

**5<sup>th</sup> SEMESTER**

**DISCIPLINE SPECIFIC ELECTIVES (DSEs)**

**IFF516D: INDUSTRIAL FISH AND FISHERIES**

**CREDITS: THEORY: 4, PRACTICAL: 2**

**OPTION - I**

**IFF516DA: INDUSTRIAL FISH AND FISHERIES: FISH CULTURE AND BREEDING TECHNIQUES**

**SYLLABUS THEORY**

**Unit I: Finfish Culture**

- 1.1. Air breathing fish culture
- 1.2. Tilapia culture
- 1.3. Carp culture/warm water fish culture
- 1.4. Trout culture/ cold water fish culture

**Unit II: Shellfish culture**

- 2.1. Prawn culture (marine and freshwater)
- 2.2. Oyster Culture/ Mussel culture
- 2.3. Pearl culture
- 2.4. Seaweed culture

**Unit III: Culture Techniques**

- 3.1. Reservoir Fisheries: Cage and Pen culture
- 3.2. Raft and Ren Culture
- 3.3. Raceway Culture
- 3.4. Sewage Fed fisheries

**Unit IV: Breeding Techniques**

- 4.1. Induced Breeding
- 4.2. Inducing agents
- 4.3. Bundh breeding (wet and dry bundhs)
- 4.4. Different types of Hatcheries

**PRACTICAL**

**(2 CREDITS)**

1. Histological study of Fish endocrine glands.
  2. Collection and preservation of Pituitary gland, Preparation of extract.
  3. Design and working of hatcheries.
  4. Water quality monitoring in hatchery.
  5. Practical demonstration of pearl culture and seaweed culture.
  6. Preparation of chart/models of different aquaculture systems.
  7. Identification of cultivable species of Oysters, Mussels, Clams etc
  8. Visit to different Aquaculture systems
    - a. Carp fish farm
    - b. Trout fish farm
    - c. Raceways etc.
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**IFF516D: INDUSTRIAL FISH AND FISHERIES**

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**OPTION - II**

**IFF516DB: INDUSTRIAL FISH AND FISHERIES: AQUARIUM SETTING AND MAINTENANCE**

**SYLLABUS THEORY**

**Unit I: Introduction to Aquarium**

- 1.1. Definition of aquarium Scope and history
- 1.2. Fabrication of home Aquarium
- 1.3. Design and construction of public fresh water and marine aquaria
- 1.4. Sealants and gums for aquarium

**Unit II: Aquarium Accessories**

- 2.1. Aerators and its types
- 2.2. Different kinds of Filters and Lighting
- 2.3. Thermostat for Aquaria
- 2.4. Hand net and other Equipments

**Unit III: Aquarium setting**

- 3.1. Site selection for Aquaria
- 3.2. Setting up of an aquarium: Gravels, pebbles, plants, ornamental objects
- 3.3. Setting up of Freshwater aquarium and accessories
- 3.4. Setting up of Marine aquarium and accessories

**Unit IV: Aquarium Maintenance**

- 4.1. Water quality parameters in case of Aquaria
- 4.2. Cleaning of Aquarium
- 4.3. Nutritional requirements of well known aquarium fishes: Different kinds of feed
- 4.4. Control of algae and snail

**PRACTICAL**

**(2 CREDITS)**

1. Fabrication and setting of home aquarium
  2. Preparing a plan for public aquarium
  3. Water quality analysis of an Aquarium
  4. Culture of fish food organisms
  5. Preparation of formulated diet
  6. Control of snails and algae in an aquarium
  7. Fabrication of simple filters and aerators used in an aquarium.
  8. Visit to different Aquarium units
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OPTION - III

IFF516DC: INDUSTRIAL FISH AND FISHERIES: FISH PROCESSING

SYLLABUS THEORY

**Unit I: Fish Processing I**

- 1.1. Proximate Composition of fish
- 1.2. Principle and importance of fish preservation
- 1.3. Fish Decomposition: Post mortem Changes, rigor mortis, rancidity and autolysis
- 1.4. Nutritional value of preserved and processed fish.

**Unit II: Fish Processing II**

- 2.1. Procurement of raw material
- 2.2. Traditional methods of fish preservation: sun drying, salt curing, pickling and smoking
- 2.3. Advanced methods of fish preservation: chilling, canning, Thermal processing
- 2.4. Advantages and disadvantages of: Thawing, Glazing, blanching

**Unit III: Fish products**

- 3.1. Fish meal, Fish Pickles, Fish cutlets, Fish wafers
- 3.2. Fish Oil
- 3.3. FPC
- 3.4. Fish Hydrolysate

**Unit IV: Fish by-products**

- 4.1. Fish glue, Ising glass
- 4.2. Chitosan
- 4.3. Shark fins
- 4.4. Pearl essence

**PRACTICAL**

**(2 CREDITS)**

1. Study of proximate composition of fish
  2. Practice and preservation of various fish products and by-products by traditional method
  3. Practice and preservation of various fish products and by-products by advanced method
  4. Preparation of different fish products
    - a. Fish cutlet
    - b. Fish balls
    - c. Fish meal
    - d. Fish wafers etc.
  5. Visit to different fish processing units
  6. Laboratory demonstration of freezing, thawing, glazing etc
  7. Study of different local fishes of the valley
  8. Visit to fish landing centre to study the procurement of raw material
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