

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NGLD301	Environmental Geology	3	0	0	3

Course Objective
To introduce the fundamental concepts of environmental geology, including natural and anthropogenic sources of pollution, and to develop an understanding of the Anthropocene epoch. The course examines the impacts of environmental degradation on air, water, and land, and emphasizes the role of geologists in contamination assessment, remediation, and sustainable resource management.
Learning Outcomes
Upon completion of the course, students will be able to understand: <ul style="list-style-type: none"> • Understand key concepts of environmental geology, including environmental issues in the Anthropocene. • Identify geogenic and anthropogenic sources of pollution and explain pollutant origin, transport, and impacts. • Evaluate environmental degradation in air, water, and soil systems. • Apply geological knowledge for remediation, waste management, and sustainable resource use.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Introduction to Environmental Geology: Fundamental concepts; Earth systems; environmental changes in the Anthropocene; human impacts on natural systems.	8	Understand key concepts of environmental geology and environmental changes in the Anthropocene.
2.	Sources of Pollutants: Geogenic and anthropogenic sources; inorganic and organic contaminants; drinking water standards; surface and groundwater pollution; geochemistry of toxic elements; introduction to medical geology.	8	Identify sources of pollutants and explain their origin and impacts on environmental and human health.
3.	Earth Processes and Environmental Impacts: Weathering, erosion, sedimentation, mass wasting; natural hazards and their environmental consequences.	6	Explain surface geological processes and evaluate their role in environmental changes.
4.	Exploration/Mining and Impacts on Environment: Environmental issues in mineral and energy resource exploitation; acid mine drainage; land degradation; soil erosion and conservation.	6	Assess environmental problems related to mining and resource exploitation.
5.	Environmental Management and Sustainability: Geological approaches to pollution control; waste disposal; climate change, global warming, and mitigation; environmental planning (EIA, EMP); case studies of sustainable engineering.	8	Apply geological knowledge for environmental management, remediation, and sustainable practices.
6.	Pollutant Transport, Remediation & Waste Management: Transport and fate of pollutants in air, water, and soil; remediation techniques (bio/phytoremediation); waste management and safe disposal methods.	6	Evaluate pollutant behaviour and apply remediation and waste management strategies.
	Total Classes	42	

Textbooks:

1. Valdiya, K S (1987) Environmental Geology. Indian Context. Tata McGraw Hill Publ.
2. Rogers, D.T. (2025). Environmental Geology and Sustainability: Risk Mitigation in Urban Areas. CRC Press.

Reference Books:

1. Keller, E A. (2012) Introduction to Environmental Geology (5h Edition). Prentice Hall.
2. Montgomery, C.W. (1989) Environmental Geology (II Edition). Wm. C Brown Publ.