

# ENVIRONMENTAL ENGINEERING (ENVE)

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ENVE 540: Biodegradation and Bioremediation

3 Credits

Microbial degradation and transformation of organic and inorganic contaminants. Principles of current bioremediation technologies for soil and groundwater contaminants.

**Prerequisite:** ENVE 411

ENVE 550: Chemical Fate and Transport

3 Credits

Chemical fate and transport modeling of environmental systems as applied to ecological systems, treatment technologies, and human health exposure assessments. ENVE 550

ENVE 569: Environmental Risk Assessment

3 Credits

Overview of ecological and human risk, including hazard identification, dose response, exposure assessment, and risk characterization.

ENVE 591: Research Methods in Environmental Engineering

1 Credits

Preparing a research proposal, critical reading of literature, understanding ethics in research, experimental design, data analysis and presentation. ENVE 591 Research Methods in Environmental Engineering (1) The goal of this course is to provide information for graduate students regarding the pertinent research methodology that applies to their research projects in environmental engineering and sciences. Understanding research methods is the key to generating valid research results which can be used to guide the design, operation, and evaluation of environmental treatment assessment, treatment, and control operations and facilities. Valid research results also require proper quality control and quality assurance plans and ethical research conduct and practices. This course will provide foundational information regarding how to conduct an effective literature review, set up research hypotheses, prepare research experiments, collect and analyze research data, discuss research results, and summarize research findings. For research result dissemination, this course will teach students how to prepare and submit research manuscripts for publication in scientific journals and technical conference proceedings. Patent application preparation also will be briefly introduced in the course instruction. The course also will provide two hours of instruction on research/professional ethics, focusing especially on plagiarism and data falsification/fabrication.

**Prerequisite:** E P C590

ENVE 594: Research Topics

1-18 Credits/Maximum of 18

Supervised student activities on research projects identified on an individual or small-group basis.

ENVE 596: Individual Studies

1-9 Credits/Maximum of 9

Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.