

ENVIRONMENTAL SYSTEMS ENGINEERING (ENVSE)

ENVSE 400: Safety Engineering

3 Credits/Maximum of 3

An introduction to the application of engineering principles for the promotion of safety for workers, consumers, and the public.

Enforced Prerequisite at Enrollment: CHEM 110 and PHYS 211 and MATH 141

ENVSE 404: Surface and Interfacial Phenomena in Environmental Systems

3 Credits

Principles underlying surface and interfacial phenomena with application to mineral processing and environmental systems.

Enforced Prerequisite or Concurrent at Enrollment: CHEM 110 and MATH 141 and PHYS 212 and EME 301
Writing Across the Curriculum

ENVSE 406: Sampling and Monitoring of the Geo-Environment

3 Credits

Issues of sampling, analysis, monitoring and control techniques for effective environmental management in the extractive industries.

Enforced Prerequisite or Concurrent: MNPR 301

ENVSE 408: Contaminant Hydrology

3 Credits

Mobility of contaminants in aquifers; multiphase flow, transport, retardation and attenuation, vapor mobility, aquifer characterization, mathematical models and aquifer remediation.

Enforced Prerequisite at Enrollment: GEOSC 452

ENVSE 412: Environmental Systems Engineering Laboratory

1 Credits

A laboratory study of the principles involved in the characterization and remediation of process wastes with an emphasis on physical separations.

Enforced Prerequisite at Enrollment or Concurrent: MNPR 301

ENVSE 420: Fire Safety Engineering

3 Credits

Overview of the history and behavior of fire, hazards and risk identification, detection and suppression systems, and emergency evacuation procedures.

Enforced Prerequisite at Enrollment: CHEM 110 and MATH 141 and PHYS 212

ENVSE 427: Pollution Control in the Process Industries

3 Credits

Development of multimedia pollution control strategies for the mineral, metallurgical processing, and fossil fuel industries.

Enforced Prerequisite at Enrollment: CHEM 110 and CHEM 112 and MATH 141 and MNPR 301

ENVSE 440: Industrial Ventilation for Contaminant Control

3 Credits

Ventilation system design and analysis for control of industrial contaminants; measurements, dilution and local exhaust ventilation strategies; laboratory demonstrations included.

Enforced Prerequisite at Enrollment: MATH 141 and PHYS 212 and CHEM 110

ENVSE 450: Environmental Health and Safety

3 Credits

Overview of toxicology, epidemiology, exposure assessment, industrial hygiene, environmental laws, and engineering approaches to protecting workers and the environment.

Enforced Prerequisite at Enrollment: CHEM 110

ENVSE 457: Industrial Hygiene Measurements

3 Credits

Industrial hygiene is the discipline devoted to the anticipation, recognition, evaluation, and control of hazards in the workplace. This course provides an overview of the common industrial hygiene measurement techniques used to evaluate exposure to chemical, physical, and biological agents in the workplace. The course will include coverage of basic definitions, exposure standards, and guidelines, and an introduction to the different types of sampling equipment and analytical methods used often in the evaluation of airborne exposure, vapors, and aerosols. Interpretation of quantitative sample results will be an area of emphasis and will become familiar with different exposure, appropriate sampling strategies, and different statistical methods available for making decisions in occupational exposure.

Enforced Prerequisite at Enrollment: CHEM 110

ENVSE 458: Industrial Hygiene Measurements Laboratory

1 Credits

Industrial hygiene is the discipline devoted to the anticipation, recognition, evaluation, and control of hazards in the workplace. This course provides an overview of the most common industrial hygiene measurement techniques used to evaluate exposure to chemical, physical, and biological agents in the workplace. Topics will include coverage of basic definitions, exposure standards, and guidelines, and an introduction to the different types of sampling equipment and analytical methods used most often in the evaluation of airborne exposure to gases, vapors, aerosols, and physical agents (noise, heat, ergonomics). Interpretation of quantitative sample results will be an area of emphasis and students will become familiar with different types of exposure distributions, appropriate sampling strategies, and different

2 *Environmental Systems Engineering (ENVSE)*

statistical tools available for making decisions in occupational exposure assessment.

Enforced Concurrent at Enrollment: ENVSE 457

ENVSE 470: Engineering Risk Analysis

3 Credits/Maximum of 3

Quantitative methods of systems analysis, probabilistic risk and reliability analysis, as well cost-benefit, and value of information analysis.

Enforced Prerequisite at Enrollment: MATH 251

ENVSE 480: Environmental Systems Engineering Process Design

3 Credits

An integrated problem-based learning experience that utilizes fundamental concepts covered in the curriculum to design a geo-environmental system.

Enforced Prerequisite at Enrollment: ENVSE 427 and seventh semester standing or higher in Environmental Systems Engineering (ENVSE_BS) major

ENVSE 494: Senior Thesis

1-6 Credits/Maximum of 6

Independent research and/or design projects under the supervision of the Environmental Systems Engineering program.

Enforced Prerequisite at Enrollment: Seventh semester standing or higher in Environmental Systems Engineering (ENVSE_BS) major
Honors

ENVSE 495: Environmental Health and Safety Engineering Internship

2 Credits

Students work with an advisor to prepare technical memos and a final report summarizing the experiential education gained through employment in industry.

Enforced Prerequisite at Enrollment: Fifth semester standing or higher

ENVSE 496: Independent Studies

1-18 Credits/Maximum of 18

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

ENVSE 497: Special Topics

1-9 Credits

Formal courses given infrequently to explore, in depth, a comparatively narrow subject that may be topical or of special interest.