

OBJECTIVES: To enable the students to

- Identify the characters of Fresh water cultivable species.
- Recognise the importance of various quality parameters in culture ponds.
- Identify shrimp and fish diseases.
- Acquire knowledge of Hypophysation technique.

COURSE OUTCOMES: By the end of the course, students will be able to

CO1: Identify the fresh water and brackish water species based on the morphological characters.

CO2: Acquire skill in estimating the physico chemical characteristics of water used for aquaculture.

CO3: Acquire knowledge on the technique of Hypophysation.

CO4: Summarise the symptoms associated with fish and shrimp diseases and suggest measures for prevention.

List of Practical:

1. Fresh water Cultivable species any (Fin & Shell Fish Specimens – Observation of morphological characters and drawings) - 5
2. Brackish water cultivable species (Fin & Shellfish- Specimens-Observation of Morphological Character and drawing)-3
3. Marine water cultivable species (Fin & Shell fish- Specimens- Observation of Morphological Character and drawing) -4
4. Hands on training on the use of kits for determination of water quality in aquaculture (DO, Alkalinity, Ammonia, pH, Turbidity- Testing kits to be used for the estimation of various parameters/Standard procedure can be demonstrated for the same)
5. Demonstration of Hypophysation (Procedure of hypophysation to be demonstrated in the practical lab with any edible fish as model)
6. Viral diseases of Fin & Shell Fish (Observation of histopathological slides / Charts/Models of viral pathogens in fin/ shell fish.
7. Bacterial diseases of Fin & Shell Fish (Observation of histopathological slides / Charts/Models of Bacterial pathogens in fin/ shell fish.
8. Fungal diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/Models of Bacterial pathogens in fin/ shell fish.
9. Fish Biometric studies: descriptive, morphometric and meristic characteristics of a sample fish.

Lab References:

1. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company.
2. Departmental repository of flash cards.
3. Manual of Vertebrate Zoology, S.S. Lal.
4. "Fishery Science & Indian Fisheries" by C.B.L.Srivastava – Kitab Mahal, Allahabad – Edition: 1988.
5. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
6. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
7. <https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

Web resources suggested by the teacher concerned and the college librarian including reading material

Co-Curricular Activities:

Mandatory : (Student training by teacher in field skills: Total 15hrs., Lab:10 +field05)

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on Breeding-Induced breeding in carps-hatchery technology of *P. Vennami*- Farming techniques- disease diagnostic techniques—concepts – Demonstration @ any aqua laboratory.
2. For Student: Students shall (individually) visit a Hatchery/Farm/ Aqua diagnostic center and make careful observations of the process method and implements- protocols and report on the same in 10 pages hand written Field work/Project work Report.
3. Max marks for Field work/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work: Title page, student details, index page, details of place visited, observations made, findings and acknowledgements.
5. (IE). Unit tests.

Suggested Co-Curricular Activities:

1. Preparation of Model/ Charts of Cultivable species of fin fish shell fish.
 2. Preparation of Model/ Chart of Ideal fish Pond-with the standards prescribed.
 3. Observation of aquaculture activities in their area (Observation of any activity related to aquaculture in the vicinity of the college/village).
 4. Preparation of Model –charts of Fin/Shellfish Diseases with eco-friendly material.
- Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc., Invited lecture.