CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-7 **Environmental Geology (L3, P1)**	**4**	**3**	**0**	**1**	**12th pass with science**	**Studied Earth System Science and geochemistry or Equivalent**

Learning Objectives
The main objective is to help equip students with an understanding of the interactions between geologic processes, ecological processes, and society. Future standard of life and living quality will be governed by the use of earth's resources. Environmental geology is the application of geologic information to the entire spectrum of interactions between people and the physical environment.

Learning outcomes
Introduce to the basic concepts and principles of physical and environmental geology, focusing on Earth materials and processes. Provide with sufficient information concerning natural hazards and the geologic environment. Develop an understanding of relationships between natural resources and pollution. Systematic understanding of the basic concepts of environmental management as they relate to the geologic environment in areas such as waste management, environmental health, global change, and environmental assessment

SYLLABUS OF DSE-7
Environmental Geology (4 credits)

Theory (45 hours)

Unit 1: (12 hours)
Concept and definition of Environmental Geology. Components of Earth System and their mutual inter-relations and interactions (atmosphere, hydrosphere, lithosphere and biosphere). Concept of biodiversity

Unit 2: (13 hours)
Earth Processes and Natural Hazards: Distribution, magnitude and intensity of earthquakes. Neotectonics and seismic hazard assessment. Seismic hazard maps. Impact of seismic hazards on long and short term environmental conditions. Mechanism of landslides, causes of major floods, Coastal hazards, cyclones and storms

Unit 3: (10 hours)
Resources and Pollution: Soil degradation and changing land use pattern. Soil contamination due to urbanization, industrialization and mining. Water pollution: Impact assessment of water availability, quality and contamination of surface water and groundwater. Major Water Pollutants, Surface-Water Pollution and Treatment, Groundwater Pollution and Treatment , Water-Quality Standards, Wastewater Treatment, Air pollution: Introduction to Air Pollution, Pollution of the Atmosphere, Sources of Air Pollution, Air Pollutants, Urban Air Pollution, Indoor Air Pollution, Control of Air Pollution, Air Quality Standards, Deforestation.

Unit 4: (10 hours)

Environmental management: Global Climatic Change, Anthropogenic influence on environment, Basic tenets of environmental laws. Environmental Protocols. Environmental Planning: Site Selection Environmental Impact Analysis and Use and Planning

Practicals (30 hours)

Study of maps of seismic zones, earthquake-prone, landslide-prone and flood-prone areas in India. Methods of water analyses for physical, chemical and biological parameters. Classification of groundwater for use in drinking and industrial purposes. Evaluation of environmental impact of air pollution, groundwater pollution, landslides, deforestation.

Essential readings

Valdiya, K.S., 2013. Environmental Geology – Ecology, Resource and Hazard Management, 2nd Edition, McGraw Hill (Education) Pvt. Ltd. India.

Richards J.S., 2013. Environmental Geology. 2nd Edition, McGraw-Hill Science Engineering

Smith, K., 2013. Environmental Hazards. Assessing Risk ang Reducing Disaster, 6th Edition, Routledge, London.

Subramaniam, V., 2001. Textbook in Environmental Science, Narosa International

Kellar, E. A. 2017. Introduction to Environmental Geology. 5th Edition, Pearson

Recommended Readings

Botkin, D,B. and Keller, E. A. Environmental Science: Earth as a Living Planet, 9th Edition, Wiley.

Merritts, D., de Wet, A. and Menking, K. 1998. Environmental Geology: an earth system science approach. W.H. Freeman & Co., N. Y.

Keller, E.A, DeVecchio, D.E and Blodgett, R.H., 2019. Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes 5th Edition, Routledge, London.