

ENVIRONMENTAL ENGINEERING (ENVE)

Courses primarily for undergraduates:

ENVE 1200: Environmental Engineering Learning Community

Credits: 1.

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. (Typically Offered: Fall)

ENVE 1900: Introduction to Undergraduate Research in Civil and Environmental Engineering

(Cross-listed with CE 1900).

Credits: 2. Repeatable, maximum of 4 times.

Prereq: Instructor Permission for Course

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. Graduation Restriction: Repeatable but only two credits may count toward graduation in CE.

ENVE 2010: Environmental Engineering Measurements and Analysis

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: CE 1900

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. (Typically Offered: Fall)

ENVE 3260: Principles of Environmental Engineering

(Cross-listed with CE 3260).

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: CHEM 1670 or (CHEM 1770 and CHEM 1780); MATH 1660; credit or concurrent enrollment in ABE 3780

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. (Typically Offered: Fall, Spring)

ENVE 4260: Environmental Engineering Science

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: CE 3260, CHEM 2310, and MICRO 2010

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. ENVE 2010 recommended. (Typically Offered: Fall)

ENVE 4270: Environmental Engineering Systems

Credits: 3. Contact Hours: Lecture 3.

Prereq: MATH 2650; MATH 2660; CE 3260; CE 3720

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. (Typically Offered: Spring)

ENVE 4280: Water and Wastewater Treatment Plant Design

(Cross-listed with CE 4280).

Credits: 3. Contact Hours: Lecture 3.

Prereq: CE 3260

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. (Typically Offered: Spring)

ENVE 4290: Air Pollution and Control

Credits: 3. Contact Hours: Lecture 3.

Prereq: MATH 2650; CE 3260

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. (Typically Offered: Spring)

ENVE 4300: Solid and Hazardous Waste Management

Credits: 3. Contact Hours: Lecture 3.

Prereq: CE 3260; credit or concurrent enrollment in ENVE 4260

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. (Typically Offered: Fall)

ENVE 4900: Independent Study

Credits: 1-3. Repeatable.

Prereq: Department Permission for Course

Independent study in environmental or water resources engineering. Pre-enrollment contract required. Graduation Restriction: Maximum of 3 credits may be counted towards Engineering Topics Electives. (Typically Offered: Fall, Spring, Summer)