Course Code	Course Name	Credits
26ZY009	AQUATIC BIOLOGY	04

Course Objectives

- To understand the fundamental concepts and principles of aquatic biology.
- To explain the diversity, structure, and adaptations of aquatic organisms.
- To develop knowledge on freshwater, marine, and estuarine ecosystems.
- To analyze ecological interactions, productivity, and environmental factors affecting aquatic life.
- To enhance scientific and practical skills related to aquatic ecosystem management and conservation.

Learning Outcomes

- Explain the basic concepts and scope of aquatic biology.
- Differentiate various aquatic ecosystems and their biological characteristics.
- Examine the adaptations and ecological roles of aquatic organisms.
- Analyze environmental factors influencing aquatic biodiversity and productivity.
- Apply scientific knowledge and conservation strategies for the sustainable management of aquatic ecosystems.

Unit 1 – Aquatic Biomes (12 Hrs.)

Brief introduction of the aquatic biomes: Freshwater ecosystem (lakes, wetlands, Streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs. Fresh water ornamental fish: Catfish, Cichlids, Cyprinids, Live -bearers,

Unit 2 – Freshwater Biology (12 Hrs.)

Lakes: Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico–chemical Characteristics: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases (Oxygen, Carbon dioxide). Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous. Streams: Different stages of stream development, Physico-chemical, environment, Adaptation of hill-stream fishes.

Unit 3 - Marine Biology (12 Hrs.)

Salinity and density of Sea water, Continental shelf, Adaptations of deep-sea organisms, Coral reefs, Sea weeds. Marine water ornamental fish: Angelfish, Butterfly fish, Damsels, Eels, Flatfish, Gobies, Lionfish, Parrotfish, Pipefish, Rabbitfish, Rays, Scorpionfish, Seahorse, Sharks, Snappers, Tangs, Tilefish, Triggerfish.

Unit 4 – Management of Aquatic Resources (12 Hrs.)

Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment Water quality assessment BOD and COD.

Unit 5 - Fisheries Management (12 Hrs.)

Biology and culture of ornamental fishes; culture of sea weeds, pearl oyster and paddy cum prawn culture. Fisheries activities of CIBA, CMFRI, CIFRI and CIFE.

Reference Books:

1. Jhingran, C.G., (1981). Fish and Fisheries of India. Hindustan Publishing Co. India.
2. Paul Raj, S. (ed.) (1996) Aquaculture for 2000 A.D. Palani Paramount Publications, Palani, Tamil Nadu.
3. Santhanam, R., Sukumaran.N., and Natarajan. P., (1999). A manual of freshwater Aquaculture. Oxford & IBH Publishing co.Pvt.Ltd.
4. Shanmugam. P.K., (1992). Fishery Biology and Aquaculture (1Edn.). Leo Pathipagam, Madras – 83. Hand book of Aqua farming – Freshwater fishes. MPEDA publication.
5. Wetzel RG (2001) Limnology: Lake and River Ecosystems, Academic Press; 3 edition

Websites and eLearning Sources:

https://www.biologydiscussion.com/aquatic-biology
https://www.easybiologyclass.com/category/aquatic-biology/
https://oceanservice.noaa.gov/education/tutorial_estuaries/