

MBPGE3 - ENVIRONMENTAL SCIENCE

Number of Hours / Week: 4

Credits: 4

UNIT I

Definition, principles and scope of environmental science. Earth, Man and environment, ecosystem, pathways in ecosystem . Physico-Chemical and Biological factors in the environment. Geographical classification and Zones. Structure and functions of ecosystem- Abiotic and biotic components, Energy flows, Food chains, Food web, Ecological pyramids: types and diversity. Terrestrial (Forest, grass land) and Aquatic (Fresh water, marine, eustarine) ecosystems. Mineral cycling. Habitat and niche. Major terrestrial biomes. Impact of microorganisms on global ecology, Microorganisms in extreme environment.

UNIT II

Definition , Principles and scope of ecology. Human ecology and Human settlement. Evolution, origin of life and speciation. Population ecology: characteristics and regulation. Community ecology: structure and attributes. Levels of species diversity and its management, Edges and Ecotones. Ecological succession. Common flora and fauna in India. Endangered and Threatened Species.

UNIT III

Biodiversity status: monitoring and documentation. Biodiversity management approaches. Conservation of biological diversity, methods and strategies for conservation. Natural resources, conservation and sustainable development. Hotspots of biodiversity, National parks and Sanctuaries.

UNIT IV

Environmental pollution- Air: Natural and anthropogenic source of pollution, Primary and Secondary pollutants , Methods of monitoring and control of air pollution, Effects of pollutants on human beings, plants, animals, material and on climate, Acid rain, Air Quality standards. Water: Types, Sources and consequences of water pollution, Physio-chemical and Bacteriological sampling and analysis of water quality, Soil: Physio-chemical and Bacteriological sampling as analysis of soil quality, Soil pollution- Control, Industrial waste effluents, and heavy metals. Their interaction with soil components, Noise: Sources of noise pollution, Noise control and battement measures. Impact of noise on human health. Radioactive and thermal Pollution. Bioremediation- Strategies for bioremediation, Biosensors, biological indicators of pollution and monitoring, Detoxification of hazardous chemicals, mycotoxins. Biological weapons.

UNIT V

Introduction to environmental impact analysis, Impact Assessment Methodologies, Generalized approach to impact analysis, Guidelines for Environmental Audit, Introduction to environmental Planning, Environmental priorities in India and Sustainable development, Environment protection- issues and problems, International and national efforts for environment protection. Global environmental problems- Ozone depletion, global warming, climatic change, desertification, green movement, ecofeminism. Current environmental issues in India

References:

1. Chapman JL & Reiss MJ (1999) *Ecology : principles and applications* (Cambridge University Press, Cambridge) 2nd ed.
2. Jones A (1997) *Environmental biology* (Routledge, London)
3. Odum EP & Barrett GW (2005) *Fundamentals of ecology* (Thomson Brooks/Cole, Belmont, CA) 5th Ed
4. Odum EP (1983) *Basic ecology* (Saunders College, Philadelphia, [Pa.] ; London)
5. Kumar A (2004) *A Textbook of Environmental Science* (APH Publishing Corporation)
6. Allaby M (2000) *Basics of Environmental Science* (Routledge)
7. Cunningham WP, Cunningham MA, & Saigo BW (2003) *Environmental science : a global concern* (McGraw-Hill, Boston ; London) 7th ed
8. Pickering KT & Owen LA (1997) *An introduction to global environmental issues* (Routledge, London) 2nd ed.