# MANGALORE UNIVERSITY

## DEPARTMENT OF APPLIED ZOOLOGY

## MSc ZOOLOGY

## ZOS504- FISHERIES AND AQUATIC BIOLOGY

**Teaching Hours 10 /Unit**

**COURSE OUTCOME**

1. Course introduces learners to fish diversity & distribution, classification of fishes their food & feeding habits and reproductive characteristics.
2. Fish culture practices types of fish culture, preservation and economics of fishery are discussed
3. Aquatic community, abiotic and biotic factors that influence fishery industry both in freshwater and marine environment are also highlighted
4. Types of planktons their classification and importance, productivity, seasonal variations and management of water bodies for acquaculture are focused.
5. Different types of aquatic pollution and their effects on fishery.
6. Student on completion of this course can become an entrepreneur in fishery/aquaculture based industry. He/she can also take up job in fishery based industry.

**UNIT I**

Fish diversity and body design: Distribution of freshwater fishes of India. Distribution of marine fishes of India. Classification of fishes with special reference to evolutionary trends and adaptations. Gas exchange and swimming– 1) Air breathing organs and gas bladder 2). Swimming modes (fin versus body trunk, swimming muscles and tail beat) Fish growth and reproduction: Growth curves, Length weight relationship, Length frequency analysis, Food and feeding habits (General account). Reproduction- The gonads, types of reproduction endocrine regulation of reproduction, Reproductive cycles, spawning, : fish egg and larvae, reproductive behavior, parental care.

**UNIT II**

Fish culture practice in India: Freshwater carps (Indian major and minor) and Lacustrine fish culture (ornamental). Mariculture – Finfish and shellfish culture. Setting up and maintenance of an aquarium. Hybridization and cryopreservation. Fish and shell fish diseases, prophylaxis and therapy. Fishery technology and economics-Fishing gears and crafts. Fishing industry in India (including preservation and processing). Fishery research Institutes in India. Fishery economics. Economic importance and nutritional value of fishes.

**UNIT III**

Aquatic environment**:** Classification of freshwater habitats: - Lotic and lentic ecosystems. Morphometry - lake and river. Physical factors (light and temperature). Chemical factors. Methods for measurement of salinity and chlorinity. BOD, COD, and oxygen and their importance Biological zonation ,Oceanography: - General features, waves, tides, current and upwelling. Physico-chemical properties of Estuary – Salinity and temperature. Inorganic nutrients; Phosphates, Silicate and Nitrate, their cycle N: P ration and its signification, wealth of the sea – minerals

**UNIT IV**

Aquatic community: - Plankton - Classification, distribution and migration, Phyton and Zooplankton- Method of collection of plankton and estimation of primary, secondary and tertiary productivity, factors affecting productivity, regional differences and seasonal variations. Phytoplankton and Zooplankton inter relations Benthos – Animal communities in lakes, stream and reservoir Management and conservation of aquatic habitats: Management of lakes - Eutrophication, control of nutrient and macrophyte biomass.

**UNIT V**

Aquatic Pollution: Major pollutants, sources, dynamics, transport paths and agents. Sewage, industrial and agricultural discharges, composition, disposal systems. Nutrients- detergents, heavy metals and pesticides composition and fate in the marine environment, biological concern, and toxicity and treatment methods. Thermal pollution:, thermal stratification, effects of thermal pollution and Management of heat. Radioactive pollution. Oil pollution - biological effects biodegradation. Bacteria and pollution.

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