

**Course Title: Inland Aquatic Resource Management**

**Course Code AEM-501**

**Credit Hours: 2+1**

**Course Teacher: Dr. Tapas Paul**

**Lecture Plan**

**Theory**

| <b>S.No.</b> | <b>Topics to be Covered</b>                                              | <b>No. of classes</b> |
|--------------|--------------------------------------------------------------------------|-----------------------|
| 1.           | Types of inland aquatic resources: concept of watershed                  | 1                     |
| 2.           | Lacustrine resources: habitat characteristics, flora and fauna           | 1                     |
| 3.           | Riverine resources: habitat characteristics, flora and fauna             | 1                     |
| 4.           | Wetlands: habitat characteristics, flora and fauna                       | 1                     |
| 5.           | Floodplains, swamps and ponds: habitat characteristics                   | 1                     |
| 6.           | Economic importance of inland aquatic resources                          | 1                     |
| 7.           | Relationship between productivity (primary and secondary) and fish yield | 1                     |
| 8.           | Wetlands: trophic classifications                                        | 1                     |
| 9.           | Functions of wetlands                                                    | 1                     |
| 10.          | Degradation of wetlands: causes and consequences                         | 1                     |
| 11.          | Constructed wetlands                                                     | 1                     |
| 12.          | Restoration and conservation of wetlands                                 | 1                     |
| 13.          | Management of wetlands                                                   | 1                     |
| 14.          | Ecological services and livelihood from wetlands                         | 1                     |
| 15.          | Ecological engineering: concept and applications                         | 1                     |
| 16.          | Ecological engineering for restoration                                   | 1                     |
| 17.          | Resource enhancement                                                     | 1                     |
| 18.          | Biomanipulation: top-down methods                                        | 1                     |
| 19.          | Biomanipulation: bottom-up methods                                       | 1                     |

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|--------------|----------------------------------------------------------------------|-----------|
| 20.          | Integrated Environment Management (IEM) Programme                    | 1         |
| 21.          | Ramsar Convention                                                    | 1         |
| 22.          | River continuum concept and new paradigm shift                       | 1         |
| 23.          | River linking                                                        | 1         |
| 24.          | Mapping of aquatic resources using remote sensing                    | 1         |
| 25.          | Mapping of aquatic resources using GIS                               | 1         |
| 26.          | Water budget and environmental flow                                  | 1         |
| 27.          | Significance of environmental flow in water conservation and ecology | 1         |
| 28.          | Environmental economics and auditing                                 | 1         |
| 29.          | Ecosystem approach to resource management                            | 1         |
| 30.          | Wasted and degraded resources; coastal and inland saline areas       | 1         |
| 31.          | Adaptations of organisms; restoration and remediation strategies     | 1         |
| 32.          | Prospects of gainful use of available technologies                   | 1         |
| <b>Total</b> |                                                                      | <b>32</b> |

#### **Practical**

| <b>S.No.</b> | <b>Topics to be Covered</b>                                                          | <b>No. of classes</b> |
|--------------|--------------------------------------------------------------------------------------|-----------------------|
| 1.           | Collection of flora and fauna of wetlands and degraded aquatic ecosystems            | 1                     |
| 2.           | Preservation of collected flora and fauna samples                                    | 1                     |
| 3.           | Qualitative analysis of plankton from wetland and degraded aquatic ecosystems        | 1                     |
| 4.           | Quantitative analysis of plankton from wetland and degraded aquatic ecosystems       | 1                     |
| 5.           | Collection and analysis of macrophytes from wetlands and degraded aquatic ecosystems | 1                     |
| 6.           | Collection and analysis of benthos from wetlands and degraded aquatic ecosystems     | 1                     |
| 7.           | Calculation of shoreline development index                                           | 1                     |
| 8.           | Study and calculation of lake and wetland morphometry                                | 1                     |
| 9.           | Calculation of morpho-edaphic index                                                  | 1                     |

|              |                                                                                                      |           |
|--------------|------------------------------------------------------------------------------------------------------|-----------|
| 10.          | Field visit to selected lakes                                                                        | 1         |
| 11.          | Field visit to selected wetlands                                                                     | 1         |
| 12.          | Field visit to degraded aquatic ecosystems                                                           | 1         |
| 13.          | Field visit to restored aquatic ecosystems                                                           | 1         |
| 14.          | Field observation and documentation of habitat characteristics, flora and fauna of selected wetlands | 1         |
| 15.          | Field assessment of wetland degradation, restoration and conservation practices                      | 1         |
| 16.          | Preparation of a field report on aquatic resource management based on field observations             | 1         |
| <b>Total</b> |                                                                                                      | <b>16</b> |