

ASSAM UNIVERSITY: SILCHAR

ENVIRONMENTAL STUDIES (AECC2)

(One-Semester Compulsory Core Module for Undergraduate Programmes)

UNIT 1: Introduction to Environmental Studies and Ecosystems (8 lectures)

- Definition, scope and importance of environmental studies; Multidisciplinary nature of environmental studies; Need for public awareness.
- Concept of ecosystem; Producers, consumers and decomposers; Energy flow in an ecosystem; Food chains and food webs; Ecological pyramids; Ecological succession.
- Nutrient cycles (Carbon cycle and nitrogen cycle).
- Major ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystem (pond, lake, river and ocean).

UNIT 2: Natural Resources: Renewable and Non-renewable Resources (8 lectures)

- Land Resources: Land change, land degradation, soil erosion and desertification.
- Forest Resources: Effects of deforestation due to timber-logging, shifting cultivation, mining and dams on forests and tribal populations.
- Water Resources: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (inter-state and international).
- Energy Resources: Renewable and non-renewable energy resources; use and importance of alternative energy resources.

UNIT 3: Biodiversity and conservation (8 lectures)

- Definition, levels of biodiversity (genetic, species and ecosystem diversity); Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots.
- Biodiversity of India: India as a mega-biodiversity nation; Endangered and endemic biodiversity of India with special reference to North East India.
- Threats to Biodiversity: Habitats loss, poaching of wildlife, man-wildlife conflicts in Indian context, biological invasions.
- Conservation of Biodiversity: *In-situ* and *ex-situ* conservation of biodiversity.

UNIT 4: Environmental pollution, Environmental Policies and Practices (8 lectures)

- Environmental pollution: Types (Air, water, soil and noise pollution), causes, effects and controls.
- Solid waste management: Control measures of urban and industrial waste; Nuclear hazards and human health risks.
- Climate change, global warming, ozone layer depletion, acid rain and impact on human communities and agriculture.
- Environment Laws: Environment Protection Act; Air (Prevention and control of pollution) Act; Water (Prevention and control of pollution); Wildlife Protection Act; Forest Conservation Act.
- Nature reserves, Sustainability and sustainable development; tribal population and right.

UNIT 5: Human Communities and the Environment

(8 lectures)

- Human population growth: Impact on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movement: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of different Indian religions and cultures in environmental conservation.
- Environmental communication and public awareness.

SUGGESTED READINGS:

1. Bharucha, E. (2003): Textbook for Environmental Studies, University Grants Commission, New Delhi and Bharati Vidhyapeet Institute of Environmental Education and Research, Pune.
2. Carson, Rachel. (1962): *Silent Spring* (Boston: Houghton Mifflin, 1962), Mriner Books, 2002.
3. Economy, Elizabeth (2010): *The River Runs Black: The Environmental Challenge to China's Future*.
4. Gadgil, M. And Ramachandra, G. (1993): *This fissured land: an ecological history of India*. University of California Press.
5. Gleeson, B. and Low, N. (eds.) (1999): *Global Ethics and Environment*, London, Routledge.
6. Grumbine, R. Edward, and Pandit, M. K. (2013): Threats from India's Himalaya dams. *Science* 339. 6115: 36-37.
7. Heywood V. H. and Watson, R. T. (1995): *Global Biodiversity Assessment*. Cambridge University Press.
8. McCully, P. (1996): *Silenced rivers: the ecology and politics of large dams*. Zed Books.
9. McNeill, John R. (2000): *Somthing New Under the Sun: An Environmental History of the Twentieth Century*.
10. Odum, E. P., Odum, H. T. And Andrews, J. (1971): *Foundamentals of Ecology*. Philadelphia: Saunders.
11. Pepper, I. L., Gerba, C. P. and Brusseau, M. L. (2011): *Environmental and Pollution Science*. Academic Press.
12. Rao, M. N. and Datta, A. K. (1987): *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
13. Raven, P. H., Hassenzahl, D. M. and Berg, L. R. (2012): *Environment*, 8th edition. John Wiley and Sons.
14. Ricklefs, R. E. and Miller, G. L. (2000): *Ecology*. W. H. Freeman, New York.
15. Robbins, P. (2012): *Political Ecology: A critical introduction*. John Wiley and Sons.
16. Rosencranz, A., Divan, S. and Noble, M. L. (2002): *Environmental law and policy in India*. Oxford University Press, India.
17. Sengupta, R. (2003): *Ecology and Economics: An approach to sustainable development*. OUP Catalogue.

18. Singh, J. S., Singh, S. P. and Gupta, S. R. (2006): Ecology, Environment and Resource Ecology, Environment and Resource Conservation. Anamaya Publishers.
19. Sodhi, N. S., Gibson, L. and Raven, P. HG. (eds).(2013): Conservation biology: voices from the Tropics. John Wiley and Sons.
20. Van Leeuwen, C. J. and Vermeire, T. G. (2007): Risk assessment of Chemicals.
21. World Commission on Environment and Development. (1987): Our Common Future. Oxford. Oxford University Press.
