1.	Title of the course	Geoenvironmental Engineering
2.	Course number	CE535L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CE5033/11
6.	To be offered by	Department of Civil and Environmental Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the fundamental concepts of the behaviour of soils, rocks and groundwater interacting with contaminants from solid and hazardous waste materials. To impart knowledge of several techniques for the remediation of contaminated sites and beneficial reuse of waste and recyclable materials incorporating the concept of sustainability.	
10.	**Course Content:** Introduction: geoenvironmental problems, need for geoenvironmental engineering; Relevant environmental laws and regulations; Contaminant transport and fate: geochemistry, groundwater flow; Site remediation: contamination sources and remediation approaches, contaminated site characterization, in-situ containment technologies, soil remediation technologies, groundwater remediation technologies; Landfills and impoundments: waste characterization and properties, landfill regulations and siting, liner and cover systems for management of leachate and gas, groundwater monitoring; Sustainable development: beneficial use of waste and recycled materials; End use of closed landfill sites; Municipal solid waste landfill mining; Bioreactor landfills.	
11.	**Textbook(s):** 1. Qian X, Koerner R and Gray D H, *Geotechnical Aspects of Landfill Design and Construction*, 1st Edition, Prentice Hall (2002). 2. Sharma H D and Reddy K R, *Geoenvironmental Engineering: Site Remediation, Waste Containment, and Emerging Waste Management Technologies*, 1st Edition, John Wiley & Sons (2004).	
12.	**Reference(s):** 1. Daniel D E, *Geotechnical Practice for Waste Disposal*, 1st Edition, Chapman and Hall (1993). 2. Reddy K R and Adams J A, *Sustainable Remediation of Contaminated Sites*, 1st Edition, Momentum Press (2015). 3. Sarsby R W, *Environmental Geotechnics*, 2nd Edition, ICE Publishing (2013).	