

ENVIRONMENTAL ENGINEERING (ENVE)

ENVE 199. SPECIAL TOPICS. (1-16 Credits)

Seminar course that includes invited speakers. Open to all students interested in learning about the Environmental Engineering undergraduate program and potential career opportunities. Graded P/N.
This course is repeatable for 16 credits.

ENVE 299. SPECIAL TOPICS. (0-16 Credits)

Equivalent to: ENVE 299H
This course is repeatable for 16 credits.

ENVE 299H. SPECIAL TOPICS. (0-16 Credits)

Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 299
This course is repeatable for 16 credits.

ENVE 321. ENVIRONMENTAL ENGINEERING FUNDAMENTALS. (4 Credits)

Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.

Prerequisites: MTH 256 with C or better or MTH 256H with C or better

ENVE 322. FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING. (4 Credits)

Application of engineering principles to the analysis of environmental problems. Topics include water, wastewater, solid wastes, and air pollution.

Prerequisites: ((CH 222 with C or better or CH 232 with C or better or CH 232H with C or better or CH 225H with C or better) and (MTH 256 [C] or MTH 256H [C]))

ENVE 401. RESEARCH. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 403. THESIS. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 405. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 406. SPECIAL PROJECTS. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 407. SEMINAR. (1-16 Credits)

Equivalent to: ENVE 407H
This course is repeatable for 16 credits.

ENVE 407H. SEMINAR. (1-16 Credits)

Attributes: HNRS – Honors Course Designator
Equivalent to: ENVE 407
This course is repeatable for 16 credits.

ENVE 410. OCCUPATIONAL INTERNSHIP. (1-12 Credits)

This course is repeatable for 12 credits.

ENVE 415. ENVIRONMENTAL ENGINEERING LABORATORY. (3 Credits)

Theoretical and empirical analysis of several unit operations, use of formal work processes, safety, teamwork, oral and written communication, and personal accountability. Lec/lab/rec.

Prerequisites: CBEE 414 with C or better
Equivalent to: CHE 415

ENVE 421. DRINKING WATER TREATMENT PROCESSES. (4 Credits)

Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.

Prerequisites: ENVE 322 with C or better

ENVE 422. WASTEWATER TREATMENT PROCESSES. (4 Credits)

Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.

Prerequisites: ENVE 421 with C or better

ENVE 425. AIR POLLUTION CONTROL. (3 Credits)

Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.

Prerequisites: ENVE 321 with C or better or ENVE 322 with C or better

ENVE 431. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)

Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.

Prerequisites: ((CH 123 with C or better or CH 223 with C or better or CH 226H with C or better or CH 233 with C or better) and (CH 440 [C] or CHE 331 [C] or CHE 331H [C]) and (ENVE 321 [C] or ENVE 322 [C]) and ENVE 421 [C])

ENVE 456. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)

Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.

ENVE 457. BIOREACTORS. (3 Credits)

Design and analysis of bioreactors using suspension and immobilized microbial cultures.

Prerequisites: CHE 333 with C or better and ENVE 322 [C]

ENVE 490. ENVIRONMENTAL ENGINEERING DESIGN. (4 Credits)

Open-ended design of environmental processes including development of process flow diagrams, control strategies, process simulators, and financial analysis of processes. Lec/rec.

Prerequisites: ENVE 421 with C or better and ENVE 422 [C]

ENVE 499. SPECIAL TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)

A critical examination of topics selected by the instructor from among topics not covered in other environmental engineering courses.

This course is repeatable for 4 credits.

ENVE 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 503. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

ENVE 505. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 506. PROJECTS. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 507. SEMINAR. (1-16 Credits)

One-credit seminar. Graded P/N.
This course is repeatable for 16 credits.

ENVE 510. INTERNSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 521. DRINKING WATER TREATMENT PROCESSES. (4 Credits)

Characterization and treatment of drinking water sources including engineering principles for the selection and design of treatment processes. Lec/rec/lab.

Recommended: ENVE 322

ENVE 522. WASTEWATER TREATMENT PROCESSES. (4 Credits)

Characterization and treatment of municipal and industrial wastewaters including engineering principles for the selection and design of treatment processes. Lec/rec.

Recommended: ENVE 421

ENVE 525. AIR POLLUTION CONTROL. (3 Credits)

Study of air pollution sources, transport, and control, including engineering, chemical, meteorological, social, and economic aspects. Lec/rec.

Recommended: ENVE 321 or ENVE 322

ENVE 531. FATE AND TRANSPORT OF CHEMICALS IN ENVIRONMENTAL SYSTEMS. (4 Credits)

Fundamentals of organic chemistry and engineering principles applied to the movement and fate of xenobiotic compounds. Lec/lab/rec.

Recommended: (CH 123 or CH 223 or CH 226H or CH 233) and (CH 440 or CHE 331 or CHE 331H) and (ENVE 321 or ENVE 322) and ENVE 421

ENVE 532. AQUATIC CHEMISTRY: NATURAL AND ENGINEERED SYSTEMS. (4 Credits)

Low temperature thermodynamic and selective kinetic treatments primarily of the inorganic chemistry groups, but also organic ligands and surface active groups, of natural and engineered waters; thermodynamic principles and computational techniques for prediction of equilibrium speciation; comparison of predictions to observations; computer laboratory. Lec/rec.

Equivalent to: OC 532

Recommended: One year of college-level chemistry (CH 221 and CH 222 and CH 223) or ((CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H)); a minimum of one year organic or physical chemistry; and concurrent enrollment in ENVE 536 and/or OC 652

ENVE 535. PHYSICAL AND CHEMICAL TREATMENT PROCESSES. (4 Credits)

Fundamental principles of physical and chemical processes relevant for the treatment of contaminants in environmental matrices (e.g. water, air and soil).

Prerequisites: ENVE 532 with C or better

Equivalent to: ENVE 538

ENVE 536. AQUEOUS ENVIRONMENTAL CHEMISTRY LABORATORY. (1 Credit)

Laboratory investigation of acid/base equilibria, coordination chemistry, and precipitation/dissolution chemistry.

Corequisites: ENVE 532

ENVE 541. MICROBIAL PROCESSES IN ENVIRONMENTAL SYSTEMS. (4 Credits)

Energetics kinetics and stoichiometry of microbial transformations of organic and inorganic compounds. Mathematical models of biodegradation.

ENVE 542. MICROBIAL PROCESS DESIGN FOR MUNICIPAL AND HAZARDOUS WASTES. (4 Credits)

Principles and design of microbial processes for treatment of municipal and hazardous wastes.

Prerequisites: ENVE 541 with C or better

ENVE 545. MICROBIAL METHODS IN ENVIRONMENTAL ENGINEERING. (3 Credits)

Covers the principles of microbiological methods pertinent to environmental engineers with an emphasis on applications in drinking water treatment, wastewater treatment, and soil remediation. The course is targeted at engineering students that do not have much experience with culture-based and molecular-based techniques.

Prerequisites: ENVE 541 with C+ or better

ENVE 554. GROUNDWATER REMEDIATION. (4 Credits)

Theory and practice of groundwater remediation. Environmental site assessments. Physical, chemical, and biological methods for in situ treatment of contaminated aquifers. Modeling of remediation technologies.

ENVE 556. SUSTAINABLE WATER RESOURCES DEVELOPMENT. (3 Credits)

Sustainable water resources engineering principles, assessing the impact of engineering practices. Use of engineering analyses and sustainable principles to design projects and minimize their environmental impact.

ENVE 599. SPECIAL TOPICS. (0-16 Credits)

This course is repeatable for 16 credits.

ENVE 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

ENVE 603. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

ENVE 699. SELECTED TOPICS IN ENVIRONMENTAL ENGINEERING. (1-4 Credits)

A critical examination of topics selected by the instructors from among topics not covered in other environmental engineering courses.

Equivalent to: ENVE 611

This course is repeatable for 8 credits.