

ENVIRONMENTAL ENGINEERING (ENV E)

Any experimental courses offered by ENV E can be found

at: registrar.iastate.edu/faculty-staff/courses/explistsings/ (<http://www.registrar.iastate.edu/faculty-staff/courses/explistsings/>)

Courses primarily for undergraduates:

ENV E 120: Environmental Engineering Learning Community

(1-0) Cr. 1. F.

Integration of first-year students into the Environmental Engineering program. Assignments and activities involve personal and leadership skill development, teamwork, academic planning and career readiness. Completed both individually and in learning teams under the direction of instructors and peer mentors.

ENV E 190: Introduction to Undergraduate Research in Civil and Environmental Engineering

(Cross-listed with C E). Cr. 2. Repeatable, maximum of 4 times.

Prereq: Permission of Instructor

Introduction to research, focusing on sub-disciplines of civil and environmental engineering. Research questions, hypotheses, literature reviews, experimental design, data collection, data analysis, and presentation. Topics chosen to introduce students to water resources, environmental engineering, transportation engineering, geotechnical/materials engineering, or structural engineering. Repeatable but only two credits may count toward graduation in C E

ENV E 201: Environmental Engineering Measurements and Analysis

(2-2) Cr. 3. F.

Prereq: C E 190

Introduction to environmental monitoring, environmental field and laboratory sampling, sample preservation and chain of custody, quality assurance and quality control, measurements of common chemical and biological components in different media, and analysis of environmental quality in natural and engineered systems. Concentrations and material balances concepts as applied to environmental engineering. Laboratory testing and experiments.

ENV E 326: Principles of Environmental Engineering

(Cross-listed with C E). (2-2) Cr. 3. F.S.

Prereq: Credit or concurrent enrollment in A B E 378; (CHEM 167 or CHEM 177); CHEM 178; MATH 166

Introduction to environmental problems, water quality indicators and requirements, potable water quality and quantity objectives, water sources and treatment methods; water pollution control objectives and treatment methods; survey of solid and hazardous waste management and air pollution control.

ENV E 426: Environmental Engineering Science

(2-2) Cr. 3. F.

Prereq: C E 326; CHEM 231; MICRO 201

Physical, chemical and biological principles related to environmental engineering and management. Topics include physical principles (mass transfer, mass balances, reactor systems), chemical principles (kinetics and equilibrium, acid-base, redox and precipitation), and biological principles (common environmental microbial processes, microbiology). Laboratory testing and experiments. ENV E 201 recommended.

ENV E 427: Environmental Engineering Systems

(3-0) Cr. 3. S.

Prereq: MATH 265; MATH 266; C E 326; C E 372

Integrated systems and modeling-based evaluation of natural and engineered environments including water, soil, and air. Exploration of public health outcomes and risk assessment in environmental engineering. Analysis of socio-environmental systems.

ENV E 428: Water and Wastewater Treatment Plant Design

(Cross-listed with C E). (3-0) Cr. 3. S.

Prereq: C E 326

Physical, chemical and biological processes for the treatment of water and wastewater including coagulation and flocculation, sedimentation, filtration, adsorption, chemical oxidation/disinfection, fixed film and suspended growth biological processes and sludge management. Design project.

ENV E 429: Air Pollution and Control

(3-0) Cr. 3. S.

Prereq: MATH 265; C E 326

Coverage of air pollution topics such as stationary and mobile sources, National Ambient Air Quality Standards, regional and global air pollution concerns (acid rain, ozone depletion, greenhouse gases), indoor air pollution, air pollution meteorology, air pollutant dispersion, and air pollution control equipment.

ENV E 430: Solid and Hazardous Waste Management

(3-0) Cr. 3. F.

Prereq: C E 326; credit or concurrent enrollment in C E 426

Evaluation, characterization, assessment, planning and design of solid and hazardous waste management systems, regulatory requirements, material characterization and collection, minimization and recycling, energy and materials recovery, composting, off-gas treatment, incineration, stabilization, and landfill design. Design of treatment and disposal systems for solid and hazardous wastes, including physical, chemical, and biological treatment, solidification, incineration, secure landfill design, and final disposal site closure plus restoration.

ENV E 490: Independent Study

Cr. 1-3. Repeatable. F.S.SS.

Prereq: Permission of Instructor

Independent study in environmental or water resources engineering.

Pre-enrollment contract required. Maximum of 3 credits may be counted towards Engineering Topics Electives.