B. Tech. Civil Engineering				
Course code: Course Title	**Course Structure.**			**Pre-Requisite**
CE 419: Environmental Geo-Techniques	**L**	**T**	**P**	**CE206: Soil mechanics CE208: Environmental Engineering**
	3	**1**	**0**	

Course Objective: To understand the fundamental principles of environmental geotechnics and its role in sustainable engineering practices. To study the behavior of soils and rocks in response to environmental factors such as contamination, seepage, and waste disposal. To explore various waste containment systems, landfill engineering, and remediation techniques for contaminated sites. To apply geotechnical engineering principles to the assessment and mitigation of environmental hazards. To introduce advanced techniques such as geosynthetics, bioremediation, and soil stabilization for environmental protection.

S. No	Course Outcomes (CO)
CO1	Understand the fundamental concepts of environmental geotechnics and its importance.
CO2	Analyse soil contamination mechanisms and apply suitable remediation techniques.
CO3	Design waste containment systems considering geotechnical principles.
CO4	Evaluate groundwater contamination and implement appropriate control measures.
CO5	Apply sustainable geotechnical solutions for environmental protection and infrastructure development.

S. No	Contents	Contact hours
UNIT 1	Introduction to Environmental Geotechnics: Scope and importance of environmental geotechnics, Soil-water-contaminant interaction, Sources of contamination in soil and groundwater, Physicochemical and biological behaviour of contaminated soils, Impact of environmental factors on soil properties	8
UNIT 2	Soil Contamination and Remediation Techniques: Mechanisms of soil contamination – Adsorption, Diffusion, Leaching, Contaminant transport in soils – Advection, Dispersion, and Biodegradation, Remediation techniques: In-situ methods – Bioremediation, Soil Vapor Extraction, Electrokinetic Remediation, Ex-situ methods – Soil Washing, Stabilization/Solidification, Thermal Desorption, Case studies of contaminated site remediation	8
UNIT 3	Waste Management and Landfills: Types and classification of waste – Municipal, Industrial, Hazardous, Landfill design and construction, Geotechnical	8