

## **ENVIRONMENTAL HEALTH SCIENCE COURSES**

### **ESC 130 General Environmental Health Science**

A comprehensive discussion of the impact of environmental pollution in the three global life support zones of water, air, and soil and the resultant adverse health effects. The course emphasizes interactions between living and non-living components of ecosystems. It also focuses on how those interactions help or harm humans and their environments. This course does not count for credit toward the Environmental Health Science major requirements. Science majors should take ESC 131; ESC 111L.

### **ESC 110L General Environment Health Science Lab**

This course complements the environmental science course for non-science majors, and it allows students to conduct hands-on analyses of environmentally relevant document such as graphs, tables, charts, and case studies. The course also instructs students on the components of the scientific method and incorporates activities to assist students in understanding and using that scientific method. Two laboratory hours per week.

### **ESC 131 Principles of Environmental Health Science**

This course for Environmental Health Science (EHS) is a scientific introduction and exposure to knowledge relating to the origins of and methods of addressing concerns within our geological, atmospheric and hydrological environments. Methods and procedures for monitoring and controlling pollution in residential and occupational settings will be explored. Characterization and control of physical, chemical, biological, and radiological pollutants to air, water, soil, and food will be presented. A minimum grade of "C" is required in this course before students may enroll in advanced Environmental Health Science courses.

### **ESC 111L Principles of Environmental Health Science Lab**

The laboratory course is project oriented with students completing multi-week investigations culminating in a self-designed research project. Three laboratory hours per week.

### **ESC 230 Solid and Hazardous Waste Control (DESIGNATED SERVICE-LEARNING COURSE)**

A study of solid and hazardous waste with emphasis on landfill, incineration, composting, and recycling as safe disposal procedures. Topics include: the evolution of solid and hazardous waste management; roles of legislative and governmental agencies; on-site handling, storage and processing; transfer and transport; processing techniques and equipment; recovery of resources, conversion products and energy; safe disposal of solid and hazardous waste and residual material; and planning and management development, selection, and implementation. Additionally, engineering principles will be used to solve waste disposal problems where applicable. Three 1- hour lecture periods. Prerequisites: ESC 131; ESC 111L or ENGR 110.

### **ESC 331 Air Pollution Control (DESIGNATED SERVICE-LEARNING COURSE)**

An overview of current air pollution problems, the chemistry of air pollution and polluted atmospheres, potential human health effects, air pollution control technology, and laws regulating air pollution. Three one-hour periods. Students will also have the option to complete a related United States Environmental Protection Agency Air pollution course. Prerequisites: ESC 131; ESC 111L or ENVE 231.

### **ESC 332 Industrial Hygiene (DESIGNATED SERVICE-LEARNING COURSE)**

Course contents entail a study of health and safety in single and multiple living units as well as in Industrial settings. Safety and healthy use of materials, equipment, and supplies will be analyzed in various residential and occupational settings. Health and safety considerations of personnel and facilities will be revealed and analyzed. Prerequisites: ESC 131; ESC 111L.

**ESC 333 Disease Vectors and Control**

This course represents a study of the vectors responsible for arthropod-borne diseases of medical and veterinary importance; emphasis is on morphology, natural history, ecology, and behavior of vectors in relation to disease transmission and their control. Three one-hour lecture periods with an option to complete the U.S. Center for Disease Control Vector borne Disease Control course. Prerequisites: ESC 131; ESC 111L; BIO 137; BIO 117L.

**ESC 334 Food and Milk Products Sanitation**

This course is a study of the sanitary controls and environmental health practices employed in the production, processing, and retailing of food and milk products. Also included are food sanitation regulations, involving food storage preparation and service. Three one-hour lecture periods. The course may serve as an elective for environmental health science and other STEM majors. Course allows students the option of also completing the U. S. Centers for Disease Control Foodborne Disease Control course. Prerequisites: ESC 131; ESC 111L.

**ESC 314L Food and Milk Products Sanitation Lab**

This course complements the lecture component for food and milk product course, and it is intended primarily for environmental health science, biology, or chemistry majors. The course includes analysis of biological, physical, and chemical aspects of food. Additionally, the course provides laboratory instruction on procedures for inspecting food facilities and investigating food borne illnesses. Three laboratory hours per week.

**ESC 335 Environmental Forensics & Analysis**

This course provides skills and experience in the field of environmental forensics and chemistry. It will provide opportunities for critical assessment and analysis of priority pollutants through techniques such as carbon aging, chemical fingerprints and physical dispersion. Prerequisites: CHEM 137; CHEM 117L.

**ESC 315L Environmental Forensics & Analysis Lab**

Students learn the services provided by a crime lab; the scientific and legal constraints placed upon criminalists; the theory and practice of collecting, preserving, and analyzing of physical evidence. Laboratory experiences include analysis of microscopic evidence, identification and individualization of physical and chemical objects, development of latent fingerprints, rolling and classification of fingerprints, some instrumental analysis, and thin layer and paper chromatography. Three laboratory hours per week.

**ESC 340 Environmental Internship I**

Each student is required to complete in two consecutive internship courses a minimum of six semester credit hours (6 SCH) and a minimum of 180 clock hours of field training in an appropriate setting approved by the advisor. Each internship course will count 3 semester credit hours and will require a minimum of 90 clock hours of field internship experience. This experience will primarily be acquired during summer months; however, the experience may be acquired during the regular academic term only when the student is able to acquire the minimum number of field clock hours without interruption. The student will apply analytical environmental techniques employed in the chemical and biological assessment of environmental quality. Prerequisites: ESC 131; ESC 111L; Permission of the advisor.

**ESC 430 Environmental Health Administration**

This course addresses the structure and administration of environmental health organizations with emphasis on the legal and financial basis of programs and the management practices utilized in present programs. A senior research paper is required. Three 1-hour lecture periods. Prerequisites: ESC 131; ESC 111L.

**ESC 434 General Environmental Toxicology**

This course presents applications of basic anatomical, biochemical, and physiological principles and assessment of environmental pollutants which potentially can produce health hazards, with approaches towards effectively reducing these threats. Content is presented in three 1-hour lecture periods. Prerequisites: ESC 131; ESC 111L; BIO 137; BIO 117L; CHEM 137; CHEM 117L.

**ESC 435 Biostatistics**

This course will cover the basic principles, methods, logic and language of statistics from a health perspective. Topics include summary statistics; basic probability; discrete and continuous random variables; sample size determination; distributions (Normal, Poisson, Binominal, Hypergeometric); estimation and hypothesis testing and confidence intervals; t-test; Analysis of Variance (ANOVA); simple and multiple linear regression; correlation. Prerequisites: ESC 131; MATH 138.

**ESC 436 Epidemiology**

Course contents present principles of epidemiologic thinking; measures of disease frequency and association, rates, etiology, prevention and control; determinants of disease and distribution factors influencing health and disease in populations; study design and analysis; indices of disease and health; epidemiology methods used in the investigation of health efforts of environmental exposures. Prerequisites: ESC 131; ESC 111L; BIO 138; BIO 118L.

**ESC 439 Water Supply Wastewater Treatment and Environmental Health  
(DESIGNATED SERVICE-LEARNING COURSE)**

This course addresses the role of liquid wastes in human health; evaluation of source, treatment, and disposal facilities; and the study of the properties, distribution and utilization of water in natural and man-made systems. Laboratory and field studies are conducted using both qualitative and quantitative approaches. Prerequisites: ESC 131, or ENVE 231.

**ESC 419L Water Supply Wastewater Treatment and Environmental Health Lab**

This course is the laboratory complement to the water and wastewater lecture course. It provides students with an understanding of the process and procedures that are used to treat both water and wastewater. Simulated treatment procedures are conducted to assist students in better understanding treatment plant facilities and equipment. Analyses of water for specific chemicals and conditions will also be conducted. Three laboratory hours per week.

**ESC 440 Environmental Internship II**

This course is a continuation of ESC 340x and all requirements of that course also apply to this follow-up course. For example, this 3 SCH course also requires that students taking the course must acquire a minimum of 90 field internship clock hours beyond the 90 hours acquired within the first half of this two-part course. ESC 440 must be taken immediately after taking ESC 340; however, the two courses may be taken concurrently only when the student is able to acquire all 180 field internship clock hours without interruption. Prerequisites: ESC 131; ESC 111L or Permission of the Instructor.

**ESC 441 Research or Directed Individual Study credit 1-4 hrs.**

The student may elect to conduct individual research on a specified environmental health problem, including intensive library and laboratory research, under the direction of a faculty member or under joint direction of a mentor while engaged in on-the-job training in a governmental agency or company. Prerequisite: Permission of the Instructor.