**Syllabus for Four Year Under Graduate Programme**

**2nd Semester-VAC (Compulsory Paper)**

Paper Name : Environmental Studies

Paper Code: FYUGPVAC1024

Credit: 4 ( L+T+P=3+0+1)

Course Objective: The objective of this course is to provide students with a comprehensive understanding of Environmental Studies, focusing on foundational concepts, human-environment interaction, natural resource management, environmental pollution, conservation, and climate change.

Learning outcomes:

1. Understand the multidisciplinary nature of environmental studies and its significance in addressing complex environmental challenges.
2. Analyze the structure and function of ecosystems, including energy flow through food chains, food webs, and ecological succession.
3. Evaluate the impacts of land use change, deforestation, and water resource management on natural ecosystems and biodiversity.
4. Assess the threats to biodiversity and analyze conservation strategies, including in-situ and ex-situ conservation methods.
5. Classify different types of environmental pollution, understand their causes, effects, and control measures.
6. Evaluate the impacts of climate change and other environmental issues on human communities and agricultural practices.
7. Analyze environmental laws and international agreements related to environmental protection and conservation efforts.
8. Apply fieldwork techniques to document environmental assets, assess pollution impacts, and study ecosystems in their natural habitats.

Unit 1:Introduction to environmental studies

(a) Multidisciplinary nature of studies;

(b) Scope and importance; concept of sustainability and sustainable development.

Unit 2: Ecosystems

What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession.

Unit 3: Natural Resources: Renewable and Non--‐renewable Resources

(a)Land resources and land use change; land degradation, soil erosion and desertification.

(b) Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

(c) Water: Use and over--‐exploitation of surface and ground water, floods, droughts

(d) Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources.

Unit 4: Biodiversity and Conservation

(a)Levels of biological diversity: genetic, species and ecosystem diversity;

Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots

(b) India as a mega--‐biodiversity nation; Endangered and endemic species of India

(c) Threats to biodiversity: Habitat loss, poaching of wildlife, man--‐wildlife conflicts,

biological invasions; Conservation of biodiversity: In--‐situ and Ex--‐situ conservation

of biodiversity.

Unit 5: Environmental Pollution

(a) Environmental pollution: types, causes, effects and controls; Air, water, soil and noise

pollution

(b) Nuclear hazards and human health risks

Unit 6: Environmental Policies & Practices

(a) Climate change, global warming, ozone layer depletion, acid rain and impacts on

human communities and agriculture

(b) Environment Laws: Environment Protection Act; Air (Prevention & Control of

Pollution) Act;

Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act.

(c) Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment

(a) Human population growth: Impacts on environment, human health and welfare.

(b) Resettlement and rehabilitation of project affected persons; case studies from Assam.

(c) Disaster management: floods, earthquake, cyclones and landslides.

(d) Environmental movements: Chipko, Narmada Bachao Andolan , The National Mission for Clean Ganga

Unit 8: Field work (Any one)

(a) Visit to an area to document environmental assets: river/forest/flora/fauna, etc.

(b) Visit to a local polluted site--‐Urban/Rural/Industrial/Agricultural.

(c) Study of common plants, insects, birds and basic principles of identification.

(d) Study of simple ecosystems--‐pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ .of California Press.
3. Gleeson, B. And Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev.,Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology.
6. Sunderland: Sinauer Associates, 2006.
7. Grumbine, R.Edward,and Pandit, M.K. 2013.Threats from India’s Himalaya dams. Science, 339: 36-37.
8. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29--‐64). Zed Books.
9. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
10. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
11. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
12. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
13. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
14. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
15. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP .
16. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
17. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
18. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
19. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
20. Wilson, E. O. 2006. The Creation: An appeal to save life on earth.New York: Norton.
21. World Commission on Environment and Development. 1987. Our Common Future.Oxford University
22. Binay Kumar Basumatary and Dr. Uttam Kalita, “Environmental Studies”, Surya Prakash.
23. Dr. Suresh Bharali, Dr. Nabajyoti Deka, Binay Kumar Basumatary, Dr. Akshay kumar Haloi and Ynusar Rahman, “ Paribesh Adhayan “ (Assamese medium)
24. Anurbha and C.P. Kaushik, “Perspective in Environmental Studies”, New Age International Publishers.
25. Anu Gopinath, Jitha G., Reshmi P. and Jeshmine P. “An Introduction to Environmental Studies”, Vishal Publication Co.
26. Malik, Tuli and Madan, “Selected Topics in Inorganic Chemistry”, S. Chand and Company Ltd.
27. Environmental Studies By Purnima Das And Miss Chubanaro Aier , Global Net Publication (2023)