidance 3
Introduction to role and function of school counselors. Overview of history of school guidance and counseling, and role of counselors in comprehensive guidance program. (Sp) DE

PSY 6250 Internship in School Counseling and Guidance 1-10®
Internship in approved school system involving comprehensive guidance activities, under supervision of licensed school counselor. (F,Sp,Su) DE

PSY 6260 Career Development: Theory and Practice 3
Consideration of career patterns and factors influencing career development and career effectiveness. (Su)

PSY 6270 Child Psychopathology 3
Focuses on issues relevant to the understanding of child emotional and behavioral disorders. Discussion of symptom characteristics, assessment, and treatment protocols, as well as research pertaining to the major mental health problems found in children and adolescents. Prerequisite: Admission to graduate program in psychology or permission of instructor. (F)

PSY 6290 Diversity Issues in Treatment and Assessment 3
Introduction to diversity issues in counseling and psychological/educational assessment, including culture, gender, language, and related issues. Training in models for providing effective psychological services to clients, taking into account their unique background. Prerequisite: PSY 6350 or instructor's consent. (F) DE

PSY 6310 Intellectual Assessment 3
Training and supervised experience in administering and interpreting individual intellectual ability tests, such as the Wechsler and Stanford-Binet scales. Prerequisite: Matriculation into School Psychology program or Combined Psychology program. (F)

PSY 6320 Objective Assessment of Personality and Affect 3
Research bases and clinical applications of objective psychological assessment instruments and techniques, designed to measure adolescent and adult personality, affect, and psychotherapy. Prerequisite: PSY 6310. (Sp)

PSY 6330 Psychometrics 3
(dual listing 5330)
Overview of measurement development principles and statistics. Evaluation, interpretation, and uses of standardized tests of aptitude, intelligence, achievement, personality, and adjustment. Prerequisites: PSY 1010, 2800. (F) DE

PSY 6340 Psychological and Educational Consultation 3
Overview of theory and practice of consultation as provided by counselors, psychologists, and other mental health education professionals. Consultation with teachers, parents, medical professionals, and organizations, emphasizing applications in educational settings. (Sp,Su) DE

PSY 6350 Introduction to Theories of Intervention in Psychology 3
Introduction to empirically based psychological practice (EBPP) and basic theories of psychological intervention. Explores basic models of EBPP, common factors associated with therapeutic change, and core theories of psychological intervention. Prerequisite: Matriculation into School Psychology/School Counseling or Combined Psychology program. (F,Su)

PSY 6360 Introduction to the Practice of Professional Psychology 3®
Observation and practice of clinical skills, while linking theory to case conceptualization and techniques of intervention. Introduction and evaluation of students on logistical aspects of psychological practice. Course has strong applied focus, while integrating theories of practice. Prerequisite: PSY 6350. (Sp)

PSY 6370 Practicum in School Counseling 3®
Supervised practicum in public school setting, under direction of licensed school counselor. Taken by students in School Counseling master's program. Graded Pass/Fail *only*. (Sp) DE

PSY 6380 Practicum in School Psychology 3®
Supervised practicum in school psychology in public school or closely related setting. Taken by second-year students in School Psychology master's program. (F,Sp,Su)

PSY 6410 Psychoeducational Assessment 3
Training and supervised experience in assessment of school-age and preschool-age children. Administration and interpretation of cognitive, developmental, and academic achievement measures, along with other psychoeducational assessment instruments and methods. (Sp)

PSY 6450 Introduction to School Psychology 1
Introductory overview of field of school psychology. Role and function of school psychologist, historical context of school psychology, and trends and new developments in service provision. Prerequisite: Matriculation into School Psychology master's program or Combined Psychology doctoral program. (F)

PSY 6460 Professional Issues in School Counseling and School Psychology 3
Legal, ethical, and professional issues relevant to school counselors and school psychologists. Issues and practices in providing counseling and psychological services to "at-risk" students. Prerequisite: Graduate standing in psychology or instructor's consent. (Sp) DE

PSY 6470 Health Psychology 3
Explores psychological and behavioral principles relating to health and illness. Focuses on development and maintenance of health behaviors. Emphasizes integration of research findings with clinical intervention. Prerequisite: Graduate standing in Psychology; or graduate standing in Health, Physical Education and Recreation. (F)

PSY 6500 Interdisciplinary Workshop 1-2®
Series of self-instructional modules and videos and a variety of elective training. Module topics include developmental disabilities, legal aspects and issues, assessment, intervention, assistive technology, transition, and prevention/intervention for aggression and violence. (F,Sp,Su)

PSY 6510 Social Psychology* 3
Provides all graduate students with common knowledge base in social psychology. Emphasizes overview of recent developments, while also discussing social psychology principles as a guide in executing evaluation research and helping clients. Understanding of both emphases ensures breadth as psychologists. Prerequisite: PSY 3510. (Sp)

PSY 6530 Developmental Psychology 3
Advanced survey course in general developmental psychology. Theory and research in human development across the lifespan, with particular emphasis on child and adolescent development. (F) DE

PSY 6570 Introduction to Educational and Psychological Research 3
Provides introduction to research methods, including identification of research problem, review and evaluation of research literature, and design and implementation of research project. Also taught as EDUC 6570. (F,Sp,Su)

PSY 6600 Research Design and Analysis I 3
Research design and statistical concepts for research in education, human services, and psychology, with emphasis on the selection and interpretation of statistical analyses. Prerequisites: EDUC/PSY 6570, passing score on 6600 Pretest via WebCT, and permission of instructor. Also taught as EDUC 6600. (F,Sp,Su)

PSY 6650 Theories of Learning: The Behavioral Perspective* 3**
In-depth examination of the major behavioral theories of learning, including classical and operant conditioning. (F)

PSY 6660 Cognition and Instruction* 3**
Survey of theory and principles in cognitive psychology, with special emphasis on applying these principles in instructional settings. (Sp)

PSY 6750 Evidence-Based Practice II: Adults 2
Introduction to application of evidence-based practice, focusing on adults. (Sp)

PSY 6790 (dual listing 4790) Psychological Principles and Individuals who are Deaf and Hard of Hearing 3
Psychological theories and research used to describe the deaf and hard of hearing. Exploration of principles that can be used in helping these individuals achieve emotional well-being. Also taught as COMD 6790/4790. (Sp)

PSY 6800 Addictive Behaviors* 3**
Provides students with an overview of the theoretical issues, research, and models that underlie our understanding of behavioral syndromes commonly referred to as "addictive behaviors." Emphasizes chemical dependency problems, as well as the well-studied pattern of "addiction." (F)

PSY 6810 Seminar 1-3®
Special topics designed to help students develop in-depth knowledge of emerging research, theory, and practice in psychology. Taught in seminar format by USU faculty or visiting scholars. (F,Sp,Su)

PSY 6820 Clinical Applications of Biofeedback* 3**
Training in clinical applications of biofeedback for treating common health, psychological, and stress-related problems. Practical experience provided in use of different modalities of biofeedback (e.g., neurofeedback, skin temperature training, and electrodermal training). Stresses importance of integrating biofeedback into other appropriate treatments. Prerequisite: Graduate standing in psychology or instructor's consent. (F)[1]

PSY 6850 Introduction to the Combined Doctoral Program 1
This seminar is designed to orient beginning PhD students to the combined program and to the School of Graduate Studies. Opportunity provided for students to meet and talk with all faculty members concerning their research. Students also begin their own research and become acquainted with required paperwork for their program. (F)

PSY 6880 Transcultural Assessment Lab 1
Psychoeducational assessment laboratory experience to be taken by students in the School Psychology and Combined Psychology programs in conjunction with PSY 6290. (Sp)

PSY 6890 Assessment of Child and Adolescent Psychopathology and Personality 3
Theoretical foundations and applied training in methods of assessing and classifying behavioral, social, and emotional problems of children and adolescents. Prerequisite: Matriculation into Combined Psychology doctoral program or School Psychology program. (Su)

PSY 6900 Independent Study 1-3®
Individual discussion and intensive study of a particular problem or area. Prerequisite: Instructor's consent. (F,Sp,Su)

PSY 6910 Independent Research 1-3®
Experiments and demonstration projects are conducted and reported. Prerequisite: Instructor's consent. (F,Sp,Su) DE

PSY 6930 University Teaching Apprenticeship 1-3®
Prepares graduate students for college teaching. Students learn to prepare study guides, examinations, and lectures, and learn to use audio-visual aids. Students also examine various current methods of instruction and course evaluation schemes. (F,Sp,Su)

PSY 6950 Internship in School Psychology 3®
Internship in approved school system involving assessment, counseling, consultation, and program development, under the supervision of a certified school psychologist. Prerequisite: Permission of instructor. (F,Sp,Su)

PSY 6970 Thesis 1-6®
Graded Pass/Fail *only*. (F,Sp,Su)

PSY 6990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

PSY 7020 Advanced Evaluation Methodology and Techniques* 3
Provides advanced theory and practice in focus group interviews, on-site visit techniques, observation and anchor scales, multiple-site evaluation standards, and advanced reporting techniques. Prerequisite: EDUC/PSY 6010. (Sp)

PSY 7030 Instrument Development* 3**
In-depth study of factors and techniques critical for designing and developing evaluation and research instruments. (F)

PSY 7040 Practicum in Evaluation Planning and Contracting 3
Provides detailed information on methods for planning program evaluations, negotiating agreements with client/sponsor, and finalizing evaluation contract. Taught every third year. Prerequisite: EDUC/PSY 6010. (Sp)

PSY 7050 Internship in Program Evaluation 1-9®
Experience in practical aspects of program evaluation through planned, supervised evaluation project participation approved by student's supervisory committee. Prerequisite: EDUC/PSY 6010. (F,Sp,Su)

PSY 7060 Internship in Research 1-9®
Research experience gained through conducting planned, supervised research project. Prerequisites: Approval by supervisory committee and EDUC/PSY 6570. (F,Sp,Su)

PSY 7070 Advanced Measurement Theories and Practice 3
Covers psychometric topics, including classical test theory, generalizability theory, item response theory, and issues concering bias in psychological testing. Prerequisites: PSY 5330/6330, EDUC/PSY 6600. (Sp)

PSY 7090 Experimental and Applied Psychological Science Program Seminar 1®
Provides opportunity for doctoral students in the Experimental and Applied Psychological Science Program to meet on a regular basis to discuss journal articles and explore student and faculty research projects. Graded Pass/Fail *only*. (F)

PSY 7100 Biological Basis of Behavior* 3**
Explores normal and abnormal behavior from a basic neuroanatomical/ neurophysiological perspective. Discusses pharmacological/nonpharmacological applications. (Sp)

PSY 7110 Advanced Theories in Cognitive Psychology 3
In-depth study of theories, models, and current research in the field of cognitive psychology, including memory, perception, problem-solving, and decision making. Prerequisite: PSY 4420 or 6660. (F)

PSY 7230 Theory and Research in Personality* 3**
Overview of theoretical approaches, research, and clinical applications regarding personality differences. (Sp)

PSY 7250 Professional Ethics and Standards* 1-3
Designed to train clinicians and researchers in the field of psychology to operate within the professional ethics and standards of the field. (Sp)

PSY 7270 Lifespan Psychopathology 3
Summarizes research on risk, epidemiology, and etiological perspectives regarding emotional and behavioral disorders of children, adolescents, and adults. Emphasizes classification and diagnosis of these disorders utilizing the DSM system. (F)

PSY 7320 Advanced Personality Assessment 2
Theory and clinical training in personality assessment, with additional techniques than those covered in PSY 6320. Focuses on the comprehensive scoring system of Rorschach. Prerequisite: PSY 6320 or instructor's consent. (Su)

PSY 7350 Practicum in School Psychology 3®
Doctoral-level practicum in a school or closely related setting. Supervised experience in developmental, learning, and school-related problems. Appropriate assessment and consultation with teachers, administrators, parents, and other related individuals. Prerequisite: Permission of program chair. (F,Sp,Su)

PSY 7360 Practicum in Counseling Psychology 3®
Doctoral-level practicum in a counseling setting. Supervised experience in individual, group, and family counseling. Appropriate assessment and consultation. Prerequisite: Permission of program chair. (F,Sp,Su)

PSY 7370 Practicum in Clinical Psychology 3®
Doctoral-level practicum in a clinical setting. Supervised experience in individual, group, and family psychotherapy. Includes psychological assessment and consultation. Prerequisite: Permission of program chair. (F,Sp,Su)

PSY 7380 Practicum in Psychology 1-6®
Doctoral-level practicum in a variety of health service settings. Supervised experience in individual, group, and family psychotherapy assessment and consultation as needed. Prerequisite: Permission of program chair. (F,Sp,Su)

PSY 7610 Research Design and Analysis II 3
Advanced treatment of research design and statistical concepts and issues in educational, human services, and psychological research. Prerequisite: EDUC/PSY 6600. Also taught as EDUC 7610. (F,Sp,Su)

PSY 7650 Longitudinal Research Design and Analysis* 3
Applied longitudinal study design and analysis for research in behavioral and educational sciences. Explores case-control, cohort, cross-over, complex sample, and randomized controlled trial designs. Examines analytical methods for observed outcomes of various distributions (e.g., Gaussian, Binomial, Poisson). Prerequisite: PSY/EDUC 7610. Also taught as EDUC 7650. (Sp)

PSY 7670 Literature Reviews in Education and Psychology 2
Advanced concepts in designing, writing, and critiquing literature reviews. Prerequisites: PSY/EDUC 6600 or consent of instructor. Also taught as EDUC 7670. (Sp,Su)

PSY 7700 Grant Writing 3**
Students learn to identify funding sources, select strategies for seeking resources, and write proposals for research, development, training, and service activities in education, psychology, and related fields. Prerequisite: PSY/EDUC 6570. (Sp)

PSY 7780 Multivariate Methods in Psychology and Education 3
Focuses on application of multivariate methods (factor analytic techniques, structural equation modeling, canonical correlation, multivariate analysis of variance, etc.) in research and measurement in psychology, education, and other social and behavioral sciences. Prerequisites: EDUC/PSY 6600, 7610. (F)

PSY 7810 Seminar 1-3®
Special topics designed to help students develop in-depth knowledge of emerging research, theory, and practice in psychology. Taught in seminar format by USU faculty or visiting scholars. (F,Sp,Su)

PSY 7820 Neuropsychology: Principles and Assessment* 2 or 4**
Overview of neuropsychological symptoms, common syndromes, and underlying neural structures. Coverage of neuropsychological assessment approaches, diagnostic issues, and supervised experience with selected neuropsychological tests. Includes some discussion of rehabilitation, but primarily emphasizes assessment. (Sp)

PSY 7840 Psychophamacology* 1**
Provides psychology graduate students with basic working knowledge of the field of psychopharmacology and the medical use of psychotropic drugs. Prerequisite: PSY 6320.[1]

PSY 7850 Internship and Professional Development Seminar 1
Advanced orientation to issues and trends in professional psychology. Internship, including application process. Also overviews remaining program requirements. Focuses on continuing development of good professional decision-making skills. (Sp)

PSY 7900 Independent Study 1-3®
Individual discussion and intensive study of a particular problem or area. Prerequisite: Instructor's consent. (F,Sp,Su)

PSY 7910 Independent Research 1-3®
Experiments and demonstration projects are conducted and reported. Prerequisite: Instructor's consent. (F,Sp,Su)

PSY 7950 Internship in Professional Psychology 1®
One-year, supervised, full-time internship required of doctoral candidates in professional psychology (clinical, counseling, and/or school psychology). Prerequisite: All doctoral coursework completed, with the possible exception of the dissertation if approved by the student's committee, prior to initiating the internship. (F,Sp,Su)

PSY 7970 Dissertation 1-18®
Graded Pass/Fail *only*. (F,Sp,Su)

PSY 7990 Continuing Graduate Advisement 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

[1]This course is offered infrequently. For more information, contact Psychology Department.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
***This course is taught alternating years. Check with department for information about when course will be taught.

Public Health (PUBH)

See Department of Biology, pages 185-193

PUBH 3120 Family and Community Health 3
Focuses on health aspects of various population groups within the community. Particular emphasis placed on guidelines for optimal family health. (Sp)

PUBH 3310 Occupational Health and Safety 3
Covers the principles of occupational health and safety, including regulatory standards. Emphasizes on-the-job health and safety problems from the occupational health and safety professional and management view. (F)

PUBH 3610 Environmental Management 3
Introduction to environmental health, emphasizing relationships among environmental quality, public health, environmental and occupational health regulations, human health risk assessment, institutions, and engineered systems in environmental health management. Prerequisites: CHEM 1210; BIOL 1610 or University Studies Breadth Life Sciences (BLS) course; MATH 1210. Also taught as CEE 3610. (F)

PUBH 3870 CI Professional/Technical Writing in Civil and Environmental Engineering 2
Gives CEE students intensive practice with oral and written communication in business and technical CEE writing. Requires concurrent enrollment in PUBH/CEE 3610. Also taught as CEE 3870. (F)

PUBH 4000 Public Health Field Experience 3-6®
Field experience in the practice of public health, as appropriate to each student's area of public health emphasis: public health education, environmental health, or industrial hygiene. Prerequisite: Junior standing in public health. (F,Sp,Su)

PUBH 4030 Communicable Disease Control 3
Comprehensive study of communicable diseases, including etiological agents, reservoirs of infection, and mechanisms of transmission, control, and prevention. Recommended prerequisite: A course in microbiology. (F) DE

PUBH 4040 Fundamentals of Epidemiology 3
Introduction to the study of the distribution and causes of communicable and noncommunicable diseases of humans and other animals. Recommended prerequisite: A course in statistics. (Sp) DE

PUBH 4300 Industrial Hygiene Seminar 1®
Participant seminar on current developments in industrial hygiene. (F)

PUBH 4310 Industrial Hygiene Recognition of Hazards 4
Through classroom and field experiences, provides an introduction to industrial hazards and familiarizes students with manufacturing and industrial processes in which industrial hygienists commonly work. Prerequisite: PUBH 3310 (may be taken concurrently). (F)

PUBH 4320 Industrial Hygiene Chemical Hazard Evaluation 3
Survey of principles and methods used to evaluate industrial chemical health hazards. Practical application in a field sampling project. Prerequisite: PUBH 3310. (Sp)

PUBH 4330 Industrial Hygiene Physical Hazards 3
Through lectures and labs, covers the potential health effects, methods of exposure evaluation, and principles of control of noise, vibration, heat and cold, and nonionizing and ionizing radiation hazards that can occur in the workplace. Prerequisite: PUBH 3310 or 4310. (Sp)

PUBH 4380 Industrial Hygiene Internship 3-6®
Field experience in the practice of industrial hygiene. Participation in an active program serving employees in either the private or public sector. Prerequisites: PUBH 4300, 4320, and 4330. (F,Sp,Su)

PUBH 4410 Industrial Safety 3
Through lectures, demonstrations, and hands-on activities, covers recognition and control of industrial safety hazards (including power tools, fire, electricity, excavations, confined spaces, and falls), material handling, process safety, protective equipment, safety promotion and training, and standards and programs. (Sp)

PUBH 4850 Special Topics in Public Health 1-3®
Prerequisite: Junior standing in public health. (F,Sp,Su)

PUBH 5000 Public Health Seminar 1®
Participant seminar on current problems in public health. (Sp)

PUBH 5330 QI Industrial Hygiene Chemical Hazard Control 3
Covers methods to control chemical occupational health hazards, with an emphasis on the function, design, and management of local exhaust ventilation. Prerequisites: PUBH 4310, MATH 1210. (F)

PUBH 5340 Industrial Hygiene and Safety Programs 2
Provides students with the foundation to administer and manage occupational health and safety programs commonly encountered in the workplace. Prerequisites: PUBH 4320 and 4330. (Sp)

PUBH 5400 Environmental Toxicology 3
(dual listing 6400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as ADVS 5400/6400 and BIOL 5400/6400. (Sp)

PUBH 5500 CI Public Health Management 2
Presentation of basic organizational and financial management tools that students will utilize in written and oral reports on an educational, environmental, or occupational health problem of their choice. Prerequisite: PUBH 4000 or 4380 or permission of instructor. (F,Sp)

PUBH 5670 Hazardous Chemicals Handling and Safety 2
Provides students with necessary skills and knowledge for working safely in areas associated with hazardous chemicals. Topics covered include: regulations, exposure routes, toxicology, chemical and physical hazards, personal protective equipment, sampling, monitoring, decontamination, and emergency response procedures. Prerequisite: CHEM 1210. Also taught as CEE 5670. (Sp)

PUBH 5730 Analysis and Fate of
(dual listing 6730) Environmental Contaminants 3
Provides students with understanding of methods used in analysis of environmental samples for organic contaminants. Examines various properties and processes determining the fate of organic contaminants in the environment. Taught first half of fall semester. Prerequisites: Grades of *C*- or better in CHEM 1210 and 1215. Also taught as CEE 5730/6730. (F)

PUBH 5790 Accident and Emergency Management 3
Introduction to fundamentals of accident, hazard, and emergency management. Topics include legislation; chemical safety fundamentals; fire, explosion, and spill fundamentals; contaminant air transport fundamentals; hazard and risk assessment; dispersion applications; and hazard and risk management applications. Prerequisite: CHEM 1220. Also taught as CEE 5790. (Sp)

PUBH 6400 Environmental Toxicology 3
(dual listing 5400)
Presents in-depth survey of toxic chemicals present in the environment, environmental factors impacting fate of chemicals, potential biological effects associated with chemical exposures, and methods of reducing associated risks. Also taught as ADVS 6400/5400 and BIOL 6400/5400. (Sp)

PUBH 6730 Analysis and Fate of Environmental
(dual listing 5730) Contaminants 3
Provides students with understanding of methods used in analysis of environmental samples for organic contaminants. Examines various properties and processes determining the fate of organic contaminants in the environment. Taught first half of fall semester. Prerequisites: Grades of *C*- or better in CHEM 1210 and 1215. Also taught as CEE 6730/5730. (F)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Rehabilitation Counseling (REH)

See Department of Special Education and Rehabilitation, pages 463-467

REH 1010 BSS Society and Disability 3
Discussion of definitions and types of disabilities, ethical issues, society's prejudice and discrimination against people with disabilities, and the individual's adjustment to the disability experience. Disability as a natural part of life. Also taught as SPED 1010. (F,Sp) DE

REH 6100 Introduction to the Profession of Rehabilitation Counseling 2
Overview of history, philosophy, and legal basis of rehabilitation programs, both public and private. Independent living programs. Roles of the rehabilitation counselor and the processs of rehabilitation. Skill development including literature use, writing, and professional organizations. (F) DE

REH 6110 Medical Aspects of Disability 3
Overview of basic medical issues affecting employment and independent living for persons with disabilities. Explores basic anatomy and systems, as well as disorders and diseases of these systems. Covers medical terminology applicable to rehabilitation counseling. (F) DE

REH 6120 Psychosocial Aspects of Disability 3
Explores psychological and sociological aspects of disabilities, including adjustment factors in living with disabilities (i.e., individual, family, sexuality, other service providers, etc.). Examines societal attitudes, women's issues, and deaf culture issues. Includes group counseling applications for persons with disabilities. (Su) DE

REH 6130 Rehabilitation Counseling Skill Development 3
Utilizes role playing of simulated interviews and rehabilitation counseling sessions to develop the basic skills necessary to function as a human service helper. Must be taken concurrently with REH 6140. Prerequisite: Permission of instructor. (Su)

REH 6140 Practicum in Rehabilitation 3®
Under faculty supervision, students receive minimum of 100 hours of firsthand experience working with persons with disabilities in rehabilitation agency or facility. Must be taken the first time concurrently with REH 6130. With faculty approval, may be repeated for credit. Prerequisite: Permission of instructor. (F,Sp,Su) DE

REH 6150 Rehabilitation Services and Resources 3
Coordination of community resources, individual assessment information, ethical issues, eligibility determination, and development of individualized rehabilitation programs and independent living plans. Time, fiscal, and caseload management skills for rehabilitation professionals. Emphasizes client choice in rehabilitation planning. (Sp) DE

REH 6160 Job Analysis, Development, and Placement for Persons with Disabilities 3
Applies career development theories to job placement. Presents job placement factors resulting in employment for persons with disabilities, including job analysis, job development and retention, advocacy, assistive technology, ADA, occupational information systems, and labor market analysis. (Sp) DE

REH 6170 Internship in Rehabilitation Counseling 6®
Direct supervised provision of rehabilitation services to persons with disabilities in a community facility or agency. Total of 300 hours of direct service required for each 6 semester credits. Repeatable for up to 12 credits. Prerequisite: Permission of instructor. (F,Sp) DE

REH 6180 Rehabilitation of Persons with Severe Mental Illness 2
Overview of rehabilitation of persons with severe mental illness, including psychopharmacology, housing, case management, job placement, diagnosis (DSMIV-TR), and social learning programs. Includes information on rehabilitation of persons experiencing substance abuse, dual diagnoses, and learning disorders. (Sp) DE

REH 6190 Introduction to Assessment in Rehabilitation 2
Addresses vocational assessment for persons with disabilities. Includes overview of traditional vocational assessment, but focuses on contemporary methodology developed for individuals with severe disabilities. Discussion of functional assessment, including client choice and ecological assessment issues. (F) DE

REH 6200 Theories of Counseling Applied to Persons with Disabilities 3
Introduction to established counseling theories and their implications for providing services to persons with disabilities. Discussion of individual and group counseling paradigms. Emphasizes development of students' individual counseling philosophies. (F) DE

REH 6210 Advanced Assessment in Rehabilitation 2
Introduction to vocational evaluation principles and their application in using commercially available vocational evaluation systems. Actual practice with the systems (including integrated report writing) in the rehabilitation services clinic. (Su)

REH 6220 Culturally Valid Rehabilitation Practices 3
Analysis of the effect of cultural/ethnic/racial/linguistic background in the rehabilitation counseling setting, including acceptance/perception of disability, and successful application, process, and rehabilitation outcome. Practice applications include provision of culturally sensitive counseling, vocational evaluation, and job placement. (Su)

REH 6230 Introduction to Rehabilitation Research 3
Provides introduction to research methods in rehabilitation and disability studies, including the various types of research designs and the use of statistical methods. Introduces students to empirical research journals in rehabilitation. (Sp) DE

REH 6240 Ethical Decision-Making in Counseling 2
Ethical standards and decision-making, current issues, and multicultural considerations concerning counseling, with emphasis on professional practice. Discussion of competency areas including professional identity, social and cultural diversity, counselor roles in social justice, advocacy, conflict resolution, and technological strategies. (Sp) DE

REH 6250 Group Counseling Techniques and Theories in Rehabilitation Counseling 3
Introduction to group counseling, including theory and practice specific to persons with disabilities. Students will participate in small and large group sessions while learning about group formation, significant stages of the group process, and ethical/legal issues related to group counseling. (Su)

REH 6560 Special Topics in Rehabilitation 1-4®
Opportunity to provide specialized training in topics unique to rehabilitation. Topics cover many disability, employment, and independent-living issues. (F,Sp,Su)

REH 6900 Independent Study 1-3®
Prerequisite: Permission of instructor. (F,Sp,Su) DE

REH 6910 Independent Research 1-3®
Prerequisite: Permission of instructor. (F,Sp,Su) DE

REH 6970 Thesis 1-6®
This course is not currently being offered. For information about when it may be offered, contact the department.

REH 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su) DE

REH 7060 Research Internship 1-3®
Guided experience in conducting rehabilitation/disability research. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

REH 7070 Internship in Grant Writing 1-3®
Guided experience in preparation of grant proposals. Prerequisite: Permission of instructor. Graded Pass/Fail *only*.

REH 7080 Writing for Publication 1-3
In-depth, individualized experience in which student chooses a topic area and writes a scholarly manuscript, which is submitted for publication in an academic journal. (F,Sp,Su)

REH 7090 Professional Conference Presentation 1-3
Individualized, supervised experience in which student makes professional conference presentation. Emphasizes value of intellectual discourse with one's colleagues on a topic of interest, chosen by the student. (F,Sp,Su)

REH 7330 Supervision Internship 1-3®
Guided experience in supervising master's students during practica and internship, as well as during other clinical experiences. Graded Pass/Fail *only*. (F,Sp,Su)

REH 7340 College Teaching Internship 1-3®
Guided experience in teaching university courses. Graded Pass/Fail *only*. (F,Sp,Su)

REH 7730 Disability Law and Policy 3**
Examines disability issues as addressed through legislative process. Analyzes key statutes and case law, reflecting historical and current landmarks in disability policy, in the context of the disability rights movement, societal perceptions, and barriers to implementation. (Sp)

REH 7740 Sociopolitical Construction of Disability* 3
Examines disability experience from four different perspectives: biomedical, environmental, functional, and sociopolitical. Also explores society's response to disability. Discusses history and perspective of the Disability Rights movement. (F)

REH 7820 Special Topics in Rehabilitation Counseling 1-3®
Critical analysis of a variety of rehabilitation counseling issues and trends. Empirical and theoretical information presented in a seminar format. (F,Sp,Su)

REH 7840 Preliminary Examinations 1
Preparation for the examination and successful completion of the written examination. Students analyze published rehabilitation research and demonstrate their ability to integrate knowledge of theoretical and empirical issues, providing an early assessment of doctoral-level competencies. (Su)

REH 7900 Independent Study 1-3®
Individual discussion and intensive study of particular problem or area. Prerequisite: Permission of instructor. (F,Sp,Su)

REH 7910 Independent Research 1-3®
Students outline and conduct research under supervision. Prerequisite: Permission of instructor. (F,Sp,Su)

REH 7930 Internship in Rehabilitation Counseling 1-12®
Professional, supervised internship experience for doctoral students. Taught Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

REH 7940 Journal Reading Group 1-2®
Seminar discussion of recent empirical and theoretical articles concerning rehabilitation counseling, disability policy, and related fields. (F,Sp,Su)

REH 7970 Dissertation 1-15®
Variable credit for dissertation project associated with doctoral program in disability disciplines. Graded Pass/Fail *only*. (F,Sp,Su)

REH 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2009-2010.
**Taught 2010-2011.

Religious Studies (RELS)

See Religious Studies Major and Minor, pages 438-440

RELS 1010 Introduction to Religious Studies 3
Historical and comparative survey of the principal beliefs and practices of the world's religions, as well as an exploration of their interplay with the cultures in which they exist. Following general introduction to the study of religion, course includes units on Hinduism, Buddhism, Chinese and Japanese religions, Islam, Judaism, Christianity, and the "new religions" in America.

RELS 3010 Introduction to Buddhism 3
General survey of historical development, basic doctrine, and practice of Hinayana and Mahayana Buddhism. Also taught as HIST 3010.

RELS 3020 Introduction to Hinduism 3
Surveys history, doctrinal developments, and sociological concerns of Hinduism from the Vedic Period through the Modern Period. Focuses primarily on Hindu religious thought as applied to Hindu life through various modes of religious action. Also taught as HIST 3020.

RELS 3710 CI Folklore Colloquium 3®
Issues, problems, and methodologies in folklore study. Focus and instructor variable. Also taught as ENGL 3710 and HIST 3710. (Sp)

RELS 3990 Introduction to Religious Studies Methodology 3
Pre-major course helping students to understand the discipline of religious studies. Explores the questions asked by religious studies, as well as the methods used to answer these questions. Helps students gain an understanding of the various approaches to the study of religion and the history of attempts to understand religion in cultural contexts.

RELS 4010 Buddhism in the West 3
One-semester introduction to Buddhism in the Western world for nonspecialists in Buddhism. Focuses on development of Buddhism as a Western religious phenomenon. Presents interpretive, historical introduction to Buddhism in the West. Also taught as HIST 4010.

RELS 4910 Special Topics in Religious Studies 1-3®
Examination of special areas and themes in religious studies.

RELS 4930 Directed Readings 1-3®
Directed readings in any special religious studies field. For each credit granted, a minimum of four books must be read. Prerequisite: Permission of instructor.

RELS 4990 Religious Studies Capstone 3
Students write a substantial research paper dealing with a religious studies topic and demonstrating their command of the research methods, documentation, and style of professional communications used in the discipline. (F,Sp)

RELS 5740 Art and Religion: Topics in Sacred Art 3
Discussion-based course investigating relationships between religion and the arts. May focus on any period of history or region of the world, depending on scholarly interests of instructor. Also taught as ARTH 5740. (Sp)

RELS 6900 Directed Readings 1-3®
Directed readings at the graduate level in any special religious studies field. For each credit granted, a minimum of four books must be read. Prerequisite: Permission of instructor.

Russian (RUSS)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

RUSS 1010 Russian First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Not open to those with more than one year high school Russian or equivalent. (F)

RUSS 1020 Russian First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: RUSS 1010, or not more than three years of high school Russian. (Sp)

RUSS 2010 Russian Second Year I 4
Further development of first-year competencies with emphasis on language structure, vocabulary expansion, reading, writing, and conversation in the context of culture. Prerequisite: RUSS 1020 or two or more years of high school Russian. (F)

RUSS 2020 Russian Second Year II 4
Further development of first-year competencies with emphasis on language structure, vocabulary expansion, reading, writing, and conversation in the context of culture. Prerequisite: RUSS 2010 or three or more years of high school Russian. (Sp)

RUSS 2880 Individual Readings 1-4®
Individual study of selected readings in Russian. Prerequisite: Instructor's permission. (F,Sp)

RUSS 3040 Advanced Russian Grammar and Composition 3
Detailed presentation of Russian grammar. Class discussions and work on oral and written assignments. Prerequisite: RUSS 2020 or equivalent. (F)

RUSS 3050 Advanced Russian Grammar and Composition 3
Detailed presentation of Russian grammar. Class discussions and work on oral and written assignments. Prerequisite: RUSS 2020 or equivalent. (Sp)

RUSS 3300 DHA Contemporary Russian Language and Culture 3
Discussion of contemporary Russia, including its geography, business, government, literature, art, etc. Prerequisite: RUSS 2020 or equivalent.

RUSS 3510 CI Business Russian 3
Study of current Russian business and commercial terminology and practices. Development of communication skills for international Russian business purposes. Prerequisite: RUSS 2020 or equivalent.

RUSS 3540 Russian Translation for Science, Business, and Culture 3
Familiarization with approaches to translation, special grammatical structures, specialized vocabulary, and reference materials and aids. Practical exercises. Prerequisite: RUSS 2020 or equivalent.

RUSS 4880 Individual Readings[1] 1-4®
Readings in technical, scientific, or literary Russian. Prerequisite: Instructor's permission. (F,Sp)

RUSS 4920 Russian Language Tutoring[1] 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Prerequisite: Permission of instructor. (F,Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

[1]This course is repeatable for credit and may be taken a maximum of three times.

Secondary Education (SCED)

See Secondary Education Program, School of Teacher Education and Leadership (TEAL), pages 441-445

Note: Effective Fall Semester 2009, many of the courses previously listed under the SCED prefix will be taught under the TEAL prefix. (TEAL courses are shown on pages 667-671.) Students registering for Summer Semester 2009 Secondary Education courses during can find them under the SCED prefix by logging into Access at: **http://www.usu.edu/myusu/**

SCED 1000 Volunteer Experience 1
Optional course providing orientation to agencies coordinating volunteer experiences in the community; such experiences are part of standards for admission to secondary teacher education. (F,Sp,Su)

SCED 3100 Motivation and Classroom Management 3
Designed to lead pre-service secondary school teachers to address two questions: (1) What diverse traits, talents, attitudes, and experiences do pre-adolescent and adolescent students bring to the middle school, junior high school, and high school environment? and (2) In light of these diverse traits, talents, attitudes, and experiences, how should teachers work with students to build cooperative classroom communities where students are motivated to engage in productive learning activities? (F,Sp) DE

SCED 3210 DSS/CI Educational and Multicultural Foundations 3
Provides preservice teachers with the opportunity to critically examine the political, economic, and educational policies influencing students' access to equitable educational experiences. Examines historical and philosophical foundations influencing the nature of multicultural education in our democratic society, how personal biases can influence instructional practices, and development of multicultural curriculum relevant to specific content areas. (F,Sp) DE

SCED 3300 Clinical Experience I 1
First clinical practicum (30 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. Required at level 1. Graded Pass/Fail *only*. Prerequisite: Program admission. (F,Sp) DE

SCED 3400 Teaching Science I 3
Laboratory practicum focused on design, practice, and performance of secondary science demonstrations and investigative lab activities. Must be taken at Level 1. Prerequisite: Program admission. (Sp) DE

SCED 3500 Teaching Social Studies 3
Methods course focused on social studies curriculum and instruction for preservice secondary teachers with teaching majors or minors in history or any of the social sciences. Should be taken at Level 1. Prerequisite: Program admission. (F,Sp) DE

SCED 3600 Teaching English 3
Methods course focused on English curriculum and instruction for preservice secondary teachers with teaching majors or minors in English. May be taken at either Level 1 or Level 2. Prerequisite: Program admission. (F,Sp) DE

SCED 4200 CI Reading, Writing, and Technology 3
Performance-based class focused on a wide range of academic skills related to reading, writing, and advanced technology access. Prerequisite: Program admission and completion of Level 1. (F,Sp) DE

SCED 4210 Cognition and Evaluation of Student Learning 3
Designed to lead the preservice secondary school teacher to address two questions: (1) How do students construct concepts; discover relationships; and develop knowledge-level skills, comprehension and communication skills, and problem-solving abilities? (2) How do teachers monitor students' progress, evaluate and communicate their achievement, and interpret the results of system-wide and standardized test results to students and their parents? (F,Sp) DE

SCED 4300 Clinical Experience II 1
Second clinical practicum (30 hours minimum) in middle and secondary schools, arranged by special methods instructors in department. Required at level 2. Graded Pass/Fail *only*. Prerequisite: Program admission and completion of Level 1. (F,Sp) DE

SCED 4400 Teaching Science II 3
Methods course focused on science curriculum and instruction for preservice secondary teachers with teaching majors in any of the science areas. Must be taken at Level 2. Prerequisite: Program admission, completion of Level 1, and SCED 3400. (F) DE

SCED 4420 Multiple Talent Approach to Thinking 2
Explores one model for the teaching of creative and critical thinking embedded in regular curricula. Includes practical application requirements. Also taught as ELED 4420. (Su)

SCED 4710 Diversity in Education 3
Provides educators with background and techniques for more effectively addressing the needs of students in a culturally and linguistically diverse society. Diversity topics also include religion, socioeconomic class, ability differences, race, gender, and sexual orientation. Prerequisite: Admission into a teacher education program. Also taught as ELED 4710. (Sp,Su) DE

SCED 4900 Senior Thesis 1-6
Student-initiated research project under faculty supervision. Requires prior approval of department head, honors committee, and instructor. Prerequisite: Approval of department head. (F,Sp)

SCED 5400 Laboratory Practicum 3
Laboratory practicum for inservice teachers, focused on design, practice, and performance of secondary science demonstrations and investigative lab activities. (F,Sp)

SCED 5500 Student Teaching Seminar 2
Ten-week capstone seminar focused upon student teaching issues, professional development, and principles of effective instruction, emphasizing reflective teaching. Graded Pass/Fail *only*. Prerequisites: Level 1 and Level 2 completion, and student teaching placement. (F,Sp) [DE]

SCED 5630 Student Teaching in Secondary Schools 10
Thirteen-week culminating practicum in which students assume full-time teaching responsibilities under direction of cooperating teachers in major and minor fields. Prerequisites: Level 1 and Level 2 completion, and student teaching placement. Graded Pass/Fail *only*. (F,Sp) [DE]

SCED 5700 Modified Student Teaching 2-4
Culminating practicum experience for students seeking dual licensure, earning half of their student teaching credit in a secondary school setting. Graded Pass/Fail *only*. Prerequisite: Program admission and completion of Level 1 and Level 2. (F,Sp)

SCED 5800 Secondary School Internship 2-6
Advanced practical teaching experience under combined public school and University supervision. Offered only by arrangement with Director of Field Experiences. Graded Pass/Fail *only*. Prerequisites: Level 1 and Level 2 completion, and special recommendation. (F,Sp) [DE]

SCED 5810 Social Studies Teaching Methods 3
Guides students in developing a philosophical rationale for teaching social studies. Includes strategies for integrating best practices in and across the curriculum. (Sp) [DE]

SCED 5820 Science Teaching Methods 3
Guides students in understanding and identifying attributes of teaching and learning science that are critical to effective instruction. Focuses on developing a safe science learning environment. (Sp) [DE]

SCED 5830 English Teaching Methods 3
Designed to give in-service ARL teachers the theoretical grounding for making decisions about all aspects of the secondary English curriculum, including: reading, writing, viewing, listening, and speaking. Examines instruction and assessment. (F) [DE]

SCED 5900 Independent Study 1-3®
Prerequisite: Instructor approval. (F,Sp)

SCED 6270 Introduction to Methods, Planning, Assessment, and Technology 4
As one of the pedagogical knowledge requirements for the Alternative Route to Secondary Licensure, this course introduces new teachers to effective teaching methods. Teachers learn how to integrate research-based teaching methods, formal and informal assessments, and technology into their lessons. (Sp) [DE]

SCED 6555 Practicum Improvement in Instruction/Seminar 1®
To meet the requirements of the Alternative Route to Secondary Licensure program, students should take this practicum during fall semester and then again during spring semester. (F,Sp) [DE]

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Science (SCI)

See College of Science, pages 141-142

SCI 4300 Science in Society 2
Investigation of interactions between current scientific topics and societal goals and concerns. Intended as a capstone course for science teaching majors. Prerequisite: Senior standing and consent of instructor. (F,Sp) [DE]

[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Sociology (SOC)

See Department of Sociology, Social Work and Anthropology, pages 448-462

SOC 1010 BSS Introductory Sociology 3
Examination of social behavior of humans and social institutions. Theories and methods for studying society and social issues, along with insights from related disciplines. (F,Sp) [DE]

SOC 1020 Social Problems 3
Study of major U.S. and international social problems. Examination of how issues are defined as social problems and ways groups attempt to solve the problems. (F,Sp) [DE]

SOC 3010 Social Inequality 3
Examines theories and research concerning how race, class, and gender intersect in the lives of societal members. (F,Sp)

SOC 3110 CI Methods of Social Research 3
Methods and techniques of analyzing social data. Examines surveys, field research, observational studies, and other social science techniques. Emphasizes analysis of data and published research. Prerequisite: Completion of 6 credits in departmental courses. (F,Sp)

SOC 3120 QI Social Statistics I 3
Examines use of statistics in social sciences. Particular focus on use of statistical analysis with surveys and census-type data. Includes parametric and nonparametric statistics utilized most in social analysis. Prerequisites: Completion of 6 credits in departmental courses and grade of *C-* or better in STAT 1040 or equivalent. (F,Sp,Su) [DE]

SOC 3200 DSS Population and Society 3
Examination of interrelationships between population change and social structure in national and international context. Examines contributions of fertility, mortality, and migration to population characteristics, particularly sex, age, and ethnic composition. Stresses demographic data and analysis. (F,Sp) [DE]

SOC 3320 Sociology of Work and Organization 3
Stresses contribution of sociology to the understanding of industry as a social system. (Sp)

SOC 3330 Medical Sociology 3
In-depth analysis of major contributions of sociology to field of medicine. (F)

SOC 3410 Juvenile Delinquency 3
Focuses on nature, extent, and causes of delinquent behavior. Examines workings of juvenile justice system and programs for delinquency prevention. (F,Sp) [DE]

SOC 3420 Criminology 3
Examines theoretical explanations for crime in the U.S. Describes characteristics of major forms of criminal behavior. (F,Sp) [DE]

SOC 3430 Social Deviance 3
Examination of sociological perspectives on deviance as they apply to lifestyles, commitment, and social control in American society. (F)

SOC 3500 Social Psychology 3
Explores interaction between the social system and the individual. Examines human behavior in terms of positions people occupy in the social structure. (F,Sp)

SOC 3600 Sociology of Urban Places 3
Provides historical and international perspective on social, cultural, and spatial characteristics of urban places. Examines changes associated with urbanization processes and the effect of urbanization on community, crime, neighborhoods, and urban space. (F)

SOC 3610 DSS Rural Sociology 3
Examines patterns and processes of social change in rural and nonmetropolitan sectors of the U.S. and other advanced industrial societies. Considers how rural social change is influenced by demographic, economic, political, and natural resource conditions at regional, national, and global scales. (F)

SOC 3750 Sociology of Aging 3
Examination of social context in which aging occurs, the social implications of aging, and attendant social policy issues. Considers both individual and societal aging, using an historical and global approach. (F) DE

SOC 4010 Contemporary Sociological Theory 3
Critical analysis of major theorists and schools of theory in sociology from the late nineteenth century through recent and current works. Emphasizes contemporary issues, insights, and uses of sociological theory. (F,Sp)

SOC 4330 Religion, Science, and Society 3
Discussion of theories and research used by sociologists to understand social dimensions of religion. Includes ways in which religion influences and is influenced by other societal institutions, such as politics, the economy, and the class system. (Sp)

SOC 4350 Political Sociology* 3
Examines prevalent theories and concepts related to global development, underdevelopment, and social change, while building an understanding of contemporary global social issues accompanying these processes. Particular emphasis placed on understanding global inequality and regional differences. (Sp)

SOC 4370 Sociology of Gender 3
Examines impacts of social constructions of gender on individual and collective experience. Investigates how gender is shaped through social processes and through the effects of social institutions. Particular attention given to relation of gender to social stratification. (F)

SOC 4420 CI Criminal Law and Justice 3
Sociological analysis of relationship between law and social control and social change, especially regarding law enforcement, courts, and corrections. (Sp) DE

SOC 4600 Senior Research Capstone Seminar 3
Students undertake sociological analysis from research question through hypotheses, research design, data collection, data analysis, and presentation. Synthesis of student training in critical thinking and substantive areas in sociology. Prerequisites: SOC 1010, 3010, 3110, 3120, 4010, or permission of instructor. (F,Sp)

SOC 4620 DSS Sociology of the Environment and Natural Resources 3
Social aspects associated with the environment and natural resources. Topics include: environmental attitudes and perceptions, environmentalism as a social movement, resource scarcity and land use, and social change in resource-based communities. (Sp)

SOC 4710 Asian Societies 3
Explores history; social, economic, and political institutions; and peoples and cultures of Asian Societies. (Sp)

SOC 4720 Applied Community Development 3
(dual listing 6720)
Uses asset-building model to explore current practice and theory of community development. Organized around service-learning placements with local and regional organizations. Includes reflective evaluation of theories based upon the service-learning experiences. Prerequisites: SOC 1010, 3010, 3110, 3120, 4010; or permission of instructor. (Sp)

SOC 4730 Women in International Development 3
Examines status of women in developing countries, and the role they play in the development process. (Sp)

SOC 4800 Seminar in Sociology 1-3®
Seminars in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) social organization, (e) social deviance, (f) social psychology, (g) human ecology, (h) gerontology. (Sp)

SOC 4900 Independent Readings in Sociology 1-5®
Independent readings in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) social organization, (e) social deviance, (f) social psychology, (g) human ecology. Prerequisite: Permission of instructor. (F,Sp,Su)

SOC 5100 Interpreting Social Research 3
Examines research design issues (conceptualization and measurement, sampling), modes of observation (experiments, surveys, field research, evaluation research), and interpreting social research findings (basic understanding of statistical analysis), as well as focusing on the ethics and politics of social research. (F,Su)

SOC 5130 Ethnographic Field School 3-6
(dual listing 6130)
Provides practical training in use of ethnographic field methods, qualitative data analysis, and ethnographic report-writing. Combines classroom instruction with supervised off-campus field research, while living in a cross-cultural setting. Fulfills program methods requirement. Application and additional fee required. Also taught as ANTH 5130/6130. (Su)

SOC 5640 Conflict Management in
(dual listing 6640) Natural Resources 3
Introduction to conflict management techniques for those involved in natural resource management. Also taught as ENVS 5640/6640. (Sp)

SOC 5650 DSS Developing Societies 3
(dual listing 6650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as ANTH 5650/6650 and GEOG 5650/6650. (F) DE

SOC 6010 Development of Sociological Theory 3
Examines development of social theory from early to premodern times. Special attention given to nineteenth century European influences on development of American sociological theory. (F)

SOC 6020 Modern Social Theory 3
Examines current analytical and empirical theories from sociology as science perspective. Also explores network, exchange, conflict, functional, and interactionist approaches to, and difficulties with, scientific theorizing. (F)

SOC 6100 Advanced Methods of Social Research 3
Examines philosophical bases, techniques, and political and ethical aspects of social research. (F)

SOC 6130 Ethnographic Field School 3-6
(dual listing 5130)
Provides practical training in use of ethnographic field methods, qualitative data analysis, and ethnographic report-writing. Combines classroom instruction with supervised off-campus field research, while living in a cross-cultural setting. Fulfills program methods requirement. Application and additional fee required. Also taught as ANTH 6130/5130. (Su)

SOC 6150 Social Statistics II 3
Statistical procedures for sociological analysis; nonparametric statistics; inferential statistics, cross-tabulation, and log-linear analysis; correlation; regression; ANOVA; and other multivariable social science statistical treatments. (Sp)

SOC 6200 Social Demography* 3
Focuses on relationships between demographic and sociological processes. Study of theoretical perspectives and empirical analyses of the determinants. Consequences of change in population size, composition, and distribution, as well as changes in demographic processes. (F)

SOC 6230 Techniques of Demographic Analysis* 3
Provides instruction in use of rates, ratios, life tables, and related measures to describe, analyze, and estimate population. Review of measures designed to examine the three demographic processes: fertility, mortality, and migration. Utilization of analytical tools to explore population composition. Special emphasis placed on use of U.S. Census data to create population profiles. (Sp)

SOC 6250 Sociology Internship/Co-op 1-6
Professional level of educational work experience in an internship/cooperative education position for graduate students. (F,Sp,Su)

SOC 6310 Sociology of Work and Occupations* 3
Uses an applied and comparative cross-cultural perspective to examine work in pre-industrial (agricultural/pastoral), industrializing, industrialized, and post-industrial societies. (Sp)

SOC 6420 Gender and Social Inequality* 3
Contemporary American gender stratification, including (1) What is the problem? (2) Why is it a problem? (3) How does it interact with other stratifiers? (4) What caused or is causing it? (5) How and why is it maintained? and (6) When does it vary and why? Comparison of different views on these issues. (Sp)

SOC 6450 Special Topics in Social Problems 3®
Seminars on various topics appropriate to sociological analysis of contemporary social problems. Subject matter will reflect current faculty research and interests. (F,Sp)

SOC 6460 Sociology of Health* 3
Examination of social and cultural factors influencing health. Analysis of health behaviors as consequences of variety of diverse personal and social processes. (F)

SOC 6620 Environment, Technology, and Social Change* 3
Focuses on human interactions with the physical environment and changes brought about by this interaction. Topics of major emphasis include: approaches to environmental sociology; environmental values and attitudes; social movements pertaining to environmental concern; and social change responses to technology and resource scarcity. (Sp)

SOC 6630 Natural Resources and Social Development* 3
Focuses on social dimensions of natural resources use, development, scarcity, and allocations. Examines ways in which changing resource conditions impact human social organization. Emphasis on topics including: social characteristics of resource-dependent communities and areas; social organizational responses to changes in availability of, or access to, natural resources; and social impacts of natural resource development activities. (Sp)

SOC 6640 Conflict Management
(dual listing 5640) in Natural Resources 3
Introduction to conflict management techniques for those involved in natural resource management. Also taught as ENVS 6640/5640. (Sp)

SOC 6650 Developing Societies 3
(dual listing 5650)
Reviews how sociology, cultural geography, and economic anthropology analyze processes of globalization in postcolonial societies. Examines changing livelihoods, patterns of spatial incorporation and societal evolution, and emergent policy problems associated with rapid socioeconomic change. Also taught as ANTH 6650/5650 and GEOG 6650/5650. (F)

SOC 6700 Advanced Rural Sociology* 3
Analysis of major developments in the study of rural society and rural communities. Emphasis on rural social changes related to economic, demographic, organizational, and technological trends at societal and global levels. (Sp)

SOC 6720 Applied Community Development 3
(dual listing 4720)
Uses asset-building model to explore current practice and theory of community development. Organized around service-learning placements with local and regional organizations. Includes reflective evaluation of theories based upon the service-learning experiences. Prerequisites: SOC 1010, 3010, 3110, 3120, 4010; or permission of instructor. (Sp)

SOC 6730 Gender and International Development* 3
Examines gender issues in economic and social development. Focuses on theory and methodologies for gender analysis. (Sp)

SOC 6750 Social Change and Development* 3
Readings from both domestic and international scholarship are used to examine the important social, economic, and political forces that shape patterns of social change and development. (Sp)

SOC 6800 Seminar in Sociology 1-3®
Seminars in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) social organization, (e) social deviance, (f) social psychology, (g) social problems, (h) international development, (i) domestic development, (j) rural sociology, (k) environmental sociology, (l) other. (F,Sp,Su)

SOC 6900 Independent Readings in Sociology 1-3®
Independent readings in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) environmental/natural resource sociology, (e) sociology of development, (f) social problems. (F,Sp,Su)

SOC 6970 Thesis Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

SOC 6990 Continuing Graduate Advisement 1-3®
Graded Pass/Fail *only*. (F,Sp,Su)

SOC 7010 Issues in Sociological Theory* 3
Explores current philosophical discussions on theoretical approaches to understanding society. Examines feminist, post-structuralist, and post-modernist conceptualizations of power, knowledge, and identity. (Sp)

SOC 7100 Advanced Survey Techiques* 3
Examines the empirical and methodological literature regarding techniques for designing and implementing mail, telephone, and internet surveys for sociological research. Focuses on practical lessons for sampling, data collection, and survey data organization. (Sp)

SOC 7110 Advanced Sociological Analysis* 3
Provides review of several quantitative approaches utilized in contemporary social research. Students undertake small-scale analytical exercises in topics including, but not limited to, log-linear and structural equation modeling, logistic regression, and event history analysis. (F)

SOC 7150 Advanced Qualitative Methods in Sociology* 3
Examines the empirical and methodological literature regarding techniques for designing and implementing qualitative data collection and analysis for sociological research. Emphasizes practical tools for graduate students seeking to use qualitative methods for their thesis or dissertation research. (Sp)

SOC 7210 Teaching Sociology 3
Provides a learning opportunity for graduate students who will be graduate instructors or teaching assistants. Reviews teaching strategies (meeting a class for the first time, teaching a large lecture class) and course development (constructing a syllabus, developing tests and writing assignments). (F)

SOC 7250 Advanced Seminar in Social Demography* 3
Detailed comparative and multilevel examination of substantive and methodological issues in the study of nuptiality, fertility, morbidity and mortality, migration, and social mobility. Covers theories, data collection strategies, measurement issues, and analytical techniques. (Sp)

SOC 7400 Perspectives on Inequality and Social Problems* 3
Examines major theoretical and empirical approaches to the sociological analysis of inequality and social problems. (F)

SOC 7440 Crime and Society* 3
Explores the field of criminology, which is primarily concerned with describing and explaining patterns of deviance violating criminal laws. Reviews the epistemological foundations of criminology, and then addresses specific topics surrounding various legal definintions of criminal behavior. (Sp)

SOC 7620 Sociology of Environmental Hazards and Risks* 3
Focuses on how individuals and organizations respond to environmental hazards and risks resulting from either natural events or human technological and industrial processes. (F)

SOC 7640 Population and Environment* 3
In-depth exploration of relationship between human populations and their environment. Heavy emphasis placed on developing an understanding of contemporary research in this area, especially with regard to the association between environmental factors and population organization, change, and growth. (Sp)

SOC 7660 The Environment and Social Inequality* 3
Explores the intersection of social inequality and the physical enviroment. Examines how social structures and individual actions both perpetuate and combat various forms of inequality, including class, race, ethnicity, gender, and "expert knowledge." (F)

SOC 7720 Community Theory and Research* 3
Explores theoretical and empirical sociological literature on the human community. Topics include: conceptualization and measurement of community well-being, dynamics and impacts of social and economic change on community life, and comparison of community research conducted in different settings. (Sp)

SOC 7800 Topical Seminar in Sociology 3®
Seminars in various areas of sociology: (a) theory, (b) methodology, (c) demography, (d) environmental/natural resource sociology, (e) sociology of development, (f) social problems. (F,Sp)

SOC 7900 Independent Study 1-3®
Independent study in sociological areas emphasizing (a) theory, (b) methodology, (c) demography, (d) environmental/natural resource sociology, (e) sociology of development, (f) social problems. (F,Sp,Su)

SOC 7970 Dissertation Research 1-12®
Graded Pass/Fail *only*. (F,Sp,Su)

SOC 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

*This course is taught alternating years. Check with department for information about when course will be taught.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Soil Science (SOIL)

See Department of Plants, Soils, and Climate, pages 415-423

Note: Effective Spring Semester 2010, courses listed with the SOIL prefix will use the Plants, Soils, and Climate (PSC) prefix.

SOIL 2000 BPS Soils, Waters, and the Environment 3
Introduction to principles of physical and biological science. Discussion of current environmental topics, focusing on soil and the waters that contact the soil. Topics include water quality, global climate change, deforestation, soil conservation, and agricultural sustainability. (Sp)

SOIL 3000 Fundamentals of Soil Science 4
Fundamentals of soil science, emphasizing physical, chemical, mineralogical, and biological properties of soils, and how these properties relate to plant growth and environmental quality. (F) DE

SOIL 3100 DSC Soils and Civilization 3
Lectures, readings, and discussions to explore effects of soil physical, chemical, and biological properties on civilization throughout history. Influence of soils on settlement patterns, land use/management, and civilization decline. Case studies focus on current soil and land use issues in western North America. (Sp)

SOIL 3200 DSC Microbes in Environmental Action 3
Microorganisms play a central role in maintaining the biosphere. In this course, the diversity of microbial lifestyles is introduced. Current examples and case studies used to demonstrate microbial actions in composting, waste water treatment, and bioremediation of pollutants in the environment. Prerequisite: Completion of Breadth Life Sciences (BLS) University Studies requirement. (Sp)

SOIL 4000 Soil and Water Conservation 4
Applied soil and water conservation in an agronomic setting. Management of soil-water-plant-atmosphere continuum. Soil conservation techniques as they apply to actual situations. (F)

SOIL 4500 Soil Reclamation 3
Provides in-depth information on causes of soil degradation (both natural and man-made) and rehabilitation procedures. (Sp)

SOIL 4700 Irrigated Soils 3
Soil salinity, soil-moisture-plant relationships, water supply and quality, irrigation water measurements, soil moisture movement, and irrigation methods. Prerequisite: SOIL 3000 or equivalent, or instructor's consent. Taught during first half of semester. (Sp)

SOIL 5050 Principles of Environmental
(dual listing 6050) Soil Chemistry 3
Introduction to common chemical processes occurring among solid, liquid, and gas phases in soil systems. Emphasis placed on chemistry of arid land soils. Prerequisites: CHEM 1110 or higher, MATH 1050 or higher. (Sp odd)

SOIL 5130 Soil Genesis, Morphology,
(dual listing 6130) and Classification 4
Morphology, development, and classification of soils. Lectures and weekly field exercises emphasize soil as a natural body of the landscape: its properties, distribution, behavior, and interpretations for diverse land uses. Prerequisite: Understanding of fundamental soil science; SOIL 3000 recommended. (F)

SOIL 5310 Soil Microbiology 3
Ecology and diversity of microorganisms in soils. Emphasis on factors controlling microbial activity and the role of microorganisms in organic matter decomposition and nutrient cycling. Prerequisites: BIOL 1610, 1620; CHEM 2300 or 2310; SOIL 3000. Also taught as BIOL 5310. (F even)

SOIL 5320 Soil Microbiology Laboratory 2
Techniques for measuring microbial activity and diversity in soils. Includes use of molecular and isotope methods. Prerequisite: Concurrent or prior enrollment in BIOL/SOIL 5310. Also taught as BIOL 5320. Contact Biology Department for further information. (F)

SOIL 5350 Wildland Soils 3
(dual listing 6350)
Application of basic principles of soil science to wildland ecosystems. Effects of disturbance and land use on wildland soil properties. Role of soils in natural resource management. Prerequisites: CHEM 1110, SOIL 3000, and one additional upper-division Soils course, or permission of instructor. Also taught as WILD 5350/6350. (Sp)

SOIL 5550 QI Soils and Plant Nutrient Bioavailability 3
(dual listing 6550)
Description of forms, transformations, and movement of plant nutrients in soils. Discussion of factors affecting nutrient supply, both qualitatively and quantitatively, for nutrient elements essential for plant growth. Prerequisites: SOIL 3000; CHEM 1110 or 1210. (Sp)

SOIL 5560 Analytical Techniques for the
(dual listing 6560) Soil Environment 2
Analysis of chemical and biological soil characteristics. Results interpreted for soil fertility, land use, and environmental remediation. Graduate credit requires a paper reviewing analysis of element or compound class. Prerequisite: SOIL 5050/6050 or 5550/6550 (may be taken concurrently), or instructor's permission. (Sp)

SOIL 5600 Surface Hydrologic Field Methods 3
(dual listing 6600)
Hydrologic concepts and terminology taught through collection, analysis, and interpretation of hydrologic data. Emphasizes principles and practice of several hydrologic measurements and water sampling in natural and manmade

environments. Prerequisite: SOIL 3000 or instructor's permission. Also taught as WATS 5600/6600. Not currently being taught. Contact department for further information.

SOIL 5620 Aquatic Chemistry 3
Provides students with understanding of principles of aquatic chemistry, emphasizing chemical equilibria, acid-base reactions, complex formation, oxidation-reduction reactions, complex formation, and dissolution chemistry. Prerequisite: CHEM 1210 or equivalent. Also taught as CEE 5620. (F)

SOIL 5650 Environmental Soil Physics 4
(dual listing 6650)
Characterization of the physical properties of soils and other porous media. Measurement, prediction, and control of processes taking place in and through soils (e.g., water flow and solute transport), including atmospheric and groundwater interactions. (F)

SOIL 5750 Environmental Quality: Soil and Water 2
Senior capstone course for Environmental Soil/Water Science (ESWS) major. Students analyze current soil and water environmental quality problem(s), formulate remediation or mitigation plans, and present findings in oral and written reports. Prerequisites: SOIL 5130 and two 5000-level Soil courses. (Sp)

SOIL 6050 Principles of Environmental
(dual listing 5050) Soil Chemistry 3
Introduction to common chemical processes occurring among solid, liquid, and gas phases in soil systems. Emphasis placed on chemistry of arid land soils. Prerequisites: CHEM 1110 or higher, MATH 1050 or higher. (Sp odd)

SOIL 6130 Soil Genesis, Morphology,
(dual listing 5130) and Classification 4
Morphology, development, and classification of soils. Lectures and weekly field exercises emphasize soil as a natural body of the landscape: its properties, distribution, behavior, and interpretations for diverse land uses. Prerequisite: Understanding of fundamental soil science; SOIL 3000 recommended. (F)

SOIL 6140 Unsaturated Flow and Transport 3
Measurement, prediction, and control of transport processes taking place in and through partially saturated porous formations (e.g., water flow and solute transport), emphasizing parameter estimation and multi-dimensional flow. (F odd)

SOIL 6190 Salt-affected Soils 2
Emphasis on chemistry of salt-affected soils. Topics include carbonate chemistry, cation exchange, and reclamation of sodium and salt-affected soils. Exploration of effects of sodium accumulation on soil hydraulic conductivity and the biochemistry of salt and potentially toxic elements. Not currently being taught. Contact department for further information.

SOIL 6200 Biogeochemistry of
Terrestrial Ecosystems 3
Inputs, outputs, and cycling patterns of major nutrients. Emphasis on mechanisms for transformations, factors influencing process rates, and the impacts of management and global change on nutrient cycles and air and water quality. Prerequisites: BIOL 1620, SOIL 3000, CHEM 2300 or 2310, or permission of instructor. Also taught as BIOL 6200 and WILD 6200. (F odd)

SOIL 6350 Wildland Soils 3
(dual listing 5350)
Application of basic principles of soil science to wildland ecosystems. Effects of disturbance and land use on wildland soil properties. Role of soils in natural resource management. Prerequisites: CHEM 1110, SOIL 3000, and one additional upper-division Soils course, or permission of instructor. Also taught as WILD 6350/5350. (Sp)

SOIL 6550 Soils and Plant Nutrient Bioavailability 3
(dual listing 5550)
Description of forms, transformations, and movement of plant nutrients in soils. Discussion of factors affecting nutrient supply, both qualitatively and quantitatively, for nutrient elements essential for plant growth. Prerequisites: SOIL 3000; CHEM 1110 or 1210. (Sp)

SOIL 6560 Analytical Techniques for
(dual listing 5560) the Soil Environment 2
Analysis of chemical and biological soil characteristics. Results interpreted for soil fertility, land use, and environmental remediation. Graduate credit requires a paper reviewing analysis of element or compound class. Prerequisite: SOIL 6050/5050 or 6550/5550 (may be taken concurrently), or instructor's permission. (Sp)

SOIL 6600 Surface Hydrologic Field Methods 3
(dual listing 5600)
Hydrologic concepts and terminology taught through collection, analysis, and interpretation of hydrologic data. Emphasizes principles and practice of several hydrologic measurements and water sampling in natural and manmade environments. Prerequisite: SOIL 3000 or instructor's permission. Also taught as WATS 6600/5600. Not currently being taught. Contact department for further information.

SOIL 6650 Environmental Soil Physics 4
(dual listing 5650)
Characterization of the physical properties of soils and other porous media. Measurement, prediction, and control of processes taking place in and through soils (e.g., water flow and solute transport), including atmospheric and groundwater interactions. (F)

SOIL 7200 Soil Interfacial Processes and
Reactive Transport 3
Course divided into two blocks. Subject matter for first block is soil electrochemistry and surface chemistry. Second block applies material from first block to system in which transport limits reaction time. (Sp odd)

SOIL 7210 Advanced Topics in Pedology 2®
Strategies for designing and critiquing pedological research through literature, discussions, and field trips. Topics will change, depending upon student interest, and can include factors and processes involved in pedogenesis, soil mineralogy, soil-biota relationships, and landscape evolution. Prerequisite: SOIL 6130/5130. (Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Spanish (SPAN)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

Lower Division

SPAN 1010 Spanish First Year I 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: No more than one year of Spanish in high school or placement in this specific class by examination. (F,Sp) DE

SPAN 1020 Spanish First Year II 4
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: SPAN 1010 (or equivalent coursework) or placement in this specific class by examination. (F,Sp) DE

SPAN 1050 Intensive First Year Spanish 8
Intensive one-semester alternative course to SPAN 1010 and 1020, emphasizing active usage. (Su)

SPAN 1800 Spanish I Study Abroad 1-4®
Communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Taught *only* in Studies Overseas in Spanish Program. (Su)

SPAN 2010 Spanish Second Year I 4
Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: SPAN 1020 (or equivalent coursework) or placement in this specific class by examination. (F,Sp)

SPAN 2020 Spanish Second Year II 4
Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: SPAN 2010 (or equivalent coursework) or placement in this specific class by examination. (F,Sp)

SPAN 2800 Spanish II Study Abroad 1-4®
Continued development of communicative competencies in the four language skills: speaking, listening, reading, and writing, with exposure to cultures and customs. Prerequisite: SPAN 1020 or equivalent. Taught *only* in Studies Overseas in Spanish Program. (Su)

Upper Division

Upper-division Spanish courses (3000 level and above) are available *only* to students who have completed SPAN 2020 or who can demonstrate equivalent proficiency through testing.

SPAN 3010 Hispanic Outreach Practicum 1-4®
Allows students of Spanish to improve their language skills and cultural awareness within a Hispanic community setting. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. May be repeated to a maximum of 4 credits, only 3 of which can be applied toward the Spanish major or minor. (F,Sp,Su)

SPAN 3040 Advanced Spanish Grammar 3
Intense review of selected problematic areas of Spanish grammar for students with advanced language skills. Prerequisite: SPAN 2020 (or equivalent coursework) or placement in this specific class by examination. (F,Sp) DE

SPAN 3060 CI Advanced Spanish Conversation and Composition 3
Development of advanced conversation and writing skills through debate and composition on contemporary controversial topics. (F,Sp)

SPAN 3100 Spanish for Healthcare Professionals 3
Study of medical terminology in Spanish. Explores Hispanic cultural issues in the health professions. Features guest lectures by medical professionals having experience in treating U. S. Hispanics/Latin Americans. Provides conversational practice for medical situations. Includes field trips to clinics/hospitals. Prerequisite: SPAN 3040 or permission of instructor. (Sp)

SPAN 3510 Business Spanish 3
Development of communication skills in Spanish for international Hispanic business purposes. (F,Sp)

SPAN 3520 Business Spanish Practicum 1-4®
Allows students of Spanish to gain practical work experience in a Hispanic Business context. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. May be repeated to a maximum of 4 credits, only 3 of which can be applied toward the Spanish major or minor. (F,Sp,Su)

SPAN 3550 DHA Spanish Culture and Civilization 3
Historical, social, political, economic, and cultural conditions and institutions of Spain. (F,Sp) DE

SPAN 3570 DHA Latin American Culture and Civilization 3
Historical, social, political, economic, and cultural conditions and institutions of Latin American countries. (F,Sp) DE

SPAN 3600 DHA Survey of Spanish Literature I 3
Selective readings and discussions of major works and authors in Spanish literature from El Cid through Calderon. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3610 DHA Survey of Spanish Literature II 3
Selective readings and discussions of major works and authors in Spanish literature from the eighteenth to twentieth centuries. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3620 DHA Survey of Latin American Literature I 3
Selective readings and discussions of major works and authors in Latin American literature from Pre-Columbian works through the beginnings of Modernism. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3630 DHA Survey of Latin American Literature II 3
Selective readings and discussions of major works and authors in Latin American literature from Modernism to the present. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3650 Spanish Literature—Study Abroad 1-4®
Selective readings and discussions of major works and authors in Spanish literature. Taught only in Studies Overseas in Spanish program. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3660 Latin American Literature—Study Abroad 1-4®
Selective readings and discussions of major works and authors in Latin American literature. Taught only in Studies Overseas in Spanish program. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; SPAN 3040 or permission of instructor. (F,Sp)

SPAN 3800 Spanish III Study Abroad 1-4®
Intense review of selected problematic areas of Spanish grammar for students with advanced language skills. Taught *only* in Studies Overseas in Spanish Program. (Su)

SPAN 4200 Applied Spanish Linguistics and Phonetics 3
Analysis of selected phonological, morphological, syntactic, and semantic features of the Spanish language, including Spanish-English contrastive analysis. Prerequisite: SPAN 3040. (Sp)

SPAN 4800 Hispanic Culture and Civilization—Study Abroad 1-4®
Historical, social, political, economic, and cultural conditions and institutions of Hispanic countries. Taught *only* in Studies Overseas in Spanish Program. (Su)

SPAN 4880 Individual Readings 1-4®
Individual readings or projects in Spanish. Prerequisite: Instructor's permission. (F,Sp)

SPAN 4900 Topics of Spanish Literature 3®
Repeatable for additional credit when topics vary. Prerequisites: At least two of the following: SPAN 3600, 3610, 3620, and 3630. (F,Sp)

SPAN 4910 Topics of Latin American Literature 3®
Repeatable for additional credit when topics vary. Prerequisites: At least two of the following: SPAN 3600, 3610, 3620, and 3630. (F,Sp)

SPAN 4920 Spanish Language Tutoring 1®
Allows students to develop tutoring skills by assisting professors in lower-division courses or fulfilling instructional duties for a comparable amount of time in the language laboratory, public schools, or similar activities with departmental approval. May be repeated to a maximum of 3 credits. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp)

SPAN 4990 Spanish Degree Assessment 1
Includes review of coursework and comprehensive exit examination, individualized according to the courses taken for the degree. Prerequisite: Permission of instructor.

SPAN 6200 Spanish Linguistics and Phonetics 3
Analysis of phonology, morphology, and syntax of the Spanish language. Prerequisite: SPAN 2020, another 3000-level or higher SPAN course, or demonstrated proficiency through testing. (Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Speech Communication (SPCH)

See Department of Languages, Philosophy, and Speech Communication, pages 334-346

SPCH 1020 CI Public Speaking 3
Speaking in formal public communication situations. Development of skills in speech preparation, audience adaptation, and delivery. Two lectures and one one-hour lab per week. (F,Sp) DE

SPCH 2110 CI Interpersonal Communication 3
Examination of theories, methods, and competencies relevant to studying, establishing, and maintaining interpersonal relationships in family, intercultural, professional, and other contexts. Classroom experiences with topics such as perception, language, nonverbal behavior, conflict resolution, and listening. (F,Sp) DE

SPCH 2250 Introductory Internship/Co-op 1-6
Introductory level educational work experience in an internship or cooperative education position approved by the department and advisor. Internship project and number of credits must be approved by advisor. (F,Sp,Su)

SPCH 2270 Argumentation and Debate 3
Techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and construction and delivery of the argumentative speech and academic debate. (F)

SPCH 2280 Listening 2
Development of comprehension, critical, and relationship listening skills. Experience in developing listening training for kindergarten to adult education. This course is not currently being taught. For information about when it may be taught, contact the Department of Languages, Philosophy, and Speech Communication.

SPCH 3000 Speech Communication Teaching Practicum 1®
Intensive speech teaching workshop. Supervised on-campus teaching experience. Must be completed prior to student teaching experience. Repeatable to a maximum of 2 credits. (Sp)

SPCH 3050 DSS Technical and Professional Communication* 3
Skill development in oral technical reporting, interviewing, and interpersonal communication to meet the unique communication requirements of business, industry, and the professions. (Sp)

SPCH 3250 CI Organizational Communication 3
Study of internal communication requirements of organizations. Analysis of communication problems associated with conflict, diversity, interpersonal influence, communication technology, and information flow. Development of effective communication practices. (F)

SPCH 3300 Clinical Experience I 1
First clinical practicum in middle and secondary schools. Arranged by special methods instructor. Required at Level I. Must be taken concurrently with SPCH 5370. Prerequisites are set by the Secondary Education Department. (F)

SPCH 3330 DSS Intercultural Communication 3
Study of how communication shapes culture and how culture, in turn, affects communication. Development of active intercultural communication in professional and personal contexts. (F,Sp)

SPCH 3400 CI Persuasion 3
Survey of theory and research investigating the process of social influence. Topics include: compliance-gaining strategies, enactment and detection of deception, verbal and nonverbal influence, attitude change, conformity, communicator characteristics, credibility, emotional appeals, and ethics. (F)

SPCH 3600 Communication and Conflict 3
Study of contemporary theories on conflict and communication. Analyses of the roles of culture, gender, and personal and/or organizational ethics in conflict and disputes. Discussion and application of negotiation, mediation, and facilitation skills. (F)

SPCH 4200 Language, Thought, and Action 3
Examines the influence of language on perception, interpretation, and evaluation in a wide variety of communication contexts, from organizational communication to mass media to interpersonal relations. (Sp)

SPCH 4250 Advanced Internship/Co-op 1-6
Internship or cooperative education at a more professional level, with increased complexity, approved by the department and advisor. Internship project and number of credits must be approved by advisor. (F,Sp,Su)

SPCH 4300 Clinical Experience II 1
Second clinical practicum in middle and secondary schools. Arranged by special methods instructor. Required at Level II. Must be taken concurrently with SPCH 5370. Prerequisites are set by the Secondary Education Department. (F)

SPCH 4460 Communication Criticism 3
Introduction to analysis of public communication from a variety of critical perspectives. With an approach including theory and practice, teaches students how to critically analyze discursive messages. (F)

SPCH 5000 Studies in Speech Communication 1-5®
Study of special topics in interpersonal, small group, organizational, or intercultural communication theory and research. Prerequisite: Permission of instructor. (F,Sp)

SPCH 5090 Small Group Theory* 3
Study of theories of group processes such as decision-making, leadership, power, conflict, deviance, and the development of group structures, functions, norms, and roles. (Sp)

SPCH 5100 CI Theories of Speech Communication 3
Social, scientific, and humanistic inquiry into the process of human communication. Multi-theoretical approach, including perspectives and research on interpersonal, persuasive, organizational, intrapersonal, group, and intercultural communication. (Sp)

SPCH 5250 Environmental Rhetoric 3
Study of persuasive tactics and strategies as used by social advocates. Focuses on environmental issues and organizations. Analysis of environmental messages with an emphasis on the development of writing and critical thinking skills. (Sp)

SPCH 5280 Communication Education Theory* 3
Study of contemporary theories and research in communication education. Emphasis on communication competency development, communication apprehension, critical thinking, communication assessment, development of communication ethics, freedom of speech, instructional communication, and history of communication education. (Sp)

SPCH 5370 Methods in Teaching Speech Communication 3
Development of materials and strategies for teaching secondary school speech communication. Prerequisite: Admission to teacher education. (F)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

*Taught 2009-2010.

Special Education (SPED)

See Department of Special Education and Rehabilitation, pages 463-467

SPED 0100 Strategies for Reading 1-3®
Practical course with major emphasis on improvement of reading, writing, and comprehension skills that are essential for academic success. Remedial class not carrying USU or transfer credit. Remedial fee required. Graded Pass/Fail *only*. (F,Sp)

SPED 1000 Principles of Effective Peer Teaching 2®
Students receive information about careers in working with individuals who have disabilities. Practical experience given in assessment, instruction, and advocacy. Teachers offer systematic instruction, close supervision, and mentoring on career

directions and professional alternatives. Available only to high school students at preapproved sites. (F,Sp) DE

SPED 1010 BSS Society and Disability 3
Discussion of definitions and types of disabilities, ethical issues, society's prejudice and discrimination against people with disabilities, and the individual's adjustment to the disability experience. Disability as a natural part of life. Also taught as REH 1010. (F,Sp) DE

SPED 2010 Effective Behavior Management Practices for Paraeducators 1-3®
Teaches paraeducators to apply effective behavior management practices to individuals with disabilities in a variety of settings. Introduction to proactive behavior management strategies, basic concepts of behavior management, and the application of intervention plans.

SPED 2150 Introductory Experience with Students with Disabilities 1-4®
Introductory seminar from which students learn basic instructional techniques from video simulations, then apply techniques in public schools. (F,Sp,Su)

SPED 2790 Special Topics 1-4®

SPED 3030 Educational and Multicultural Foundations 3
Explores historical and cultural aspects of schooling and the inclusion of students with disabilities and bilingual students in general education classrooms. Examines how schooling practices change from elementary to high school and commonalities that bind the teaching profession. (Sp)

SPED 4000 Education of Exceptional Individuals 2
Characteristics of all types of exceptional children with emphasis on the educational and psychological implications of these conditions to the development of the child. (F,Sp,Su) DE

SPED 4790 Special Topics 1-4®

SPED 4910 Undergraduate Research and Creative Opportunities 1-4®
Individually directed study at the undergraduate level. Graded Pass/Fail *only*. Permission of instructor required. (F,Sp,Su) DE

SPED 4970 Honors Thesis 1-6®
Provides an opportunity for honors students in the Department of Special Education and Rehabilitation to interact with other honors students in the College of Education and Human Services and explore an interdisciplinary area of interest. A written paper will be required. (F,Sp,Su)

SPED 5010 QI Applied Behavioral Analysis 1: Principles, Assessment, and Analysis 3
Covers topics related to collecting data, using data to make decisions, analyzing data, graphing data, and applying principles of behavior management and instruction to children and youth. Prerequisite: Admission to special education major or permission of instructor. (F) DE

SPED 5040 Foundations of Effective Assessment and Instructional Practices 3
Principles of standardized and curriculum-based assessment. Foundations for designing effective instructional programs to help students achieve mastery and proficiency. Prerequisite: Admission to special education major and SPED 5010 or permission of instructor. (F) DE

SPED 5050 Applied Behavioral Analysis 2: Applications 3
Expands knowledge of basic applied behavior analysis principles. Develops skills for remediating behavior problems using functional behavioral assessment. Prerequisite: Admission to special education major or permission of instructor. (Sp) DE

SPED 5060 Consulting with Parents and Teachers 3
Provides strategies for communicating with parents and teachers, as members of a multidisciplinary team, to assist parents and other teachers in collaborative problem solving. Prerequisite: Admission to special education major or permission of instructor. (Sp) DE

SPED 5070 Policies and Procedures in Special Education 1-3®
Provides an understanding of federal and state laws for persons with disabilities and procedures for organizing a special education classroom and auxiliary staff. Prerequisite: Admission to special education major or permission of instructor. (F) DE

SPED 5200 CI Student Teaching in Special Education 3-15
Graded Pass/Fail *only*. Prerequisite: Admission to special education major or permission of instructor. (F,Sp,Su) DE

SPED 5210 CI Student Teaching in Special Education: Dual Majors 3-15
Undergraduate student teaching for dual majors. Graded Pass/Fail *only*. (F,Sp,Su) DE

SPED 5220 Special Education Student Teaching Seminar 3
Weekly seminar taken concurrently with student teaching (SPED 5200 or 5210). Focuses on problems arising during student teaching and the development of a teaching portfolio. Prerequisites: Admission to teacher education and completion of the SPED sequence. (F,Sp,Su)

SPED 5230 Student Teaching in Special Education: Alternative Preparation 3-15
Student teaching for students in alternative teacher preparation programs. Graded Pass/Fail *only*. (F,Sp,Su) DE

SPED 5300 Orientation to Teaching Students with Mild/Moderate Disabilities 2
Provides preservice teachers with overview of information and resources, examples, and practice in applying effective instructional and behavior management strategies in their classrooms. Emphasizes knowledge/skills first day and first week of school. (Su) DE

SPED 5310 Teaching Reading and Language Arts to Students with Mild/Moderate Disabilities 2-4
Curriculum, instructional methods, assessment, and data-based decision making related to teaching reading and language arts to students with mild/moderate disabilities. (F) DE

SPED 5320 Teaching Content Areas and Transition to Students with Mild/Moderate Disabilities 3
Students learn to teach content area material, learning strategies, and transition-related skills to students with mild/moderate disabilities. Also includes assessment and decision making strategies related to these curricular areas. (Sp) DE

SPED 5330 Eligibility Assessment for Students with Mild/Moderate Disabilities 1
Covers topics of choosing and administering eligibility assessment tests for students who may have mild/moderate disabilities. Interpretation of test results and applying results to decisions regarding students' eligibility for special education services. Graded Pass/Fail *only*. (F) DE

SPED 5340 Teaching Math to Students with Mild/Moderate Disabilities 3
Explains procedures for teaching mathematics to students with mild/moderate disabilities, so that each progresses as fast as his or her capabilities will allow. Prerequisite: Admission to special education major or permission of instructor. (Sp) DE

SPED 5350 Teaching Students with Mild/ Moderate Disabilities I 3
Provides students with information and skills in the area of classroom and individual behavior management procedures. Emphasizes research-validated strategies that students will apply to everyday instructional situations. Prerequisite: Admission to the Alternative Teacher Preparation Licensure Program. (F) DE

SPED 5360 Teaching Students with Mild/ Moderate Disabilities II 3
Provides students with instructional and management skills. Through case studies and classroom simulations, students learn research-validated

instructional and management skills. Prerequisite: Admission to the Alternative Preparation Licensure Program. (Sp) DE

SPED 5400 Orientation to Teaching Students with Severe Disabilities 2
Provides preservice teachers with overview of information, resources, examples, and practices in applying effective instructional and behavior management strategies to students with severe disabilities. (F) DE

SPED 5410 Practicum: Direct Instruction Reading and Language Arts for Students with Mild/Moderate Disabilities 1-3
Students learn to use Direct Instruction techniques, positive management, curriculum-based assessment, and data-based decision-making to teach reading and language arts to children with mild/moderate disabilities. Students are placed in a classroom, where they teach a group of children daily. (F) DE

SPED 5420 Practicum: Teaching Mathematics to Students with Mild/Moderate Disabilities 4
Covers use of effective instructional techniques, positive management, curriculum-based assessment, and data-based decision making to teach mathematics content to children with mild/moderate disabilities. Students placed in a classroom, where they teach one or more group(s) of children daily. (Sp) DE

SPED 5430 Field-Based Applications for Students with Mild/Moderate Disabilities 3
Designed to help students acquire and consistently demonstrate effective teaching practices to aid students with mild/moderate disabilities. Teaches students to analyze and solve instructional and management problems. Graded Pass/Fail *only*. Prerequisite: Admission to the Alternative Teacher Preparation Licensure Program. (F) DE

SPED 5510 Curriculum for Students with Severe Disabilities 3-4
Provides information about commercially available curricular materials, as well as how to plan for and design functional academic curricula, for persons with severe disabilities. Prerequisite: Admission to Special Education major or permission of instructor. (F) DE

SPED 5520 Curriculum for Secondary-Level Students with Severe Disabilities 3
Provides information on developing and implementing secondary-level classroom, community, domestic, leisure, and transition instructional programs. Prerequisite: Admission to Special Education major or permission of instructor. (Sp)

SPED 5530 Technology for Teaching Exceptional Learners 3
Familiarizes students with existing technology (IT and AT), federal and state technology legislation, and resources to fund technology in the classroom. Teaches methods for evaluating technology needs of individuals with disabilities. Prerequisite: Admission to Special Education major or permission of instructor. Taught on campus during spring semester *only.* Occasionally offered off campus during fall semester. (F,Sp) DE

SPED 5540 Assessment of Persons with Severe Disabilities 1
Provides students with knowledge and skills necessary for conducting assessment activities with pupils having severe disabilities. Covers norm-referenced/standardized, criterion-referenced, and alternative assessment instruments. Students complete assignments in administering, interpreting, and communicating results of each type of assessment. (Sp)

SPED 5550 Field-Based Applications for Students with Severe Disabilities 3
Designed to help students acquire and consistently demonstrate effective teaching practices to aid students with severe disabilities. Teaches students to analyze and solve instructional and management problems. Prerequisite: Admission to Severe Alternative Teacher Preparation Program. (Sp) DE

SPED 5560 Practicum in Improving School System Programs 1-4®
Practicum or seminar providing information/experience in public school instruction. Permission of instructor required.

SPED 5570 Advanced Field-Based Applications for Students with Severe Disabilities 3
Designed to help students become competent in various effective teaching practices with students who have severe disabilities. Prerequisites: Admission to Severe Alternative Teacher Preparation Program and completion of SPED 5550. (F) DE

SPED 5600 Practicum: Instruction in Academic Skills 3
A field-based class providing experience in observing and teaching functional academic curricula to students with severe disabilities. Prerequisite: Permission of instructor. (F) DE

SPED 5610 Practicum: Instruction in Daily Living Skills 4
Provides opportunity to assess students' needs and to design programs for community, domestic, leisure, and transitional skills. Prerequisite: Permission of instructor. (Sp)

SPED 5710 Young Children with Disabilities: Characteristics and Services 3
Provides information about young children with disabilities, including historical development of services, skill areas, family involvement, teaming, and the array of service environments. Prerequisite: Admission to Special Education major or permission of instructor. (Sp)

SPED 5720 Behavior Analysis Practicum 3
Students receive supervised training in applying behavior analysis principles in community, school, and institutional settings. Either SPED 5050 or PSY/SPED 5720 fulfill part of practicum requirement for Behavior Analysis track. Prerequisite: Permission of instructor. Also taught as PSY 5720.

SPED 5730 (dual listing 6260) Intervention Strategies for Young Children with Disabilities 3
Provides information on curricula, instructional strategies, service environments, and staffing roles for teachers of young children (0-5) with disabilities. (F)

SPED 5790 Special Topics 1-4®
(F,Sp,Su) DE

SPED 5810 Seminar and Field Experiences with Infants and Families 4
Participation with an infant and family in both the home and early intervention setting. Seminar topics include infant medical issues, health, safety, syndromes, and low incidence characteristics. (Sp)

SPED 5820 Preschool Practicum with Young Children with Disabilities in Community Environments 1-4®
Students participate in variety of environments serving preschoolers with disabilities, assist in developing a family service plan, and teach other staff to implement techniques. (F)

SPED 5830 Seminar Working with Peers on Multidisciplinary Teams 1
Seminar for discussion of topics pertaining to how teams work with children, with and without disabilities, in a practicum. Students are assigned to a team for planning and problem solving throughout the semester. (F,Sp)

SPED 5840 Seminar: Preschool Practicum with Young Children with Disabilities 2
Students participate in variety of environments, problem solving and teaming about their experiences. Must be taken concurrently with SPED 5820. (F)

SPED 5900 Independent Study 1-3®
Permission of instructor required. (F,Sp,Su) DE

SPED 5910 Independent Research 1-3®
Permission of instructor required. (F,Sp,Su)

SPED 6010 Interventions for Parents and Families 2
Explores special challenges faced by parents and families of at-risk students and students with disabilities. Emphasizes intervention strategies, supportive resources, and parent programs.

SPED 6020 Design and Evaluation of Instruction 3
Presents curriculum in which diagnosis and instruction are welded as a unit into the regular teaching procedures. (Sp) DE

SPED 6030 Clinical Practicum: Student Teaching 2-12
Supervised practicum in a clinical teaching setting. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. DE

SPED 6040 Functional and Augmentative Communication Approaches and Technology 3
Theory and methods of symbolic and nonsymbolic communication acquisition, especially for students with dual sensory impairments. Application of instruction and systems within natural routines. (F)

SPED 6050 Issues with the Delivery of Services for Students with Dual Sensory Impairments 2
In-depth presentation of best practices for educational services for students with dual sensory impairments. (F)

SPED 6060 Legal Issues in Special Education 3
Provides knowledge of a wide range of legal issues concerning the provision of special education services to students with disabilities. (F,Sp,Su) DE

SPED 6070 Infusing Mobility and Communication for Students with Dual Sensory Impairments 2
Reviews methods for providing orientation and mobility training to students with dual sensory impairments. Provides methods for infusing these and communication objectives into normal age-based routine activities. (Sp)

SPED 6080 Collaboration and Management of Services for Students with Dual Sensory Impairments 2
Reviews methods of planning and coordination of services for students with dual sensory impairments (e.g., transition, lifestyle planning, transition team coordination). Service management addressing issues of scheduling, monitoring, and training of staff and peers. (Sp)

SPED 6090 Curriculum and Environmental Variations and Management 2
Presents instructional and curricular strategies to promote utilization of residual vision or hearing skills. Overviews tactile cuing and movement-based approaches, with emphasis on integration within natural context and functional activities. Review of model delivery methods. (Sp)

SPED 6110 Social and Psychological Implications of Visual Impairments 2
Explores attitudes and beliefs related to visual impairment and blindness. Emphasizes impact of vision loss on the psychosocial functioning of individuals and their families. Studies self-concept, self-esteem, and strategies to enhance these areas in visually impaired children. (Su)

SPED 6120 Ocular Disorders and Examination Techniques of Low Vision 4
Students demonstrate the ability to identify the important parts of the visual system, to understand and interpret eye reports, and to translate the information into an educational plan. Participants also conduct and supervise vision screening clinics. In addition, participants demonstrate a basic understanding of approaches and practices of low-vision services. Includes low-vision aids, optics, and environmental modifications. (F) DE

SPED 6130 Literary Braille Codes and Technologies 4
Focuses on reading and writing literary braille. Includes literary braille contractions, short-form words, punctuation, and rules of usage for basic Grade 2 braille, using the Perkins Braille Writer. Emphasizes accuracy, beginning formatting, and ability to apply the rules. Using a slate and stylus, as well as computerized braille writers, students learn to write literary braille. (F) DE

SPED 6140 Nemeth Braille Codes and Braille Technologies 3
Transcription of print mathematical symbols into appropriate formats, using Nemeth Braille Code of Mathematics. Computation skills using adapted abacus for basic mathematical operation. Explores braille music, foreign language braille, computer braille, and Grade 3 braille. Emphasizes literary braille in more extended writing projects. (Sp) DE

SPED 6150 Teaching Children with Dual Sensory Impairments (Deaf/Blind) 3
Provides basic understanding of the needs of learners (ages 0-22) having sensory impairments with multiple disabilities. Includes role and characteristics of the transdisciplinary team, learning environments, resources, assessment procedures, and instructional strategies. Identifies inclusion procedures, transitional issues, and methods of encouraging parental involvement. (Su)

SPED 6160 Introduction to Orientation and Mobility 2
Introduces students to orientation and mobility, as well as basic assessment techniques. Students learn to use the results of these assessments, along with specific teaching techniques in pre-cane orientation and mobility skills, in teaching children with visual impairments. Students also become familiar with basic indoor (non-cane) mobility techniques, learn to identify and teach orientation cues in the environments, and develop lesson plans to teach concepts necessary for future cane travel. (Su)

SPED 6170 Instructional Management for Students with Visual Impairments (0-21) 4®
Emphasizes best practices for instructional management of children with visual impairments in early intervention settings, preschool programs, and early elementary grades. Also addresses practices for older students in upper elementary through high school grades. Explores strategies for development of basic concepts, socialization skills, emergent literacy, effective braille reading and writing, daily living skills, career understanding, and recreational and leisure skills. Focuses on understanding agency and community resources, family collaboration, modification and adaptation of materials and environments, and adapted technology. (Sp) DE

SPED 6180 Field Studies in Visual Impairments 1
Participants work with visually impaired students in a variety of educational sites. Emphasizes use of adapted technology, implementation of teaching activities, student assessment, and modification of educational materials. Corequisite: SPED 6130 or 6170. (F,Sp) DE

SPED 6220 Characteristics of Children with Emotional and Behavioral Disorders 3
Explores characteristics of children and youth with emotional and behavioral disorders. Covers definitions, prevalence and incidence, classification, causal factors, and facets of disordered behavior. (3 cr)

SPED 6230 Education of Students with Emotional and Behavioral Disorders 2
Methods of teaching students with emotional and behavioral disorders, including educational strategies and behavioral treatments.

SPED 6260 (dual listing 5730) Intervention Strategies for Young Children with Disabilities 3
Provides information on curricula, instructional strategies, service environments, and staffing roles for teachers of young children (0-5) with disabilities. (F)

SPED 6280 Instructional Leadership for At-Risk Students 3
Examines theories and practices of instructional leadership for at-risk students. Instructs students in services and programs available for at-risk students. (Sp,Su) DE

SPED 6290 Teaching Social Skills, Self-Management, and Values 3
Discussion of current research and practices related to teaching social skills, self-management, and values. Explores teaching procedures and curriculum programs. (Sp)

SPED 6300 Collaboration Skills for Classroom Teachers 3
Emphasizes knowledge, attitudes, and skills which special educators must possess to effectively collaborate with parents and professionals. (F) DE

SPED 6320 Seminars in Learning Characteristics of Students with Dual Sensory Impairments 2
Investigates characteristics of dual sensory impairment, learning styles, and environmental demands. Awareness of eye and ear anatomy. Interpretation of formal assessments. Development of instructional strategies. (Su)

Course Descriptions

SPED 6410 Field Studies I: Analysis of Service for Students with Dual Sensory Impairments 2
First of three field experiences for students in the DSI program. Emphasizes team-based review and analysis of services. (F)

SPED 6420 Field Studies II: Analysis of Service for Students with Dual Sensory Impairments 2
Practicum in integrated programs for students with dual sensory impairments within the context of the model classroom. Emphasizes transdisciplinary methods for assessment, instructional design, and planning skills.

SPED 6430 Field Studies III: Analysis of Service for Students with Dual Sensory Impairments 2
Advanced practicum in integrated programs for students with dual sensory impairments. Emphasizes an overall management of instructional environment and services.

SPED 6500 Interdisciplinary Workshop 1-3®
Series of self-instructional modules and videos and a variety of elective training. Module topics include developmental disabilities, legal aspects and issues, assessment, intervention, assistive technology, transition, and prevention/ intervention for aggression and violence. (F,Sp,Su)

SPED 6550 Practicum in the Evaluation of Instruction 1-4®
Field-based research course contributing toward graduate degrees and supervisory licensure related to the assessment of an ongoing or newly proposed program of instruction. (F,Sp,Su)

SPED 6560 Improvement of Instruction 1-4®
Focuses on effective teaching methodologies, teaching performance, and curriculum decision making. (F,Sp,Su)

SPED 6700 (dual listing 7700) Single-Subject Research Methods and Designs 3
Examines single-subject research methods for applied research, including measurement, design, and analysis issues. Also taught as EDUC 6700/7700. (F) DE

SPED 6720 Advanced Behavior Analysis in Education 3
Discussion of advanced behavior analytic assessment and intervention techniques used in classroom settings. Topics include: functional analysis, function-based interventions, behavioral teaching procedures, reinforcer identification strategies, and strategies for promoting generalization and maintenance of behavior. (Sp) DE

SPED 6790 Special Topics DE 1-4®

SPED 6810 Seminar in Special Education 1-3®
(F,Sp,Su)

SPED 6900 Independent Study 1-2®
Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 6910 Independent Research 1-2®
Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 6930 Internship in Special Education 2-10
Professional and supervised intern experience for master's program. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 6960 Creative Project 1-6®
Culminating experience of MEd program. Prerequisite: Proposal approval by supervisory committee. (F,Sp,Su) DE

SPED 6970 Thesis 1-9®
Culminating experience of MS program. Graded Pass/Fail *only*. Prerequisite: Proposal approval by supervisory committee. (F,Sp,Su) DE

SPED 6990 Continuing Graduate Advisement 1-8®
Graded Pass/Fail *only*. (F,Sp,Su) DE

SPED 7050 Internship in Program Evaluation 1-5®
Guided experience in evaluation of educational programs in schools, treatment centers, homes, and communities. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7060 Research Internship 1-5®
Guided experience in conducting educational research. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7070 Grant Writing 1-3®
Guided experience in preparation of grant proposals. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7080 Writing for Publication 1-3
In-depth individualized experience in which the student chooses a topic area, then writes a scholarly manuscript which is submitted for publication in a peer-reviewed academic journal. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7090 Conference Presentation 1-3
Individualized, supervised experience in which the student identifies an important topic and appropriate conference, and then makes a professional conference presentation. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7330 Supervision Internship 1-5®
Guided experience in supervising undergraduate and master's students during practica, student teaching, and other field experiences. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7340 College Teaching Internship 1-3®
Guided experience in teaching university courses. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7400 Cultural and Linguistic Diversity and Disability 3**
Surveys major issues, topics, and perspectives related to the intersection of cultural/linguistic diversity and disability. (F)

SPED 7500 Interdisciplinary Workshop 1-3®
Workshop on current interdisciplinary issues and topics in special education and related fields. (F,Sp,Su)

SPED 7700 (dual listing 6700) Single-Subject Research Methods and Designs 3
Examines single-subject research methods for applied research, including measurement, design, and analysis issues. Also taught as EDUC 7700/6700. (F,Su) DE

SPED 7710 Advanced Single-Subject Research Methods and Design 3
Explores advanced concepts and procedures in within-subject research methods. Builds on knowledge and skills acquired in SPED 7700 regarding scientific questions, measures, research designs, data analysis, and inference. Students analyze research and design, conduct, and report a scientific study. Prerequisite: SPED 7700. (Sp)

SPED 7720 Advanced Applied Behavior Analysis 3**
Discussion of advanced topics in applied behavior analysis including: functional analysis, function-based interventions, behavioral acquisition procedures, and strategies for promoting generalization and maintenance of behavior. Specific discusssion of how applied behavior analytic principles can be used in educational contexts. (Sp)

SPED 7730 Advanced Topics in Behavior Analysis* 3
Discusses advanced topics and issues in behavior analysis, including generalization, higher-order learning, variability, novelty, rule-governed behavior, and private events. (Sp)

SPED 7800 Seminar: Issues in Special Education and Rehabilitation 1-3®
Critical analysis of variety of special education and rehabilitation issues and trends. Empirical and theoretical information presented in a seminar format. (F,Sp,Su)

SPED 7810 Research Seminar in Special Education and Rehabilitation 1-3®
Identification of research problems and discussion of research strategies and methods. Applications of research, data analysis, and statistical concepts. (F,Sp,Su)

SPED 7820 Seminar: Special Topics 1-3®
In-depth study of special topics in special education and rehabilitation. Seminars examine historical aspects, relevant research, and theoretical positions on selected topics. (F,Sp,Su)

SPED 7830 Special Education Personnel Preparation Methods 2
Focuses on critical issues in preparing special education teachers. Includes teaching, supervision, and overall program development. Students demonstrate supervision and teaching competencies. (Sp)

SPED 7900 Independent Study 1-3®
Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7910 Independent Research 1-3®
Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7920 Doctoral Program Professional Seminar 3
Orients new students to doctoral program, utilizing five goals: (1) familiarize students with requirements of the program and of the Graduate School, (2) acquaint students with the faculty and the resources available, (3) initiate a career planning process, (4) teach students some fundamental concepts underlying scientific research, and (5) teach students to conduct literature reviews. (F)

SPED 7930 Internship in Special Education 1-12®
Professional, supervised internship experience for doctoral students. Graded Pass/Fail *only*. Prerequisite: Permission of instructor. (F,Sp,Su)

SPED 7940 Journal Reading Group 1-2®
Seminar discussion of recent empirical and theoretical journal articles in special education and related fields. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7970 Dissertation 1-15®
Variable credit for dissertation project in connection with doctoral program in special education. Graded Pass/Fail *only*. (F,Sp,Su)

SPED 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

*Taught 2010-2011.

**Taught 2009-2010.

Statistics (STAT)

See Department of Mathematics and Statistics, pages 359-368

STAT 1040 QL Introduction to Statistics 3
Descriptive and inferential statistical methods. Emphasis on conceptual understanding and statistical thinking. Examples presented from many different areas. Prerequisite: *C* or better in MATH 1010 or Math ACT score of at least 23 (Math SAT score of at least 540) within the Math prerequisite acceptability time limit; or satisfactory score on Math Placement Test. (F,Sp,Su) DE

STAT 2000 QI Statistical Methods 3
Introduction to statistical concepts, graphical techniques, probability, distributions, estimation, one and two sample testing, chi-square tests, and simple linear regression. Prerequisite: *C-* or better in MATH 1050 or Math ACT score of at least 23 (Math SAT score of at least 540) within the Math prerequisite acceptability time limit; or satisfactory score on Math Placement Test. (F,Sp) DE

STAT 2250 Internship and Cooperative Studies 1-6
Lower-division internship/cooperative work experience in statistics. (F,Sp,Su)

STAT 2300 QL Business Statistics 4
Descriptive and inferential statistics, probability, sampling, estimation, tests of hypotheses, linear regression and correlation, chi-square tests, analysis of variance, and multiple regression. Prerequisite: *C-* or better in MATH 1050 or Math ACT score of at least 25 (Math SAT score of at least 580) within the Math prerequisite acceptability time limit; or satisfactory score on Math Placement Test. (F,Sp,Su) DE

STAT 2950 Directed Reading and Conference 1-3®
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su)

STAT 3000 QI Statistics for Scientists 3
Introduction to statistical concepts, graphical techniques, discrete and continuous distributions, parameter estimation, hypothesis testing, and chi-square tests. Prerequisite: *C-* or better in MATH 1100 or 1210. (F,Sp,Su) DE

STAT 4250 Advanced Internship/Co-op 1-6®
Advanced educational work experience in statistics. Prerequisite: Approval of instructor. (F,Sp,Su)

STAT 4500 Methods of Teaching Statistics in Secondary and Middle School 3
Teaching methods course required for all prospective mathematics and statistics composite teaching majors. Corequisite: MATH 4500. Prerequisites: MATH 3110; MATH 4200 or 4310; STAT 2000 or 3000. (F,Sp)

STAT 4950 Directed Reading and Conference 1-3®
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su)

STAT 5100 CI/QI Linear Regression and Time Series 3
Methods for prediction and hypothesis testing in multiple linear regression models, including analysis of variance and covariance, logistic regression, introduction to time series, and signal processing. Prerequisite: *C-* or better in STAT 2000 or 3000. (F) DE

STAT 5120 Categorical Data Analysis 3
Analysis of categorical data, contingency tables, goodness of fit, random sampling, log-linear and logistic regression models, and sampling for proportions, as well as stratified and cluster sampling. Prerequisite: *C-* or better in STAT 5100. (F)

STAT 5200 Design of Experiments 3
Design, analysis, and interpretation of experiments, split plots, incomplete blocks, confounding, fractional factorials, nested designs, two- and three-way analysis of variance, covariance, and multiple regression. Prerequisite: *C-* or better in STAT 2000 or 3000. (Sp) DE

STAT 5300 QI Statistical Process Control 3
Techniques and applications of statistics in modern management of industrial processes. Control charts, acceptance sampling, design of industrial experiments, and analysis of process failures. Prerequisite: *C-* or better in STAT 2000 or 3000. This course is not currently being offered. For information about when it may be offered, contact the department.

STAT 5410 Applied Spatial Statistics 3 (dual listing 6410)
Explores spatial point patterns, spatially continuous data, area (grid) data, nearest neighbor distances, K function, complete spatial randomness, variogram, kriging, correlogram, and Moran's I. For graduate (6000-level credit), a major project is required. Prerequisite: *C-* or better in STAT 3000. Knowledge of a statistical package (e.g., S-Plus, R, SAS, etc.) or any programming language (e.g., C/C++, FORTRAN, etc.) is *strongly recommended*. (F)

STAT 5570 Statistical Bioinformatics 3 (dual listing 6570)
Introduction to current statistical issues in bioinformatics, primarily gene expression and sequence analysis, using bioconductor tools. Topics include data normalization and visualization, differential expression, annotation, scoring alignments, HMMs, and phylogenetic trees. For graduate (6000-level) credit, major project required. Prerequisite: *C-* or better in STAT 5100 or 5200. (Sp)

STAT 5600 CI Applied Multivariate Statistics 3
Introduction to multivariate statistical procedures for data analysis. Topics include MANOVA, principal component analysis, factor analysis, clustering, and classification. Prerequisite: *C-* or better in STAT 5100. (Sp)

Course Descriptions

STAT 5810 Topics in Statistics 1-3®
STAT 5820 Topics in Statistics 1-3®
Prerequisite: Consent of instructor. (F)[DE] (Sp)[DE]

STAT 5890 CI Problem Solving in Statistics 3
Capstone course for Statistics majors, applying course material covered in the undergraduate major. Prerequisite: Permission of instructor. (Sp)

STAT 5940 Directed Reading and Conference 1-3®
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su)

STAT 5950 Senior Honors Project 1-4
A senior project, required for completion of the departmental honors program and developed under the direction of a departmental faculty member. Prerequisite: Permission of instructor. (F,Sp,Su)

STAT 5970 Seminar 1-3®
Review of current literature and developments in the field of statistics. (F,Sp)

STAT 6100 Advanced Regression Analysis* 3
Explores the following topics in the theory of linear models: least squares estimation, the general linear hypothesis, regression diagnostics for multicollinearity, outliers, and influential points. Also includes discussion of robust regression, nonlinear regression, generalized linear models, ACE, generalized additive models, and regression models for survival data. Prerequisites: *C-* or better in MATH 5720 and STAT 5100. (F)

STAT 6180 Time Series 3
The domain and frequency domain time series analysis, including Box-Jenkins methods, spectral analysis and filtering, introduction to state space methodology. Prerequisites: *C-* or better in STAT 5100, MATH 5720. This course is not currently being offered. For information about when it may be offered, contact the department.

STAT 6190 Wavelet Methods for Time Series 3**
Explores time series models, time and frequency domain analysis, discrete wavelet transform, and wavelet ANOVA, as well as applications in physics and finance. Prerequisites: *C-* or better in MATH 5720 and STAT 5100. (Sp)

STAT 6200 Analysis of Unbalanced Data and Complex Experimental Designs* 3
Examines means and effects models, estimability, and type I-IV hypotheses. Contrasts and sums of squares. Generalized linear models for experimental data. Linear mixed models. Generalized linear mixed models. Analysis of complex experimental designs. Nonreplicated experiments. Tests for additivity. Half-normal plots. Prerequisite: *C-* or better in STAT 5200. (Sp)

STAT 6250 Graduate Internship/Co-op* 1-8®**
Educational work experience at the graduate level. Prerequisite: Permission of instructor.

STAT 6410 Applied Spatial Statistics 3
(dual listing 5410)
Explores spatial point patterns, spatially continuous data, area (grid) data, nearest neighbor distances, K function, complete spatial randomness, variogram, kriging, correlogram, and Moran's I. For graduate (6000-level credit), a major project is required. Prerequisite: *C-* or better in STAT 3000. Knowledge of a statistical package (e.g., S-Plus, R, SAS, etc.) or any programming language (e.g., C/C++, FORTRAN, etc.) is *strongly recommended*. (F)

STAT 6530 Modern Nonparametric Statistics 3**
Examines topics in resampling methods including: the jackknife and the bootstrap, bias, variance, and confidence intervals. Also explores the following topics in smoothing methods: histograms, kernel density estimates, and local polynomial regression. Includes testing procedures using ranks and empirical cumulative distribution functions. Prerequisites: *C-* or better in MATH 5710 and STAT 3000. (Sp)

STAT 6550 Statistical Computing* 3**
Survey of algorithms and tools for modern statistical computing. Topics include simulation design and implementation, algorithms for linear regression and subset selection, smoothing algorithms, fast fourier transform, EM algorithm, numerical methods for maximum likelihood estimation, and neural networks. Prerequisites: *C-* or better in MATH 5720 and knowledge of a programming language. (Sp)

STAT 6560 Graphical Methods* 3**
Statistical graphics and scientific visualization of one, two, and higher dimensional data. Well-chosen and designed graphics are vital in exploratory data analysis, model diagnostics, and data presentation. Includes specific methods and general principles, such as effective use of color and motion. Prerequisites: *C-* or better in STAT 3000 and programming experience. (F)

STAT 6570 Statistical Bioinformatics 3
(dual listing 5570)
Introduction to current statistical issues in bioinformatics, primarily gene expression and sequence analysis, using bioconductor tools. Topics include data normalization and visualization, differential expression, annotation, scoring alignments, HMMs, and phylogenetic trees. For graduate (6000-level) credit, major project required. Prerequisite: *C-* or better in STAT 5100 or 5200. (Sp)

STAT 6600 Multivariate Analysis 3
Statistical methods for analyzing multivariate data and the theory behind them. Topics include multivariate normal distribution and multivariate distributions derived from it, multivariate t-tests, regression, MANOVA, principal components and factor analysis, multidimensional scaling, classification, and cluster analysis. Prerequisites: *C-* or better in MATH 5720. This course is not currently being offered. For information about when it may be offered, contact the department.

STAT 6650 Statistical Learning: Multivariate Statistical Analysis for Bioinformatics, Data Mining, and Machine Learning 3**
Explores supervised learning, linear methods for regression and classification, model assessment and selection, model inference and averaging, additive models, boosting, neural networks, support vector machines, and unsupervised learning. Prerequisites: *C-* or better in MATH 5720 and STAT 5100. Programming experience in R or a related language is *strongly recommended*. (F)

STAT 6710 Mathematical Statistics I 3
Modes of convergence of random variables, laws of large numbers, characteristic functions, and the central limit theorem. Prerequisite: *C-* or better in MATH 5720. (F)

STAT 6720 Mathematical Statistics II 3
Consistency, loss functions, risk, and notions of optimality of estimations. Hypothesis testing and confidence regions. Large sample theory, notions of robustness. Prerequisite: *C-* or better in STAT 6710. (Sp)

STAT 6740 Bayesian Statistics 3**
Conditional probability, Bayes' theorem, conjugate and objective priors, Bayesian inference and decision theory, model averaging, multi-parameter and hierarchical models, sampling and numerical integration methods, linear models, generalized linear models, and models for correlated data. Prerequisites: MATH 5720 and STAT 5100. (Sp)

STAT 6810 Topics in Statistics (Topic)* 3®**
STAT 6820 Topics in Statistics (Topic)* 3®**
Prerequisite: Permission of instructor. (F) (Sp)

STAT 6890 Practical Statistical Consulting* 1-3®**
Introduction to statistical consulting for graduate students, for faculty in other research departments, and for business, industry, and government. Prerequisite: Permission of instructor. (F,Sp,Su)

STAT 6910 Seminar in Statistics* 1-3®**
Review of current literature and developments in statistics. Prerequisite: Permission of instructor. (F,Sp)

STAT 6950 Directed Reading and Conference* 1-4®**
Prerequisite: Prior arrangement with specific instructor. (F,Sp,Su)

STAT 6970 Thesis and Research 1-6®
Outlining and conducting research in statistics. Thesis preparation. Graded Pass/Fail *only*. (F,Sp,Su)

STAT 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

STAT 7110 Linear Models (Topic)* 3®**
STAT 7120 Linear Models (Topic)* 3®**
(F) (Sp)

STAT 7180 **Time Series Analysis (Topic)*** ** **3®**
STAT 7190 **Time Series Analysis (Topic)*** ** **3®**
(F) (Sp)

STAT 7210 **Experimental Design (Topic)*** ** **3®**
STAT 7220 **Experimental Design (Topic)*** ** **3®**
(F) (Sp)

STAT 7310 **Business and Industrial Statistics (Topic)*** ** **3®**
STAT 7320 **Business and Industrial Statistics (Topic)*** ** **3®**
(F) (Sp)

STAT 7510 **Nonparametric Statistics (Topic)*** ** **3®**
STAT 7520 **Nonparametric Statistics (Topic)*** ** **3®**
(F) (Sp)

STAT 7550 **Computational and Graphical Statistics (Topic)*** ** **3®**
STAT 7560 **Computational and Graphical Statistics (Topic)*** ** **3®**
(F) (Sp)

STAT 7610 **Multivariate Statistics (Topic)*** ** **3®**
STAT 7620 **Multivariate Statistics (Topic)*** ** **3®**
(F) (Sp)

STAT 7710 **Mathematical Statistics (Topic)*** ** **3®**
STAT 7720 **Mathematical Statistics (Topic)*** ** **3®**
(F) (Sp)

STAT 7730 **Bayesian Statistics and Decision Theory (Topic)*** ** **3®**
STAT 7740 **Bayesian Statistics and Decision Theory (Topic)*** ** **3®**
(F) (Sp)

STAT 7810 **Topics in Statistics (Topic)** **1-3®**
STAT 7820 **Topics in Statistics (Topic)** **1-3®**
(F) (Sp)

STAT 7970 **Dissertation Research** **1-15®**
Graded Pass/Fail *only*. (F,Sp,Su)

STAT 7990 **Continuing Graduate Advisement** **1-9®**
Graded Pass/Fail *only*. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
***This course will be taught as needed. For information about availability, contact the Department of Mathematics and Statistics.

Social Work (SW)

See Department of Sociology, Social Work and Anthropology, pages 448-462

SW 1010 **Introduction to Social Welfare** **3**
Foundation course to facilitate development of an approach to thinking about social welfare. Explores broad common base of social work professional values, knowledge, skills, social policies, and programs. (F,Sp) DE

SW 2100 **Human Behavior in the Social Environment** **3**
Interrelatedness of social, cultural, and environmental factors that combine with biological and psychological compenents to mold human behavior. Relevance of these factors to generalist social work practice. Prerequisite: SW 1010. (Sp) DE

SW 2400 **Social Work with Diverse Populations** **3**
Examines characteristics of various populations, including patterns, dynamics, and consequences of discrimination, economic deprivation, and oppression. Emphasis placed on empowerment of groups and individuals, as well as the accumulation of multicultural competence. Prerequisite: SW 1010. (Sp) DE

SW 3050 **Practice I** **3**
Introduction of generalist social work framework as an integrative tool, with special attention shown to strengths and empowerment perspective. Individuals as targets for change. Prerequisite: Admission to advanced standing in social work bachelor's program, SW 1010, 2100, 2400. (F)

SW 3350 **Child Welfare** **3**
Developments in programs for meeting such needs of children as substitute parental care, adoptions, delinquency problems, mental retardation, and unmarried motherhood. Prerequisites: SW 1010, 2100, 2400.

SW 3360 **Adolescents: Theories, Problems, and Issues*** **3**
Focuses on major social problems confronting youth today: teenage pregnancy, substance abuse, unemployment, education, and mental health. Investigation of theories explaining these problems and society's efforts to resolve these problems. Prerequisites: SW 1010, 2100, 2400.

SW 3450 **School Social Work*** **3**
Overview of social work practice in an educational setting. Prerequisite: SW 1010. (Sp)

SW 3550 **Social Gerontology*** **3**
Overview of field of aging and its connection to the practice of social work. Prerequisite: SW 1010. (Sp)

SW 3650 **Mental Health*** **3**
Services offered for the prevention and treatment of mental illness and the feasibility of social action programs on a community level. Prerequisites: SW 1010, 2100, 2400.

SW 3750 **Medical Social Services*** **3**
Introduction to role of social worker in health settings. Emphasizes definition of health and disease, patient rights, and consumer participation. Examination of basic health programs, major trends in health planning, and alternate models of health delivery. Prerequisites: SW 1010, 2100, 2400.

SW 3850 **Spirituality and Social Work*** **3**
Provides a framework of knowledge, values, skills, and experiences for spiritually sensitive social work practice. Prerequisite: SW 1010. (F)

SW 4100 **Social Work Research** **3**
Survey of qualitative and quantitative scientific methods of research in social work. Articulation of research with practice and policy. Prerequisites: SW 1010, 2100, 2400. (F)

SW 4150 **Practice II** **3**
Introduction to generalist social work practice at the micro level. Emphasizes study of skills from a strengths and empowerment perspective with individuals, families, and small groups. Special attention paid to ethical issues and working with diverse population. Prerequisite: SW 3050. (Sp)

SW 4160 **Practice III** **3**
Introduction to generalist social work practice at the macro level. Emphasizes study of skills from a strengths and empowerment perspective with groups, organizations, and community systems. Special attention paid to ethical issues and working with diverse populations. Prerequisite: SW 4150. (Sp)

SW 4870 **Beginning Field Practicum** **6®**
Practical experience in a social service agency. Seminar integrates field work experiences and academic knowledge. Emphasizes use of self and integration of knowledge, values, skills, and methods of practice, with special emphasis given to the code of ethics. Prerequisite: Instructor's permission and by application. (F)

SW 4900 **Topical Issue Seminar** **3-6®**
Advanced seminar, designed as a forum for students from varied social science disciplines. Seminars may include issues involved in social work values and ethics, diversity, promotion of social and economic justice, and/or populations-at-risk. Prerequisites: SW 1010, 2100, 2400, and permission of instructor. DE

SW 4950 Directed Readings 1-5®
Independent readings in various areas of social work: practice, policy, HBSE, research, populations-at-risk, values and ethics, social and economic justice, and diversity. Prerequisite: Instructor's permission and a plan for study. (F,Sp)

SW 5350 CI Social Welfare Policy 3
Introduction to policy making in social welfare. Principles of social and economic justice used to analyze selected social policies and programs within a historical and contemporary context. Attention given to differential impact on at-risk populations. Prerequisites: SW 1010, 2100, 2400. (F)

SW 5550 Family Violence: Interpersonal and Intergroup Conflict 3
Examines various types of family and interpersonal violence (i.e., date rape, partner abuse, child abuse, elder abuse, etc.). Focuses on factors leading to violence, as well as consequences for individuals and society. (F)

SW 5870 Advanced Field Practicum 6®
Supervised social work practice and projects. Provides opportunities for advanced social work students to apply classroom learning in a field setting. Minimum of 240 hours in a social service agency required. Prerequisite: Instructor's permission and SW 4870. (Sp)

Master of Social Work Courses

Students should be admitted to the Master of Social Work Program *prior to enrolling* in the following courses.

SW 6000 Principles and Philosophy of Social Work 3
Explores history, traditions, ethics, purpose, philosophy, and knowledge base of the social work profession. Introduces generalist social work problem-solving approach. (F) DE

SW 6050 HBSE I: Individuals and Families in Their Environment 3
Presents and critiques knowledge of human development from infancy to late adolescence in the context of individuals and famililes. Identifies relationships between theoretical frameworks and various biopsychosocial environments. (F) DE

SW 6100 Generalist Practice I: SW Practice with Individuals, Families, and Groups 3
Provides a beginning and general base of practice knowledge, values, and skills for work with individuals, families, and treatment groups in a variety of community and agency contexts. (F) DE

SW 6150 Generalist Practice II: SW Practice with Groups, Organizations, and Communities 3
Provides a beginning and general base of practice knowledge, values, and skills for work with groups, organizations, and communities. (Sp) DE

SW 6200 Social Work Research Methods 3
Introduction to qualitative and quantitative social work research in context of generalist problem-solving approach. (F,Su) DE

SW 6250 HBSE II: Groups, Organizations, and Communities 3
Presents and critiques knowledge of human development in the context of groups, communities, organizations, and institutions. (Sp) DE

SW 6300 Social Policy Analysis 3
Foundation policy course providing comprehensive exploration of theory, history, structure, and impact of social welfare policy on individuals, families, groups, organizations, and institutions. (Sp) DE

SW 6400 Field Practicum I 4
Provides supervised educational and practical social work experience with specified educational objectives in a human-service organization. (F) DE

SW 6450 Field Practicum II 5
Continuation of SW 6400, providing supervised educational and practical social work experience with specified educational objectives in a human-service organization. (Sp) DE

SW 6475 Foundation Block Field Practicum 9
Provides a concentrated supervised educational and practical social work experience with specified educational objectives in a human-service organization. (F,Sp,Su) DE

SW 6500 Advanced Child Welfare Practice in Rural Settings 3
Provides overview of services provided to abused/neglected children and their families, with emphasis on rural contexts. Explores assessment and treatment of problems commonly experienced by child welfare populations. (F) DE

SW 6550 Advanced Practice with Victims and Perpetrators of Family Violence 3
Familiarizes students with problem of family violence, as well as with micro and macro intervention approaches to working with individuals and families impacted by family violence. (Sp,Su) DE

SW 6575 Social Work Practice with Substance Abusing Clients 3
Addresses practice in the field of substance abuse, including understanding of substance abuse policy and treatment issues. (F,Sp,Su) DE

SW 6600 Policy and Administration 3
Addresses planning and program development of human service organizations. Studies theories, types, levels, applications, and issues of planning and policy implementation. (Sp) DE

SW 6650 Advanced Research Methods 3
Students apply their understanding of research methods, theories, and social work values (learned in SW 6200) while completing a research project. (Sp,Su) DE

SW 6700 Advanced Generalist Practice I: Individuals and Families 3
Focuses on advanced application of generalist problem-solving theories and skills in working with individuals and families. (F) DE

SW 6750 Advanced Generalist Practice II: Groups 3
Focuses on advanced application of generalist problem-solving theories and skills in working with task and treatment groups. (Sp) DE

SW 6775 Forensic Social Work Practice 3
Provides introduction to and overview of forensic social work practice. (F,Sp,Su) DE

SW 6800 Law and Ethics for Social Workers 3
Provides students with basic understanding of law and ethics within the context of social work practice, including legal rights of individuals, legal processes, the legal system, and ethical dilemmas and issues. (F,Su) DE

SW 6850 Advanced Clinical Practice with Individuals and Families 3
Emphasizes differential assessment and treatment of individuals, families, and family subsystems. Introduction to primary mental disorders in children and adults. Examines causal theory and prognosis, as well as theories about family dysfunction. (Sp,Su) DE

SW 6875 Clinical Practice with Women 3
Explores treatment approaches for working with women in both individual and group setttings. DE

SW 6900 Field Practicum III 6
Provides advanced supervised educational and practical social work experience with specified educational objectives in a human-service organization reflecting the student's selected focus area. (F,Sp) DE

SW 6950 Field Practicum IV 6
Continuation of SW 6900, providing advanced supervised educational and practical social work experience with specified educational objectives in a human-service organization reflecting the student's selected focus area. (Sp) DE

SW 6975 Advanced Block Field Practicum 12
Provides concentrated advanced supervised educational and practical social work experience with specified educational objectives in a human-service organization reflecting the student's selected focus area. (F,Sp,Su) DE

SW 6990 Independent Study 1-3®
Independent Study courses contracted between faculty member in the Social Work Program and MSW student. Prerequisite: Approval of Social Work Program director and department head. (F,Sp,Su) DE

SW 6993 Research Project 1-3®
MSW student research projects supervised by a faculty member in the Social Work Program. Prerequisite: Approval of the Social Work Program director and the department head. (F,Sp,Su) DE

SW 6995 Special Topics on Social Work Practice 1-3®
Course content varies. Follows strict guidelines determined by the Social Work Program. (F,Sp,Su) DE

*This course is taught alternating years. Check with department for information about when course will be taught.
®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Teacher Education and Leadership (TEAL)

See Elementary Education Program, School of Teacher Education and Leadership (TEAL), pages 243-252

Also see Secondary Education Program, School of Teacher Education and Leadership (TEAL), pages 441-445

Note: Effective Fall Semester 2009, many of the courses previously listed under the EDUC, ELED, and SCED prefixes will be taught under the TEAL prefix. These TEAL courses are listed below. Students registering for Summer Semester 2009 courses can find them under their previous prefixes by logging into Access at: **http://www.usu.edu/myusu/**

TEAL 1010 Exploring Education as a Potential Career 3
Students assess themselves as prospective teachers. Opportunities provided for students to observe in public schools (K-12), as well as to complete volunteer service in other community educational settings.

TEAL 4600 (dual listing 6600) Philosophy and Organization of the Middle Level School 3**
Focuses on characteristics of young adolescents and how middle level schools can be organized to meet those characteristics through interdisciplinary teaming, advisory programs, and exploratory mini-courses. (F)

TEAL 4610 (dual listing 6610) Curriculum, Methods, and Assessment for the Middle Grades 3**
Integrates current approaches to curriculum design with instructional models and assessment of learning appropriate for grades 5-9. (Sp)

TEAL 4620 (dual listing 6620) Service Learning Applications for the Middle Grades 3
Examines literature related to service learning for the middle grades and application of service learning in curriculum. (Su)

TEAL 4630 (dual listing 6630) Methods for Teaching Middle-Level Mathematics 3**
Teaching methods course for elementary teachers seeking a middle-level (Level II) mathematics endorsement. Prerequisites: Satisfactory completion of MATH 1210 and ELED 4060 or an equivalent elementary mathematics methods course. (F) DE

TEAL 4730 (dual listing 6730) Educational Linguistics 3
Examines theoretical foundations, functions, and characteristics of first language acquisition and language variation in the Pre-K-12 classroom context. Also emphasizes social context of language in K-12 classroom interaction, instruction, and curriculum. Additional requirements for graduate students. (F) DE

TEAL 4745 (dual listing 6745) Second Language Acquisition in the Classroom 3
Explores the processes of second language acquisition, including the influences of linguistic, cognitive, and sociocultural factors, as well as the relationship to first language acquisition. Emphasizes implications for teaching in the K-12 classroom environment. Additional requirements for graduate students. (Sp)

TEAL 4760 (dual listing 6760) ESOL Instructional Strategies 3
Includes strategies for promoting oral language, reading, and writing for K-12 English language learners. Methods for integration for second language learners into the larger school community. Discussion of parental involvement. Prerequisite: Admission into a teacher education program. (F,Sp)

TEAL 4770 (dual listing 6770) ESOL Instructional Strategies in the Content Areas 3
Focuses on methods which help English language learners in content-area classrooms to increase academic learning and integration into the larger school community. Prerequisite: Admission into a teacher education program. (F,Sp,Su)

TEAL 4780 (dual listing 6780) Assessment for Language Learners 3
Explores principles and techniques for developing, analyzing, and interpreting assessment measures for English language learners, including oral, writing, reading, and content-area assessment, as well as assessments used in public schools. Prerequisite: Admission into a teacher education program. (F,Su) DE

TEAL 5560 (dual listing 6560) Special Topics 0.5-4®
Field-based program focusing upon characteristics of effective teaching methodologies, teaching performance, curriculum decision making, value guidelines, and the characteristics of the learner. May be graded with a letter grade *or* graded as Pass/Fail, as determined by the instructor. Also taught as EDUC 5560/6560. (F,Sp,Su) DE

TEAL 6010 (dual listing 7010) Critical Issues in Secondary Education 3
Introduces graduate students to critical issues affecting secondary education. Particular attention given to nature of the high school as an institution, its development, and how it functions in today's environment. (Sp,Su) DE

TEAL 6020 (dual listing 7020) Foundations and Change in Early Childhood Education 3
Survey course designed to acquaint professionals with historical and philosophical foundations of early childhood education, leading to examination of contemporary trends and issues. (Sp) DE

TEAL 6040 Designing and Interpreting Measurements for Assessing Student Learning 3
Teachers and instructional supervisors develop their talents for (a) designing and interpreting measurements for monitoring students' learning and (b) interpreting scores from standardized and government-mandated tests. (F,Su)

TEAL 6050 (dual listing 7050) Theories of Instructional Supervision 3
Principles and theoretical base of supervision as they relate to improving instructional practices. Emphasizes research findings and recommended practices. Differentiated syllabi provided between master's and doctoral versions. (F,Su)

TEAL 6080 Leadership and the School Principal* 3
Focuses on the school principalship. Provides an overview of the roles and responsibilities of the principal, with emphasis placed on understanding leadership and instructional leadership. Introduces students to knowledge, dispositions, and skills required of successful school principals. (F,Sp,Su) DE

TEAL 6090 (dual listing 7090) Theories of Organizational Leadership in Education 3
Introduces prospective school administrators to theories of organizational behavior and practices of managing and leading people within the context of the school organization. Differentiated syllabi provided between master's and doctoral versions. (Sp,Su)

TEAL 6100 Motivation and Management in Inclusive Settings 3
Leads in-service teachers to develop classroom management strategies for gaining and maintaining students'cooperation. (Sp,Su) DE

TEAL 6150 Foundations of Curriculum 3
Examination of theories, principles, and foundations of curriculum, emphasizing program planning and current curriculum trends. (F,Su) DE

TEAL 6190 Theories of Learning and Models of Teaching 3
Reviews the philosophical, psychological, and sociological genealogies behind historical and current theories of learning. Analyzes the approaches, metaphors, and models of teaching that these theories inform. (Sp,Su) DE

TEAL 6200 Curriculum and Issues in Early Childhood Education 2
Examination of current issues and research topics in early childhood education important to the improvement of K-3 programs. (F)

TEAL 6220 Workshop in Early Childhood Education 1-6®
Exploration of current topics important in teaching young children. (Su) DE

TEAL 6230 Literacy Learning in Early Childhood 3
Investigation of early literacy development and effective classroom practices in kindergarten and the primary grades. Relevant research is examined. (F,Su) DE

TEAL 6240 Workshop in Science Education 1-6®
Exploration of current topics in science education. (Su) DE

TEAL 6250 Graduate Cooperative Work Experience 1-10®
Cooperative education work experience at a professional level. Prior approval required. Graded Pass/Fail *only*. (F,Sp,Su)

TEAL 6255 Mathematics Curriculum and Instruction 2
Examination of current curriculum standards, trends, and effective methods of instruction for mathematics in middle and secondary schools. (Su)

TEAL 6260 Supervised Practicum in Early Childhood Education 2
Encompasses approximately 125 hours of supervised practicum in a kindergarten classroom and observations in prekindergarten settings. Participants demonstrate their ability to integrate and apply early childhood theory and research in kindergarten. DE

TEAL 6300 Workshop in Mathematics Education 1-6®
Exploration of current topics and methods in mathematics education. In the past, topics have included: relevant mathematics in rural settings, integration of mathematics and children's literature, and ethnomathematics. (Su)

TEAL 6305 Secondary English Curriculum and Instruction 2
Examination of current curriculum standards, trends, and effective methods of instruction for English/language arts in middle and secondary schools. (Su)

TEAL 6310 Literacy and Cognition 3
Practical approaches for teaching reading/writing and learning skills to elementary, middle, and high school students in all content areas. (F,Su) DE

TEAL 6340 Adolescent Literacy Development 3
Focuses on instructional practices, as well as research and theory related to fostering the literacy development of middle school and high school students (Sp,Su) DE

TEAL 6350 Reading Assessment and Intervention 3
Covers the correlates and diagnosis of reading problems, as well as methods and materials for remedial reading instruction. Prerequisites: ELED 3100, 4040; or teaching experience in elementary, middle, or secondary school. (Sp) DE

TEAL 6370 Supervised Internship in Reading and Writing 1-3
Individual practicum experience designed to allow graduate students to implement and focus on one or more aspects of reading and writing instruction in a classroom or clinical setting. Prerequisite: Consent of instructor. DE

TEAL 6380 Effective Writing Instruction 3
Investigates the nature of writing and its theoretical/research base, in order to help students better understand instructional strategies for teaching composition. Primarily focuses on effective methods for teaching and assessing student writing. (Sp,Su) DE

TEAL 6390 Teaching with Tradebooks in the Elementary and Middle Level Classroom 3
Explores the use of trade books in the elementary and middle level classroom. Focuses on how teachers can use various genres to invite children to read and write. Prerequisite: TEAL 6310. (Su) DE

TEAL 6400 Multiple Talent Approach to Teaching 2
Explores one model for embedding the teaching of creative and critical thinking in regular curricula. Includes practical application requirements. (Su)

TEAL 6410 Social Foundations of Education 2
Examines current educational issues and trends within contexts of history, philosophy, and cultural foundations. (F,Su) DE

TEAL 6420 Education of Gifted and Talented Learners 2
Provides multiple cultural and historical perspectives on giftedness and talent. Explores characteristics of gifted individuals, with emphasis on identifying needs. Provides general overview of possible services for gifted learners. Must be taken concurrently with TEAL 6430. (F) DE

TEAL 6430 Practicum: Individual Case Study 1
Practicum experience in association with TEAL/SCED 6420. Requires intensive supervised study of gifts and talents of individual child of student's choice. Graded Pass/Fail *only*. Must be taken concurrently with TEAL 6420. (F) DE

TEAL 6440 Creativity in Education 2
Exploration of theories, research, and strategies concerning creativity, and their application to personal creativity and to improvement of classroom practice. (Su) DE

TEAL 6460 Identification and Evaluation in Gifted Education 2
Provides educators with theory and models for identifying students as gifted, creative, and talented. Presents models for evaluation of programs for gifted learners. Explores instruments for use in identification and evaluation. Must be taken concurrently with TEAL 6470. (Sp) DE

TEAL 6470 Practicum: Team Consultation 1
Practicum experience in association with TEAL/SCED 6460. Requires participation, as part of a consultative team, to improve practice in an approved setting for a specific child, classroom, school, school district, or other educational entity. Graded Pass/Fail *only*. Must be taken concurrently with TEAL 6460. (Sp) DE

TEAL 6480 Methods and Materials in Gifted Education 2
Explores programming and curriculum models in gifted education, with special attention to the development of instructional materials for use with students. Must be taken concurrently with TEAL 6490. (F) DE

TEAL 6490 Practicum: Classroom Applications 1
Practicum experience in association with TEAL 6480. Requires application of at least three curriculum, cognitive, or affective models in the student's current teaching assignment. Graded Pass/Fail *only*. Must be taken concurrently with TEAL 6480. (F) DE

TEAL 6500 School Finance and Resource Management 3
Focuses on generating, allocating, and managing revenues and resources for public schools. Emphasizes law and policy regarding Utah school finance. (Sp,Su) DE

TEAL 6505 Science Curriculum and Instruction 2
Examination of current curriculum standards, trends, and effective methods of instruction for science in middle and secondary schools. Emphasizes science program improvement through investigative lab activities. (Su)

TEAL 6540 Data-Based Decision Making for School Leaders 3
Prepares prospective school leaders to conduct research and to collect and analyze data for decision making and program evaluation in schools. (F)

TEAL 6550 Practicum in the Evaluation of Instruction 1-4®
Field-based research study contributing toward graduate degrees. Supervisory licensure related to assessment of ongoing or newly proposed program of instruction. (F,Sp,Su)

TEAL 6555 Science Education and the Meaning of Science* 3
Examines the theories and influences shaping the activity of science. Also explores how these theories have been challenged over time, as well as how they influence science education. (Su)

TEAL 6560 Special Topics 0.5-4®
(dual listing 5560)
Field-based program focusing upon characteristics of effective teaching methodologies, teaching performance, curriculum decision making, value guidelines, and the characteristics of the learner. May be graded with a letter grade *or* graded as Pass/Fail, as determined by the instructor. Also taught as EDUC 6560/5560. (F,Sp,Su)

TEAL 6570 Advanced Comprehension 3
Designed to enhance teachers' understanding of research and practice related to teaching vocabulary and reading comprehension and fostering motivation for reading. Prerequisite: TEAL 6310. (Alt years) DE

TEAL 6580 Character and Values Education 2
Overview of research, theory, and practical approaches to values education, emphasizing processes of moral development and socialization. (Su) DE

TEAL 6590 Supervising School Reading Program 3
Examines strategies for improving school reading programs. Emphasizes simulations, guided practice, and small group discussions. Prerequisite: TEAL 6350. (F) DE

TEAL 6600 Philosophy and Organization
(dual listing 4600) of the Middle Level School 3**
Focuses on characteristics of young adolescents and how middle level schools can be organized to meet those characteristics through interdisciplinary teaming, advisory programs, and exploratory mini-courses. Graduate students have additional course requirements for design and implementation of a project. (F)

TEAL 6610 Curriculum, Methods, and
(dual listing 4610) Assessment for the Middle Grades 3**
Integrates current approaches to curriculum design with instructional models and assessment of learning appropriate for grades 5-9. To receive credit for 6610, graduate students design and implement an action research project related to curricular or pedagogical interests, then share their findings in class. Project will include review of literature related to student's interest. Prerequisite: TEAL 6600. (Sp)

TEAL 6620 Service Learning Applications
(dual listing 4620) for the Middle Grades 3
Examines literature related to service learning for the middle grades and application of service learning in curriculum. (Su)

TEAL 6630 Methods for Teaching
(dual listing 4630) Middle-Level Mathematics 3**
Teaching methods course for elementary teachers seeking a middle-level (Level II) mathematics endorsement. Prerequisites: Satisfactory completion of MATH 1210 and ELED 4060 or an equivalent elementary mathematics methods course. DE

TEAL 6700 Improvement of Science Instruction 3
For practicing elementary and middle-school teachers or those seeking alternative licensure in science education. Survey of current research in science education and strategies for implementing best practice in classroom settings. Considers a Science/Technology/Society approach to teaching science, as well as the use of action research to improve practice. (F) DE

TEAL 6710 Diversity in Education 3
Analyzes the role of education in a culturally and linguistically diverse society. Examines the place multicultural education and inclusive pedagogies have in advancing educational equity and social justice. Explores multiple ways educators work with and for transnational communities. (Sp,Su) DE

TEAL 6720 Practicum in Science Instruction 1
Optional practicum to be taken semester following enrollment in TEAL 6700. (Sp) DE

TEAL 6730 Educational Linguistics 3
(dual listing 4730)
Examines theoretical foundations, functions, and characteristics of first language acquisition and language variation in the Pre-K-12 classroom context. Also emphasizes social context of language in K-12 classroom interaction, instruction, and curriculum. Additional requirements for graduate students. (F,Su) DE

TEAL 6740 School Law* 3
Acquaints students with legal issues relating to public education. Considers rights and responsibilities of students, teachers, and educational practitioners. Relates these rights to school programs and operations as determined by state and federal laws and court decisions. (F,Su) DE

TEAL 6745 Second Language Acquisition
(dual listing 4745) in the Classroom 3
Explores the processes of second language acquisition, including the influences of linguistic, cognitive, and sociocultural factors, as well as the relationship to first language acquisition. Emphasizes implications for teaching in the K-12 classroom environment. Additional requirements for graduate students. (Sp)

TEAL 6750 Improvement of Mathematics Instruction 2
Examines advanced concepts in curriculum theory and methods of teaching mathematics in the elementary and middle school. Prerequisite: ELED 4060 or teaching experience in elementary or middle school. (Sp)

TEAL 6760 ESOL Instructional Strategies 3
(dual listing 4760)
Includes strategies for promoting oral language, reading, and writing for K-12 English language learners. Methods for integration for second language learners into the larger school community. Discussion of parental involvement. Prerequisite: Admission into a teacher education program. (F,Sp)

TEAL 6770 ESOL Instructional Strategies
(dual listing 4770) in the Content Areas 3
Focuses on methods which help English language learners in content-area classrooms to increase academic learning and integration into the larger school community. Prerequisite: Admission into a teacher education program. (F,Sp,Su)

TEAL 6780 Assessment for Language Learners 3
(dual listing 4780)
Explores principles and techniques for developing, analyzing, and interpreting assessment measures for English language learners, including oral, writing, reading, and content-area assessment, as well as assessments used in public schools. Prerequisite: Admission into a teacher education program. (F,Su) DE

TEAL 6800 Improvement of Social Studies Instruction 3
Emphasizes contemporary research and practice related to K-12 social studies programs. Examines curriculum and methods of instruction surrounding topics such as the interrelationships between global education, multicultural education, and civic education. Prerequisite: ELED 4050 or teaching experience in elementary or middle school. (Su)

TEAL 6840 Workshop: Intermountain Conference on Education of the Gifted and Talented 1-2®
Provides instruction by leading national authorities in gifted and talented education, as well as networking with educators of the gifted from throughout the Intermountain West. Graded Pass/Fail *only*. (Su)

TEAL 6900 Independent Study 0.5-3®
(F,Sp,Su) DE

TEAL 6910 Independent Research 0.5-3®
(F,Sp,Su)

TEAL 6930 Supervision and Administrative Internship—Elementary 3
Jointly (with TEAL 6940) provides experience in supervision and administration in elementary school settings as they relate to the performances of the six Interstate School Leaders Licensure Consortium (ISLLC) Standards for School Leaders. Graded Pass/Fail *only*. Prerequisite: TEAL 6080. (F,Sp,Su) DE

TEAL 6940 Supervision and Administrative Internship—Secondary 3
Jointly (with TEAL 6930) provides experience in supervision and administration in secondary school settings as they relate to the performances of the six Interstate School Leaders Licensure Consortium (ISLLC) Standards for School Leaders. Graded Pass/Fail *only*. Prerequisite: TEAL 6080. (F,Sp,Su) DE

TEAL 6945 Supervision and Administration Internship 3
Provides experience in supervision and administration in school systems. (F,Sp,Su)

TEAL 6950 Leadership Portfolio Development 1
Creation of leadership portfolio as culminating activity for completion of Administrative/Supervisory Endorsement. Portfolio includes leadership vision, educational philosophy, and professional resume. Graded Pass/Fail *only*. (F,Sp,Su) DE

TEAL 6960 Master's Creative Project 3
Individually directed creative project, with a focus closely related to coursework or to area of teaching specialization. Only students pursuing the Plan B MEd option should enroll in this course. Prerequisite: Instructor's approval. (F,Sp,Su) DE

TEAL 6970 Thesis 3-6
Individually directed work in thesis writing, with guidance from committee chair. Designed for use on MA and MS degrees only. Graded Pass/Fail *only*. Prerequisite: Instructor's approval. (F,Sp,Su)

TEAL 6980 Portfolio Project 3
Individually directed portfolio for students in the MEd Plan B degree, only to be taken at the end of student's program of study. Designed for students to integrate and apply concepts learned in the master's program. Prerequisite: Instructor's approval. (F,Sp,Su)

TEAL 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su) DE

TEAL 7000 Student Teaching Supervision 1-3®
Considers ways and means of providing desirable experiences for student teachers in the public schools. Analysis of roles of classroom teacher and college supervisor. (F,Sp)

TEAL 7010 Critical Issues in Secondary Education 3
(dual listing 6010)
Introduces graduate students to critical issues affecting secondary education. Particular attention given to nature of the high school as an institution, its development, and how it functions in today's environment. (Sp,Su)

TEAL 7020 Foundations and Change in
(dual listing 6020) Early Childhood Education 3
Survey course designed to acquaint professionals with historical and philosophical foundations of early childhood education, leading to examination of contemporary trends and issues. (Sp)

TEAL 7050 Theories of Instructional Supervision 3
(dual listing 6050)
Principles and theoretical base of supervision as they relate to improving instructional practices. Emphasizes research findings and recommended practices. Differentiated syllabi provided between master's and doctoral versions. (F,Su) DE

TEAL 7055 Internship in Program Evaluation 1-6®
Experience in practical aspects of program evaluation through planned, supervised evaluation project participation approved by student's supervisory committee. Prerequisite: Instructor's approval. (F,Sp,Su)

TEAL 7065 Internship in Research 1-6®
Experience in conducting research through planned, supervised research project participation approved by student's supervisory committee. Prerequisite: Instructor's approval. (F,Sp,Su)

TEAL 7090 Theories of Organizational
(dual listing 6090) Leadership in Education 3
Introduces prospective school administrators to theories of organizational behavior and practices of managing and leading people within the context of the school organization. Differentiated syllabi provided between master's and doctoral versions. (Sp,Su)

TEAL 7100 Practices of Instructional Supervision* 2
Application of instructional supervisory theories and practices of supervisory behaviors as they relate to improvement of instruction. Prerequisite: TEAL 7050. (Su)

TEAL 7150 Curriculum Theory* 3
Examines the origins and development of major historical and contemporary curriculum theories. Considers how these theories affect the organization of the school, while also affecting the lives and work of teachers, administrators, students, and the community. Prerequisite: TEAL 6150. (Sp) DE

TEAL 7300 Historical, Social, and Cultural Foundations of Education 3
Examines relationship of modern school in terms of historical, cultural, and social foundations of education. Prerequisites: TEAL 6410, 7020/6020, or permission of instructor. (F)

TEAL 7310 Teaching-Learning Foundations in Education 3
Seminar in which learning theories and teaching models/skills are demonstrated, critically examined, and integrated. Prerequisite: Graduate course in educational psychology or equivalent. (Sp) DE

TEAL 7320 Theories and Modes of Reading 3
Examination of cognitive and sociocultural research related to K-12 students' acquisition and use of reading, writing, and learning strategies. Explores implications for school policies and classroom instruction. (Sp) DE

TEAL 7325 Instructional Leadership 3
Emphasizes application of theory, research, and effective practice to instructional and curricular improvement. Examines educational change.

TEAL 7330 Internship in Supervision 1-3
Directed experiences in supervision with selected public school personnel in approved settings. Experiences arranged by student's graduate committee. Prerequisite: Instructor's approval. (F,Sp,Su)

TEAL 7350 Internship in Curriculum Development 1-3
Directed experiences in curriculum development with selected public school personnel in approved settings. Experiences arranged by student's graduate committee. Prerequisite: Instructor's approval. (F,Sp,Su) DE

TEAL 7360 Research in Literacy 3
Covers classical, historical, and contemporary research studies in literacy, with an emphasis upon understanding and translating findings into classroom practices or clinical settings. Doctoral students complete additional course assignments. Prerequisite: Permission of instructor. (Su) DE

TEAL 7500 Interdisciplinary Workshop 1-2®
(F,Sp,Su)

TEAL 7550 Evaluation of Supervisory Performance 1-4®
Program for graduate students to become acquainted with and demonstrate competency in supervision. (F,Sp,Su)

TEAL 7810 Research Seminar 1-3®
Identification of research problems and critical issues, consideration of critical issues and research methods, and application of data analysis procedures under faculty direction. (F,Sp,Su)

TEAL 7900 Independent Study 0.5-3®
(F,Sp,Su)

TEAL 7910 Independent Research 0.5-3®
(F,Sp,Su) DE

TEAL 7970 Dissertation 1-9®
Individual work on research problems in PhD or EdD program. Emhasizes writing and editorial techniques. Graded Pass/Fail *only*. (F,Sp,Su)

TEAL 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.

Theatre Arts (THEA)

See Department of Theatre Arts, pages 468-477

THEA 1000 Theatre Orientation for Majors 1
Departmental policies, procedures, requirements, and philosophy. Introduction to fundamental audition and portfolio presentation techniques. (F)

THEA 1013 BCA Understanding Theatre 3
Survey of dramatic principles and structure, genre, and conventions for nonmajors. Functions and contributions of theatre artists and practices of the contemporary stage. (F,Sp,Su) DE

THEA 1023 BCA Introduction to Film 3
Study of elements of film narrative in fictional and nonfictional movies to provide a deeper understanding of content and film form. (F) DE

THEA 1030 BHU Exploring Performance Through Aesthetic Texts 3
Introduces concepts and practices of performance studies and oral language arts. Integrates interpretation, analysis, and performance of major literary genres and oral forms of communication that contain aesthetic qualities. Students learn theatre techniques to create original performance pieces. (F,Sp,Su)

THEA 1033 Beginning Acting 3
Demonstration of skills in actor awareness (personal and group), organic acting techniques, scene study with partners, and monologue preparation. Provides understanding of theories and methodologies. Skills demonstrated in areas of body movement, diction, observation, concentration, imagination, and "action." (F,Sp)

THEA 1113 Beginning Voice 3
Training in basic vocal principles (Rodenburg, Linklater). Covers proper breath placement and support, physical alignment, projection, and resonance. Students learn basic warm-up to prepare the voice for performance. (F)

THEA 1223 Stage Makeup 2
Emphasizes one-dimensional and three-dimensional illusional work, focusing on knowledge and skills in "corrective" aging and period makeup, with introductions to related areas, such as hair, hands, and prosthetics. Enrollment restricted to students who are theatre arts majors or who have received departmental authorization. (F,Sp)

THEA 1430 Movement for Actors I 2
Introductory, experiential course in movement, including Laban Movement Analysis, Alexander Technique, and authentic movement. Improvisation will be emphasized to develop a creative approach to character, emotion, and action through movement. (F,Sp)

THEA 1513 Stage and Costume Crafts 3
Introduction to different physical theatre forms, standard stage equipment, and methods of staging plays. Basic practices in set construction, stage lighting, sound, and costume construction. Enrollment limited to Theatre Arts majors and to students receiving departmental permission. (F,Sp)

THEA 1713 Introduction to Playscript Analysis 3
Introductory course focusing on plot, character, language, and thematic analysis of varied historical and modern performance texts in the context of contemporary staging practice. Enrollment limited to theatre majors and minors *only*. (F,Sp)

THEA 2410 Directing 3
Provides instruction and practice in play selection, script analysis, research, blocking, leadership, communication skills, conduct of rehearsals, self-awareness, production organization and operation, and personal organization for stage direction. Principles apply in professional, civic, and educational settings. Prerequisite: THEA 1033 (F,Sp)

THEA 2420 Intermediate Acting: Scene Study 3
Scene study from the modern and contemporary theatre using the principles studied in THEA 1033. Prerequisite: THEA 1033. (F,Sp)

THEA 2430 Movement for Actors II 2
Theory and practice in physical theatre movement styles, including Grotowski, Mime, Commedia dell'Arte, and others. Emphasis on creative approach for projecting character, emotion, and action through use of the body. History and practical experience in advanced movement styles. Prerequisite: THEA 1430. (F,Sp)

THEA 2440 Introduction to Dance for Theatre: Jazz, Ballet, and Tap 2
Offers an introduction to the three most influential styles of dance in musical theatre: jazz, ballet, and tap. Enables dancers to learn new steps quickly by utilizing the appropriate techniques. Time steps and turns are mastered. (F,Sp)

THEA 2470 Movement: Stage Combat 3
Techniques in stage combat. Prerequisite: THEA 1430. (F,Sp)

THEA 2480 Intermediate Voice for Theatre 3
Training in vocal technique, incorporating breath support, vocal range, power, and projection. Training in speech and articulation. Work in various vocal theories (Berry, Linklater, Hart). Instruction in the International Phonetic Alphabet. Prerequisite: THEA 1113. (Sp)

THEA 2490 Intermediate Acting: Shakespeare 3
Exploring language and techniques of playing Shakespeare through scene study and monologues. Prerequisite: THEA 1033. (F,Sp)

THEA 2510 Scene Painting 3
Instruction in scene painting techniques. For theatrical technicians and designers. Demonstration and lab work included. Prerequisite: THEA 1513. (F,Sp)

THEA 2540 Lighting Design 3
Introduction to basic elements of lighting design. Demonstration of techniques used to create and execute a lighting design. Provides basic understanding of light energy, angle, color, and technology available for designing with this medium. (F,Sp)

THEA 2550 Stage Management 3
Provides problem-solving environment for students to acquire knowledge and skills necessary for becoming a competent stage manager. Discussion of organization, delegation, scheduling, and personnel management. Prerequisite: Permission of instructor. (F,Sp)

THEA 2555 Production Practicum 1®
Specialized crew work in ongoing Theatre Arts Department productions. Assignments made upon meeting with technical director. (F,Sp,Su)

THEA 2556 Production Run Crew 1®
Specialized crew work for Theatre Arts Department productions. Assignments made upon meeting with technical director. (F,Sp,Su)

THEA 2560 Theatre and Studio Sound 3
Sound recording, reinforcement, and control operation skills for theatrical production. (F,Sp)

Course Descriptions

THEA 2666 Performance Practicum I 1®
Performance work in ongoing Theatre Arts Department productions, upon casting by the director. (F,Sp)

THEA 2667 Performance Practicum II 1®
Performance work in ongoing Theatre Arts Department productions, upon casting by the director. (F,Sp)

THEA 3050 DHA Period Styles/Historic Interiors 3
Intensive instruction in architecture, furniture, and interior design of major Western European periods from Egyptian to the present. Taught through lectures, slide presentations, and student-compiled source book with examples of major styles. (F,Sp)

THEA 3230 DHA/CI Survey of Western Theatre 3
History of performance traditions, theatre architecture, management systems, personnel, and written drama in the West from ancient Egypt to mid-20th Century. (F) DE

THEA 3300 Clinical Exerience in Teaching I 1
Clinical apprenticeship consisting of teaching theatre in local schools. Includes observation, tutorial work, small group discussions, whole class instruction, and lesson/unit planning. Graded Pass/Fail *only*. (F,Sp)

THEA 3410 Dance for Theatre: Tap 1
Builds on tap skills learned in the introductory course, emphasizing mastery of single and double tap sounds and ensuring a solid foundation for elementary and intermediate tap steps commonly used in theatre productions. Prerequisite: THEA 2440. (F,Sp)

THEA 3420 Dance for Theatre: Jazz 1
Builds on jazz skills learned in the introductory course, incorporating contemporary jazz styles, jazz techniques, and routines used in musical theatre repertory. Prerequisite: THEA 2440. (F,Sp)

THEA 3430 Period Dance Styles 3
Dances learned from different periods then "rechoreographed" for stage practice. Prerequisite: THEA 1430. (F,Sp)

THEA 3440 Dance for Theatre: Ballet 1
Designed for an in-depth experience in ballet, focusing on technique and learning ballet choreography. Builds on ballet skills learned in the introductory course. Prerequisite: THEA 2440. (F,Sp)

THEA 3450 DHA Dialects 3
Review of International Phonetic Alphabet. Explores range of regional American and British dialects, as well as specific foreign language dialects. Prerequisites: THEA 1113 and 2480. (F,Sp)

THEA 3510 Scene Design 3
Preparation for designing sets used in theatre. Development of skills in drafting, rendering, model-making, research, and portfolio development. Prerequisite: THEA 1513. (F,Sp)

THEA 3520 Stage Costume Design 3
Theory and practice in design and selection of costumes for nonrealistic, historical, and modern plays. Study of relationship of costume to character and production. Prerequisites: THEA 1513 and 3570; or permission of instructor. (F,Sp)

THEA 3570 DHA Historic Clothing 3
Historic survey of development of clothing from ancient Egyptians to the present day. (F,Su)

THEA 4030 DHA Storytelling 3
(dual listing 6030)
Reviews background and techniques of traditional telling. Explores psychological, educational, therapeutic, historical, and folkloric aspects of storytelling. For 6030 credit, graduate students must participate in microteaching sessions in areas of expertise, with additional storytelling research or service. (F,Sp,Su) DE

THEA 4250 Playwriting 3
Study of dramatic theory and sample plays, combined with practice in writing short plays. Minimum of three plays required. Prerequisite: THEA 1713. Also taught as ENGL 4250. (Sp)

THEA 4300 Clinical Experience in Teaching II 1
Clinical apprenticeship of teaching theatre in local schools, including observation, tutorial work, small group discussions, whole class instruction, and lesson/unit planning. Graded Pass/Fail *only*. Prerequisite: THEA 3300. (F)

THEA 4330 Drama and Theatre for Youth: Grades K-6 3
(dual listing 6330)
Practical teaching strategies, tools, and performance techniques for integrating drama and theatre in the classroom and beyond, with special emphasis on language arts curriculum. For graduate credit, students must participate in microteaching sessions with additional research, writing, and/or service assignments. (F,Sp,Su) DE

THEA 4400 Company Workshop 3®
Company workshop of theatrical productions emphasizing process and instruction. Supervised rehearsals, technical preparation, and public performances. Prerequisite: Permission of instructor. (F,Sp)

THEA 4450 Advanced Voice for Theatre 3
Advanced vocal training includes units in microphone technique, radio drama, classical Greek theatre, and vocal improvisation. Prerequisites: THEA 1113 and 2480. (Sp)

THEA 4480 Theatre Leadership and Management 3
(dual listing 6480)
Explores legal and financial choices, market research and marketing plans, physical plant and season operations, consideration of union and management relationships, and various planning and budget control procedures. For 6480 credit, graduate students must participate in microteaching sessions with additional practicum, writing, or problem solving assignments. (Sp)

THEA 4510 Advanced Scene Design 3
(dual listing 6510)
Preparation for graduate school or a career in design. Advanced instruction in drafting, rendering, model-making, technical skills, research, design principles, and portfolio development. For 6510 credit, graduate students must participate in microteaching sessions with additional rendering assignments. Prerequisites: THEA 1513 and 3510. (F,Sp)

THEA 4520 Advanced Costume Design 3
(dual listing 6520)
Advanced theory and practice in the design and selection of costumes for nonrealistic, historical, and modern plays. For 6520 credit, graduate students must participate in microteaching sessions with additional research or practicum assignments. Prerequisite: THEA 3520. (F,Sp)

THEA 4540 Advanced Lighting Design 3
(dual listing 6540)
Advanced training in elements of lighting design. Exploration of advanced techniques used to create and execute a lighting design. For 6540 credit, graduate students must participate in microteaching sessions with additional research or practicum assignments. Prerequisite: THEA 2540. (Sp)

THEA 4740 Advanced Performance Practicum I 1-2®
Advanced performance work in ongoing Theatre Arts Department productions, upon casting by the director. Director will assign credits. (F,Sp)

THEA 4750 Advanced Production Practicum 1-3®
Specialized practical experience in theatre production, including opportunities for advanced work in directing, design, scene and costume construction, stage management, props, sound, and lighting, under the supervision of Theatre Arts Department faculty members. (F,Sp,Su)

THEA 4840 Advanced Performance Practicum II 1-2®
Advanced performance work in ongoing Theatre Arts Department productions, upon casting by the director. Director will assign credits. (F,Sp)

THEA 4850 Advanced Production Projects 1-3®
Specialized practical experience for Theatre Arts Department productions. Assignments made in conjunction with the technical director. (F,Sp,Su)

THEA 5240 DHA/CI Contemporary Theatre 3®
(dual listing 6240)
History and theory of a theatre movement since the 1980s, primarily in the English-speaking world, leading to a study of the theatrical world and its practices today. For 6240 credit, graduate students must participate in microteaching sessions with additional reading or writing assignments. Prerequisite: THEA 3230. (F,Sp)

THEA 5250 Playwriting Company Workshop 3®
Advanced study in playwriting. Course culminates in the performance of original works. Enrollment is contingent on permission of instructor. Theatre Arts majors and students who have completed THEA/ENGL 4250 will have priority. (F)

THEA 5270 DHA Performance Theory and Criticism 3®
(dual listing 6270)
Topics in dramatic theory, including traditional Aristotelian analysis, comedy, tragedy, and modern and postmodern performance theories. For 6270 credit, graduate students must participate in microteaching sessions with additional research or writing assignments. (Sp)

THEA 5290 Special Topics in Theatre
(dual listing 6290) History and Literature 3®
Specialized topics in theatre history, performance, and dramatic literature. Sample topics include Classical Theatre of Greece and Rome, Golden Age Spanish Theatre, Elizabethan Theatre, Musical Theatre, Asian Theatre, and others. For 6290 credit, graduate students must participate in microteaching sessions with additional research or writing assignments. Prerequisite: THEA 3230. (F,Sp)

THEA 5310 Theatre Mentorship and Service 1-3®
Clinical mentorship of teaching skills, including observation, instruction, and evaluation in specific areas of expertise. Projects may include developing and using drama and theatre practices for service in classroom or community settings. Prerequisite: Permission of instructor. (F,Sp,Su)

THEA 5340 Theatre Production Methods for Educators 3
Specialized practical instruction in technical methods and theatre production for education majors. Required for students in the Theatre Education Emphasis. Prerequisite: THEA 1513. (Sp)

THEA 5360 Drama in the Secondary Education
(dual listing 6360) Classroom: Grades 7-12 3
Practical teaching strategies, tools, and performance and production techniques for meeting core curriculum requirements in the secondary education classroom. Prerequisite: Sophomore-level or higher. (Sp)

THEA 5370 Methods in Teaching Theatre and Speech 3
Development of materials and strategies for teaching secondary school speech and theatre, and managing secondary theatre drama programs. Prerequisite: Admission to Secondary Teacher Education Program (STEP). (F)

THEA 5390 Student Teaching Seminar 2
Focuses on problems arising during student teaching. Includes plans, procedures, adaptive classroom strategies, and evaluation. Graded Pass/Fail *only*. (F,Sp)

THEA 5400 Advanced Acting: Period Styles I 3®
Acting techniques covering a variety of historical and physical styles, including a rotation of Greek, Restoration, and Turn of the Twentieth Century. Prerequisites: THEA 1033; and THEA 2420 or 2490. (F,Sp)

THEA 5410 Advanced Directing 3
(dual listing 6410)
Provides instruction and practice in advanced techniques of script analysis, research outside the discipline, review of literature, awareness of thinking styles and values, and preparation for studio directing assignments. Prerequisites: THEA 2410 and permission of instructor. (F,Sp)

THEA 5420 Advanced Acting: Period Styles II 3®
Acting techniques covering a variety of historical and physical styles, based upon production needs of current season. Prerequisites: THEA 1033; and THEA 2420 or 2490. (F,Sp)

THEA 5430 Advanced Acting: Acting for the Camera 3
Acting for the camera. Prerequisite: THEA 1033. (F,Sp)

THEA 5440 Advanced Acting: Musical Theatre Auditions 3
Introduction to techniques of musical theatre auditions. Prerequisites: THEA 1033; and THEA 2420 or 2490. (F,Sp)

THEA 5470 Advanced Acting: Modern Methods 3
Twentieth Century acting techniques, methodologies, and theories. Prerequisites: THEA 1033; and THEA 2420 or 2490. (F,Sp)

THEA 5510 Computer-Aided Design for Theatre 3
Computer-aided design applications for theatre. Drafting and rendering on computer for set, light, and costume design. Prerequisites: THEA 2540, 3510, 3520. (F)

THEA 5590 Design Studies for Theatre 2®
(dual listing 6590)
Actualization of a design from conception through completion with faculty supervision. Creation of all drafting, renderings, and/or models for portfolio development. (F,Sp)

THEA 5740 Repertory Theatre Performance 2-8®
(dual listing 6740)
Rehearsal, crew, and staff assignments. Performance of four plays in repertory. Company members selected through audition, based on ability and commitment to theatre. For 6740 credit, graduate students fulfill mentoring assignments and/or additional assignments in community service. Enrollment limited and by permission of Theatre Arts Department staff. (Su)

THEA 5750 Repertory Theatre Production 2-8®
(dual listing 6750)
Rehearsal, crew, and staff assignments. Performance of four plays in repertory. For 6750 credit, graduate students work with undergraduate students in mentoring situations. (Su)

THEA 5900 Special Projects I 1-4®
Directed individual research studies or creative projects in theatre. (F,Sp,Su)

THEA 5910 Senior Project 2
Culminating project and/or recital in student's specified program. (F,Sp)

THEA 5920 Special Projects II 1-4®
Directed individual research, advanced design, or creative projects in theatre. (F,Sp,Su)

THEA 5930 Special Projects III 1-4®
Directed individual advanced design or creative projects in theatre. (F,Sp,Su)

THEA 5950 Rendering and Painting for the Theatre 3
Hands-on experience for theatrical technicians and designers using a variety of drawing techniques commonly used in theatrical design. Primary method of instruction is demonstration and experience through lab work. (F,Sp)

THEA 6010 Introduction to Graduate Study in Theatre 3
Bibliography, research methods, and writing. (F)

THEA 6030 Storytelling 3
(dual listing 4030)
Reviews background and techniques of traditional telling. Explores psychological, educational, therapeutic, historical, and folkloric aspects of storytelling. For 6030 credit, graduate students must participate in microteaching sessions in areas of expertise, with additional storytelling research or service. (F,Sp,Su) DE

THEA 6180 Theatre Production Portfolio 3
Prepares graduate students for the workplace using portfolio presentation techniques, job applications, resumes, interview techniques, and the creation of a design portfolio. (Sp)

THEA 6240 Contemporary Theatre 3®
(dual listing 5240)
History and theory of a theatre movement since the 1980s, primarily in the English-speaking world, leading to a study of the theatrical world and its practices today. For 6240 credit, graduate students must participate in microteaching sessions with additional reading or writing assignments. Prerequisite: THEA 3230. (F,Sp)

THEA 6250 Playwriting 3
Advanced study in playwriting. Course culminates in the performance of original works. Enrollment is contingent on permission of instructor. Theatre Arts majors and students who have completed THEA/ENGL 4250 will have priority. (Sp)

THEA 6270 Performance Theory and Criticism 3®
(dual listing 5270)
Topics in dramatic theory, including traditional Aristotelian analysis, comedy, tragedy, and modern performance theory. Includes preparation for review and adjudication of performance. For 6270 credit, graduate students must participate in microteaching sessions with additional research or writing assignments. (Sp)

THEA 6290 Special Topics in Theatre
(dual listing 5290) History and Literature 3®
Specialized topics in theatre history, performance, and dramatic literature. Sample topics include Classical Theatre of Greece and Rome, Golden Age Spanish Theatre, Elizabethan Theatre, Musical Theatre, Asian Theatre, and others. For 6290 credit, graduate students must participate in microteaching sessions with additional research or writing assignments. Prerequisite: THEA 3230. (F,Sp)

THEA 6330 Drama and Theatre for Youth: Grades K-6 3
(dual listing 4330)
Practical teaching strategies, tools, and performance techniques for integrating drama and theatre in the classroom and beyond, with special emphasis on language arts curriculum. For graduate credit, students must participate in microteaching sessions with additional research, writing, and/or service assignments. (F,Sp,Su) DE

THEA 6360 Drama in the Secondary Education
(dual listing 5360) Classroom: Grades 7-12 3
Practical teaching strategies, tools, and performance and production techniques for meeting core curriculum requirements in the secondary education classroom. Prerequisite: Sophomore-level or higher. (Sp)

THEA 6410 Advanced Directing 3
(dual listing 5410)
Provides instruction and practice in advanced techniques of script analysis, research outside the discipline, review of literature, awareness of thinking styles and values, and preparation for studio directing assignments. Prerequisites: THEA 2410 and permission of instructor. (F,Sp)

THEA 6480 Theatre Leadership and Management 3
(dual listing 4480)
Explores legal and financial choices, market research and marketing plans, physical plant and season operations, consideration of union and management relationships, and various planning and budget control procedures. For 6480 credit, graduate students must participate in microteaching sessions with additional practicum, writing, or problem solving assignments. (Sp)

THEA 6510 Advanced Scene Design 3
(dual listing 4510)
Preparation for graduate school or a career in design. Advanced instruction in drafting, rendering, model-making, technical skills, research, design principles, and portfolio development. For 6510 credit, graduate students must participate in microteaching sessions with additional rendering assignments. Prerequisites: THEA 1513 and 3510. (F,Sp)

THEA 6520 Advanced Costume Design 3
(dual listing 4520)
Advanced theory and practice in the design and selection of costumes for nonrealistic, historical, and modern plays. For 6520 credit, graduate students must participate in microteaching sessions with additional research or practicum assignments. Prerequisite: THEA 3520. (F,Sp)

THEA 6540 Advanced Lighting Design 3
(dual listing 4540)
Advanced training in elements of lighting design. Exploration of advanced techniques used to create and execute a lighting design. For 6540 credit, graduate students must participate in microteaching sessions with additional research or practicum assignments. Prerequisite: THEA 2540. (Sp)

THEA 6590 Design Studies for Theatre 2®
(dual listing 5590)
Actualization of a design from conception through completion with faculty supervision. Creation of all drafting, renderings, and/or models for portfolio development. (F,Sp)

THEA 6740 Repertory Theatre Performance 2-8®
(dual listing 5740)
Rehearsal, crew, and staff assignments. Performance of four plays in repertory. Company members selected through audition, based on ability and commitment to theatre. For 6740 credit, graduate students fulfill mentoring assignments and/or additional assignments in community service. Enrollment limited and by permission of Theatre Arts Department staff. (Su)

THEA 6750 Repertory Theatre Production 2-8®
(dual listing 5750)
Rehearsal, crew, and staff assignments. Performance of four plays in repertory. For 6750 credit, graduate students work with undergraduate students in mentoring situations. (Su)

THEA 6790 Seminar in Drama 1-4®
Flexible service topics course covering a range of topics according to individual student need and/or visiting instructors, independent study, etc. (F,Sp)

THEA 6800 Graduate Studies in Theatre 1-6®
Research and preparation for graduate practicum projects in theatre. (F,Sp)

THEA 6900 Research Studies 1-4®
Directed individual research studies or creative projects in theatre. (F,Sp,Su)

THEA 6920 Graduate Projects in Theatre 2-3®
Studio practicum in support of projects in stage directing, design, and technical practice. (F,Sp)

THEA 6970 Thesis 1-4®
Graded Pass/Fail *only*. (F,Sp)

THEA 6990 Continuing Graduate Advisement 1-2®
Graded Pass/Fail *only*. (F,Sp)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DEThis course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

University Studies (USU)

See General Education Requirements, pages 67-69

Also see University Studies Depth Education Requirements, pages 70-75

USU 1000 Introduction to Computers and Information Literacy 1
Introduction to basic concepts of computers and information literacy. Preparation for USU Computer and Information Literacy (CIL) test. For students having some familiarity with computers, but needing additional instruction. Graded Pass/Fail *only*. Taught during the first seven weeks of fall or spring semester. **Note:** USU 1000 *cannot* be counted toward the breadth requirements. (F,Sp) DE

USU 1010 University Connections 1-3
Provides an environment of challenge and support to help new students make a successful transition to USU. Class curriculum and activities provide an environment wherein students become familiar with the broad academic, social, and cultural opportunities offered by USU and the surrounding community. **Note:** USU 1010 *cannot* be counted toward the breadth requirements. (F,Sp) DE

USU 1100 First-Year Seminar 3
Characterized by investigation of a topic that is most likely a research, scholarly, or artistic specialty of the faculty member. Topic presented in pedagogically interesting ways. May include fieldwork or trips to enhance study of the topic. **Note:** USU 1100 *cannot* be counted toward the breadth requirements.

USU 1300 BAI U.S. Institutions 3
Provides basic understanding of the history, principles, form of government, and economic system of the United States. Emphasis on ideas and critical thinking, rather than dates, names, and places. (F,Sp,Su) [DE]

USU 1320 BHU Civilization: Humanities 3
Provides basic understanding of a broad range of themes, which cut across human history and continue to be important in contemporary society. (F,Sp,Su) [DE]

USU 1330 BCA Civilization: Creative Arts 3
Students will explore questions such as: What is Art? How is it judged? How does artistic expression vary across cultures? Course will cover several forms of art, and students will attend concerts, visit galleries, and attend theatrical performances. (F,Sp,Su) [DE]

USU 1340 BSS Social Systems and Issues 3
Examines debates in the social sciences about contexts which shape human experience. Compares experiences between life stages, individuals, groups, societies, and/or historical periods. Contrasts different social science disciplines. (F,Sp,Su) [DE]

USU 1350 BLS Integrated Life Science 3
Interdisciplinary course focusing on basic concepts of life science. Demonstrates role of modeling, prediction, and observation in the process of scientific discovery, which occurs within an historical and social context. (F,Sp,Su) [DE]

USU 1360 BPS Integrated Physical Science 3
Interdisciplinary course focusing on basic concepts of physical science, including structure of matter and magnitude and character of the forces of nature. Demonstrates role of modeling, prediction, and observation in the process of scientific discovery, which occurs within an historical and social context. [DE]

USU 3330 DHA Arts Symposium 1-2®
Students attend a number of cultural events offered at USU and in the community, as well as write critiques of the events. Prerequisite: Completion of at least 30 credits. **Note:** USU 3330 may be applied to the depth requirements, but *not* to the breadth requirements. Two credits of USU 3330 are needed to fulfill the DHA requirement.

USU 4900 Undergraduate Research 1-3
Research experience pursued with a faculty mentor. Prior to registration, student must make arrangements with a faculty mentor within his or her department. **Note:** USU 4900 *cannot* be counted toward fulfillment of University Studies requirements.

USU 6900 Responsible Conduct of Research 1
Provides an underpinning of ethical conduct for students entering into the research enterprise while at USU. Designed for upper-level undergraduates and graduate students, with each weekly session being split between lecture and discussion activities. Subjects covered include those required of all trainees being supported on Public Health Service grants. **Note:** USU 6900 *cannot* be counted toward fulfillment of University Studies requirements.

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
[DE]This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

Watershed Sciences (WATS)

See Department of Watershed Sciences, pages 479-482

WATS 1020 Watershed Sciences Professional Orientation 1
Introduction and orientation to natural resource/environmental disciplines and related professional careers for Watershed Sciences majors. Discussion of education, curricula, faculty, professional societies, and employment opportunities. Graded Pass/Fail *only*. (F) [DE]

WATS 1200 BLS Biodiversity and Sustainability 3
Provides students with an understanding of the biodiversity dilemma and the impact our species is having on natural ecosystems. Today, species extinctions occur at an alarming rate. These losses of biodiversity occur because of changes humans have made to the habitats and biogeochemical cycles of our planet The last third of the course focuses on ways to mitigate these impacts. (F,Sp)

WATS 2250 Introductory Internship/Co-op 1-3®
Introductory-level educational experience in internship/cooperative education position approved by department. Prerequisite: Permission of department. (F,Sp,Su)

WATS 2930 Introduction to Geographic Information Sciences 4
Introduces students to background and theory behind global position systems and remote sensing. Through the use and development of maps, students learn to integrate information from different geographic sources. Includes a weekly laboratory section. (F)

WATS 3000 DSC Oceanography 3
Examines fundamental interrelationships between physical environment of the oceans and the life forms they support. Suitable for nonbiologists. (Sp)

WATS 3100 DSC/CI Fish Diversity and Conservation 3
Systematics, physiology, ecology, evolution, and conservation of major groups of marine and freshwater fishes. Stresses functional morphology, physiological ecology, and community interactions explaining fish abundance and distribution. Prerequisite: BIOL 1010 or 1610 or 1620. (F) [DE]

WATS 3110 Fish Diversity Laboratory 1
Focuses on field collection, identification, and habitat relationships of freshwater fishes in North America. Prerequisite: WATS 3100 (may be taken concurrently). (F)

WATS 3600 Geomorphology 4
Geomorphic processes, origin of landforms and surficial deposits. Emphasizes fluvial and hillslope landscape elements, and surficial geologic mapping. Three one-hour lectures and one three-hour lab per week. Prerequisite: GEO 1010 or 1110 or GEOG 1000. Also taught as GEO 3600. (F)

WATS 3700 CI Fundamentals of Watershed Science 3
Study of water movement, hillslope processes, and nutrient movement in catchments, and its relevance to the properties, land use, and management of watersheds as natural resource units. (Sp) [DE]

WATS 3820 DSC/QI Climate Change 3
Emphasizes physical basis of climate (climate dynamics), as well as the mechanisms and processes for its fluctuations on sub-seasonal to interannual time scales (climate variations) and on regional to hemispheric/global time scales. Prerequisite: CLIM 2000 or GEOG 1000. Also taught as CLIM 3820. (Sp)

WATS 4250 Advanced Internship/Co-op 1-9®
Internship/cooperative education work experience; increased complexity to help student gain a more professional level of experience. Prerequisite: Permission of department. (F,Sp,Su)

WATS 4310 Wetland Ecology and Management 3
(dual listing 6310)
Explores the physical, chemical, and biological structure of wetlands. Focuses on the major types of wetlands found in North America, as well as their ecology and management; U.S. wetland policy and mitigation; and regional, national, and global impacts on restoration of wetlands. (Sp)

WATS 4490 Small Watershed Hydrology* 4**
(dual listing 5490)
Detailed exploration of concepts of hydrologic processes in small, wildland watersheds. Concentrates on recent research findings concerning key hydrological processes. Particular attention paid to study of partitioning of water in the hydrologic cycle, sources for runoff generation, snow and snowmelt, and erosion. Features process modeling and parameter estimation techniques as related to wildland systems. Prerequisites: MATH 1210, WATS 3700. (F)

WATS 4500 Limnology: Ecology of Inland Waters 3
(dual listing 6500)
Ecosystem analysis of physical, chemical, and biological interactions in lakes and streams. Application of these concepts for managing aquatic system. Graduate students write an additional research paper and present a lecture. Prerequisite: CHEM 1210. (Sp) DE

WATS 4510 Aquatic Ecology Practicum 3
Integration of limnological theory and methods of conducting field and laboratory analyses of physical, chemical, and biological parameters. Students will design and conduct their own research project within the framework of a general water quality or fishery issue addressed by the class. Development of analytical, statistical, and writing skills. Field trips required. Prerequisites: WATS 4500; STAT 3000 (may be taken concurrently). (F)

WATS 4530 Water Quality and Pollution 3
(dual listing 6530)
Reviews biological and social problems caused by point and nonpoint source water pollution; toxicology; abiotic and biotic water quality parameters; and use criteria of the Clean Water Act. Graduate-level class will require additional readings of the peer-reviewed literature and an additional class meeting to have in-depth discussions of those readings. Each graduate student will be responsible for making a presentation at the beginning of class, and leading the discussion. (Sp)

WATS 4650 Principles in Fishery Management 3
(dual listing 6650)
Emphasizes management of fish populations within context of community and ecosystem dynamics. Stresses use of simulation models to assess effects of growth, recruitment, and mortality on age-structured populations. (Sp) DE

WATS 4750 Fundamentals of Remote Sensing Science 3
(dual listing 6740)
Develops the scientific principles behind remote sensing. Examines the basic physics of electromagnetic radiation and the interactions of radiation with the surface and the atmosphere. Prerequisites: MATH 1060, 1210; PHYS 2210. (F)

WATS 4930 Geographic Information Systems 4
(dual listing 6920)
Examines structure and operation of Geographic Information Systems (GIS). Explores design, theory, and implementation of GIS software, digitizing, fundamentals of vector and raster GIS processing, georeferencing, map accuracy, and site location. To receive graduate-level credit, students must complete a more rigorous final project directed toward their thesis or dissertation. To qualify for enrollment in WATS 4930, students must have achieved a class rank of junior or senior, or must receive permission from the instructor. (F) DE

WATS 4950 Special Topics 1-3®
Individual study and research upon selected watershed sciences problems. (F,Sp,Su)

WATS 4960 Directed Readings 1-3®
Provides one-on-one interaction between student and instructor. Prerequisite: Permission of department. (F,Sp,Su)

WATS 4970 Undergraduate Research 1-3®
Individual or team research. Prerequisite: Permission of department. (F,Sp,Su)

WATS 4980 Watershed Sciences
(dual listing 6800 and 7800) Departmental Seminar 1®
Exposes students to new developments in research and management in the fields of watershed sciences. Features participation by students, faculty, and guest lecturers. Graduate students should register for only one semester each year, but attend all year. Undergraduate students are only required to register once. Graduate students will participate in an additional reading and discussion group for the seminars. Graded Pass/Fail *only*. (F,Sp)

WATS 5150 Fluvial Geomorphology 3
(dual listing 6150)
Focuses on physical processes in streams that control their shape, plan form, slope, bed material, and distribution of channel bars. Emphasizes field analysis of these topics, and application of geomorphology to aquatic ecology and environmental restoration. Also taught as GEO 5150/6150. (F)

WATS 5170 Fluvial Geomorphology Lab 2
(dual listing 6170)
Field analysis focuses on physical processes in streams which control their shape, plan form, slope, bed material, and distribution of channel bars. Application of geomorphology to aquatic ecology and environmental restoration. Also taught as GEO 5170/6170. (F)

WATS 5200 Fish Habitat Relationships in Managed Forests 3
Examines biological and social factors influencing aquatic ecosystems and fish habitats within the context of forest management. Analyzes ecological relationships of fish habitats within forest ecosystem, and how these are influenced by forest management practices. Provides examples of forest habitat issues in major regions of North America, illustrating that both biological and social factors must be considered in developing management strategies and programs. (F)

WATS 5250 Remote Sensing of Land Surfaces 4
(dual listing 6250)
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as BIE 5250/6250 and CLIM 5250/6250. (Sp)

WATS 5330 Large River Management 3
(dual listing 6330)
Focuses on constituencies participating in modern management of large river basins, including water developers, irrigators, municipalities, power consumers, recreationists, environmentalists, and scientists. Primary examples drawn from Colorado, Columbia, Rio Grande, and Missouri river basins. (Sp)

WATS 5490 Small Watershed Hydrology* 4**
(dual listing 4490)
Detailed exploration of concepts of hydrologic processes in small, wildland watersheds. Concentrates on recent research findings concerning examining key hydrological processes. Particular attention paid to study of partitioning of water in the hydrologic cycle, sources for runoff generation, snow and snowmelt, and erosion. Features process modeling and parameter estimation techniques as related to wildland systems. Additional oral and written assignments required for graduate students. Prerequisites: MATH 1210, WATS 3700. (F)

WATS 5550 Freshwater Invertebrates 3
Ecology, collection, and systematics of freshwater aquatic invertebrates. Focuses on insects, but also covers crustaceans, molluscs, and annelids. Several weekend field trips and a collection are required. Prerequisite: One year of general biology or zoology, or permission of instructor. Also taught as BIOL 5550. (Sp)

WATS 5600 Surface Hydrologic Field Methods 3
(dual listing 6600)
Hydrologic concepts and terminology taught through collection, analysis, and interpretation of hydrologic data. Emphasizes principles and practice of several hydrologic measurements and water sampling in natural and manmade environments. Prerequisite: SOIL 3000 or instructor's permission. Also taught as SOIL 5600/6600. Not currently being taught. Contact department for further information.

WATS 5640 Riparian Ecology and Management 3
(dual listing 7640)
Explores structure and function of riparian ecosystems and management options for maintaining sustainable ecological function. Prerequisites: NR/BIOL 2220, WATS 3700. (Sp)

WATS 5660 Watershed and Stream Restoration 2
Overview of the current theory and practice of watersheds and streams. Emphasizes field visits with restoration projects and specialists. Prerequisites: WATS/WILD 5490/4490, WATS/GEO 5150, WILD 5610 (or equivalent). Currently taught through Regional Campuses and Distance Education as a summer short course. (Su)

WATS 5670 Watersheds and Stream Restoration Practicum 2
Capstone experience. Development of a restoration plan for a site, involving site planning and design. Currently taught through Regional Campuses and Distance Education as a summer short course. (Su)

WATS 5680 Paleoclimatology* 3
(dual listing 6680)
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as GEO 5680/6680 and CLIM 5680/6680. (Sp)

WATS 5760 Remote Sensing: Modeling and Analysis 3
(dual listing 6760)
Advanced techniques in the analysis of the earth's surface using remotely-sensed imagery and data in a digital format. Projects employ and/or develop research models. (Sp)

WATS 5930 Geographic Information Analysis 3
(dual listing 6930)
Techniques of geographic information systems, data structures, data input and output, and data manipulation and analysis. Prerequisites: STAT 2000 or higher; WATS 4930 or ENVS 3500, or instructor's permission. (Sp) DE

WATS 6120 Aquatic Production Biology 2**
(dual listing 7120)
Review of current literature on bacterial, algal, invertebrate, and fish production in lakes, rivers, and the sea. Particular emphasis is placed on whole-ecosystem productivity studies. (Sp)

WATS 6150 Fluvial Geomorphology 3
(dual listing 5150)
Focuses on physical processes in streams that control their shape, plan form, slope, bed material, and distribution of channel bars. Emphasizes field analysis of these topics, and application of geomorphology to aquatic ecology and environmental restoration. Also taught as GEO 6150/5150. (F)

WATS 6160 Hillslope and Landscape Geomorphology 3**
Includes basics of hillslope weathering, transport, and hydrologic processes. Surveys classic and recent literature on hillslope-scale and landscape-scale geomorphic research. Three lectures and several Saturday field trips. Prerequisite: GEO/WATS 3600. Also taught as GEO 6160. (Sp)

WATS 6170 Fluvial Geomorphology Lab 2
(dual listing 5170)
Field analysis focuses on physical processes in streams which control their shape, plan form, slope, bed material, and distribution of channel bars. Application of geomorphology to aquatic ecology and environmental restoration. Also taught as GEO 6170/5170. (F)

WATS 6200 Watershed Analysis 2**
Explores watershed analysis, which is a procedure used to characterize the human, aquatic, riparian, and upland features, conditions, processes, and interactions within a watershed. Watershed analysis includes ecosystem analysis at the watershed level, providing a systematic way to understand and organize system information for the purpose of understanding the consequences of management actions prior to implementation. (Sp)

WATS 6230 Fish Ecology 2**
(dual listing 7230)
Reviews current literature on physiological, behavioral, population, and the community ecology of fishes. Particular emphasis placed on current literature relevant to management of sport and endangered freshwater species. (Sp)

WATS 6240 Graduate Internship/Co-op 1-9®
Graduate-level educational experience in internship/cooperative education position approved by department. (F,Sp,Su)

WATS 6250 Remote Sensing of Land Surfaces 4
(dual listing 5250)
Basic principles of radiation and remote sensing. Techniques for ground-based measurements of reflected and emitted radiation, as well as ancillary data collection to support airborne and satellite remote sensing studies in agriculture, geography, and hydrology. Prerequisites: MATH 1100 or 1210; and PHYS 2110 or 2210. Also taught as BIE 6250/5250 and CLIM 6250/5250. (Sp)

WATS 6310 Wetland Ecology and Management 3
(dual listing 4310)
Explores the physical, chemical, and biological structure of wetlands. Focuses on the major types of wetlands found in North America, as well as their ecology and management; U.S. wetland policy and mitigation; and regional, national, and global impacts on restoration of wetlands. (Sp)

WATS 6330 Large River Management 3
(dual listing 5330)
Focuses on the scientific basis of river management and the constituencies participating in modern management of large rivers, including water developers, irrigators, municipalities, power consumers, recreationists, environmentalists, and scientists. Primary examples drawn from Colorado, Columbia, Rio Grande, and Missouri river basins. (Sp)

WATS 6500 Limnology: Ecology of Inland Waters 3
(dual listing 4500)
Ecosystem analysis of physical, chemical, and biological interactions in lakes and streams. Application of these concepts for managing aquatic system. Graduate students write an additional research paper and present a lecture. Prerequisite: CHEM 1210. (Sp) DE

WATS 6520 Applied Hydraulics 3**
Basic fluid mechanics applied to wildland watershed systems and directed at nonengineering students. Explores nature of fluid state, fluid motion, and steady uniform and varied flow in open channels, under both subcritical and supercritical conditions. Surveys concepts of boundary layers, turbulence, convection, dispersal, and wave formation in unsteady flows. Emphasizes problem formulation and solving. Prerequisites: WATS 5490/4490; MATH 2280 (recommended). Also taught as CEE 6520. (Sp)

WATS 6530 Water Quality and Pollution 3
(dual listing 4530)
Reviews biological and social problems caused by point and nonpoint source water pollution; toxicology; abiotic and biotic water quality parameters; and use criteria of the Clean Water Act. Graduate-level class will require additional readings of the peer-reviewed literature and an additional class meeting to have in-depth discussions of those readings. Each graduate student will be responsible for making a presentation at the beginning of class, and leading the discussion. (Sp)

WATS 6550 Assessment of Abundance and Related Parameters for Biological Populations 3
Students learn to estimate population abundance and associated error bounds using mark-recapture, area-swept, declining catch, line-transect, and other techniques. Emphasizes sampling design considerations to match objectives of an assessment to appropriate/feasible level of accuracy and precision. (Sp)

WATS 6600 Surface Hydrologic Field Methods 3
(dual listing 5600)
Hydrologic concepts and terminology taught through collection, analysis, and interpretation of hydrologic data. Emphasizes principles and practice of several hydrologic measurements and water sampling in natural and manmade environments. Prerequisite: SOIL 3000 or instructor's permission. Also taught as SOIL 6600/5600. Not currently being taught. Contact department for further information.

WATS 6650 Principles in Fishery Management 3
(dual listing 4650)
Emphasizes management of fish populations within context of community and ecosystem dynamics. Stresses use of simulation models to assess effects of growth, recruitment, and mortality on age-structured populations. (Sp) DE

WATS 6680 Paleoclimatology* 3
(dual listing 5680)
Covers climate through the past four billion years of geologic time. Explores driving forces behind climate changes. Examines data and methods used in paleoclimate research. Includes discussion of literature and stresses local paleoclimate records. Three lectures per week, along with field trips. Prerequisite: GEO/WATS 3600 or permission of instructor. Also taught as GEO 6680/5680 and CLIM 6680/5680. (Sp)

WATS 6700 Restoration Ecology 3
Provides an understanding of ecological restoration, how to determine restoration goals, how to establish targets, and how to determine what are good measures of success. Teaches restoration implementataion, best practices for restoration monitoring, and how to develop and sustain community support for restoration. (Sp)

WATS 6740 Fundamentals of Remote Sensing Science 3
(dual listing 4750)
Develops the scientific principles behind remote sensing. Examines the basic physics of electromagnetic radiation and the interactions of radiation with the surface and the atmosphere. Prerequisites: MATH 1060, 1210; PHYS 2210. (F)

WATS 6760 Remote Sensing: Modeling and Analysis 3
(dual listing 5760)
Advanced techniques in the analysis of the earth's surface using remotely-sensed imagery and data in a digital format. Projects employ and/or develop research models. (Sp)

WATS 6800 Watershed Sciences
(dual listing Departmental Seminar 1®
4980 and 7800)
Exposes students to new developments in research and management in the fields of watershed sciences. Features participation by students, faculty, and guest lecturers. Graduate students should register for only one semester each year, but attend all year. Undergraduate students are only required to register once. Graduate students will participate in an additional reading and discussion group for the seminars. Graded Pass/Fail *only*. (F,Sp)

WATS 6820 Stream Ecology 3
(dual listing 7820)
Explores structure, function, and dynamics of flowing water ecosystems. (F)

WATS 6870 Ecology Seminar 1®
The Ecology Center schedules regular seminars throughout the school year with ecological scientists from other institutions participating. Ecology majors are required to attend a minimum of 10 such lectures. Graded Pass/Fail *only*. Students should register for fall semester, but attend through spring semester. Also taught as BIOL 6870, ENVS 6870, PSC 6870, and WILD 6870. (F,Sp)

WATS 6900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su) DE

WATS 6910 Directed Study 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WATS 6920 Geographic Information Systems 4
(dual listing 4930)
Examines structure and operation of Geographic Information Systems (GIS). Explores design, theory, and implementation of GIS software, digitizing, fundamentals of vector and raster GIS processing, georeferencing, map accuracy, and site location. To receive graduate-level credit, students must complete a more rigorous final project directed toward their thesis or dissertation. To qualify for enrollment in WATS 4930, students must have achieved a class rank of junior or senior, or must receive permission from the instructor. (F) DE

WATS 6930 Geographic Information Analysis 3
(dual listing 5930)
Techniques of geographic information systems, data structures, data input and output, and data manipulation and analysis. Prerequisites: STAT 2000 or higher; WATS 4930 or ENVS 3500, or instructor's permission. (Sp) DE

WATS 6940 Snow Hydrology 3
Focuses on snow science, including atmospheric formation, precipitation, distribution on the landscape, metamorphosis prior to melt, and snow pack melt dynamics. Also covers related issues, such as snow melt modeling, remote sensing, water supply, and biogeochemical cycling. Prerequisites: WATS 3700 or 4600 or SOIL 4600 or CEE 3430, or permission of instructor. Also taught as CEE 6940. (Sp)

WATS 6960 Graduate General Ecology 4
General concepts, history, and issues in all major areas of the science of ecology including: environmental biophysics; and physiological, behavioral, evolutionary, community, ecosystem, and applied ecology in both terrestrial and aquatic environments. Also taught as BIOL 6960, ENVS 6960, PSC 6960, and WILD 6960. (F)

WATS 6970 Thesis Research 1-12®
Offers credit for field or laboratory research at master's level. Graded Pass/Fail *only*. (F,Sp,Su)

WATS 6990 Continuing Graduate Advisement 1-9®
Offers credit for students currently enrolled in a master's program, who are not currently taking classes. Students may be conducting research or waiting for final approval from School of Graduate Studies. Graded Pass/Fail *only*. (F,Sp,Su)

WATS 7120 Aquatic Production Biology* 2
(dual listing 6120)
Review of current literature on bacterial, algal, invertebrate, and fish production in lakes, rivers, and the sea. Particular emphasis is placed on whole-ecosystem productivity studies. (Sp)

WATS 7230 Fish Ecology* 2
(dual listing 6230)
Reviews current literature on physiological, behavioral, population, and the community ecology of fishes. Particular emphasis placed on current literature relevant to management of sport and endangered freshwater species. (Sp)

WATS 7640 Riparian Ecology and Management 3
(dual listing 5640)
Explores structure and function of riparian ecosystems and management options for maintaining sustainable ecological function. Prerequisites: NR/BIOL 2220, WATS 3700. (Sp)

WATS 7800 Watershed Sciences
(dual listing Departmental Seminar 1®
4980 and 6800)
Exposes students to new developments in research and management in the fields of watershed sciences. Features participation by students, faculty, and guest lecturers. Graduate students should register for only one semester each year, but attend all year. Undergraduate students are only required to register once. Graduate students will participate in an additional reading and discussion group for the seminars. Graded Pass/Fail *only*. (F,Sp)

WATS 7820 Stream Ecology 3
(dual listing 6820)
Explores structure, function, and dynamics of flowing water ecosystems. (F)

WATS 7900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WATS 7910 Directed Study 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WATS 7970 Dissertation Research 1-12®
Offers credit for field or laboratory research at doctoral level. Graded Pass/Fail *only*. (F,Sp,Su)

WATS 7990 Continuing Graduate Advisement 1-9®
Offers credit for students currently enrolled in a doctoral program, who are not currently taking classes. Students may be conducting research or waiting for final approval from School of Graduate Studies. Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.
DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**
*Taught 2010-2011.
**Taught 2009-2010.
***This course is taught alternating years. Check with department for information about when course will be taught.

Women and Gender Studies (WGS)

See Women and Gender Studies, page 488

WGS 1010 BSS Introduction to Women and Gender Studies 3
Survey course covering fundamentals of women and gender studies. Explores women's and men's diverse experiences, perspectives, and contributions to society and its institutions. Examines cultural beliefs and stereotypes concerning women's and men's roles in society. Reviews feminist theory, socialization, ideology, and history of women's movement. (Sp)

WGS 2010 Women and Leadership 3
Engages students in academic and practical experiences that strengthen their sense of self and prepare them to pursue leadership roles. Discussion of research and readings pertinent to the study of women's leadership and activism. Development of and participation in a personal leadership project providing a substantive opportunity to apply information and skills learned through the class. (Sp)

WGS 4410 Gender and the Mass Media 3
(dual listing 6410)
Examines the nature of gender-based images in a variety of mass media, from advertising to magazines, television, and film. Analysis of gender stereotypes and portrayals in news and entertainment media, along with resulting social impacts. Prerequisites: Fulfillment of Communications Literacy CL2 requirement; junior standing or instructor permission. Also taught as JCOM 4410/6410. (F)

WGS 4550 DHA/CI Women and Gender in America 3
Writing intensive course drawing on film, primary documents, and readings to trace the history of women, emphasizing race, class, and gender influences of each era. Also taught as HIST 4550. (F)

WGS 4900 Directed Study: Women and Gender Studies 1-3®
Directed research, writing, and reading in relation to gender studies. Provides students with an in-depth opportunity to work individually with a faculty member. Contract for work to be completed must be signed by the Women and Gender Studies director, the faculty member, and the student, then filed with the Women and Gender Studies Program. Prerequisite: Permission of program chair. (F,Sp,Su)

WGS 6410 Gender and the Mass Media 3
(dual listing 4410)
Examines the nature of gender-based images in a variety of mass media, from advertising to magazines, television, and film. Analysis of gender stereotypes and portrayals in news and entertainment media, along with resulting social impacts. Enrollment in WGS 6410 limited to graduate students *only*. Also taught as JCOM 6410/4410. (F)

® Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

Wildland Resources (WILD)

See Department of Wildland Resources, pages 483-487

WILD 2000 Introduction to Forest, Range, and Wildlife Sciences 1
With a combination of field trips, computer lab exercises, and classroom discussions, students gain an overview of forest, range, and wildlife sciences, including a review of career opportunities for students completing a BS degree in forest, range, or wildlife. (F,Sp) DE

WILD 2200 BLS Ecology of Our Changing World 3
Foundations of ecological and evolutionary relationships of organisms with other organisms and with the physical environment, emphasizing populations, communities, and ecosystems. Integration of basic science with applications of science to understanding human interactions with the environment. (F,Sp) DE

WILD 2250 Introductory Internship/Co-op 1-3®
Introductory-level educational experience in internship/cooperative education position approved by department. Prerequisite: Departmental signature. (F,Sp,Su) DE

WILD 2300 Mushroom Identification 1
Lecture course covering taxonomy, ecology, and importance of macro and micro fungi. Also taught as BIOL 2300. (F)

WILD 2310 Mushroom Identification Lab 1-2®
Lab course acquainting students with basic fungal taxonomic groups. Students collect, preserve, and identify fungi they collect. Edible fungi prepared and eaten. Also taught as BIOL 2310. (F)

WILD 2500 Computer Applications in Natural Resources 3
Advanced spreadsheet, graphics, aerial photography, and Geographic Information Systems for natural resource management. (F) DE

WILD 3300 CI Management Aspects of Wildlife Behavior 3
Principles, concepts, and mechanisms of animal behavior, emphasizing behavioral ecology, development, and comparative aspects of special relevance to management of fish and wildlife. Prerequisites: BIOL 1610, 1620, and BIOL/NR 2220. (Sp)

WILD 3600 Wildland Plant Ecology and Identification 4
Autecology and identification of dominant grass, forb, and woody plants of the Intermountain West. Emphasizes native species; however, introduced or noxious weeds are included. Explores plant structure and function, as related to the environment. Enrollment limited to WILD Department majors. Department authorization required for all nonmajors. (F) DE

WILD 3610 Wildland Animal Ecology and Identification 4
Autecology and identification of important mammals, birds, reptiles, and amphibians of the Intermountain West. Emphasizes native species distribution and habitat requirements in relation to the environment. Prerequisite: NR/BIOL 2220. Enrollment limited to WILD Department majors. Department authorization required for all nonmajors. (F)

WILD 3800 Wildland Ecosystems 3
Structure, function, and dynamics of terrestrial ecosystems in response to natural and anthropogenic impacts, with emphasis on the vegetation of the Intermountain West and Great Plains. Prerequisites: NR/BIOL 2220; and SOIL 3000 (or concurrent enrollment). (Sp)

WILD 3810 Plant and Animal Populations 3
Basics of plant and animal population ecology, including population regulation, life histories, single and multi-species interactions, and metapopulations. Case studies will cover topics of both management and conservation concern. Prerequisites: NR/BIOL 2220, MATH 1100 or higher. (Sp)

WILD 4000 Principles of Rangeland Management 3
Modern principles of rangeland management, including history of the profession, ecology, plant physiology, impacts of grazing on individual plants and plant communities, grazing management, range animal nutrition, rangeland watersheds, and the economics and planning of rangeland practices. Also introduces range-wildlife relations and vegetation manipulation. (Sp)

WILD 4050 Urban Fish and Wildlife Management 3
Concentrates on: understanding impacts of urbanization on wildlife and habitat; developing basic understanding of wildlife needs; completing urban wildlife habitat inventory; and preparing urban wildlife conservation and management plan. (F,Sp,Su)

WILD 4250 Advanced Internship/Co-op 1-9®
Advanced-level educational experience in internship/cooperative education position approved by department. Prerequisite: Departmental signature. (F,Sp,Su) DE

WILD 4500 Principles of Wildlife Management 3
Provides students with a working knowledge of the application of basic concepts in ecology and animal behavior to the management of wildlife resources to achieve diverse objectives of conservation, control, or cropping. Prerequisites: WILD 3610 and 3810. (Sp)

WILD 4520 Wildland Fire Behavior 3
Comprehensive examination of fuels, weather, and topography and how they interact to determine wildland fire behavior, including rate of spread, energy release, and intensity. This course is being offered in WebCT format. For information, contact the department. (F,Sp,Su)

WILD 4540 Forest Harvest and Utilization 2
Elements of timber harvest systems, including policies and practices for minimizing biophysical impacts. Utilization of wood resources. (F)

WILD 4550 Wildlife Law Enforcement 3
Explores essential topics relating to enforcement of wildlife and other natural resource laws, including applicable state and federal laws, policy formulation, rights of the individual, search and seizure, field forensic procedures, and the judicial process. (F)

WILD 4600 Conservation Biology* 3
Patterns and processes creating biological diversity. Causes and consequences of diversity losses from genes to ecosystems, including habitat fragmentation and exotic invasion. Conservation laws and organizations. Approaches to conserving diversity loss, including reserve design, corridors, and species reintroductions. Prerequisite: NR/BIOL 2220. (Sp)

WILD 4700 Ecological Foundations of Restoration 3
Explores meanings of "restoration," use of reference communities, restoration of processes versus structure, species reintroductions, managing natural processes to meet restoration goals, and fundamentals of physiological, population, community, and ecosystem ecology from a restoration perspective. Prerequisites: NR/BIOL 2220, WILD 4850. (Sp)

WILD 4750 CI Monitoring and Assessment in Natural Resource and Environmental Management 3
Lectures, laboratory exercises, and field-based projects introduce students to the concepts, strategies, and analytical methods of natural resource and environmental monitoring and assessment. Prerequisites: BIOL/NR 2220; MATH 1100 or higher; STAT 2000 or 3000; and passing score on the University Studies Computer and Information Literacy (CIL) exam. (F)

WILD 4810 Directed Reading in Wildlife Damage Management 2
Focuses on wildlife damage management, especially as it reflects on both positive and negative human-wildlife interactions. For this reading course, students work with instructor to develop appropriate and rigorous reading program. (F,Sp,Su) DE

WILD 4850 Vegetation and Habitat Management 3
Applying ecological principles and concepts to manipulate the composition, structure, and productivity of wildland vegetation for a range of objectives, including the creation and maintenance of wildlife habitat, using biological, chemical, and mechanical methods, as well as fire. Prerequisites: SOIL 3000; WILD 3600. (F)

WILD 4880 Genetics in Conservation and Management 3
Introduces principles of modern genetics, with applications, examples, and assignments related to ecology and management issues. Emphasizes genetic marker systems, gene flow, genetic drift, and adaptation. Prerequisites: CHEM 1110 or 1210; and BIOL 1610. (F)

WILD 4900 Managing Dynamic Ecological Systems 3
Emphasizes how people from diverse natural resource disciplines benefit from integrating Eastern and Western philosophical and cultural beliefs with behavioral principles and processes to manage dynamic systems with due consideration for the ecological, cultural, and economic values of societies. (Sp)

WILD 4910 Assessment and Synthesis in Natural Resource Science 3
Science-based assessments of natural resources conducted through implementation of analytical methods and synthesis. Case studies used to develop concepts, strategies, and problem-solving skills. Basic GIS and remote sensing skills developed. Prerequisites: WILD 3600, 3610, 3800, 3810, and 4750. (Sp)

WILD 4950 Special Topics 1-3®
Individual study and research upon selected problems. Prerequisite: Departmental permission. (F,Sp,Su) DE

WILD 4960 Directed Readings 1-3®
Individual reading research on forest, range, and wildlife science readings. Prerequisite: Departmental approval. (F,Sp,Su)

WILD 4970 Undergraduate Research 1-3®
Individual or team research. Prerequisite: Departmental permission. (F,Sp,Su) DE

WILD 4980 Undergraduate Seminar 1®
Intended to bring upperclassmen up-to-date on topics in forest, range, and wildlife sciences. Graded Pass/Fail *only*. (F,Sp)

WILD 5000 Predator Ecology and Management* 3
Reviews biology, ecology, theory, management, and policy issues involving large vertebrate predators. Uses case histories to explore predation theory, population ecology, natural history, and management strategies. (Sp)

WILD 5070 Range Wildlife Relations 3
(dual listing 6070)
Explores interactions on rangelands between wild and domestic ungulates, as well as other wildlife forms around the world, but with emphasis on western North America. Prerequisite: WILD 3610 or permission of instructor. (F)

WILD 5100 Wildlife Management Laboratory 3
Familiarizes students with variety of wildlife management and research techniques and strategies, including techniques to catch, mark, and restrain wild animals; monitoring wildlife populations; measuring physiological parameters; measuring habitat variables; assessing and preventing wildlife damage; and interpreting and analyzing biological data. (F)

WILD 5220 Community-based Conservation
(dual listing 7220) Partnerships 3**
Seeks to infuse ecology with applied conservation and management approaches. Conservation and management of natural resources requires an understanding of ecological relationships and strategies for working with diverse stakeholders. PhD-level students present their research. (Sp)

WILD 5300 Wildlife Damage Management Principles 3
(dual listing 7300)
Explains current legal, ethical, and biological principles for the control and/or management of problem vertebrate species. (Sp)

WILD 5350 Wildland Soils 3
(dual listing 6350)
Application of basic principles of soil science to wildland ecosystems. Effects of disturbance and land use on wildland soil properties. Role of soils in natural resource management. Prerequisites: CHEM 1110; SOIL 3000, and one additional upper-division Soils course, or permission of instructor. Also taught as SOIL 5350/6350. (Sp)

WILD 5420 CI Forest and Shade Tree Pathology 3
Nature, cause, and management of forest diseases. Also taught as BIOL 5420 and PLSC 5420. (Sp)

WILD 5430 Advanced Forest Pathology 2
In-depth exploration of forest pathology issues, focusing on ecosystem-level processes. (Sp)

WILD 5460 Avalanche and Snow Dynamics 2
Fundamentals of snow and avalanche dynamics. Avalanche safety, forecasting, hazard evaluation, and control. (Sp—first half)

WILD 5510 Forest Entomology 2
Basic insect taxonomy, life histories, structure, and function. Ecological relationships, recognition, and management of insects of economic importance to forestry. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 5650 Urban/Community Forestry 3
Social, biological, and administrative aspects of managing urban/community forests, including field and classroom exercises and a management planning project. Also taught as PLSC 5650. (Sp) DE

WILD 5700 Forest Assessment and Management 3
Detailed analysis of forest stand structure and growth. Development of silvicultural prescriptions to meet specific objectives. Analysis of costs and benefits of alternative forest management strategies. Emphasizes forest management to achieve a broad range of objectives. (Sp)

WILD 5710 Wildland Disturbance: Ecology and Management 3
Examines causes, effects, and management options for selected biotic and abiotic agents of disturbance in wildland ecosystems. (F)

WILD 5750 Applied Remote Sensing 3
(dual listing 6750)
Covers the application of remote sensing to landcover mapping and resource monitoring at a quantitative level. Students instructed on the effects of atmosphere and surface interaction on the reflectance collected by electro-optical sensors, as well as on the proper use and interpretation of various calibration and classification algorithms. (F)

WILD 5860 Poisonous Range Plants Affecting Livestock 3**
Poisonous plants of rangelands and their effects on grazing animals, especially livestock. Management practices to reduce or prevent poisoning. Also taught as ADVS 5860. (Sp)

WILD 6000 Grazing Systems 2**
Overview and analysis of various strategies for managing grazing on rangelands. Special attention given to ecological mechanisms by which a particular grazing system may benefit livestock production or the sustainability of rangeland resources. (Sp)

WILD 6050 Rangeland Fire Ecology and Fire Prescription Development 3
Provides understanding of the role prescribed and natural fires have in western U.S. rangeland plant communities, and when fire can be used to achieve a specific plant community. Students learn basics of fire behavior and ignition techniques, and how to write prescribed fire use plans. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 6070 Range Wildlife Relations 3
(dual listing 5070)
Explores interactions on rangelands between wild and domestic ungulates, as well as other wildlife forms around the world, but with emphasis on western North America. Prerequisite: WILD 3610 or permission of instructor. (F)

WILD 6200 Biogeochemistry of Terrestrial Ecosystems 3**
Inputs, outputs, and cycling patterns of major nutrients. Emphasis on mechanisms for transformations, factors influencing process rates, and the impacts of management and global change on nutrient cycles and air and water quality. Prerequisites: BIOL 1620, SOIL 3000, CHEM 2300 or 2310, or permission of instructor. Also taught as BIOL 6200 and SOIL 6200. (F)

WILD 6240 Graduate Internship/Co-op 1-9®
Graduate-level educational experience in internship/cooperative education position approved by department. (F,Sp,Su)

WILD 6270 Advanced Silviculture 3
In forestry, there is a trend toward more complex silviculture to implement increasingly complex stand-level objectives. This course covers important techniques used in the development and implementation of silvicultural prescriptions for this sort of stand management. Prerequisite: Permission of instructor. (Sp)

WILD 6350 Wildland Soils 3
(dual listing 5350)
Application of basic principles of soil science to wildland ecosystems. Effects of disturbance and land use on wildland soil properties. Role of soils in natural resource management. Prerequisites: CHEM 1110; SOIL 3000, and one additional upper-division Soils course, or permission of instructor. Also taught as SOIL 6350/5350. (Sp)

WILD 6400 Ecology of Animal Populations* 4
Growth, fluctuation, balance, and control of animal populations. Prerequisite: NR/BIOL 2220 or equivalent. (F)

WILD 6420 Vegetation Sampling Design 4
Advanced intrastand vegetation sampling design and elementary (nonmultivariate) between stand comparisons, primarily for research purposes. Prerequisites: STAT 5200; WILD 6770. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 6500 Biometry: Design and Analysis of Ecology Research 4
Examines research design from statistical perspective, showing how data analysis is largely determined by research design and its implementation. Reviews statistical tools for analysis of ecological data in the context of design. Prerequisite: Graduate standing. (F)

WILD 6510 Topics in Spatial Ecology 1-3®**
Seminars on analysis and interpretation of spatially explicit ecological data. Topics vary yearly, and range from spatial statistics to assessing uncertainty in environmental information systems to spatial analyses of plant and animal populations. Prerequisites: Graduate-level course in statistics and permission of instructor. (Sp)

WILD 6610 Regional Terrestrial Ecosystems 4
Synthesis of structural, functional, and regulatory processes and their interactions with humans in terrestrial ecosystems found in the Intermountain West and Great Plains. Prerequisites: NR/BIOL 2220, SOIL 3000; or equivalent courses. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 6710 Landscape Ecology 3
(dual listing 7710)
Focuses on landscape-scale patterns and processes, and ways of understanding ecological complexity. Explores conceptual underpinnings of larger-scale ecology. Emphasizes understanding of current peer-reviewed literature. (Sp)

WILD 6720 Advanced Conservation Biology* 3
(dual listing 7720)
Examines cases and consequences of population and species declines, including activities such as habitat fragmentation and introduction of exotic species, as well as natural causes due to genetics and demography. (Sp)

WILD 6740 Physical Processes in Remote Sensing 3
Assures that students are well-versed in the science and technology of remote sensing. Covers various algorithms and their ability to extract biophysical information from remotely sensed images. Helps students gain firm knowledge of the capabilities and limitations of these algorithms and their use in understanding landscape level biophysical interactions. (Sp)

WILD 6750 Applied Remote Sensing 3
(dual listing 5750)
Covers the application of remote sensing to landcover mapping and resource monitoring at a quantitative level. Students instructed on the effects of atmosphere and surface interaction on the reflectance collected by electro-optical sensors, as well as on the proper use and interpretation of various calibration and classification algorithms. (F)

WILD 6770 Plant Community Ecology* 3
Theory and concepts of plant community ecology. Plant community composition, distribution in space, and dynamics in time. Species environmental response models, competition theory, statistical predictive models, and concepts of multivariate analysis in plant ecology. (Sp)

WILD 6800 Forest, Range, and Wildlife
(dual listing 7800) Sciences Departmental Seminar 1®
Review of current research by graduate students and faculty. Exposes students to new developments in research and management in the fields of wildland resources. Features participation by students, faculty, and guest lecturers. Graduate students should register for only one semester each year, but should attend all year. Graded Pass/Fail *only*. (F,Sp)

WILD 6850 (dual listing 7850) Population Ecology 3
Using framework of mathematical modeling, reviews basic ecological processes (e.g., competition, predation, and environmental stresses) that determine numbers of individuals in plant and animal populations. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 6870 Ecology Seminar 1®
The Ecology Center schedules regular seminars throughout the school year with ecological scientists from other institutions participating. Ecology majors are required to attend a minimum of 10 such lectures. Graded Pass/Fail *only*. Students should register for fall semester, but attend through spring semester. Also taught as BIOL 6870, ENVS 6870, PSC 6870, and WATS 6870. (F,Sp)

WILD 6880 (dual listing 7880) Current Issues in Conservation Genetics and Management* 2
Reviews variety of topics in fast-moving field of conservation genetics. Explores management applications and implications, with particular emphasis on current primary literature. Recommended prerequisite: Prior course in genetics. (Sp)

WILD 6900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su) DE

WILD 6910 Directed Study 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WILD 6960 Graduate General Ecology 4
General concepts, history, and issues in all major areas of the science of ecology including: environmental biophysics; and physiological, behavioral, evolutionary, community, ecosystem, and applied ecology in both terrestrial and aquatic environments. Also taught as BIOL 6960, ENVS 6960, PSC 6960, and WATS 6960. (F)

WILD 6970 Thesis Research 1-12®
Original research for MS degree on a topic in rangeland resources. Graded Pass/Fail *only*. (F,Sp,Su)

WILD 6990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

WILD 7000 Theory and Applications of Rangeland Ecosystem Management 3
Application of range management principles, new theory, and public policy to on-the-ground decision-making in public and private lands. Field trips required. (F,Su)

WILD 7030 Plant-Herbivore Interactions* 3
Emphasizes principles of self-organization as applied to plant (tolerance and avoidance of herbivory) and herbivore (food and habitat selection) behavior. Stresses importance of history and ongoing interactions with the environment in understanding the dynamics of plant-herbivore interactions. (Sp)

WILD 7200 Plant Physiological Ecology 3**
Plant response to environmental factors; includes environmental biophysics, physical and physiological factors influencing productivity, water use, resistance to stress, reproduction, establishment of plants, and competition with neighboring plants. (F)

WILD 7220 (dual listing 5220) Community-based Conservation Partnerships 3**
Seeks to infuse ecology with applied conservation and management approaches. Conservation and management of natural resources requires an understanding of ecological relationships and strategies for working with diverse stakeholders. PhD-level students present their research. (Sp)

WILD 7300 (dual listing 5300) Wildlife Damage Management Principles 3
Explains current legal, ethical, and biological principles for the control and/or management of problem vertebrate species. (Sp)

WILD 7400 Plant Population Ecology* 3
Dynamics of plant populations as influenced by interactions with their abiotic and, especially, biotic environments. Topics include dormancy and germination strategies, intra- and interspecific competition, facilitation, disturbance, herbivory, pathogenic and mutualistic fungi, pollination, seed dispersal, and vegetative reproduction. (F)

WILD 7420 Analysis of Ecological Communities 5**
Advanced treatment of classification and ordination of ecological communities, emphasizing ecological data structures and methods of common use in ecological research. Prerequisite: STAT 3000 or WILD 6500 or consent of instructor. (Sp)

WILD 7710 (dual listing 6710) Landscape Ecology 3
Focuses on landscape-scale patterns and processes, and ways of understanding ecological complexity. Explores conceptual underpinnings of larger-scale ecology. Emphasizes understanding of current peer-reviewed literature. (Sp)

WILD 7720 (dual listing 6720) Advanced Conservation Biology* 3
Examines cases and consequences of population and species declines, including activities such as habitat fragmentation and introduction of exotic species, as well as natural causes due to genetics and demography. (Sp)

WILD 7800 (dual listing 6800) Forest, Range, and Wildlife Sciences Departmental Seminar 1®
Review of current research by graduate students and faculty. Exposes students to new developments in research and management in the fields of wildland resources. Features participation by students, faculty, and guest lecturers. Graduate students should register for only one semester each year, but should attend all year. Graded Pass/Fail *only*. (F,Sp)

WILD 7850 (dual listing 6850) Population Ecology 3
Using framework of mathematical modeling, reviews basic ecological processes (e.g., competition, predation, and environmental stresses) that determine numbers of individuals in plant and animal populations. This course is not currently being offered. For information about when it may be offered, contact the department.

WILD 7880 (dual listing 6880) Current Issues in Conservation Genetics and Management* 2
Reviews variety of topics in fast-moving field of conservation genetics. Explores management applications and implications, with particular emphasis on current primary literature. Recommended prerequisite: Prior course in genetics. (Sp)

WILD 7900 Graduate Special Topics 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WILD 7910 Directed Study 1-6®
Offers credit for special assignments, reading, and seminars beyond regularly scheduled courses. (F,Sp,Su)

WILD 7970 Dissertation Research 1-12®
Original research and study for PhD degree. Graded Pass/Fail *only*. (F,Sp,Su)

WILD 7990 Continuing Graduate Advisement 1-9®
Graded Pass/Fail *only*. (F,Sp,Su)

®Repeatable for credit. Check with major department for limitations on number of credits that can be counted for graduation.

DE This course may be available through Regional Campuses and Distance Education (RCDE), and may be offered through multiple delivery methods. Current RCDE offerings may be viewed at: **http://distance.usu.edu/**

*Taught 2010-2011.

**Taught 2009-2010.