

# ENVIRONMENTAL SCIENCE (ENV)

## **ENV 1101 An Introduction to Environmental Analysis (Lab) (1)**

Pre-requisite(s): Credit or concurrent enrollment in ENV 1301  
Methods of collection, analysis, and interpretation of environmental data as used in the social, behavioral, physical and biological disciplines.

## **ENV 1103 Wildlife Ecology Laboratory Exercises (1)**

Pre-requisite(s): ENV 1303; or concurrent enrollment in ENV 1303  
Laboratory experience in basic ecological methodologies, including interpreting elementary graphic and statistical information, gathering population and habitat data, and understanding how science might be used to solve practical environmental problems.

## **ENV 1301 Exploring Environmental Issues (3)**

A survey of the fundamental physical, biological, and social forces affecting the solution of environmental problems. Principles of environmental history, political science, economics, biology, geology, physics, anthropology, and related disciplines.

## **ENV 1303 Wildlife Ecology (3)**

Introduction to wildlife identification, populations, life histories, behavior and habitats and the role of wildlife in ecological communities and ecosystems.

## **ENV 1305 Freshman Environmental Seminar (3)**

Pre-requisite(s): Freshman or sophomore standing  
Introduces first-year students to significant topics in environmental studies. Emphasizes critical inquiry and thinking, research, scholarly communication, and problem-solving. Does not apply on the laboratory science requirement.

## **ENV 1309 Introduction to Environmental Sustainability (3)**

This course will introduce students to the major tenets of sustainability and will explore the real world application of sustainable practices on a local, national, and global scale. Topics will demonstrate interrelationships of various tools and approaches for sustainable development. Mastery of the materials from this course will prepare students to make positive changes on campus and beyond.

## **ENV 1V9R Research (3)**

Pre-requisite(s): Consent of the instructor  
Undergraduate research undertaken with the supervision of a faculty member. May be taken for a maximum of 6 hours.

## **ENV 2307 Ecology for a Changing World (3)**

Pre-requisite(s): BIO 1405, 1305 or 1401; and credit or concurrent enrollment in ENV 1301 or 1303  
The principles of ecology, emphasizing the effects of human activities on individuals, populations, communities and large-scale ecological systems.

## **ENV 2376 Environment and Society (3)**

Introduction to ethical, historical, and social science analysis of environmental issues, such as climate change, loss of biodiversity, water pollution, and urbanization. Emphasis on case histories and human dimensions of environmental problem solving.

## **ENV 2V9R Research (3)**

Pre-requisite(s): Consent of the instructor  
Undergraduate research undertaken with the supervision of a faculty member. May be taken for a maximum of 6 hours.

## **ENV 3100 Environmental Health Seminar (1)**

Pre-requisite(s): ENV 3314; or consent of instructor  
Seminars by faculty and visiting speakers on topics in environmental health science. May be repeated once, with different content. Major paper required.

## **ENV 3103 Seminar on Environmental Topics (1)**

Seminars by faculty and visiting speakers on various topics in environmental studies. May be repeated once, with different content.

## **ENV 3106 Conserving Biodiversity (Lab) (1)**

Pre-requisite(s): ENV 3306 or concurrent enrollment in ENV 3306  
Laboratory and field sampling methods for determining species diversity, minimum viable population size, and impacts of human disturbance on species survival.

## **ENV 3108 Marine Environments Laboratory (1)**

Pre-requisite(s): Credit or concurrent enrollment in ENV 3308  
Study of specimens and field surveys of major taxa of marine organisms; visits to typical marine and estuarine habitats. Overnight field trips required.

## **ENV 3133 Analytical Analysis of Water Quality (1)**

Pre-requisite(s): Upper-level standing  
This course provides instruction relating to the delineation of watersheds by the use of topographical maps and aerial photographs, and the use of scientific methodology to estimate quantitative values for contaminant levels.

## **ENV 3137 Wildlife Management Methods (1)**

Pre-requisite(s): ENV 3337 or concurrent enrollment  
Laboratory techniques used in wildlife management, abundance estimates, management of habitats, and resolving current issues in wildlife management. Studies of game, non-game, endangered, and exotic species.

## **ENV 3187 Environmental Chemistry Laboratory (1)**

Pre-requisite(s): Credit or concurrent enrollment in ENV 3387; or consent of instructor  
Introduction to experimental, field sampling, and analytical methods in environmental chemistry. Emphasis on field detection of both organic and inorganic compounds in soil, water, and air via spectrometric, chromatographic, and fluorometric instrumentation.

## **ENV 3188 Laboratory Methods in Environmental Assessment and Monitoring (1)**

Co-requisite(s): ENV 3187  
Pre-requisite(s): ENV 1301, 1101, and 2307  
Lab expands upon concepts learned in ENV 3210 by providing techniques that determine biological responses to stressors.

## **ENV 3216 Air Quality and Monitoring Laboratory (2)**

Pre-requisite(s): CHE 1300, 1301 or 1405; and credit or concurrent enrollment in ENV 3316  
An introduction to laboratory, field sampling, and data analysis techniques used in air quality monitoring. Topics will include measurement and analysis of pollutants such as ozone, particulate matter, and sulfur dioxide, and basic modeling.

## **ENV 3300 The Environment and Political Processes (3)**

Cross-listed as PSC 3300  
See PSC 3300 for course information.

**ENV 3301 Team Research in Environmental Studies (3)**

Pre-requisite(s): Sophomore or junior standing; or consent of the instructor

Students will participate in a team research project under the supervision of a Baylor faculty member. Students will be expected to attend one hour of lecture and to complete a minimum of six hours of field or laboratory work a week. May be repeated once under different topic.

**ENV 3303 Directed Reading in Environmental Studies (3)**

Pre-requisite(s): ENV 1301 or consent of instructor

Critical reading in environmental studies. Student-led discussion and evaluation. May be repeated with a change of topic for a maximum total credit of six semester hours.

**ENV 3306 Conserving Biodiversity (3)**

Pre-requisite(s): ENV 1301 or BIO 1306 or consent of instructor

Introduction to causes of species and habitat loss. Application of ecological and genetic concepts to conservation and restoration of animal and plant species.

**ENV 3308 Marine Environments and Biodiversity (3)**

Pre-requisite(s): Six hours of environmental studies or biology courses, or consent of instructor

Introduction to marine life forms, ecological adaptations, habitats, and critical issues in conserving marine biodiversity.

**ENV 3310 Field Techniques for Environmental Science (3)**

Pre-requisite(s): ENV 1301 and ENV 1101

Environmental sampling methods and sample processing; data collection and analysis, and biological indexing. Course provides hands-on experience in performing Texas Commission for Environmental Quality sampling techniques for air, water, sediments, and biota, with emphasis on aquatic systems.

Fee: \$200

**ENV 3314 Introduction to Environmental Health (3)**

Cross-listed as BIO 3315

Pre-requisite(s): Sophomore standing or above

Study of environmental hazards to the health of humans and other vertebrates, including pollution, radiation, wastes, urbanization, and climate change. Topics include epidemiology, risk assessment, infectious diseases, emerging contaminants, and regulation.

**ENV 3316 Introduction to Air Quality (3)**

Pre-requisite(s): CHE 1300, 1301 or 1405

Introduction to atmospheric chemistry, and transport and deposition of air pollutants. Topics include major sources of pollution, climate change, atmospheric regulation, and impacts on human health.

**ENV 3320 Environment and Human Behavior (3)**

Cross-listed as ANT 3320

See ANT 3320 for course information.

**ENV 3333 Watershed Assessment (3)**

Pre-requisite(s): ENV 1301 or consent of instructor

An introduction to the scientific tools and methodology by which watersheds may be delineated and assessed with respect to point and non-point pollution. This course will deal primarily with surface waters.

**ENV 3337 Principles of Wildlife Management (3)**

Pre-requisite(s): ENV 1303 or 2307 or consent of instructor

Introduction to techniques used in wildlife management including population estimation, forage evaluation, and habitat mapping. Investigation of the natural history and management strategies for a variety of game, non-game, endangered, and exotic species.

**ENV 3370 Managing Environmental Health and Safety (3)**

Pre-requisite(s): CHE 1405, 1300 or 1301; and ENV 3314 or consent of instructor

Anticipation, recognition, evaluation, and control of chemical, radiological, biological, and physical hazards in the workplace and in environmental contexts.

**ENV 3387 Environmental Chemistry (3)**

Pre-requisite(s): ENV 1101, 1301, and CHE 3331

An introduction to the chemistry of soil, water, and air, and the sources, fate, and transport of environmental pollutants. Topics include applications of chemistry to remediation and waste minimization. Open to students with diverse backgrounds. Credit or concurrent enrollment in ENV 3387 is required to enroll in ENV 3187 Environmental Chemistry Laboratory.

**ENV 3V90 Individual Research Problems (1-3)**

Pre-requisite(s): Completion of a departmental application providing a description of the project and consent of instructor

A research project conducted under the supervision of a Baylor faculty member in Environmental Science, a supporting department, or a pre-approved off-campus laboratory or field station. Three hours of laboratory or field work per week will be required during fall or spring semester, or fifty hours total during the summer, for each semester hour of credit. This course may be repeated for up to six semester hours of credit.

**ENV 3V93 Environmental Sustainability Internship (1-3)**

Pre-requisite(s): Consent of a Baylor faculty sponsor; and completion of a departmental application

Campus or community internship to develop leadership in environmental sustainability. Open to non-majors. The course may be repeated for up to three semester hours of credit.

**ENV 3V9R Research (3)**

Pre-requisite(s): Consent of the instructor

Undergraduate research undertaken with the supervision of a faculty member. May be taken for a maximum of 6 hours.

**ENV 4102 Seminar on Environmental Topics (1)**

Seminars by faculty, students and visiting speakers. Each student will prepare and present one thirty to forty-five minute seminar. May be repeated once, with different content.

**ENV 4170 Fundamentals of Ecotoxicology Laboratory (1)**

Co-requisite(s): ENV 4370

Pre-requisite(s): ENV 1301, 2307, 3210, 3187, and 3188

Field and laboratory techniques critical to gathering information on environmental stressors and responses of organisms to them.

**ENV 4199 Senior Thesis I (1)**

Pre-requisite(s): Senior standing in environmental studies major  
Student selects an environmental problem for independent research project. After approval by thesis adviser, literature search is conducted and bibliography for the thesis is completed.

**ENV 4287 Field and Laboratory Tests (2)**

Pre-requisite(s): CHE 1316, 3331, 3332; and/or concurrent enrollment in ENV 4387

Field and bench tests of chemically contaminated water and soil, using portable test kits, with simple bench tests of selected remediation methods such as ion-exchange, precipitation, and membrane separations.

**ENV 4299 Senior Thesis II (2)**

Pre-requisite(s): Credit or concurrent enrollment in ENV 4199

Preparation of information and data analysis in appropriate thesis form.

**ENV 4302 Team Problem Solving in Environmental Studies (3)**

Students will contribute the skills of their specializations to analyze and to suggest a solution to a current environmental problem. May be repeated once with a change of content.

**ENV 4304 Aquatic Chemistry (3)**

Pre-requisite(s): ENV 3387 or consent of instructor  
Concepts and issues in aquatic chemistry, including chemical equilibria of natural waters and anthropogenic impacts. Required field trips.

**ENV 4306 Economic Anthropology (3)**

Cross-listed as ANT 4306  
See ANT 4306 for course information.

**ENV 4307 Environmental Law (3)**

Cross-listed as PSC 4307  
Pre-requisite(s): Upper-level standing or consent of instructor  
Fundamentals of environmental protection laws in the United States, including the evolution of environmental law in the areas of case law, common law, and administrative law. Topics include air and water quality, toxic and hazardous substances, endangered species, and wetlands and coastal management issues.

**ENV 4308 Air Quality Regulation (3)**

Reviews history and policy of United States, transboundary, and global air pollution and resulting environmental regulations.

**ENV 4310 World Food Problems (3)**

Cross-listed as ANT 4311  
Pre-requisite(s): Upper-level standing  
A seminar approach with emphasis on the various causes of malnutrition including the ecological basis for food production, the impact of economics and politics on food production and distribution, and the consequences of malnutrition.

**ENV 4313 Agricultural Ecology (3)**

Pre-requisite(s): ENV 1301, or BIO 1306, or 1401  
Application of ecological principles to sustainable agricultural management. Emphasis on Texas and the tropics. Required weekend field trips.

**ENV 4315 Research Methods (3)**

Pre-requisite(s): ENV 1301 and 2376  
Research design and methods. Students produce a comprehensive research proposal in their major field(s) of study.

**ENV 4318 Heavy Metals & Global Public Health (3)**

Pre-requisite(s): BIO 1305 or BIO 1405, BIO 1306 or BIO 1406, CHE 1301, and CHE 1302, and upper level standing  
Examines the impacts of natural and anthropogenic sources of metals on human health and the relationship between natural geological factors and health in humans and animals in the context of geographic significance and public health responses.

**ENV 4322 Climate Anthropology (3)**

Cross-listed as ANT 4321  
See ANT 4321 for course information.

**ENV 4323 The Environment and Economic Analysis (3)**

Cross-listed as AVS 4323, ECO 4323  
Pre-requisite(s): ECO 1305 or 2306; and upper-level standing  
Economic analysis in description, analysis, and policy formulation of environmental problems such as natural resource development, ecology, energy needs, noise, water, and air pollution. Economic tools used will include social welfare analysis, externalities, and benefit cost analysis.

**ENV 4325 Human Health Risk Assessment (3)**

Pre-requisite(s): ENV 3314 or concurrent enrollment in ENV 3314; or consent of instructor  
Concepts, data sources, and methodologies used in the field of human risk assessment, including environmental hazard identification, dose-response assessment, exposure assessment, risk characterization, and risk communication. Required project utilizing professional risk assessment software.

**ENV 4327 Human Catastrophe and Cultural Response (3)**

Cross-listed as ANT 4327  
See ANT 4327 for course information.

**ENV 4330 Urban Political Processes (3)**

Cross-listed as PSC 4330  
See PSC 4330 for course information.

**ENV 4331 Social Demography (3)**

Cross-listed as SOC 4331  
See SOC 4331 for course information.

**ENV 4332 Science Leadership: Community Environmental Research (3)**

Cross-listed as GEO 4332  
Pre-requisite(s): Upper-level standing; and consent of instructor  
Development of science leadership skills through community-based research on environmental problems.

**ENV 4333 Coastal Zone Management (3)**

Pre-requisite(s): Upper-level standing  
Strategies for managing beaches, deltas, barrier islands and coastal seas, including issues in flood and storm risk, pollution mitigation, recreational development and fisheries exploitation.

**ENV 4335 Applied Environmental Impact Analysis (3)**

Government regulations and increased citizen awareness relationship to the impact of plans and projects on the environment. The course includes an examination of major environmental legislation and its impact on decision making in the public sector. Legislative Acts pertinent to the development of Environmental Impact Analysis are studied.

**ENV 4337 Environmental Sustainability and Religion (3)**

Pre-requisite(s): Upper-level standing or consent of instructor  
Cases studies in interactions between world and indigenous religions and environmental science, management, and planning. Topics include religious engagement with agriculture, extractive industries, watershed management, biodiversity conservation, pollution regulation, climate policy, and environmental NGOs.

**ENV 4340 Environmental Archaeology (3)**

Cross-listed as ANT 4340, ARC 4340  
See ANT 4340 for course information.

**ENV 4344 Fundamentals of Toxicology (3)**

Cross-listed as BIO 4344  
Pre-requisite(s): CHE 1301, 1302, 3331, BIO 1305,1306, 3322, and 3122; or consent of instructor  
Basic concepts of toxicology, including historical perspectives, the disposition and metabolism of toxic substances, pharmacokinetics, target organ toxicity, non-organ directed toxicity, toxic agents, industrial toxicology, forensic toxicology, environmental toxicology, toxicity testing techniques, and risk assessment.

**ENV 4345 Water Management (3)**

Cross-listed as GEO 4345  
Interdisciplinary field of water management. Scientific, technical, institutional, economic, legal, and political aspects of water management.

**ENV 4349 Pollution Abatement and Prevention Systems (3)**

Pre-requisite(s): ENV 3333, 3387, CHE 1302, or EGR 1301; or consent of instructor

Analysis, design, and performance of pollution treatment and remediation methods. Emphasis on the practices of pollution prevention, green chemistry, and industrial ecology as more sustainable pollution reduction strategies.

**ENV 4350 Development and Indigenous Peoples (3)**

Cross-listed as ANT 4350

Pre-requisite(s): ANT 1305, SOC 1305 or consent of instructor

With particular reference to indigenous peoples, this course examines the ethnographic context of Third World development and evaluates key issues that influence the development process.

**ENV 4351 Futuristics (3)**

Cross-listed as ANT 4351

See ANT 4351 for course information.

**ENV 4354 Water Treatment (3)**

Pre-requisite(s): ENV 1101 and 1301 or consent of instructor

Water use, treatment and disposal. Topics to be examined include the history of human use, resource access, water and wastewater treatment, disposal and re-use, anthropogenic impacts, regulations, current practices and theory in application of municipal, commercial and domestic treatment strategies. Activities include lecture, discussion, field trips, and student participation in the department's On-Site Wastewater Testing Program.

**ENV 4355 Principles of Renewable Resource Management (3)**

Theory, principles, and management of renewable resources to meet human needs. Field trips to management activities will be included.

**ENV 4362 Applied Anthropology (3)**

Cross-listed as ANT 4362

See ANT 4362 for course information.

**ENV 4365 The Environment and Energy (3)**

Pre-requisite(s): ENV 1301 and upper-level standing

Fundamental concepts of energy: the nature of energy flows and storage, potential and kinetic energy, energy loss and reversible and irreversible processes. Renewable and non-renewable energy sources and the impact of energy consumption on problems of societal sustainability.

**ENV 4369 Seminar in Anthropology (3)**

Cross-listed as ANT 4369

See ANT 4369 for course information.

**ENV 4370 Fundamentals of Ecotoxicology (3)**

Co-requisite(s): ENV 4170

Pre-requisite(s): ENV 1301, ENV 2307, ENV 3210, BIO 1305, BIO 1306, and CHE 1302; or consent of instructor

A survey of subjects critical to the study of contaminant impacts on the environment: principles of toxicology; use of toxicological information sources and data bases; ecological stressors and responses to better understand ecological risks.

**ENV 4371 Wetlands (3)**

Cross-listed as GEO 4371

See GEO 4371 for course information.

**ENV 4373 Global Soil Systems (3)**

Pre-requisite(s): BIO 1402 or 4401, CHE 3332, ENV 2375, or consent of instructor

Principles of the biodegradation and possible bioremediation of organic chemicals in the soil environment.

**ENV 4374 Global Soil Systems (3)**

Cross-listed as GEO 4373

See GEO 4373 for course information.

**ENV 4375 Natural Landscape Evaluation and Planning (3)**

Cross-listed as GEO 4375

See GEO 4375 for course information.

**ENV 4377 Advanced Studies in Wilderness, Parks, and Nature Reserves (3)**

Pre-requisite(s): ENV 3306 or consent of instructor

Topics in the management of national or state parks, nature reserves or wilderness areas, such as recreational impacts, disturbance ecology, or environmental interpretation. May be conducted as an off-campus field seminar.

**ENV 4379 Ecosystem Planning and Management (3)**

Course utilizes ecosystem-based concepts and data to develop environmental management plans which also consider social variables, such as regulations, economic development, and community welfare. Students draft and present plans based on regional ecosystems.

**ENV 4380 Restoration Ecology (3)**

Cross-listed as BIO 4381

Pre-requisite(s): ENV 2307 and 3306, or BIO 3303 or consent of instructor

Principles and practices for restoring natural systems that have been degraded or destroyed. Emphasis on re-establishment of soils, plants, and animals in terrestrial and aquatic environments. Legislative, political, industrial, and regulatory perspectives considered.

**ENV 4386 Remote Sensing (3)**

Cross-listed as AVS 4386, BIO 4386, GEO 4386, GEOG 4386

See GEO 4386 for course information.

**ENV 4389 American Environmental History (3)**

Cross-listed as HIS 4388

See HIS 4388 for course information.

**ENV 4390 Chemical Investigation and Remediation (3)**

Pre-requisite(s): ENV 4387, CHE 1316, and 3332

Methods of site analysis, toxicology of chemical contamination, use of "chemical fingerprinting," determination of exposure methods and exposure routes, analysis of epidemiological data, general methods for remediation of toxic and hazardous wastes, and use of both technical and moral considerations in decision making.

**ENV 4393 Environmental Ethics (3)**

See REL 4393 for course information.

**ENV 4394 Internship in Environmental Education (3)**

Pre-requisite(s): Consent of the Econnections coordinator

Participation as a teaching intern in the Baylor Econnections program for Waco schools or in an approved off-campus program. Students must engage in preparation and teaching a minimum of six hours a week.

**ENV 4397 Tropical Environments: Ecology and Sustainable Management (3)**

Pre-requisite(s): Consent of instructor and upper-level standing

Off-campus field course exploring tropical ecosystems, such as rainforests and coral reefs. Investigation of past impacts of human cultures, and of sustainable practices for future environmental management. Topics may include agriculture, forestry, aquatic resources, energy production, and ecotourism.

**ENV 43C2 Environmental Capstone (3)**

Pre-requisite(s): Twenty hours of environmental science courses and upper-level standing

Advanced seminar integrating principles of environmental science, social science, and policy to solve environmental problems. Assignments and subject matter may differ depending on the topic being evaluated and the instructor of record.

**ENV 4410 Humans and Environmental Change (4)**

Pre-requisite(s): Upper-level standing

Effect of human activity on landscape evolution through time, including impacts of agriculture, forest clearing, mining, soil erosion, invasive species, pollution, and transportation infrastructure. Assessment and documentation of environmental change. Required laboratory section and weekend field trips.

**ENV 4450 Applied Forest Ecology (4)**

Pre-requisite(s): ENV 1301 or BIO 1306

Ecological analysis of forest and woodland structure, energy and nutrient cycling, population dynamics and response to disturbance. Application of concepts to sustainable forest management.

**ENV 4485 Introduction to Geographic Information Systems (4)**

Cross-listed as AVS 4485, GEO 4485

See GEO 4485 for course information.

**ENV 4487 Advanced GIS Analysis (4)**

Cross-listed as AVS 4487, ENV 4388, GEO 4487

Principles and techniques for geospatial data collection, manipulation, modeling, visualization, and analysis. Emphasis is placed on current raster modeling techniques, spatial statistical analysis methods, and using GIS as a predictive tool for environmental research.

**ENV 4613 Field School in Environmental Studies (6)**

Pre-requisite(s): Consent of instructor

Application of the scientific method to the investigation and resolution of an environmental issue.

**ENV 4680 Field School in Cultural Anthropology (6)**

Cross-listed as ANT 4680

See ANT 4680 for course information.

**ENV 4V13 Special Topics in Field and Laboratory Methodologies (1-3)**

Pre-requisite(s): Upper-level standing or consent of instructor

A field experience centered on a region, ecosystem type, or environmental issue. Incorporates system-specific sampling methodologies. Requires off-campus field trips. May be repeated up to a total of three credit hours when content differs.

**ENV 4V50 Problems (1-3)**

Advanced interdisciplinary study of the environment. Subject and hours credit mutually agreed upon by student and directing professor(s) prior to registration. May be repeated for a maximum total credit of three semester hours.

**ENV 4V90 Advanced Individual Research Problems (1-3)**

Pre-requisite(s): Consent of the instructor; and ENV 3V90 or completion of a departmental application providing a description of the project

A research project conducted under the supervision of a Baylor faculty member in Environmental Science, a supporting department, or a pre-approved off-campus laboratory or field station. Students must participate in project design, data analysis, or reporting. Three hours of laboratory or field work per week will be required during fall or spring semester, or fifty hours total during the summer, for each semester hour of credit. This course may be repeated for up to six semester hours of credit.

**ENV 4V93 Internship in Environmental Planning or Management (1-3)**

Pre-requisite(s): Consent of a Baylor faculty sponsor; and completion of a departmental application

An internship with the City of Waco, a federal or state agency, Christian or non-profit organization or with industry to acquire practical experience in environmental planning or management. The course may be repeated for up to three semester hours of credit.

**ENV 4V9R Research (3)**

Pre-requisite(s): Consent of the instructor

Undergraduate research undertaken with the supervision of a faculty member. May be taken for a maximum of 6 hours.