

**Aquatic Ecology (Theory)****Unit 1: Aquatic Ecosystem:**

Global distribution of water and hydrological cycle. Diversity and composition of aquatic ecosystems (fresh water, marine and estuarine). Ecological differences between lentic and lotic environments. Adaptations of benthic communities in lotic systems.

**Unit 2: Physico-Chemical Characteristics of Water:**

Temperature, thermal stratification and overturn, light, salinity, tides, currents, pH, dissolved oxygen, free carbon dioxide, hardness, alkalinity, conductivity, suspended and dissolved solids. Biogeochemical cycles: carbon, phosphorus, nitrogen and sulphur.

**Unit 3: Trophic Dynamics - I:**

Food chains, energy flow and trophic relationship in lentic and lotic biotopes. Biological Productivity: Basic concepts, methods of estimation of primary productivity and secondary productivity.

**Unit 4: Trophic Dynamics - II:**

Eutrophication: Causative factors, consequences and control. Physico-chemical and biological differences between oligotrophic and eutrophic water bodies. Ecological succession.

**Unit 5: Aquatic Pollution:**

Aquatic pollution and its types (biological, chemical, thermal and industrial). Impact of water pollution on aquatic communities and its control measures. Bio-indicator species. Concepts of bio-monitoring with special reference to aquatic biota.

**Suggested Reading:**

1. Alex, M. & Theresa, A. (1998). Environmental Management of Aquaculture (Fish edition), Chapman & Hall, London.
2. Basheer, A. (1989). Marine Biology: Some Aspects of Marine Ecology and Marine Fisheries. Daya Publishing House, Delhi – 35.
3. Boyd, C. E. & Tucker, C. S. (1998). Pond Aquaculture Water Quality Management. Kluwer Academic Publishers.
4. Das, B and Kar, D. (2012). Basic Limnology and Fish Biodiversity, Manglam publishers and Distributors, Delhi-110053
5. Kar, Devashish; (2007). Fundamentals of Limnology and Aquaculture Biotechnology, Daya Publishing House, Delhi- 110035.
6. Kosygin, L (2009). Wetlands of North east India. Akansha publishing house, New Delhi
7. Kumar Arvind. (2008). Aquatic environment and toxicology. Daya Publishing House, Delhi – 35
8. Sakhare, V. B. (2007). Reservoir Fisheries and Limnology. Daya Publishing House, Delhi – 35.
9. Sakhare, V. B. (2011). Limnology: current perspectives. Daya Publishing House, Delhi – 35
10. Santhanam R, Velayatham & Jegathesan P.G. (1990). A Manual of Fresh Water Ecology. Daya Publishing House, Delhi – 35.
11. Schowrerbel, J. & Hemmings, B. (1991). Hand Book of Limnology. Scientific Publishers, Jodhpur.
12. Vijaykumar K. & vasanthkumar, B. (2010). Aquatic ecosystem and its management. Daya Publishing House, Delhi – 35.
13. Welcomme, R. L. (2007). Inland Fisheries: Ecology and Management/FAO. Daya Publishing House, Delhi – 110 035.

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**Aquatic Ecology (Practical)**

1. Qualitative analysis of plankton in different water bodies.
2. Quantitative analysis of plankton in different water bodies.
3. Analysis of physical parameters of water (temperature, velocity, transparency, suspended and dissolved solids).
4. Analysis of chemical parameters of water (pH, dissolved oxygen, free  $\text{CO}_2$ , alkalinity, hardness, and conductivity).
5. Estimation of primary productivity by light and dark bottle method.

**DISTRIBUTION OF MARKS:**

1. Qualitative/quantitative analysis of plankton
2. Analysis of physical and chemical parameter
3. Primary productivity
4. *Viva voce*
5. Laboratory record