

**Name of the Programme: UG General Education Programmes**

**Course Code: VAC-100**

**Title of the Course: Environmental Studies I**

**Number of Credits: 02**

**Effective from AY: 2023-24**

<b>Pre-requisites for the Course:</b>	<b>Nil</b>	
<b>Course Objectives:</b>	<b>Sensitise students to environmental conservation and sustainable use of resources</b>	
<b>Content:</b>	Module 1 : Multidisciplinary nature of environmental studies Definition, scope and importance Need for public awareness. Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion and desertification. • Role of an individual in conservation of natural resources. • Equitable use of resources for sustainable lifestyles.	15 Hours
	Module 2: Ecosystems Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries); Biodiversity and its conservation Introduction – Definition: genetic, species and ecosystem diversity. Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at	15 hours

	<p>global, National and local levels. India as a mega-diversity nation IV, Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</p>	
<b>Pedagogy:</b>	<b>Class lectures, Case Studies, Field visits</b>	
<b>References/ Readings:</b>	<ol style="list-style-type: none"> <li>1. Agarwal K.C. (2001): Environmental Biology, Bikaner, Nidi</li> <li>2. Bharucha E.: The Biodiversity of India, Ahmedabad, Mapin</li> <li>3. Bharucha E.: Textbook of Environmental Studies. Orient BlackSwan</li> <li>4. Brunner R.C. (1989): Hazardous Waste Incineration, New York, McGraw-Hill</li> <li>5. Chatwal G.R. &amp; Sharma H. (2005): A Textbook of Environmental Studies, Mumbai, Himalaya</li> <li>6. Clark R.S.: Marine Pollution, Oxford, Clanderson</li> <li>7. Cunningham W.P., Cooper T.H., Gorani E. &amp; Hepworth M.T. (2001): Environmental Encyclopaedia, Mumbai, Jaico.</li> <li>8. De A.K.: Environmental Chemistry, Wiley.</li> <li>9. Desai R.J. (2003): Environmental Studies, Mumbai, Vipul, Goa University, Taleigao Plateau, Goa.</li> <li>10. Gleick H.P. (1993): Water in Crisis, Stockholm Env't. Institute, OUP Hawkins R.E.: Encyclopedia of Indian Natural History, Mumbai, BNHS.</li> <li>11. Heywood V.H. &amp; Watson R.T. (1995): Environment Protection and Laws, Mumbai, Himalaya.</li> <li>12. Jadhav H. &amp; Bhosale V.M. (1995): Environment Protection and Laws, Mumbai, Himalaya.</li> <li>13. McKiney M.L. &amp; Schoel R.M. (1996): Environment Science, Systems and Solutions, Web Enhanced Edition.</li> <li>14. Mhaskar A.K.: Matter Hazardous, Techno-Science Publications Miller T.G. Jr.: Environmental Science, Wadsworth</li> <li>15. Odum E.P. (1971): Fundamentals of Ecology, Philadelphia, W.B. Saunders.</li> <li>16. Rao M.N. &amp; Datta A.K. (1986): Waste Water Treatment, Oxford &amp; IBH.</li> <li>17. Santra S.C. (2004): Environmental Science, Kolkata, Central Book Agency.</li> <li>18. Sharma B.K. (2001): Environmental Chemistry, Meerut, Goel Publishing House.</li> <li>19. Townsend C., Harper J. &amp; Begon M.: Essentials of Ecology, Blackwell Science.</li> <li>20. Trivedi R.K.: Handbook of Environmental Laws, Rules, Guidelines, Compliances and, Standards, Vol.1 &amp; 2, Enviro Media.</li> <li>21. Trivedi R.K. &amp; P.K. Goel: Introduction to Air Pollution, Techno-Science Publications.</li> <li>22. Wagner K.D. (1998) Environmental Management, Philadelphia, W.B. Saunders Magazines</li> </ol>	

	<ul style="list-style-type: none"> <li>• Down to Earth, Centre for Science &amp; Environment, Survey of the Environment published by The Hindu</li> <li>• E- resource <a href="http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf">http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf</a></li> </ul>
<b>Course Outcomes:</b>	<p><b>Students will have the ability to</b></p> <ol style="list-style-type: none"> <li><b>1. Distinguish between renewable and non-renewable resources</b></li> <li><b>2. Understand different ways to manage resources sustainability</b></li> <li><b>3. Appreciate the value of bio-diversity and its management</b></li> </ol>