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: ENVE 321 with C or better or ENVE 322 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

ENVE 421. DRINKING WATER TREATMENT PROCESSES. (4 Credits)
Measurement of physical and chemical characteristics of water and wastewater. Engineering principles for the selection and design of treatment processes.
Prerequisites: ENVE 321 with C or better or ENVE 322 with C or better

ENVE 422. ENVIRONMENTAL ENGINEERING DESIGN. (4 Credits)
Design of water and wastewater treatment facilities including physical, chemical, and biological processes.
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: ((ICH 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 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. WATER AND WASTEWATER CHARACTERIZATION. (4 Credits)
Measurement of physical and chemical characteristics of water and wastewater. Engineering principles for the selection and design of treatment processes.

ENVE 522. ENVIRONMENTAL ENGINEERING DESIGN. (4 Credits)
Design of water and wastewater treatment facilities including physical, chemical, and biological processes.

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.
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.

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.

ENVE 535. PHYSICAL AND CHEMICAL PROCESSES FOR HAZARDOUS WASTE TREATMENT. (4 Credits)
Principles and design of unit operations and processes for the treatment of hazardous waste and contaminated soils.
Prerequisites: ENVE 532 with C or better

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)

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. This course is repeatable for 8 credits.