

# Value Added Courses

## Semester-I

### Course Title: Environmental Studies (VAC-1)

### THEORY (02 Credits)

Unit	Content of Environment Studies	30 Hours
Unit 1	<b>Introduction to Environmental Studies</b>	1 Hour
	Components of environment: atmosphere, hydrosphere, lithosphere, and biosphere; Scope and importance; Concept of sustainability and sustainable development.	
Unit 2	<b>Ecosystems</b>	5 Hours
	Definition and concept of Ecosystem. Structure of ecosystem (biotic and abiotic components); Functions of Ecosystem: Physical (energy flow), Biological (food chains, food web, ecological succession), and Biogeochemical (nutrient cycling) processes. Concepts of productivity, ecological pyramids and homeostasis. Types of Ecosystems.	
Unit 3	<b>Natural Resources</b>	5 Hours
	Land resources; Soil erosion and desertification; Impacts of mining and dam building on environment; Water resources: Natural and man-made sources; Uses of water; Over exploitation of surface and ground water resources; Floods, droughts, and international & interstate conflicts over water; Energy resources: Renewable and non-renewable energy sources; Use of alternate energy sources.	
Unit 4	<b>Biodiversity and Conservation</b>	5 Hours
	Definition of Biodiversity; Levels of biological diversity; Biodiversity hotspots; Endemic and endangered species of India; IUCN Red list criteria and categories; Threats to biodiversity; Biodiversity conservation strategies: in-situ and ex-situ methods of conservation; National Parks, Wildlife Sanctuaries, and Biosphere reserves; Biological Indicator species.	
Unit 5	<b>Environmental Pollution</b>	4 Hours
	Environmental pollution: causes, effects, and controls; Pollutants and it's types; Nuclear hazards and human health risks; Solid waste management.	
Unit 6	<b>Global Environmental Issues and Policies</b>	5 Hours
	Climate change, Global warming, Ozone layer depletion, and Acid rain; International agreements and programs related to climate and environmental issues; Sustainable Development Goals; Environment legislation in India: Wildlife Protection Act, 1972; Water (Prevention and Control of Pollution) Act, 1974; Forest (Conservation) Act 1980; Air (Prevention & Control of Pollution) Act, 1981; Environment Protection Act, 1986; Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.	
Unit 7	<b>Environment and Ecology (with reference to Jharkhand state)</b>	5 Hours
	<b>Geographical feature:</b> Soil, Climate, River, lakes, flora & fauna,	

	<p>National parks &amp; Wildlife Sanctuaries, Policies &amp; Programmes related to conservation of forest in context to Jharkhand.</p> <p><b>Industry in Jharkhand and its impact on Environment:</b> large scale Industry (Iron &amp; Steel, Mining &amp; Mineral Extraction, Chemical &amp; Explosive, Cement, Agro based and Automotive) and small-scale Industry (Handloom sector, Tassar &amp; Lac industry, Sericulture, Stone industry).</p> <p><b>Mineral profile &amp; Tourist Spots of Jharkhand</b> (Hill Station, Waterfalls, Water spots, Religious Tourist Place, Cultural &amp; Ethnic Tourist spots.</p>	
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### Suggested Readings:

- Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
- Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
- Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
- Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
- Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
- Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
- Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
- Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.