



**Syllabus for  
Environmental Studies  
Ability Enhancement Compulsory Course (AECC)  
at Undergraduate level**

**Under**

**NATIONAL EDUCATION POLICY -2020  
NEP-2020**

## **Ability Enhancement compulsory course Environmental Studies**

1. The module consists of 8 units in which the first seven units will cover 45 lectures which are classroom based to enhance knowledge skills and attitude to environment. Unit 8 is based on field activities which will be covered in 5 lecture hours and would provide students first-hand knowledge on various local environmental aspects.
2. To ensure the interdisciplinary spirit of the proposed curriculum, teaching must be carried out by the faculty who are trained at post-graduate (M.Sc.) and Ph.D. in the 'Environmental Science subject only. A candidate who is qualified with UGC-NET/K-SET in the area of Environmental Science will be well- equipped to teach this curriculum.
3. The scheme of Examination and the question paper pattern for AECC – Environmental Studies will be multiple choice questions (MCQ) for 30 marks and 20 marks for internal assessment with 2 credits.

# Environmental Studies Syllabus

<b>No. of Credits</b>	<b>No. of Lecture Hours</b>
<b>2</b>	<b>45</b>

	<b>Content of AECC – Environmental Studies</b>	<b>45 Hours</b>
UNIT 1	<p><b>Introduction to Environmental Studies:</b> Multidisciplinary nature of environmental studies. Scope and importance; Concept of sustainability and sustainable development</p>	2 Hr
UNIT 2	<p><b>Ecosystems</b> What is an ecosystem? Structure and function of ecosystem; Classification of Ecosystem- Terrestrial Ecosystem viz., Forest Grassland, Tundra, Taigas, Mangroves, Desert: Aquatic ecosystem- Lentic Exosystem- ponds, lakes, oceans: Lotic Ecosystem- Streams, rivers, estuaries; Energy flow model and energy fixation in an ecosystem: food chains, food webs and ecological succession. Functions of ecosystems in biodiversity and climate control. Value of different ecological services in an ecosystem.</p>	6 Hr
UNIT 3	<p><b>Natural Resources: Renewable and Non-Renewable Resources:</b> Land resources- Measurement methods for LULC, land use pattern, Land degradation, soil erosion and desertification.  Deforestation: Causes and impacts due to mining, dam building on</p>	8 Hr

	<p>environment, biodiversity and tribal populations, Forest Fragmentation, Buffer Zones.</p> <p>Global distribution of Water resources: origin and composition of Sea water, ice sheets and ice caps: Use and over-exploitation of surface and ground water, floods, droughts, Water scarcity, conflicts over water (International and Interstate)</p> <p>Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, Next generation of energy Resources- Solar energy, generation of bio fuels, hydrogen energy, case studies.</p>	
UNIT 4	<p><b>Biodiversity and Conservation:</b></p> <p>Levels of biological diversity: Genetic, species and ecosystem diversity; Biogeographic zones of India; Measurement of Biodiversity: Biodiversity patterns and global biodiversity hot spots.</p> <p>India as a mega-biodiversity nation; Endangered and endemic species of India. Invasive species, Keystone species.</p> <p>Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Methods of conservation of biodiversity: In-situ conservation: National Parks, Wildlife Sanctuaries, Biosphere Reserve, Gene sanctuaries and Ex-situ conservation- Seed Bank, Tissue culture, IVF, Cryopreservation.</p> <p>Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic, Productive and consumptive value.</p>	8 Hr
UNIT 5	<p><b>Environmental Pollution</b></p> <p>Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution.</p> <p>Nuclear hazards and biological effects of radiations and human health risks.</p> <p>Solid waste management, Control measures of urban and industrial waste Pollution case studies.</p> <p>Environmental Remediation Techniques- Phytoremediation and Bioremediation.</p>	8 Hr
UNIT 6	<p><b>Environmental Policies &amp; Practices</b></p> <p>Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.</p> <p>Environment Laws: Environment Protection Act; Air (Prevention &amp; Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act.</p> <p>Evolution and development of international environmental laws- Stockholm Conference, Nairobi Declaration, Rio Conference, Rio+5 and Rio+10</p>	7 Hr

	<p>international agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD). COPs, IPCC, UNFCCC, UNCED, UNCCD, REDD.</p> <p>Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context</p>	
UNIT 7	<p><b>Human Communities and the Environment</b></p> <p>Human population growth: Impacts on environment, human health and welfare.</p> <p>Resettlement and rehabilitation of project affected persons; case studies.</p> <p>Disaster management: floods, earthquake, cyclones and landslides.</p> <p>Environmental movements: Chipko, Appiko, Silent valley, Bishnois of Rajasthan, Save Dehing Patkai, Cauvery calling, Save Soil, Save Sundarbans</p> <p>Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Sacred Groves</p> <p>Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).</p>	6 Hr
UNIT 8	<p><b>New age Environmental Issues</b></p> <p>Polar Ice Caps melting</p> <p>Carbon Footprint, Carbon Credits, Carbon Trading</p> <p>Virtual labs on Science of Climate change. Sustainable Developmental Goals</p>	5 Hr
<p><b>References</b></p> <ul style="list-style-type: none"> <li>• Carson, R. (2002). Silent Spring. Houghton Mifflin Harcourt.</li> <li>• Gadgil, M., &amp; Guha, R. (1993). This Fissured Land: An Ecological History of India. Univ. of California Press.</li> <li>• Gleeson, B. and Low, N. (eds.) (1999). Global Ethics and Environment, London, Routledge.</li> <li>• Glejck, P. H. (1993). Water in Crisis. Pacific Institute for Studies in Dev., Environment &amp; Security. Stockholm Env. Institute, Oxford Univ. Press.</li> <li>• Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. (2006). Principles of Conservation Biology. Sunderland: Sinauer Associates.</li> <li>• Grumbine, R. Edward, and Pandit, M.K. (2013). Threats from India's Himalaya dams. Science, 339: 36-37.</li> <li>• McCully, P. (1996). Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.</li> <li>• McNeill, John R. (2000). Something New Under the Sun: An Environmental History of the Twentieth Century.</li> <li>• Nandini, N. (2019). A text book on Environmental Studies (AECC). Sapna Book House, Bengaluru.</li> <li>• Odum, E.P., Odum, H.T. &amp; Andrews, J. (1971). Fundamentals of Ecology. Philadelphia: Saunders.</li> <li>• Pepper, I.L, Gerba, C.P. &amp; Brusseau, M.L. (2011). Environmental and Pollution Science.</li> </ul>		

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**B.Sc. (Basic/ Hons.) Semester I / II Examination**  
**Model question paper Ability Enhancement Compulsory Course (AECC)**  
**Subject: Environmental Studies**

Time: 1 h

Max. Marks: 30

**Prepare 30 objective type questions by giving equal weight to the entire syllabus**

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**Total Marks: 50 Marks**

**Credits: 02**

**Semester end examination: 30 Marks**

**Internals: 20 Marks**