Rani Channamma University Belagavi

III Semester - All UG Programmes

COMPULSORY-III: ENVIRONMENTAL SCIENCE

Paper title: COMPULSORY-III	**Marks: Th 40 + IA 10**
Paper Code:	**Total hours: 30**
Teaching hours: 2 hours/ Week	**Credits: 02**

Compulsory Paper-III		**Semester in which the course is to be taught**
Streams	All UG Programmes of RCU	III semester

1. The Subject should be taught by Faculties of Environmental Science, Chemistry, Botany, Zoology & Geography departments.
2. **Pattern of Examination**: Total marks – 50.
   (Internal Assessment – 10 marks and Final Examination - 40 marks).
3. Final Examination Question Paper Pattern: Multiple Objective Questions (40 of 1 mark each)
4. Duration of the examination: 1 hour
5. Teaching hours and credits: **2 hours** of teaching per week and 2 credits.

Content of Environmental Studies **30 hours**

Unit-I: Introduction to Environmental Studies: **7 hours**

Multidisciplinary nature of environmental studies. Scope and importance; Concept of sustainability and sustainable development. Ecosystems: Edfinition, Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems: a) Forest ecosystem; b) Grassland ecosystem and c) Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit-II: Natural Resources: **7 hours**

Natural Resources: Renewable and Non-Renewable Resources: 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.

Unit – III: Biodiversity and Conservation: **8 hours**

Levels of biological diversity: Genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hotspots. 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.

Environmental Pollution: Types, causes, effects and controls; Air, water, soil and noise pollution.

Nuclear hazards and human health risks. Solid waste management, Control measures of urban and industrial waste. Pollution case studies.

Unit –IV: Environmental Policies and Practices: 8 hours

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. Human Communities and the Environment 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 (e.g., CNG vehicles in Delhi).

References:

1. Bharucha, E. (2015). Textbook of Environmental Studies.
2. Carson, R. (2002). Silent Spring. Houghton Mifflin Harcourt.
3. Climate Change: Science and Politics. (2021). Centre Science and Environment, New Delhi.
4. Gadgil, M., & Guha, R. (1993). This Fissured Land: An Ecological History of India. Univ. of California Press.
5. Gleeson, B. and Low, N. (eds.) (1999). Global Ethics and Environment, London, Routledge.
6. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. (2006). Principles of Conservation Biology. Sunderland: Sinauer Associates.
7. Nandini, N., Sunitha N., & Sucharita Tandon. (2019). A text book on Environmental Studies (AECC). Sapna Book House, Bengaluru.
8. Odum, E.P., Odum, H.T. & Andrews, J. (1971). Fundamentals of Ecology. Philadelphia: Saunders.
9. Pepper, I.L, Gerba, C.P. & Brusseau, M.L. (2011). Environmental and Pollution Science. Academic Press.
10. Rajit Sengupta and Kiran Pandey. (2021). State of India's Environment 2021: In Figures. Centre Science and Environment.
11. Singh, J.S., Singh, S.P. and Gupta, S.R. (2014). Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
12. Sodhi, N.S., Gibson, L. & Raven, P.H. (Eds). (2013). Conservation Biology: Voices from the Tropics. John Wiley & Sons.
13. Wilson, E. O. (2006). The Creation: An appeal to save life on Earth. New York: Norton.
14. World Commission on Environment and Development. (1987). Our Common Future. Oxford University Press.
15. K. Kapoor. (Narosa Publishers)