ENVIRONMENTAL ENGINEERING • EVEG

2000 Introduction to Environmental Engineering (3) Prereq.: CHEM 1202 and MATH 1550. Basic principles of calculations in environmental engineering; overview of professional ethics; requirements and models of environmental problem solving. May be taken for a max. of 6 sem. hrs. of credit.

3100 Water Distribution and Wastewater Collection (3) Prereq.: CE 3200. Principles and practices used in analysis and design of water supply systems and storm and wastewater collection systems.

3110 Water and Wastewater Treatment (3) Prereq.: CE 2200 (for CE and EVEG majors, a grade of “C” or better is required in CE 2200). Physical, chemical, and biological characteristics of water and wastewater; quality regulation; basic reactor engineering; operation and simple design of physical, chemical, and biological unit processes in water and wastewater treatment.

3271 Senior Project I: Consulting Format (3) Prereq.: EVEG 3100, 3110. Student project teams tackle selected design projects within a designated time allocation. Project management (proposals, flowcharts, technical content) mimicking methodologies utilized by professional consulting firms; findings presented using professional format, i.e., final reports address rationale, process treatment trains, and/or process sizing.

3272 Senior Project II: Consulting Format (3) Prereq.: EVEG 3271. Student project teams finalize design effort initiated in EVEG 3271. Construction of prototypes and bench scale demonstrations; extension of designs; simulation analysis.

3273 Independent Undergraduate Research Project (1-4) Prereq.: EVEG 4135 and consent of department. Independent research project under the direction of a faculty member. Students develop the objectives and scope of the research and conduct appropriate analytical and experimental (field and/or laboratory) studies. Results and conclusion of the project are summarized in a report and defended orally.

3400 Environmental Engineering II (3) F,S Prereq.: CHEM 2060 (2261); EVEG 2000. Also offered as BE 3400. Fundamentals of microbiology, ecology, enzyme kinetics, and biochemical approaches applied to environmental engineering; applications to biological wastewater treatment, bioremediation of soil, air, surface and ground waters, landfill, and natural systems.

4105 Quantitative Water Management (3) Prereq.: EVEG 3110. Quantitative tools used to solve water management problems based upon hydraulic, mass balance, stoichiometric, kinetic, and equilibrium phenomena.

4110 Unit Operations Laboratory (2) Prereq.: CHEM 2060, EVEG 3110, EVEG 4135. Understanding of the physical, chemical, and biological operations and processes commonly utilized in environmental engineering: presentation of theoretical concepts and operational problems; laboratory experiments; and formal reports.

4120 Design of Solid and Hazardous Waste Management Systems (3) Prereq.: EVEG 3110 and CHE 3102. Design of solid and hazardous waste systems; process selection, elements of waste management systems; physicochemical, biological, and thermal process design; regulations related to design of waste management systems.

4130 Control and Treatment of Urban Storm Water (3) Prereq.: EVEG 3100, 3110 or equivalent background. Fundamentals of the interrelated processes of urban hydrology, storm water quality, and storm water treatment as impacted by anthropogenic activities within our constructed environment; design of hydrologic controls and unit operations and process control for storm water as a wastewater or reuse water.

4135 Water Quality Analysis for Natural Systems (4) Prereq.: CHEM 1201; ENGL 2000; EXST 2201. 3 hrs. lecture; 3 hrs. lab. Application and interpretation of standard sanitary chemical and microbiological methods to water quality problems in the areas of water supply, wastewater treatment, and pollution of natural waters.

4139 Lakes Management and Modeling (3) Prereq.: CE 2200. Integration and application of limnological and engineering principles to the development of engineered restoration and management solutions for lakes and their watersheds; development and application of dynamic models for system management and solution development.

4140 Design of Wastewater Management Facilities (3) Prereq.: EVEG 3100 and 3110; civil engineering students enrolled in this course must have credit in CE 4750. 2 hrs. lecture; 3 hrs. lab. Design of wastewater management facilities; process selection and evaluation using computer-assisted procedures; preparation of design drawings, reports, and cost estimates.

4150 Integrated Environmental System Design I (3) F Prereq.: EVEG 3110 and CHE 3102. Preliminary designs will be applied to full designs in EVEG 4151. Principles of integrated environmental system design; economic, regulatory, and risk-based requirements in initial preliminary design of environmental systems incorporating minimization, destruction, treatment, and disposal technologies in all media; emphasis on preliminary design and screening of classical management systems.

4151 Integrated Environmental System Design II (3) S Prereq.: EVEG 4150. Continuation of EVEG 4150. Final project designs are presented to representatives of the public and private sectors. Economic, regulatory, and risk-based requirements in completion of environmental design projects developed in 4151; minimization, destruction, treatment, and disposal technologies in all media.

4153 Hazardous Waste Management (3) Prereq.: consent of instructor. Identification and classification of wastes; regulations; treatment, storage, and disposal techniques; facilities parameters.

4157 Design of In-Situ Waste Site Remediation Processes (3) F Prereq.: EVEG 3110 and CHE 3102. Design of systems for in-situ remediation of hazardous and industrial waste sites; unit processes for containment and recovery integrated into design of treatment trains for control of sources and attainment of cleanup goals; emerging technologies for vapor extraction, soil washing, bioremediation, and natural recovery employed to minimize cost and risk.

4159 Design of Natural Systems for Wastewater Treatment (3) F Prereq.: EVEG 3110. Design of constructed wetlands, lagoons, and land application systems for wastewater treatment; economic analysis, design, and selection criteria of natural systems for treatment of municipal and industrial wastewater.

4780 Special Topics in Environmental Engineering Design (3) Prereq.: senior standing and departmental approval. May be taken for a max. of 6 sem. hrs. of credit when topics vary. More than one section of this course may be taken for credit concurrently when topics differ. Selected topics in environmental engineering design.

4781 Special Topics in Environmental Engineering Science (3) Prereq.: senior standing and departmental approval. May be taken for a max. of 6 sem. hrs. of credit when topics vary. More than one section of this course may be taken for credit concurrently when topics differ. Selected topics in environmental engineering science.