

COURSE – ENVIROMENTAL EDUCATION (EE)

PROGRAM- UNDERGRADUATE	YEAR- 1st Year	SEMESTER- I (B.A.) SEMESTER-II (OTHER THAN B.A.)
Course component- <i>Value Added Course (VAC)</i>		Course code- UENVVAC10001

Course Description:

Through the process of environmental education as Value added course (VAC), under-graduate student in the affiliated colleges of this University can learn about the detail information about the global Ecosystems and environmental issues and engage themselves in problem-solving activities, and take steps to protect the environment at their localities. As a result, students are better able to understand environmental challenges and make judgments that are well-informed and moral.

To aid in achieving these aims, the following five related objectives have been suggested:

Awareness: increasing the sensitivity and knowledge of individuals and social groupings to environmental challenges and solutions.

Knowledge: empowering to learn a variety of facts and develop a fundamental grasp of nature and environments.

Attitude: helping social groups and individuals adopt a perspective on the environment that will motivate them to actively contribute to its improvement and protection.

Skills: improving social groups' and individuals' awareness of and response to environmental problems.

Participation: specific involvement of individuals and social groups the chance to join in efforts to speak environmental issues at their levels.

Course outcomes:

After completing this course students will able to:

- Understand the concept of natural resources, their types and availability.
- To develop concept and need of conservation of natural resources and their sustainable development.
- Develop knowledge of ecosystem diversity in India and understanding ecosystem services.
- Understand the concept of Biodiversity, factor impacting towards its loss and conservation.
- Develop an understanding the types of pollution and their adverse impact on environment and health system; controlling measures and policies.
- Understanding crucial Social Issues related to Environment.

<ul style="list-style-type: none"> Learn the major international treaties and legislation. 		
Core compulsory		Total Credits-04
PAPER LEVELS - 100		
MAX. Marks. 75		Credit distribution: Theory-Marks-60 (MCQ)-Credit-03 Field work/Projects & attendance -Marks-10+5 –Credit-01
Lectures-60 [Lectures-45 +Tutorials-15]		Mandatory: Mid-semester test & Field work report preparation
Units	Topics	No. of Lectures
Unit-1	<u>Environmental education and sustainable development</u> Definition and objectives of Environmental education; Levels and significance of Environmental Education. Sustainable Development- Definition; Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs.	<u>4 lectures</u>
Unit-2	<u>Natural Resources</u> Classification of natural resources- biotic and abiotic, renewable and non-renewable. Biotic resources: Major type of biotic resources- forests, grasslands, wetlands, wildlife and aquatic (fresh water and marine); Microbes as a resource; Status and challenges. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. Water resources: Fresh and marine water resources; Availability and use of water resources; Environmental impact of over-exploitation, issues and challenges; Water scarcity and stress; Conflicts over water. Soil and mineral resources: Important minerals; Mineral exploitation; Environmental problems due to extraction of minerals and use; Soil as a resource and its degradation.	<u>7 lectures</u>
Unit-3	<u>Ecosystems and ecosystem services:</u> Concept of an ecosystem -Structure and function of an ecosystem. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Major ecosystem types in India and their basic characteristics - forests, wetlands, grasslands, agriculture.	<u>7 lectures</u>

	coastal and marine; Ecosystem services- classification and their significance. Forest Ecosystem of North Bengal.	
Unit-4	<p><u>Biodiversity and its conservation</u></p> <p>Definition, types of biodiversity. Biodiversity Hot-spots. Biogeographical classification of India. India as a mega-diversity nation.</p> <p>Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values</p> <p>Threats to biodiversity: Land use and land cover change; Commercial exploitation of species; Invasive species; Fire, disasters and climate change; man-wildlife conflicts.</p> <p>Conservation of biodiversity: <i>in-situ</i> and <i>ex-situ</i> conservation of biodiversity. National and International Instruments for biodiversity conservation. Endangered and endemic species of India</p>	<u>7 lectures</u>
Unit-5	<p><u>Environmental Pollution and management</u></p> <p>Definition of pollution; Point sources and non-point sources of pollution.</p> <p>Air pollution: Sources of air pollution; Primary and secondary pollutants; Criteria pollutants- carbon monoxide, lead, nitrogen oxides, ground-level ozone, particulate matter and sulphur dioxide; Indoor air pollution; Adverse health impacts of air pollutants; Air pollution control. National Ambient Air Quality Standards. AQL.</p> <p>Water pollution: Sources of water pollution; River, lake and marine pollution, groundwater pollution; Water quality parameters and standards; adverse health impacts of water pollution on human and aquatic life. Water pollution control.</p> <p>Soil pollution and solid waste: Soil pollutants and their sources; Solid and hazardous waste; Impact on human health, Solid waste Management</p> <p>Noise pollution: Definition of noise; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; adverse impacts of noise on human health. Abatement of noise pollution.</p> <p>Thermal and Radioactive pollution: Sources and impact on human health and ecosystems.</p> <p>Role of an individual in prevention of pollution. Pollution case studies.</p>	<u>8 lectures</u>
Unit-6	<p><u>Social Issues and the Environment</u></p> <p>Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies.</p> <p>Disaster management: floods, earthquake, cyclone and landslides.</p> <p>Water conservation, rain water harvesting, watershed</p>	<u>7 lectures</u>

	<p>management Population explosion and environment Human Rights and environment. Role of women and environment. Role of Information Technology in Environment and human health. Environmental Movements.</p>	
Unit-7	<p><u>Environmental Treaties and Legislation</u></p> <p>Major International Environmental Agreements: Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES); Ramsar Convention on Wetlands of International Importance; United Nations Convention to Combat Desertification (UNCCD); Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer, United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Paris Agreement; India's status as a party to major conventions.</p> <p>Major Indian Environmental Legislation: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air (Prevention and Control of Pollution) Act, 1981; The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002; Noise Pollution (Regulation and Control) Rules, 2000; Ramsar sites; Biosphere reserves; Protected Areas; National Green Tribunal; Some landmark Supreme Court judgments.</p> <p>Major International organizations and initiatives: United Nations Environment Programme (UNEP), International Union for Conservation of Nature (IUCN), World Commission on Environment and Development (WCED), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Panel on Climate Change (IPCC), and Man and the Biosphere (MAB) programme.</p>	<u>5 lectures</u>
Field Work/Project	<p>Submission of individual/group field report on any of the following activity focusing environmental conservation /management (Any One).</p> <p>1. Plantation of one tree sapling (indigenous or fruit species) at home premises/ in college campus/ adopted</p>	<u>15 lectures</u>

	<p>village/community. Supervise continuously and record the growth pattern. Submit initial and final plant condition with relevant details and future benefits of the tree (Geo-tagged photos etc.)</p> <ol style="list-style-type: none"> 2. Cleaning and restoration of a nearby ponds/ river/water body. Supervise and clean periodically and record the quantity and quality of solid wastes. Submit initial and final water-body condition with relevant details (Geo-tagged photos etc.) 3. Cleaning and restoration of a nearby picnic spot/public place. Supervise and clean periodically and record the quantity and quality of solid wastes. Submit initial and final status of the place with relevant details (Geo-tagged photos etc.) 4. Three Awareness campaign on environmental issues (safe solid waste disposal, communicable diseases, safe drinking water, tree plantation, vaccination, etc.) in nearby locality/adopted villages. Submit detailed report of the campaign with relevant details like no. of person participated, feedback and outcomes of the campaigns (Geo-tagged photos etc.) 	
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Suggested readings:

- Adenle A., Azadi H., Arbiol J. (2015). Global assessment of technological innovation for climate change adaptation and mitigation in developing world, *Journal of Environmental Management*, 161 (15): 261-275.
- Ahluwalia, V. K. (2015). *Environmental Pollution, and Health*. The Energy and Resources Institute (TERI).
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- Bawa, K.S., Oomen, M.A. and Primack, R. (2011) *Conservation Biology: A Primer for South Asia*. Universities Press.
- Bhagwat, Shonil (Editor) (2018) *Conservation and Development in India: Reimagining Wilderness*. Earthscan Conservation and Development, Routledge.
- Bohra, Saroj, *Judicial Intervention and Evolution of Environmental Principles and Doctrines* (January 7, 2019). Available at SSRN: <https://ssrn.com/abstract=3311406> or <http://dx.doi.org/10.2139/ssrn.3311406>. Cambridge University Press
- Chapman, J. L. and Reiss, M. J. (1992). *Ecology – Principles and Applications*,
- D. K. Choudhary, *Environmental Education (For Degree Level Students)*, Manish Prakashan, Varanasi
- D.K.Asthana, Meera Asthana, *A textbook of Environmental Studies*, S Chand & Company



- Erach Bharucha, A textbook of Environmental Studies, Universities Press (India) Pvt. Limited
- Fisher, Michael H. (2018) An Environmental History of India- From Earliest Times to the Twenty-First Century, Cambridge University Press.
- Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press.
- Hughes, J. Donald (2009) An Environmental History of the World- Humankind's Changing Role in the Community of Life, 2nd Edition, Routledge.
- J. L. Chapman and M. J. Reiss (1999) 2nd edition Ecology: Principles and Applications
- J. S. Singh, S. P. Singh, S.R. Gupta, Ecology, Environmental Science and Conservation
- Khitoliya R.K. (2006). Environmental pollution, S Chand & Company.
- L. Jeanne, James F. Kitchell, Nancy E. Langston and Monica G. Turner (1998.) Ecology. Oxford University Press.
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- Miller, G. T., & Spoolman, S. (2015) Environmental Science. Cengage Learning.
- Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. <https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf>
- Misra, R. (2018). Indian manual of plant Ecology, Scientific publishers (India).
- Odum, E. P. and Barrett, G. W. (2005). Fundamentals of Ecology, 5th Edition, Cengage
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- Publications, Merrut, India.
- Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press.
- Rajesh Makol, Lalita Makol, Environmental Education, Rajesh Makol.
- Robert E. Ricklefs and Gary L. Miller Ecology by W. H. Freeman Publications, 1999.
- S.P. Misra, S.N. Pandey, Essential Environmental Studies, CRC Press.
- Sharma, P. D. (2009). Ecology and Environment, 10th Revised Edition, Rastogi
- Singh, J.S., Singh, S.P. & Gupta, S.R. 2006. Ecology, Environment and Resource Conservation. Anamaya Publications <https://sdgs.un.org/goals>
- Smith, R. L. (2006). Element of Ecology, 6th Edition, Pearson Education, New Delhi, India; 658 p 4.
- Stanley I. Dodson, Timothy F. H. Allen, Stephen R. Carpenter, Anthony R. Ives, Robert Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press.
- UNEP (2007) Multilateral Environmental Agreement Negotiator's Handbook, University of Joensuu.
- William D. Bowman, Sally D. Hacker and Michael L (2017) Ecology, Oxford University Press, USA Publications.

[Dr. Monoranjan Chowdhury]
Signature of the Chairman
Board of Under-Graduate Studied
Environmental Education (EE)