

ABILITY ENHANCEMENT COMPULSORY COURSE

Environment Science

Course: ENVS2AECC02

(Theory)

**DEPARTMENT OF INTERDISCIPLINARY STUDIES
SCHOOL OF ENVIRONMENTAL SCIENCES
HIMACHAL PRADESH UNIVERSITY
SUMMERHILL SHIMLA**

COURSE: ENVS2AECC2
ENVIRONMENT SCIENCE (THEORY)

Year end Examination: 100 marks

Note: The Examiner will set a total of nine (9) questions covering all topics/units of the prescribed course by setting at least two questions from each unit. Out of the nine questions, one question containing ten (10) short-answer type questions of two marks each that will cover entire course will compulsory. The candidate will attempt a total of five questions (one from each unit) including the compulsory question. All questions will carry equal marks.

Unit 1

Introduction to environmental studies & Ecosystems: Multidisciplinary nature of environmental studies: Scope and importance; what is an ecosystem? :Structure and function of ecosystem, Energy flow in an ecosystem, food chains, food webs and ecological succession, Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems; 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, Concept of sustainability and sustainable development.

(20 Periods)

Unit 2

Natural Resources & its management and conservation: Land resources and land use change: Land degradation, soil erosion and desertification; Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations; Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state); Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

(15 Periods)

Unit 3

Environmental Pollution & Management: Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution, Solid waste management: Control measures of urban and industrial waste. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act; International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD); Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

(15 Periods)

Unit 4

Environment & Social Issues: Human population growth: Impacts on environment, human health and welfare; Resettlement and rehabilitation of project affected persons; case studies; Disaster management: floods, earthquake, cyclones and landslides; Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan; Environmental ethics: Role of Indian and other religions and cultures in environmental conservation; Environmental communication and public awareness, case studies

(10 Periods)

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*. Sunderland: Sinauer Associates, 2006.
 6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36-37.
 7. McCully, P. 1996. *Rivers no more: the environmental effects of dams* (pp. 29-64). Zed Books.
 8. McNeill, John R. 2000. *Something New Under the Sun: An Environmental History of the Twentieth Century*.
 9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. *Fundamentals of Ecology*. Philadelphia: Saunders.
 10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. *Environmental and Pollution Science*. Academic Press.
 11. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
 12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. *Environment*. 8th edition. John Wiley & Sons.
 13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India*. Tripathi 1992.
 14. Sengupta, R. 2003. *Ecology and economics: An approach to sustainable development*. OUP.
 15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
 16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology: Voices from the Tropics*. John Wiley & Sons.
 17. Thapar, V. 1998. *Land of the Tiger: A Natural History of the Indian Subcontinent*.
 18. Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.
 19. Wilson, E. O. 2006. *The Creation: An appeal to save life on earth*. New York: Norton.
 20. World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University Press.

GENERAL INSTRUCTION/GUIDELINES FOR EXECUTION OF CURRICULUM

- **Ability Enhancement Compulsory Courses [AECC]:** A total of 2 courses will be offered as Ability Enhancement Compulsory Courses [AECC] with $4 \times 2 = 8$ credits for AECC.
- The AECC courses are the mandatory courses based upon the content that leads to knowledge enhancement; i. Environment Science and ii. English/ Hindi/ MIL Communication. All these are mandatory courses for obtaining a B.Sc. (Honors) degree in the concerned subject. These courses are mandatory for all disciplines.
- Environment Science (Course: ENVS2AECC02 Theory) is mandatory course for all disciplines.
- Set a total of nine (9) questions covering all topics/units of the prescribed course by setting at least two questions from each unit. Out of the nine questions, one question containing ten (10) short-answer type questions of two marks each that will cover entire course will compulsory. The candidate will attempt a total of five questions (one from each unit) including the compulsory question. All questions will carry equal marks.
- Classroom Attendance: 75% class attendance is compulsory for every student.