TARA GOVERNMENT COLLEGE (AUTONOMOUS) , SANGAREDDY

B.Sc. ZOOLOGY SYLLABUS UNDER CBCS

B.Sc. III Year

V – SEMESTER, DSE – I (A)

Paper – VI

Applied Zoology

Periods: 45 Max. Marks:70

UNIT – I (7 Periods)

1. Aquaculture

1.1 Types of Fisheries; Fresh Water Fish and Prawn culture
1.2 Fresh water fishing gears and crafts; Induced Breeding.
1.3 Hatchery design and Management of fish and prawn; Transportation of fish and prawn seed.
1.4 Preservation, Processing and By-products of fishes.
1.5 Fish Diseases and control measures

UNIT – II

2. SERICULTURE (8 Periods)

2.1 Life cycle of *Bombyx mori*
2.2 Structure of silk gland and secretion of silk
2.3 Silkworm rearing technology.
2.4 Spinning, harvesting and storage of cocoons.
2.5 Silk worm Pests and Diseases: Uzi fly; Protozoan, Viral, Fungal and Bacterial; Control and prevention.
2.6 Prospects of Sericulture in India

UNIT – III (15 Periods)

3. Apiculture and Vermiculture

3.1 Selection of Bee Species for Apiculture.
3.2 Bee Keeping Equipment.
3.3 Methods of Extraction of Honey (Indigenous and Modern).
3.4 Bee Diseases and Enemies.
3.5 Products of Apiculture Industry and its Uses (Honey, Bees Wax).
3.6 Introduction of Vermiculture and Vermicomposting.
3.7 Vermiculture techniques.
3.8 Bedding, Essential parameters for Vermiculture and Management
3.9 Methods of Harvesting (Manual & Mechanical).
3.10 Economic Importance of Vermiculture.

UNIT – IV (15 Periods)

4. Poultry Farming & Animal Husbandry

4.1 Classification of Fowls based on their use – Broilers and Commercial layers.
4.2 Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs.
4.3 Poultry diseases - Viral, Bacterial, Fungal, Protozoan
4.4 Management of a modern Poultry Farm, progressive plans to promote Poultry as a Self-Employment venture
4.5 Dairy farm and its management
4.6 Animal Husbandry – Introduction, Preservation of semen, artificial insemination of cattle, Induction of early puberty and synchronization of estrus in cattle

M.Sc Zoology

Code I - 303

Semester - III
Elective I
Paper III - Fisheries - I

UNIT I – Introduction to Fisheries

15 Hrs

1.1 History of fisheries, perspectives and prospects of Indian fisheries.
1.2 General account of systematic classification of fishes.
1.3 Classification of fisheries.
1.4 Fisheries resources and management.
1.5 Fishery economics.

UNIT II – Ecology of Water Bodies

15 Hrs

2.1 Ecology of lentic and lotic ecosystems.
2.2 Ecosystem energetic, trophodynamics and ecological productivity.
2.3 Physico-chemical characteristics of freshwater, brackishwater and Marine water.
2.4 Dynamics of fish population- fecundity, recruitment and harvesting.
2.5 Aquatic pollution and its impact on fisheries, eutrophication.

UNIT III – Biology of Cultivable Organisms and Culture Systems

15 Hrs

3.1 Criteria for selection of fish species for culture.
3.2 Biology of Indian and exotic major carps.
3.3 Biology of cultivable prawns and crabs.
3.4 Biology of cultivable mollusks, oysters and echinoderms.
3.5 Culture systems of fishes, prawns and crabs: open, closed, semi intensive and intensive.

UNIT IV – Fishing Crafts, Gears and Fish Biotechnology

15 Hrs

4.1 Fishing Crafts – Non-mechanized and mechanized vessels and maintenance of boats.
4.2 Fishing Gears – Gear material, gear making, accessories; types of gear and their preservation.
4.3 Cryopreservation; transgenic fish; fish genomics – chromosomal mapping, inbreeding genetic markers.
4.4 Sex reversal; monosex culture; hybridization.
4.5 Fish processing and preservation; fish by-products and value added products.

M.Sc Zoology

Code Z - 402

Semester- IV
Core Paper
Paper - II: Fish Biology

UNIT I - Introduction and Diversity of Fishes

15 Hrs

1.1. Introduction, general characteristics, evolutionary succession and fossil history of fishes.
1.2. The early evolution of fishes; Chondrichthian fishes - Sharks, Skates and Rays.
1.3. Characterization and classification of: Ostracoderms, placoderms, acanthodians, holocephali, and elasmobranchs.
1.4. Characterization and classification of cyclostomes, sarcopterygii, dipnoi, and actinopterygii.
1.5. Integumentary system - basic structure of skin, dermal and epidermal pigments, fins, and scales.

UNIT II - Fishes habits and habitats

15 Hrs

2.1. Buoyancy – Dynamic lift and static lift; swim bladder- structure and function.
2.2. Locomotion – Myotomal muscles and caudal fin oscillation mechanisms
2.3. Feeding mechanisms – Food habits and feeding, fish as predators and prey; Food chains and food webs.
2.4. Osmoregulation and ion balance – Freshwater, brackish water and marine teleosts; kidney and salt balance
2.5. Fish migration, migratory mechanisms, mating, and parental care.

UNIT III - Fish Biology

15 Hrs

3.1. Skeletal system - skull, splanchanocranium, jaw suspension and vertebral column.
3.2. Digestive system – Digestive tract, enzymes and digestion.
3.3. Respiratory mechanism – Respiratory gills and lungs.
3.4. Circulatory system – Heart and accessory pumps.
3.5. Excretory system – Excretory organs and excretion.

UNIT IV - Fish biology and Embryogenesis

15 Hrs

4.1. Nervous system- Central nervous system, brain and peripheral nervous system.
4.2. Sense organs – Olfactory, taste buds, touch receptors, photoreceptors, lateral line and internal ear.
4.3. Endocrine system – Pituitary gland, urohypophysis, adrenal gland, gonads, and thyroid gland.
4.4. Reproductive system- Male and female reproductive organs; role of hormones.
4.5. Embryogenesis - Early development and post embryonic development.

M.Sc Zoology

Code Z - 403

Semester IV
Elective I
Paper – III : Fisheries - II

UNIT I - Seed Production Technology

15 Hrs

1.1 Fish and prawn seed resources in India.
1.2 Collection of seeds from natural resources and transportation of seeds.
1.3 Advanced techniques in seed production - Induced breeding methods in fishes and prawns.
1.4 Bundh breeding, brood stock management.
1.5 Hatcheries – Types, construction and management of hatcheries.

UNIT II - Pond and Reservoir Management

15 Hrs

2.1 Site selection, design and construction of aquafarms.
2.2 Pre-stocking pond management – Aquatic weeds, insects and their control.
2.3 Farm Management - Nursery, rearing and stocking ponds.
2.4 Reservoir ecosystem.
2.5 Reservoir fisheries and their management.

UNIT III - Feed and Health Management

15 Hrs

3.1 Feed management – Feeding habits of cultivable fishes; nutritional requirements, supplementary feeding.
3.2 Live feed – Fish food organisms, culture of plankton; significance of plankton in aquaculture.
3.3 Health management of fishes – Parasitic and non-parasitic diseases and their control.
3.4 Health management of prawns – Parasitic and non-parasitic diseases and their control.
3.5 Disease diagnosis and therapeutic methods.

UNIT IV - Cultures and Integrated Farming

15 Hrs

4.1 Composite fish culture; Sewage-fed, cage and pen cultures.
4.2 Air-breathing and ornamental fish culture.
4.3 Integrated fish cum agriculture – Paddy, Horticulture and *Azolla*.
4.4 Integrated fish cum livestock – Poultry, Piggery and Dairy.
4.5 Utilization of renewable energy resources and bio-gas slurry in aquaculture.