

University of Calcutta

Under Graduate Curriculum under Choice Based Credit System (CBCS)

Syllabus for Ability Enhancement Compulsory Course-2 (AECC-2) in **Environmental Studies**

Semester-2

Total Marks-100(Credit -2)

(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

[Marks obtained in this course will be taken to calculate SGPA & CGPA]

Theory

Unit 1 Introduction to environmental studies	2 lectures
<ul style="list-style-type: none">•Multidisciplinary nature of environmental studies;•Scope and importance; Concept of sustainability and sustainable development.	
Unit 2 Ecology and Ecosystems	6 lectures
<ul style="list-style-type: none">•Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession.•Characteristic features of the following:<ul style="list-style-type: none">a) Forest ecosystemb) Grassland ecosystemc) Desert ecosystemd) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)	
Unit 3 Natural Resources	8 lectures
<ul style="list-style-type: none">• Concept of Renewable and Non-renewable resources• Land resources and land use change; Land degradation, soil erosion and desertification.•Deforestation: Causes, consequences and remedial measures•Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).•Energy resources: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.	
Unit 4 Biodiversity and Conservation	8 lectures
<ul style="list-style-type: none">•Levels of biological diversity: genetic, species and ecosystem diversity;• Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots•India as a mega-biodiversity nation; Endangered and endemic species of India•Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;•Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.•Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	
Unit 5 Environmental Pollution	8 lectures
<ul style="list-style-type: none">• Environmental pollution: concepts and types,• Air, water, soil, noise and marine pollution- causes, effects and controls• Concept of hazardous waste and human health risks• Solid waste management: Control measures of Municipal, biomedical and e-waste.	

Unit 6 Environmental Policies and Practices	7 lectures
<ul style="list-style-type: none"> •Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture •Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention & Control of Pollution) Act; Environment Protection Act; Biodiversity Act. •International agreements: Montreal Protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD). •Protected area network, tribal populations and rights, and human wildlife conflicts in Indian context. 	
Unit 7 Human Communities and the Environment	6 lectures
<ul style="list-style-type: none"> •Human population growth: Impacts on environment, human health and welfare. •Case studies on Resettlement and rehabilitation. • Environmental Disaster: Natural Disasters-floods, earthquake, cyclones, tsunami and landslides; Manmade Disaster- Bhopal and Chernobyl. •Environmental movements: Bishnois, Chipko, Silent valley, Big dam movements. •Environmental ethics: Role of gender and cultures in environmental conservation. •Environmental education and public awareness 	
Project/ Field work	Equal to 5 lectures
<ul style="list-style-type: none"> •Visit to an area to document environmental assets: Natural resources/flora/fauna, etc. •Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. •Study of common plants, insects, fish, birds, mammals and basic principles of identification. •Study of ecosystems-pond, river, wetland, forest, estuary and agro ecosystem. 	
Total	50 Lectures

Suggested Reading:

Asthana, D. K. (2006). *Text Book of Environmental Studies*. S. Chand Publishing.

Basu, M., Xavier, S. (2016). *Fundamentals of Environmental Studies*, Cambridge University Press, India

Basu, R. N., (Ed.) (2000). *Environment*. University of Calcutta, Kolkata

Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.

De, A.K., (2006). *Environmental Chemistry*, 6th Edition, New Age International, New Delhi.

Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). *Environment Reader for Universities*, Centre for Science and Environment, New Delhi.

Masters, G. M., & Ela, W. P. (1991). *Introduction to environmental engineering and science*. Englewood Cliffs, NJ: Prentice Hall.

Odum, E. P., Odum, H. T., & Andrews, J. (1971). *Fundamentals of ecology*. Philadelphia: Saunders.

Sharma, P. D., & Sharma, P. D. (2005). *Ecology and environment*. Rastogi Publications.