



**COURSES IN ANTHROPOLOGY**

**4623 Approaches to Cross-Cultural Human Problems.** Prerequisite: 1113 or junior standing. Introduces students to the complex problems of contemporary global-scale cultures and helps them better understand their place on this global arena. This course will look at specific international issues or problems, and relate them to processes occurring in many parts of the world. (Irreg.) [IV-NW]

**COURSES IN BIOLOGY (BIOL)**

**1134 Introductory Biology: Evolution, Ecology and Diversity.** Prerequisite: Life science majors only. Major biological principles and concepts as illustrated in a survey of the diversity, behavior, and ecological functions of animals, plants, fungi, and microbes. Emphasis is on evolution, ecology, and diversity. Will include biological laboratory experience with emphasis on problem solving. Problems will be derived from topics in evolution, ecology, and diversity. Will include training in scientific procedures, including laboratory technical skills, writing skills, and introduction to statistical analysis. Recitation will include discussion and case study analysis of the major biological principles presented in the lecture within the context of health and the environment. Will involve problem sets, primary journal articles, and writing assignments. Includes both online and classroom activities. **Laboratory** (Sp) †**G3403 Principles of Ecology.** Prerequisite: 1114 and 1121, or 1134, or Plant Biology 1114. Patterns of environments and biological communities; the processes maintaining these patterns. **Laboratory** (F, Sp)

**COURSES IN CHEMISTRY AND BIOCHEMISTRY (CHEM)**

**1315 General Chemistry.** Prerequisite: Mathematics 1503 or 1643, or math ACT equal to or greater than 23. General Chemistry is an overview of the chemical basis of natural phenomena. First of a two-semester sequence in general chemistry. Topics covered: basic measurement, atomic theory, electron configuration, periodicity, chemical reactivity and energetics, stoichiometry, gas laws and changes in state, bonding and molecular structure. A student may not receive credit for this course and CHEM 1335. **Laboratory.** (F, Sp, Su) [II-LAB]

**1415 General Chemistry (Continued).** Prerequisite: CHEM 1315 with a minimum grade of C or CHEM 1335 with a minimum grade of C or a satisfactory score on the chemistry placement examination. Topics covered include thermochemistry, equilibrium, thermodynamics, acid and base properties, kinetics and electrochemistry. A student may not receive credit for this course and CHEM 1435. **Laboratory.** (F, Sp, Su) [II-LAB]

**3053 Organic Chemistry I: Biological Emphasis.** Prerequisite: CHEM 1415 or CHEM 1425. Intended for life science majors. First course in a two-semester sequence (3053 and 3153). This course will cover the concepts of organic structure, nomenclature, and reactivity with an emphasis on biological applications. (F, Sp, Su)

**3153 Organic Chemistry II: Biological Emphasis.** Prerequisite: CHEM 3053 with a grade of C or better. Intended for life science majors. Second course in a two-semester sequence (3053 and 3153). This course will cover the concepts of organic chemical reactivity with an emphasis on carbohydrates, lipids, and proteins. (F, Sp, Su)

**COURSES IN CIVIL ENGINEERING AND ENVIRONMENTAL SCIENCE (CEES)**

**1000 CEES Seminar.** Seminar provides a common meeting time for students and faculty for department activities, such as invited speakers, project presentations, educational surveys, cross-course project coordination, and policy announcements. Students must enroll every semester that they are matriculated in CEES at OU after the freshman year, but in no case can a student graduate without successfully completing four semesters of seminar. (F, Sp)

**1112 Introduction to Civil Engineering and Environmental Science.** Prerequisite: freshman only. Introduction to fundamental concepts (mass/flow balance), problem solving and design, and simple computing software for architectural, civil or environmental engineers and environmental scientists. (F)

**2213 CADD Fundamentals.** Prerequisite: CEES Majors only and Sophomore standing. Introduction to computer aided design and drafting with a focus on the AutoCAD and MicroStation platforms. This course is primarily about learning to use the software and learning how to convey an engineering design graphically. (F)

**2313 Water Quality Fundamentals.** Prerequisite: Chemistry 1415; Mathematics 2423 or 2924. Introduction to environmental mass balance and fate processes. Studies of mass and energy transfer, introductory environmental chemistry, water quality parameters, mathematics of growth, statistics and data analysis, introduction to environmental laws and regulations. (F)

**2323 Environmental Transport and Fate Process.** Prerequisite: 2313. Physicochemical and biological processes controlling contaminant distribution and fate; hydrological processes controlling contaminant transport; sources, prevention and remediation of environmental pollutants. (Sp)

**4114 Aquatic Chemistry (Slashlisted with 5114).** Prerequisite: Senior standing and one year of general chemistry. Environmental kinetics and thermodynamics in aquatic systems; acid/base, precipitation/solubility, metal complexation and oxidation/reduction reactions; environmental colloidal and solid-liquid interface chemistry. No student may earn credit for both 4114 and 5114 or Environmental Science 4114 and 5114. **Laboratory** (F)

**4253 Statistics and Probability.** Prerequisite: MATH 2423 or 2924 and PHYS 2524 or 2424. Designed to help students understand the fundamentals of probability, statistics, reliability, and risk methods in support of decision making for future engineers and scientists. Fundamental concepts in probability and statistics will be reviewed and used throughout the course. Engineering decisions are often based on data that contain uncertainty; future scientists and engineers should understand how uncertainty affects calculated quantities, accuracy, precision, and reliability. (Sp)

**G4263 Hazardous and Solid Waste Management.** Prerequisite: junior or above status in CEES or permission of instructor. Sources and types of solid wastes; identification and classification of hazardous wastes; waste handling, transportation, treatment and disposal techniques, federal and state legislation; and environmental and health effects. (F)

**4324 Environmental Biology and Ecology (Slashlisted with 5324).** Prerequisite: 2323. Examines applied environmental biology; biological consequences of environmental impacts; mitigation of environmental impacts via biogeochemical, ecological and microbial processes. No student may earn credit for both 4324 and 5324. **Laboratory** (F)

**4911 Introduction to ES Capstone.** Prerequisite: Senior standing in Environmental Science. Introduction to the capstone design project, which is a two-semester long, open-ended engineering design problem that requires applying the skills and techniques acquired in earlier engineering courses. This course will focus on introducing the project requirements forming multi-disciplinary teams of students developing team identities assigning team roles evaluating project constraints and developing a project design schedule.

**4913 Environmental Science Capstone.** Prerequisite: CEES 4114, CEES 4324, CEES 4911; and CEES 4253 co-requisite. The capstone experience draws upon undergraduate course work in environmental science, biology, chemistry, physics, mathematics, and related sciences. Student teams address a client-driven, open-ended, real-world problem. Faculty coordinators serve in advisory capacities only, introducing field, laboratory, and computer methods and coordinating class meetings and presentations. Any other in-class presentations cover non-traditional (non-technical) topics. (Sp) [V]

**4943 Air Quality Management.** Prerequisite: MATH 2423 or 2924; and CHEM 1315. Important aspects of air quality will be covered, including air quality legislation, major sources and effects of air pollutants, monitoring, atmospheric dispersion, and air quality modeling. (Sp)

**COURSES IN ENGINEERING (ENGR)**

**1410 Freshman Engineering Orientation I.** Prerequisite: declared major in engineering. All entering freshmen with a declared engineering major are required to enroll. One hour of this seminar a week is in a large group setting where all students meet and cover details on all engineering disciplines. Additional topics would be continuums of majors, success in the College of Engineering, success at the University of Oklahoma, study abroad programs, advising issues, graduate school opportunities, career planning, and information related to technical/honor societies and participation. A second hour a week is a required small group session with an upper-class mentor from the College of Engineering Dean's Leadership Council. This second hour will focus on basic enrollment and retention strategies such as adding and dropping classes and choosing electives in addition to a weekly topic area. (F)

**COURSES IN ENGLISH (ENGL)**

**3153 Technical Writing.** Prerequisite: 1213 and Engineering or hard science majors only. For students of the pure and applied sciences. Focuses on the forms of report writing most frequently encountered in research and industry. (F, Sp, Su)

**COURSES IN GEOGRAPHY (GEOG)**

**4293 Hydrologic Science (Slashlisted with 5293).** Prerequisite: Math 1823 or 1914, and either Physics 2414, 2514 or Chemistry 1315. Study of the processes which control the storage and movement of water at global, regional, and local scales. The emphasis is on the land portion of the hydrologic cycle, and includes the study of processes such as infiltration, soil water flow in the saturated and unsaturated zone, rainfall/runoff and evaporation. Lab sections include exercises on a computer in the field and in a soils lab. No student may earn credit for both 4293 and 5293. (Sp)

**COURSES IN HISTORY OF SCIENCE (HSCI)**

**3333 Technology and Society in World History.** Prerequisite: junior standing, or completion of one History of Science lower-division course, or permission of instructor. A survey of the history of technology since 1500. Emphasizes historical contexts and cultural meanings, not technical details, as it explores the key steps in the construction of our modern technological world. Materials include literature and film as well as non-fiction. (Sp) [IV-WC]

**COURSES IN MATHEMATICS (MATH)**

**1823 Calculus and Analytic Geometry I.** Prerequisite: 1523 at OU, or satisfactory score on the math assessment. Topics covered include equations of straight lines; conic sections; functions, limits and continuity; differentiation; maximum-minimum theory and curve sketching. A student may not receive credit for this course and 143. (F, Sp, Su) [I-M]

**2423 Calculus and Analytic Geometry II.** Prerequisite: 1823. Integration and its applications; the calculus of transcendental functions; techniques of integration; and the introduction to differential equations. A student may not receive credit for this course and 2123. (F, Sp, Su) [I-M]

**COURSES IN MICROBIOLOGY (MBIO)**

**2815 Introduction to Microbiology.** Prerequisite: one course in college chemistry. Introduction to microorganisms as biological entities. Survey of the roles of microorganisms in the ecosystem. Application of microorganisms to industrial and environmental problems. Discussion of microorganisms as causes of human disease and response of hosts to microbial invasion. This course does not count for major credit in Microbiology or Botany. **Laboratory** (F, Sp, Su) [II-LAB]

**COURSES IN PHYSICS (PHYS)**

**2514 General Physics for Engineering and Science Majors.** Prerequisite: Mathematics 1823 or Mathematics 1914 with grade of C or better. Not open to students with credit in 1205. Vectors, kinematics and dynamics of particles, work and energy systems of particles, rotational kinematics and dynamics, oscillations, gravitation, fluid mechanics, waves. (F, Sp, Su) [II-NL]

**2524 General Physics for Engineering and Science Majors.** Prerequisite: 2514 and Mathematics 2423 or 2924 with a grade of C or better. Not open to students with credit in 1215. Temperature, heat, thermodynamics, electricity, magnetism, optics. (F, Sp, Su)

**COURSES IN PLANT BIOLOGY (PBIO)**

**1114 General Botany.** Previous course in chemistry (high school or college) recommended. Fulfills Arts and Sciences' biological science requirement. Basic processes and structures in plants; their relation to factors in the environment; reproduction; heredity, heritable and nonheritable variations in plants and their causes and consequences are studied. Scientific procedures are acquired through application and discussion. **Laboratory** (F, Sp, Su) [II-LAB]