

## **BACHELORS WITH WATER MANAGEMENT AS MAJOR (CT – II)**

### **6<sup>th</sup> SEMESTER**

#### **WMG622J2 WATER MANAGEMENT \_ FRESH WATER ECOLOGY**

**CREDITS: THEORY: 4, PRACTICAL: 2**

#### **COURSE OUTCOME:**

*It offers students a snapshot of the physical, chemical, and biological processes that characterize inland waters such as lakes, streams, rivers, and wetlands and focuses on understanding the relationships between humans and freshwater, and discusses these challenges in Management. Field and laboratory study of the ecology of freshwater systems lead to provide experience by sampling and identifying freshwater organisms, designing and analyzing ecological experiments.*

#### **UNIT I: FRESHWATER BIODIVERSITY**

Major taxonomic groups of freshwater biodiversity: Algae, Zooplankton, Macrophytes, Macroinvertebrates and Fish, Measures of diversity; Endemism and Biological invasion in freshwater ecosystems

#### **UNIT II: STREAM AND RIVER ECOLOGY**

Fluvial ecosystem diversity, Stream classification, Stream flow and Hydrograph, Environmental Flow, Influence of thermal regime and substrate on aquatic biota, streams and rivers as products of Landscapes

#### **UNIT III: LAKES AND WETLAND ECOLOGY**

Lakes: Origin, diversity, distribution and Classification, Wetlands: Origin, diversity, distribution and Classification, Lake stratification, Paleolimnology, Ontogeny of freshwater systems

#### **UNIT IV: THREATS TO FRESHWATER SYSTEMS**

Threats to freshwater systems: Habitat and hydrology modification, Channelization, mining, invasion, pollution, overexploitation, acidification, dams, Climate change, Harmful algal blooms

#### **PRACTICAL:**

1. Collection/Identification of some freshwater Plankton specimen
2. Collection/Identification of some freshwater Periphyton specimen
3. Collection/Identification of some freshwater Zooplankton specimen
4. Collection/Identification of some Macroinvertebrates Specimen
5. Calculation of species diversity indices from a given data
6. Calculation of Nygaards Indices and water Pollution index
7. Field visit to any lake/wetland/river/stream/spring
8. Identification and study of bioindicator species

#### **SUGGESTED READINGS:**

1. How to know the freshwater Algae by G W Prescott
  2. Stream Ecology: Structure and functioning of running waters JD Allan
  3. The ecology of running waters by HBN Hynes
  4. Ecology of Streams and Rivers by Eugene Angelier
  5. Stream Hydrology: An introduction for ecologists by Nancy D. Gordon
  6. Freshwater Ecology: Concepts and environmental applications of Limnology by Walter K.Dodds and Matt R. Whiles.
  7. Encyclopedia of inland waters by Gene E Likens
  8. Limnological Analysis by Robert G Wetzel
  9. Introduction to Limnology by Stanely I Dodson
  10. Treatise on Limnology by GE Hutchinson
  11. An introduction to the Aquatic Insects of North America by Richard Merritt, Kenneth Cumminis, and Martin B Berg.
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