

# ENVIRONMENTAL ENGINEERING (ENVE)

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## ENVE 1000E. Environmental Sustainability. (3 Credits)

Detailed examination of anthropogenic impacts on the environment, resulting from the need for energy, food and shelter. Subtopics in the broad areas of energy, food, shelter, waste, water, sustainable development will be grounded with case studies of UConn activities/programs in sustainability. Overarching and linking each topic is the impact of population and water resources with a focus on environmental literacy. Resolution of scientific/technological, public policy and economic aspects of environmental sustainability issues will be explored, including strategies for success, and possible pitfalls, in achieving environmental sustainability in the subtopic areas. CA 2.

**Skill Codes:** COMP Environmental Literacy

**Content Areas:** CA2: Social Science

**Topics of Inquiry:** TOI4: Environmental Literacy, TOI5: Indiv Values Soc Inst

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%201000E>)

## ENVE 2193. International Study. (1-6 Credits)

Special environmental engineering topics taken in a foreign study program.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%202193>)

## ENVE 2310E. Environmental Engineering Fundamentals. (3 Credits)

(Also offered as CE 2310E.) Concepts from aqueous chemistry, biology, and physics applied in a quantitative manner to environmental problems and solutions. Mass and energy balances, chemical reaction engineering. Quantitative and fundamental description of water and air pollution problems. Environmental regulations and policy, pollution prevention, risk assessment. Written and oral reports.

**Enrollment Requirements:** CHEM 1128Q or 1148Q.

**Skill Codes:** COMP Environmental Literacy

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%202310E>)

## ENVE 2411. Introduction to Computer Aided Design. (1 Credit)

(Also offered as CE 2411.) Introduction to computer-aided design and drawing, emphasizing applications in civil and environmental engineering and landscape design. Introduction to fundamental CAD concepts and techniques, such as drawing commands, dimensioning, layers, editing techniques, and plotting, and additional software packages to create planimetric and topographic maps. Related topics include scale, coordinate geometry, and terrain representation.

**Enrollment Requirements:** Enrollment in the School of Engineering; this course and CE 2410 may not both be taken for credit.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%202411>)

## ENVE 3100. Climate Resilience and Adaptation: Municipal Policy and Planning. (3 Credits)

(Also offered as ENVS 3100.) An interdisciplinary study of climate change focusing on the local, municipal scale: impacts, policy, vulnerability and adaptation with emphasis on tools such as vulnerability assessments that help local communities determine priorities for adaptation efforts.

**Enrollment Requirements:** Open to juniors or higher; instructor consent required. Recommended preparation: ENVE 1000, EVST 1000, or NRE 1000.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203100>)

## ENVE 3110E. Brownfield Redevelopment. (3 Credits)

(Also offered as ENVS 3110E.) Interdisciplinary study of the process of investigating, cleaning up and putting back into use abandoned sites with suspected contamination, also known as brownfields. Legal, environmental, financial and social aspects are discussed. Service learning component working with communities on local brownfield sites.

**Enrollment Requirements:** Not open for credit to students who have passed ENVE 3995 when offered as Brownfield Redevelopment.

**Skill Codes:** COMP Environmental Literacy

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203110E>)

## ENVE 3111. Brownfield Practicum. (3 Credits)

This is a service learning course in which students will work with Connecticut communities to assist them with the process of investigating, cleaning up and putting back into use abandoned sites with suspected contamination, also known as brownfields.

**Enrollment Requirements:** ENVE 3110E or ENVS 3110E or EVST 3110E.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203111>)

## ENVE 3120. Fluid Mechanics. (4 Credits)

(Also offered as CE 3120.) Statics of fluids, analysis of fluid flow using principles of mass, momentum and energy conservation from a differential and control volume approach. Dimensional analysis. Application to pipe flow and open channel flow. Laboratory activities and written lab reports.

**Enrollment Requirements:** CE 2110; MATH 2110Q and 2410Q; open only to students in the School of Engineering. Recommended preparation: CE 2120. Not open for credit to students who have passed ME 3250.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203120>)

## ENVE 3193. Foreign Study. (1-6 Credits)

Special advanced environmental engineering topics taken in a foreign study program.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203193>)

## ENVE 3200. Environmental Engineering Laboratory. (3 Credits)

(Also offered as CE 3300.) Aqueous analytical chemical techniques, absorption, coagulation/flocculation, fluidization, gas stripping, biokinetics, interpretation of analytical results, bench-scale design projects, written and oral reports.

**Enrollment Requirements:** CE 2251, CE/ENVE 2310E; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203200>)

**ENVE 3201. Environmental Engineering Laboratory I. (1 Credit)**

Analytical chemistry techniques, adsorption, coagulation/flocculation, chemical and biological oxidation and kinetics. Interpretation of analytical results through written reports.

**Enrollment Requirements:** Corequisite: ENVE 3220 and 4210; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203201>)

**ENVE 3202. Environmental Engineering Laboratory II. (1 Credit)**

Dispersion modeling, air pollution control sampling and design, air quality modeling, stormwater sampling, soil processes, environmental health assessment, BMP design and modeling. Interpretation of analytical results through written reports.

**Enrollment Requirements:** Corequisite: ENVE 3230 and 4320; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203202>)

**ENVE 3220. Water Quality Engineering. (3 Credits)**

(Also offered as CE 3320.) Biological unit processes in wastewater treatment systems, disinfection, and bioremediation scenarios.

Applications to design of wastewater treatment systems.

**Enrollment Requirements:** ENVE 2310E; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203220>)

**ENVE 3230. Air Pollution Control. (3 Credits)**

Gaseous pollutants and their properties; basic analytical techniques for air pollutants; particulate pollutants and their properties; equipment design for removal of gaseous and particulate materials; economic and environmental impact of air pollutants; federal and state regulations.

**Enrollment Requirements:** ENVE 2310E or CHEG 2103; enrollment in the School of Engineering. Recommended preparation: CHEG 2111 or ME 2233.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203230>)

**ENVE 3270. Environmental Microbiology. (3 Credits)**

Content includes general microbiology, cell structure, cell growth kinetics, and genetics. In addition to the fundamental microbiological mechanisms, the application of microbial knowledge in natural environment and engineering systems (including water and wastewater treatment, soil and solid waste treatment) is also included. Will broaden the students' views of microbiological fundamentals and the applications to environmental systems.

**Enrollment Requirements:** Enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203270>)

**ENVE 3530. Engineering and Environmental Geology. (3 Credits)**

(Also offered as EARTH 3710.) Application of geological principles to engineering and environmental problems. Topics include site investigation, geologic hazards, slope processes, earthquakes, subsidence, and the engineering properties of geologic materials. Course intended for both geoscience and engineering majors. Formerly offered as GSCI 3710.

**Enrollment Requirements:** Recommended preparation: EARTH 1050 or 1051.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203530>)

**ENVE 3995. Special Topics in Environmental Engineering. (1-6 Credits)**

Classroom or laboratory course on specific topics as announced.

**Enrollment Requirements:** Prerequisites and recommended preparation vary.

May be repeated for credit

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203995>)

**ENVE 3996. Directed Research in Environmental Engineering. (1-3 Credits)**

Individualized or group research conducted under the supervision of the instructor.

**Enrollment Requirements:** Open only with consent of supervising instructor; enrollment in the School of Engineering.

May be repeated for a total of 6 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%203996>)

**ENVE 4210. Environmental Engineering Chemistry. (3 Credits)**

Quantitative analysis of chemical behavior in environmental systems.

Thermodynamics and kinetics of acid/base, coordination, precipitation/dissolution, sorption, and redox reactions. Structures and reactions of organic pollutants. Applications to design of water treatment systems.

**Enrollment Requirements:** CHEM 1128Q or 1148Q and ENVE 2310E or CHEG 2103 and MATH 2410Q; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204210>)

**ENVE 4310. Environmental Modeling. (3 Credits)**

(Also offered as CE 4310.) Systematic approach for analyzing contamination problems. Systems theory and modeling will be used to assess the predominant processes that control the fate and mobility of pollutants in the environment. Assessments of lake eutrophication, conventional pollutants in rivers and estuaries and toxic chemicals in groundwater.

**Enrollment Requirements:** CE 2310E; CE 3120 or CHEG 3123; enrollment in School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204310>)

**ENVE 4320. Ecological Principles and Engineering. (3 Credits)**

An introduction to ecology and natural treatment systems for managing waste and pollutants with a focus on aqueous contaminants. Topics will include stormwater management, treatment wetlands, restoration ecology, composting, and bioremediation.

**Enrollment Requirements:** ENVE 4210, which may be taken concurrently; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204320>)

**ENVE 4530. Geoenvironmental Engineering. (3 Credits)**

(Also offered as CE 4530.) Subsurface contaminant fate and transport, site characterization, overview of soil remediation techniques.

**Enrollment Requirements:** ENVE 2310E; open to juniors or higher in the School of Engineering. Recommended preparation: CE 3510.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204530>)

**ENVE 4540. Design of Groundwater Systems. (3 Credits)**

Design of groundwater engineering systems used for water supply and/or preservation/improvement of water quality. Steady and transient flow, pumping tests, well hydraulics, and well-field design. Unsaturated zone hydrology, design and evaluation of landfills. Heterogeneity in natural systems, parameter estimation and inverse methods. Application of basic geostatistics in the design of groundwater systems.

**Enrollment Requirements:** ENVE 3120. Recommended preparation: CE 3510.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204540>)

**ENVE 4810. Engineering Hydrology. (3 Credits)**

(Also offered as CE 4810.) Hydrologic cycle: precipitation, interception, depression storage, infiltration, evapotranspiration, overland flow, snow hydrology, groundwater and streamflow processes. Stream hydrographs and flood routing. Hydrologic modeling and design. Computer applications. Design project.

**Enrollment Requirements:** CE 3120 or ENVE 3120 or CHEG 3123; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204810>)

**ENVE 4820. Hydraulic Engineering. (3 Credits)**

(Also offered as CE 4820.) Design and analysis of water and wastewater transport systems, including pipelines, pumps, pipe networks, and open channel flow. Introduction to hydraulic structures and porous media hydraulics. Computer applications.

**Enrollment Requirements:** CE 3120 or ENVE 3120 or CHEG 3123; enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204820>)

**ENVE 4886. Thesis I. (1 Credit)**

Introduction to research through literature review and preparation of a research proposal.

**Enrollment Requirements:** Enrollment in the School of Engineering.

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204886>)

**ENVE 4897. Thesis in Environmental Engineering. (1-3 Credits)**

Introduction to research through literature review and preparation of a research proposal, execution of the research proposal, preparation of written report and oral defense.

**Enrollment Requirements:** Open only with consent of supervising instructor; enrollment in the School of Engineering.

May be repeated for a total of 3 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204897>)

**ENVE 4910W. Environmental Engineering Design I. (2 Credits)**

Students working individually or in groups produce solution to environmental engineering design projects from data acquisition through preliminary design, cost estimating and final specifications, oral presentation and written reports.

**Enrollment Requirements:** ENGL 1007 or 1010 or 1011 or 2011; ENVE 3120; ENVE 3220, which may be taken concurrently; open to seniors.

**Skill Codes:** COMP Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204910W>)

**ENVE 4920W. Environmental Engineering Design II. (2 Credits)**

Students working individually or in groups complete the implementations of protocols and techniques covered in ENVE 4910W, final cost of entire project, feasibility, oral presentation and written reports. Instructors will supply initial conditions and performance expectations.

**Enrollment Requirements:** ENVE 4910W; ENGL 1007 or 1010 or 1011 or 2011; open to seniors.

**Skill Codes:** COMP Writing Competency

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204920W>)

**ENVE 4996. Independent Research in Environmental Engineering. (1-3 Credits)**

Independent research conducted under the supervision of the instructor.

**Enrollment Requirements:** Open only with consent of supervising instructor; enrollment in the School of Engineering.

May be repeated for a total of 6 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204996>)

**ENVE 4999. Independent Study in Environmental Engineering. (1-6 Credits)**

Individual study in specialized area of environmental engineering as mutually arranged between student and instructor.

**Enrollment Requirements:** Enrollment in the School of Engineering.

May be repeated for a total of 12 credits

View Classes (<https://catalog.uconn.edu/course-search/?details&code=ENVE%204999>)