

**M Sc., IV- SEMESTER
HARD CORE PAPER : I
ENVIRONMENTAL BIOLOGY**

32 Hrs

UNIT - I

16 Hrs

A. Ecosystem Introduction: Historical account, Scope, Basic concepts and Approaches to the study of Environmental Biology. Components of Environment - An overview of abiotic factors and Biotic factors. Concepts of habitat and Ecological niche. Ecotone and Edge effect. Food chains, Food-webs and their structure in Ecological Pyramids in aquatic, terrestrial and parasitic Environments.

B. Population Ecology: Introduction. An overview of important population attributes – Density, Natality, Growth rates, Growth forms and concept of carrying capacity, Patterns in human population growth and its explosion -Remedial measures. Mortality - life tables and survivorship curve, sex ratio, age distribution, dispersal and dispersion, aggregation and Allee's principle, population fluctuation and cyclic oscillations and Population interactions.

UNIT - II

A. Bioecology of Freshwater Zooplankton: Definition, Types and adaptations of Zooplankton. Brief study of organizations, life cycles and Ecological importance of Rotifers, Cladocerans, Copepods-Calanoids, Harpacticoids and Cyclopoids, and Ostracods. Mass culturing of Zooplankton.

B. Microbial Ecology: Ecological role, beneficial and pathogenic Microorganisms. Indicator Microorganisms. Role of microorganisms in biodegrading and bioremediation of organic and metal pollution.

UNIT – III

16 Hrs

Pollution, Conservation and Management of Environment:

Pollution - Global and Indian scenario. Brief account of – sources, biological effects and control measures of major Air and Noise pollution with special reference to present scenario in India. Role and objectives of Pollution Control Board Water pollution- causes and impact with reference to major Indian rivers. Marine pollution. Basis and impact of photochemical smog and green house effect.

UNIT – IV

Conservation and management of natural resources- types, need, strategies of conservation, sustainable development, significance of non - conventional energy resources: solar, wind, nuclear and bio –energy. National and International Organizations.. Impact of development of Agricultural, Industrial and Life styles on environment and their assessment (EIA) Environmental management and sustainability of Biosphere. **Space ecology** – man in space, Earth's space environment, Asteroids, comets and Plants. **Ecological Tourism**-advantages and disadvantages, ecotourism projects in India. International ecotourism society.

PRACTICALS:

4 X 16 = 64 Hrs

1. Field visit to Sewage pond, Natural lake (and if possible river): Collection of water samples and study of physico-chemical parameters such as colour, pH, temperature, conductivity, total solids and turbidity
2. Estimation of Dissolved Oxygen in three natural (sewage, pond and Tap) water samples.
3. Estimation of free Carbon di-Oxide in three natural (sewage, pond and Tap) water samples.
4. To study the relationship between Dissolved Oxygen and free Carbon di-Oxide, if any, in three natural (sewage, pond and Tap) water samples.
5. Repetition of Practical's listed in sl no. 2 and 3.
6. Determination of BOD in three natural (sewage, pond and Tap) water samples
7. Determination of COD in three natural (sewage, pond and Tap) water samples
8. To study the relationship between BOD and COD, if any, in three natural (sewage, pond and Tap) water samples
9. Repetition of Practical's listed in sl no. 6 and 7.
10. Estimation of Phosphate concentration in three natural (sewage, pond and Tap) water samples.
11. Estimation of Nitrate concentration in three natural (sewage, pond and Tap) water samples.
12. Repetition of Practical's listed in sl no. 9 and 10.
13. Collection, observation of planktons (Phytoplankton and Zooplankton) from polluted and non-polluted water bodies.
14. Estimations of bacterial abundance in different water samples – using DEMA.
15. Visit to RNHM, Mysore, to study models of freshwater, marine, estuarine and terrestrial habitats.
16. Survey of Animal Population - to visit different habitats/areas in and around Mysore and collect data on some population attributes, application of Bio-statistical tests to the collected data and its interpretation.

REFERENCES

- 1) Begon, Harper and Townsend, 1995. Ecology: Individuals, populations and community. II edition. Blackwell Series, U.S.A.
- 2) Bhatia, H.S. 1998: A Text book on Environmental Pollution and Control, Galgotia, New Delhi.
- 3) Clarke, G.L. 1963. Elements of Ecology, . Wiley Eastern Limited. New Delhi.
- 4) Emmel, T.C. 1976. Population Biology, Harper and Row publishers, N.Y.
- 5) Kormondy, E.J. 1978. Concepts of Ecology, Prentice Hall of India Pvt. Ltd., New Delhi.
- 6) Odum E.P. 1971. Fundamentals of Ecology. III Edition. W.B.Saunders's Co., Philadelphia.
- 7) Odum, E.P. 1983. Basic Ecology, Holt Saunders, Japan.
- 8) Paul Colinvaux, 1986: Ecology. John Wiley and Sons, N.Y.
- 9) Peter Stilling, Ecology: Theory and applications. 2nd ed. Prentice Hall, International Edn.
- 10) Richard Brewer, 1988. The Science of Ecology, Saunders College of Publishers, Harcourt Brace publ. N.Y
- 11) Sharma, P.D. 1996: Ecology and Environment Rastogi, Publications, Meerut.

For Practicals:

1. APHA, 1992: Standard methods for examination of water and waste water, 18th edition,

