B.Sc. II

INDUSTRIAL FISH AND FISHERIES

The syllabus is based on 6 theory periods and practicals of 6 periods per week. The examination shall comprised of two theory papers of 50 marks each of three hours duration, practical of 6 hours duration, carrying 30 marks and 20 marks for internal, 10 marks for each paper.

SEMESTER –III

Paper – I
(PRINCIPLE OF AQUACULTURE**)**

Unit – I **Periods**

- Definition and History of Aquaculture, Scope and Importance 02
- Status of aquaculture in India 02
- Hatchery technology, important hatcheries, reverine seed collection, Different stages of seed – spawn, fry and fingerlings. 06

Unit – II

- Principle's of site selection in fish farm construction. 03
- Quality and productivity of water, soil characteristics and others Parameters (including texture ppt, and moisture content) 03
- Nursery and rearing ponds management. 04

Unit – III

- Harvesting of fry and Fingerlings. Transportation of fish seed and brood fish (various methods of transportations) 05
- Different system of Aquaculture -Monoculture, Poly culture, cage culture and pen culture. 05

Unit – IV

- Extensive, Semi-intensive and intensive fish culture, 04
- Raceway culture, culture in re-circulatory systems. 04
- Warm, water and cold water aquaculture, sewage-fed fish culture. 04

SEMESTER – III

PAPER – II
(FISH BREEDING TECHNOLOGY AND GENETICS)

Unit – I **Periods**

- Principles of genetics ,sex determination and control mechanism 03
- Inheritance and inbreeding. 03
- Selection, hybridization, transgenic fish, 04

Unit – II

- Cryopreservation of gametes. 02
- Production of monosex and sterile fishes 04
- Significance of cryopreservation, mono-sex and sterile fishes in aquaculture. 04

Unit – III

- Endocrine glands in fish. 04
- Role of gonadotropins in fish breeding. Broodstock maintenance. 03
- Breeding of carps and other cultivable fishes 05

Unit – IV

- Induced breeding by hypophysation. Use of HCG, Pheromones and new generation drugs in artificial fish breeding. 06
- Steeping, Bundh breeding (dry and wet bundh). 04

PRACTICAL FOR THIRD SEMESTER

- Collection and analyses of soil (Texture ptt., moisture contained)

- Physico-chemical characteristics of water: Nitrate, sulphate, phosphate, Dissolved Oxygen, Biological Oxygen demands, Chemical Oxygen demand, Turbidity, Temperature, Salinity, Hardness and alkalinity.

- Study of food in a pond, collection and identification of fish food (plankter, benthos, nectos) organisms.
- Visit to farms to study different system of aquaculture.
- Characteristics of gravid fishes and selection for induced breeding.
- Histological studies of fish endocrine glands.
- Collection and preservation of pituitary glands, preparation of extract by hypophysation .
- Study of different hatchery systems, water quality monitoring in hatcheries.
- Fish seed and brood fish transportation, from Nursery rearing pond.

Distribution of marks: **Max. Marks: 30**

Que.1: Identification, classification and comments	06
Que. 2: Water analysis experiments (any one)	04
Que. 3: Soil analysis experiments (any one)	04
Que. 4: Dissection of any cultivable fish	05
Que. 5: Histology of endocrine glad and identification	04
Que 6: Viva-Voce	02
Que 7: Record and Submission of tour diary	05
	30

References:

1. Text Books of Fish and Indian fishes: R.P. Parihar
2. Aquaculture system and practices A selected review:- E. A. Baluyut
3. Pond Aquaculture Water quality management : Claude E. Boyd & C.S. Tucker
4. An Introduction to Fishes: S.S. Khanna
5. Applied Fisheries : Q. J. Shammi
6. Fish & Fisheries: Pande & Shukla
7. Principal of Fishery science : Sameer R. Fale & Yogesh V. Bhute
8. Introduction to Aquaculture: A. Patel
9. Genetics and Fish Breeding : C. E. Purodom
10. Fish Genetics & Aquaculture Biotechnology : T. J. Pandian & C. A. Strussmann
11. Genetics Sex Differentiation in Fish : T. S. Pandian
12. Fish Genetics and Biotechnology: Bose