

**6<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE (DSE)**

**OPTION-I**

**WM620DA: WATER MANAGEMENT: AQUATIC ECOLOGY**

**CREDITS - THEORY-4, PRACTICAL-2**  
**MAXIMUM MARKS: 60 MINIMUM MARKS: 24**

*Objectives/Expected Learning Outcomes: The course describes the ecological structure and functions of aquatic ecosystems. The students will also acquire knowledge of importance of aquatic biodiversity and different strategies for management of aquatic ecosystems.*

**UNIT-I: AQUATIC ENVIRONMENT** **15 HOURS**

1. Aquatic environment -introduction
2. Types of aquatic systems: lentic and lotic; marine and freshwater
3. Zonation in aquatic systems
4. Gaseous exchange at air-water interface
5. Diversity and importance of aquatic resources of Kashmir

**UNIT-II: AQUATIC ECOSYSTEM** **15 HOURS**

1. Aquatic ecology-overview
2. Abiotic factors-light, temperature, substrate and salinity
3. Aquatic food chain and food web
4. Productivity in aquatic ecosystems
5. Biological interactions in aquatic ecosystems

**UNIT-III: AQUATIC BIODIVERSITY** **15 HOURS**

1. Algae in aquatic systems (Phytoplankton and Periphyton)
2. Zooplankton
3. Macroinvertebrate
4. Ichthyofauna
5. Aquatic plants

**UNIT-IV: AQUATIC ECOSYSTEM SERVICES** **15 HOURS**

1. Introduction to aquatic ecosystem services
2. Classification of aquatic ecosystem services
3. Evaluation of aquatic ecosystem services
4. Carbon sequestration in aquatic systems
5. Threats to aquatic ecosystem services

**PRACTICAL (2 CREDITS - 60 HOURS) MAXIMUM MARKS: 30 MINIMUM MARKS: 12**

1. Measurement of depth of lakes.
2. Measurement of primary productivity using light and dark bottle method.
3. Collection and identification of phytoplankton
4. Collection and identification of zooplankton
5. Collection and identification macrophytic diversity in any lake or wetland
6. Identification and study of fish diversity in an aquatic ecosystem

**6<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE (DSE)**

**OPTION-I**

**WM620DB: WATER MANAGEMENT: WATER ECONOMICS AND PUBLIC HEALTH**

**CREDITS - THEORY-4, PRACTICAL-2**  
**MAXIMUM MARKS: 60 MINIMUM MARKS: 24**

*Objectives/Expected Learning Outcomes: The course describes the current and emerging trends in water resource economic and accounting and its impacts on public health, sanitation, water supply and availability.*

**UNIT-I: WATER ECONOMICS**

**15 HOURS**

1. Water sector and national economy
2. Prices and water allocation
3. Economics of water sufficiency and demand
4. Concept of blue economy
5. Virtual water and trade

**UNIT-II: WATER RESOURCE ACCOUNTING**

**15 HOURS**

1. Water accounting and valuation
2. Ecosystem services approach for water valuation
3. Water privatization
4. Water use efficiency in agriculture and industrial sector
5. Hydropower potential of J&K state and its economic impact

**UNIT-III: WATER AND SANITATION**

**15 HOURS**

1. Water supply and health
2. Water consumption and production
3. Swachh Bharat abhiyan
4. Swasth Bharat abhiyan
5. WASH

**UNIT-IV: WATER AND PUBLIC HEALTH**

**15 HOURS**

1. Health and the millennium development goals
2. Policy interventions in the public health sector.
3. Waterborne diseases
4. Economic burden of waterborne diseases
5. Control of water born disease

**PRACTICAL (2 CREDITS- 60 HOURS) MAXIMUM MARKS: 30 MINIMUM MARKS: 12**

1. Assessment of percentage of households with access to sanitation facility
2. Assessment of quantity of water used per capita per day
3. Assessment of percentage of people suffering from water borne disease
4. Cost-benefit analysis of sanitation
5. Socio- economic survey of two villages
6. Visit to a hydropower plant and report preparation