ENVE 450. Aquatic Chemistry  
3 Credits  
Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibrium solubility, buffering and redox conditions. Crosslisted with: ENVE 550.  
Prerequisite(s): C E 256.

ENVE 451. Unit Processes/Operation of Water Treatment  
3 Credits  
Theory and applications with unit processes in environmental engineering. Physical and chemical treatment methods are emphasized. Crosslisted with: ENVE 551.

ENVE 452. Unit Processes/Operation of Wastewater Treatment  
3 Credits  
Theory and applications with unit processes in environmental engineering. Biological treatment methods are emphasized. Crosslisted with: ENVE 552.

ENVE 456. Environmental Engineering Design  
3 Credits (2+3P)  
Design of chemical, physical and biological operations and processes involved in water and wastewater treatment.  
Prerequisite: C E 356.

ENVE 458. Urban Water-Energy-Environment Systems  
3 Credits  
An introduction to environmentally sustainable solutions to water-energy nexus. This course integrates scientific principles, engineered processes, and systems analyses to address society’s growing needs of water and renewable energy and their interconnections with environment.  
Prerequisite(s): C E 256.

ENVE 459. Environmental Microbiology  
3 Credits  
An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants.

ENVE 462. Sampling and Analysis of Environmental Contaminants  
3 Credits (1+6P)  
Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as E S 462.  
Prerequisites: C E 256 and E S 256.

ENVE 487. Air Pollution Control Systems Design  
3 Credits  
An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment.  
Prerequisite(s): Senior or graduate standing.

ENVE 550. Aquatic Chemistry  
3 Credits  
Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.  
Prerequisite(s): C E 256.

ENVE 551. Unit Processes/Operation of Water Treatment  
3 Credits  
Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451. Restricted to: ENVE majors.  
Prerequisite(s): C E 356.

ENVE 552. Unit Processes/Operation of Wastewater Treatment  
3 Credits  
Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 452. Restricted to: ENVE majors.  
Prerequisite(s): Consent of instructor.

ENVE 552 L. Unit Processes/Operation of Wastewater Treatment Laboratory  
1 Credit  
Dry laboratory emphasizing design of common unit operations/processes in biological treatment. Restricted to majors.  
Prerequisite: consent of instructor.  
Corequisite: ENVE 552.

ENVE 557. Surface Water Quality Modeling  
3 Credits  
Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Restricted to majors.

ENVE 598. Special Research Programs  
1-3 Credits  
Individual investigations either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to majors.

ENVE 599. Master's Thesis  
15 Credits  
Thesis. May be repeated for a maximum of 6 credits.

ENVE 630. Fate and Transport of Environmental Contaminants  
3 Credits  
Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem.  
Prerequisites: C E 555 and consent of instructor.