ZOS 503- FISHERIES AND AQUATIC BIOLOGY

Teaching hours **10 Hrs/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 techniques are learned.
3. Aquatic community, abiotic and biotic factors that influence fishery industry both in freshwater and marine environment is highlighted
4. Enable to understand plank tonic productivity and management of water bodies for aquaculture is focused.
5. Enable to learn pollution impact on fishery industry their management.
6. Student on completion of this course can become an entrepreneur in fishery/aquaculture based industry. He 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– Air breathing organs and gas bladder, swimming modes. Fish growth and reproduction: Growth curves, length weight relationship, length frequency analysis, Food and feeding habits. Reproduction- The gonads, types of reproduction, endocrine regulation of reproduction, 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 and live feed culture. Setting up and maintenance of an aquarium. Hybridization and cryopreservation. Fish and shell fish diseases, prophylaxis and therapy. Fishery technology and fishery economics
.Fishing gears and crafts. Fishing industry in India (including preservation and processing). Fishery research Institutes in India. Economic importance and nutritional value of fishes.Marine nutraceuticals, Drugs from sea. Drugs used in aquaculture.

UNIT III

Aquatic environment: Classification of freshwater habitats - Lotic and lentic ecosystems, lakes and rivers. 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. Coral reefs.Physico-chemical properties of estuary – Salinity and temperature. Inorganic

nutrients, phosphates, silicates and nitrate, their cycle N: P ration and its signification, wealth of the sea – minerals. Mangrove ecosystems.

UNIT IV

Aquatic community: Planktons - 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, streams and reservoirs. Management and conservation of aquatic habitats: Management of lakes - Eutrophication, control of nutrient and macrophyte biomass.Seaweeds and sea grasses.

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, biomonitoring, bacterial pollution and seafood poisoning

REFERENCES.

1. Beaven, C. R.(1998) Handbook of the freshwater fishes of India, Narendra Publishing House.
2. Biswas, K. P. (1996) A Text Book of Fish, Fisheries and Technology, 2nd edition, Narendra Publishing House.
3. Brown, E and Margret (1957) Physiology of Fishes Vol I & II, Academic Press, Inc. Publishers.
4. Brown, M.E. (1957) Physiology of fishes, Vols. 1 and 2, Academic press,
5. Cormack, D. (1983) Responses to oil and chemical Marine pollution, Applied science publishers.
6. Daniels, R. J. R. (2002) Freshwater fishes of Peninsular India, Universities press.
7. Day. F. (1889) Fauna of British India: Fishes of India.FishesVol -1 and Vol-2, Taylor and Fran
8. Edwards, C.A. (1973) Environment pollution by pesticides, plenum press London.
9. Eeoffrey M. (1987) Pollution threat of Heavy Metal in Aquatic Environments, Elsevier Applied science publishers, England.
10. Erichsen Jones, J.R. (1973) Fish and river pollution, Butterworths, London.