Course Code	Course Title	Credit Hours
ENE-921	Contaminated Site Remediation	3(3+0)

Course Description

This course provides an overview of the sources and the pathways of subsurface environmental contamination and the approaches and methodologies to investigate and characterize the contaminated sites and evaluate the associated risks. The course covers the concepts, methods, issues and various forms and stages of the contaminated site remediation. The theory and design principles of a number of soil and groundwater remediation technologies will be explained along with the control aspects of air emissions associated with the soil treatment units and groundwater treatment units.

Course Outline

Chemistry: chemistry of soil and groundwater contamination

Hydrogeology: hydrology, geological formations, groundwater flow

Contaminant Transport: Nonaqueous phase liquids (NAPL), light nonaqueous phase liquids (LNAPL), dense nonaqueous phase liquids (DNAPL), dissolved contamination

Risk Assessment: Types of health risks and approaches of risk assessments

Remediation Targets: detection limits, background levels, regulatory standards, criteria, screening levels, clean-up levels and goals

Groundwater Remediation and Treatment: physical barriers, groundwater extraction, groundwater discharge, in situ treatment, control of air emissions from groundwater treatment units

Soil Remediation: soil excavation and materials handling, immobilization technologies, separation technologies, destruction technologies, control of air emissions from soil treatment units

Reuse and Land Application: reuse and land application of liquid and solid wastes

Recommended Books

1. Sellers, K. (2018). Fundamentals of hazardous waste site remediation. Routledge.
2. Suthersan, S. S., & Payne, F. C. (2004). In situ remediation engineering. CRC Press.
3. Wise, D. L. (2000). Remediation engineering of contaminated soils. CRC Press.