

Course Title: Aquatic Environment and Biodiversity**Course Code AEM-509****Credit Hours:1+1****Course Teacher: Dr. Tapas Paul****Lecture Plan****Theory**

S.No.	Topics to be Covered	No. of classes
1.	Basic ecological concepts: habitat ecology, systems ecology, synecology and autecology	1
2.	Characteristic features of different biomes and their ecological significance	1
3.	Concept of community, continuum and community attributes	1
4.	Community development and ecological succession: types and stages	1
5.	Changes in ecosystem production during succession and the concept of climax	1
6.	Biodiversity: definition, concept and importance in aquatic ecosystems	1
7.	Categories of biodiversity: species diversity, genetic diversity and habitat diversity	1
8.	Ecosystem services and economic appraisal of biodiversity	1
9.	Biodiversity indices: concepts, types and their significance	1
10.	Concepts and applications of the Index of Biotic Integrity (IBI)	1
11.	Global biodiversity patterns, major threats and causes of biodiversity loss	1
12.	Biodiversity conservation measures: in-situ and ex-situ conservation	1
13.	Biodiversity hotspots, biosphere reserves, national parks and wildlife sanctuaries	1
14.	Marine protected areas, Ecologically Sensitive Areas (ESAs) and their significance	1
15.	International conventions and organizations: Convention on Biological Diversity (CBD), IUCN, CITES, WWF, Ramsar Convention and Man and Biosphere Programme	1
16.	Indian legislation for biodiversity conservation and the ecosystem approach to aquatic resource management	1
Total		16

Practical

S.No.	Topics to be Covered	No. of classes
1.	Introduction to aquatic ecosystems and methods of biodiversity assessment	1

2.	Identification of major aquatic habitats and their ecological characteristics	1
3.	Collection of aquatic flora from freshwater ecosystems	1
4.	Identification and classification of common aquatic plants and algae	1
5.	Collection of aquatic fauna from different ecosystems	1
6.	Identification and classification of common aquatic invertebrates	1
7.	Identification of common freshwater fishes and other aquatic vertebrates	1
8.	Preparation of a checklist of flora and fauna from a selected aquatic ecosystem	1
9.	Estimation of species richness, abundance and relative abundance of aquatic organisms	1
10.	Calculation of the Shannon–Wiener diversity index using sample biodiversity data	1
11.	Calculation of Simpson's diversity index and interpretation of results	1
12.	Calculation of Hill diversity indices and comparison of biodiversity measures	1
13.	Comparison of biodiversity indices among different aquatic ecosystems or sampling sites	1
14.	Introduction to the Index of Biotic Integrity (IBI) and its application in aquatic ecosystem assessment	1
15.	Field visit to a biodiversity-rich ecosystem, protected area or Ecologically Sensitive Area (ESA), subject to availability	1
16.	Preparation of a field report on aquatic biodiversity, threats, conservation measures and ecosystem-based resource management	1
Total		16