EVEN - ENVIRONMENTAL ENGR (EVEN)

EVEN 201 Introduction to the Environmental Engineering Profession

Credit 1. 1 Lecture Hour. Introduction to the study and practice of environmental engineering; professionalism and professional registration; engineering ethics; exercises in technical communication. **Prerequisites:** Grade of C or better in ENGL 103 or ENGL 104; or approval of instructor.

EVEN 291 Research

Credits 0 to 4. 0 to 4 Other Hours. Research conducted under the direction of faculty member in environmental engineering. May be taken four times for credit. **Prerequisites:** Freshman or sophomore classification or approval of instructor.

EVEN 301/CVEN 301 Environmental Engineering

Credits 3. 3 Lecture Hours. Water quality; material balances; chemical, physical and biological processes; water quality modeling; water and wastewater treatment; air quality; solid and hazardous waste management. **Prerequisites:** Grade of C or better in CHEM 107; Grade of C or better in CVEN 302 and MATH 308, or concurrent enrollment. **Cross Listing:** CVEN 301/EVEN 301.

EVEN 304/CVEN 304 Environmental Engineering Lab

Credit 1. 3 Lab Hours. Environmental measurements on physical, chemical, biological and biotechnological parameters of water. **Prerequisites:** CVEN 301/EVEN 301 or EVEN 301/CVEN 301, or concurrent enrollment; CVEN 311/EVEN 311 or concurrent enrollment; or approval of instructor. **Cross Listing:** CVEN 304/EVEN 304.

EVEN 311/CVEN 311 Fluid Dynamics

Credits 3. 3 Lecture Hours. Fluid properties; statics; kinematics; basic conservation principles of continuity, energy and momentum; similitude and hydraulic models; incompressible flow in pipes; fluid dynamic drag. **Prerequisites:** Grade of C or better in MATH 251 or MATH 253; grade of C or better in CVEN 221; grade of C or better in CVEN 302, or concurrent enrollment; also taught at Galveston campus. **Cross Listing:** CVEN 311/EVEN 311.

EVEN 320 Principles of Environmental Engineering Chemistry

Credits 3. 3 Lecture Hours. Fundamental chemical principles needed for the study of natural and engineered environmental systems including thermodynamics and kinetics of acid and base reactions, the carbonate system, reactivity of organic compounds and atmospheric systems. **Prerequisites:** Grade of C or better in CHEM 107; grade of C or better in EVEN 301/CVEN 301 or CVEN 301/EVEN 301 or concurrent enrollment; admitted to major degree sequence in civil engineering or environmental engineering, or approval or instructor.

EVEN 339/CVEN 339 Water Resources Engineering

Credits 3. 3 Lecture Hours. Quantitative hydrology, precipitation, hydrograph analysis, reservoir and stream routing; groundwater, Darcy equation, well equation, well design; probability concepts in design; water law; dams; reservoirs; spillways; open channel and pipe network hydraulics; pumps; urban stormwater drainage; flood damage mitigation. **Prerequisite:** Grade of C or better in CVEN 311/EVEN 311 or EVEN 311/CVEN 311. **Cross Listing:** CVEN 339/EVEN 339.

EVEN 399 Mid-Curriculum Professional Development

Credits 0. 0 Lecture Hours. Participation in an approved high-impact learning practice; reflection on professional outcomes from environmental engineering body of knowledge; documentation of experience appropriate to eventual professional licensure; self-assessment of learning at mid-curriculum point. **Prerequisites:** EVEN 301/CVEN 301 or CVEN 301/EVEN 301; EVEN 304/CVEN 304; EVEN 311/CVEN 311 or CVEN 311/EVEN 311; CVEN 302; CVEN 221; or approval of instructor.

EVEN 400 Design Problems in Environmental Engineering I

Credits 2. 1 Lecture Hour. 3 Lab Hours. . Capstone design project of an interdisciplinary or specialized nature involving both technical and non-technical aspects of an environmental engineering problem; managing a project through the evaluation, selection and preparation of an appropriate design solution for an open-ended problem; project to be completed in EVEN 401. **Prerequisite:** Grade of C or better in EVEN 301/CVEN 301 and EVEN 320; grade of C or better in EVEN 402 or CVEN 402/EVEN 402, and EVEN 413 or CVEN 413/EVEN 413, or concurrent enrollment; senior classification; environmental engineering major; or approval of instructor.

EVEN 401 Design Problems in Environmental Engineering II

Credits 2. 0 Lecture Hours. 6 Lab Hours. Continuation and completion of capstone environmental engineering project developed in EVEN 400; critical evaluation, revision, preparation and communication of final design solution. **Prerequisites:** Grade of C or better in EVEN 400; senior classification; environmental engineering major; or approval of instructor.

EVEN 402/CVEN 402 Engineered Environmental Systems

Credits 3. 3 Lecture Hours. Unit operations and processes in environmental engineering; physical, chemical and biological treatment of water and wastewater; treatment system analysis and design. **Prerequisites:** Grade of C or better in CVEN 301/EVEN 301 or EVEN 301/CVEN 301. **Cross Listing:** CVEN 402/EVEN 402.

EVEN 404 Environmental Unit Operations Laboratory

Credit 1. 3 Lab Hours. Applications of laboratory methods to measure fundamental aspects of behavior of environmental engineering processes; examination of critical chemical, physical and biological processes that control behavior of materials in multiple media (air, water, land) in natural and engineered systems; evaluation of effects of important process variables. **Prerequisites:** Grade of C or better in EVEN 304/CVEN 304 and EVEN 320; grade of C or better in EVEN 301 or CVEN 301/EVEN 301; grade of C or better in EVEN 402 or CVEN 402/EVEN 402 or concurrent enrollment; environmental engineering major; or approval of instructor.

EVEN 406 Environmental Protection and Public Health

Credits 3. 3 Lecture Hours. Communicable and noncommunicable diseases; environmental risk assessment; environmental assessments; comprehensive environmental planning; small water and wastewater systems; solid waste management; hazardous spills and waste management; vector control; environmental administration. **Prerequisites:** Grade of C or better in CVEN 301/EVEN 301 or EVEN 301/CVEN 301; or approval of instructor. **Cross Listing:** CVEN 402/EVEN 402.

EVEN 413/CVEN 413 Natural Environmental Systems

Credits 3. 3 Lecture Hours. Water quality assessment of natural environmental systems; development and calibration of models to describe fate and transport of contaminants in aquatic systems; application of models to design of water quality control facilities. **Prerequisite:** Grade of C or better in EVEN 301/CVEN 301 or CVEN 301/EVEN 301. **Cross Listing:** CVEN 413/EVEN 413.

EVEN 458/CVEN 458 Hydraulic Engineering of Water Distribution Systems

Credits 3. 3 Lecture Hours. Pressure conduit hydraulics; design, modeling, and analysis of water conveyance and distribution systems including pipelines, pipe networks, and pumps. **Prerequisite:** Grade of C or better in CVEN 339/EVEN 339 or EVEN 339/CVEN 339 or approval of instructor. **Cross Listing:** CVEN 458/EVEN 458.

EVEN 462/CVEN 462 Engineering Hydrogeology

Credits 3. 3 Lecture Hours. Groundwater in the hydrologic cycle; aquifer properties; well hydraulics, testing, and design; groundwater quality; and groundwater management and sustainability. **Prerequisites:** Grade of C or better in CVEN 311/EVEN 311 or EVEN 311/CVEN 311; Grade of C or better in CVEN 301/EVEN 301, EVEN 301/CVEN 301, CVEN 339/EVEN 339, or EVEN 339/CVEN 339; junior or senior classification; or approval of instructor. **Cross Listing:** CVEN 462/EVEN 462.

EVEN 463/CVEN 463 Engineering Hydrology

Credits 3. 3 Lecture Hours. Occurrence, distribution and properties of natural waters of the earth; measurement and engineering analysis of hydrologic phenomena including precipitation, streamflow and groundwater, hydrologic design of water resources development and management projects. **Prerequisite:** Grade of C or better in CVEN 339/EVEN 339 or EVEN 339/CVEN 339. **Cross Listing:** CVEN 463/EVEN 463.

EVEN 466 Sustainability and Life Cycle Analysis

Credits 3. 3 Lecture Hours. Definitions of sustainability and sustainable development from social, economic, political, and technical perspectives; life-cycle analysis and quantitative assessment of sustainability; industrial ecology; valuation of environmental goods and externalities; sustainable infrastructure design and management. **Prerequisites:** Junior or senior classification or approval of instructor.

EVEN 485 Directed Studies

Credits 0 to 3. 0 to 3 Other Hours. Research and design problems of limited scope approved on an individual basis intended to promote independent study; results of study presented in writing. May be taken for credit up to three hours. **Prerequisites:** Approval of department head.

EVEN 491 Research

Credits 0 to 3. 0 to 3 Other Hours. Research conducted under the direction of faculty members in environmental engineering. May be taken for credit up to three hours. **Prerequisites:** Junior or senior classification and approval of instructor.