

SEMESTER-V
COURSE 14 A: SUSTAINABLE AQUACULTURE MANAGEMENT

Theory

Credits: 3

3 hrs/week

LEARNING OUTCOMES:

Students at the successful completion of this course will be able to

- Evaluate the present status of aquaculture at the Global level and National level
- Classify different types of ponds used in aquaculture
- Demonstrate induced breeding of carps
- Acquire critical knowledge on commercial importance of shrimps
- Identify fin and shell fish diseases

SYLLABUS:

Unit: 1

- 1.1 Present status of Aquaculture – Global and National scenario
- 1.2 Major cultivable species for aquaculture: freshwater, brackish water and marine.
- 1.3 Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp.
- 1.4 Design and construction of fish and shrimp farms

Unit: 2

- 2.1 Functional classification of ponds – head pond, hatchery, nursery ponds
- 2.2 Functional classification of ponds -rearing, production, stocking and quarantine ponds
- 2.3 Need of fertilizer and manure application in culture ponds
- 2.4 Physio-chemical conditions of soil and water optimum for culture (Temperature, depth, turbidity, light, water, PH, BOD, CO₂ and nutrients)

Unit: 3

- 3.1. Induced breeding in fishes
- 3.2. Culture of Indian major carps: Pre-stocking management (Dewatering, drying, ploughing / desilting; Predators, weeds and algal blooms and their control, Liming and fertilization)
- 3.3. Culture of Indian major carps - Stocking management
- 3.4. Culture of Indian major carps - post-stocking management

Unit: 4

- 4.1 Commercial importance of shrimp & prawn
- 4.2 *Macrobrachium rosenbergii*- biology, seed production.
- 4.3 Culture of *L. vannamei* – hatchery technology and culture practices
- 4.4 Mixed culture of fish and prawns

Unit: 5

- 5.1 Viral diseases of Fin Fish & shell fish
- 5.2 Fungal diseases of Fin & Shell fish
- 5.3 Bacterial diseases of Finfish & Shell fish
- 5.4 Prophylaxis in aquaculture

REFERENCES:

1. Pillay TVR & M.A.Dill, 1979. Advances in Aquaculture. Fishing News Books Ltd., London
2. Stickney RR 1979. Principles of Warm Water Aquaculture. John Wiley & Sons Inc.1981
3. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier ScientificPublishing Company.
4. Bose AN et.al. 1991. Costal Aquaculture Engineering. Oxford & IBH Publishing CompanyPvt. Ltd.

Web resources:

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>

SEMESTER-V
COURSE 14 A: SUSTAINABLE AQUACULTURE MANAGEMENT

Practical

Credits: 1

2 hrs/week

LEARNING OUTCOMES:

On successful completion of this practical course, student shall be able to:

- Identify the characters of Fresh water cultivable species
- Estimate physico chemical characteristics of water used for aquaculture
- Examine the diseases of fin and shell fish
- Suggest measures to prevent diseases in aquaculture

SYLLABUS:

- a. Fresh water Cultivable species any (Fin & Shell Fish Specimens – Observation of morphological characters by observation and drawings)-5
- b. Brackish water cultivable species (Fin & Shell fish- Specimens- Observation of Morphological Character by observing drawing) -5
- c. Hands on training on the use of kits for determination of water quality in aquaculture (DO, Salinity, pH, Turbidity- Testing kits to be used for the estimation of various parameters/ Standard procedure can be demonstrated for the same)
- d. Demonstration of Hypophysation(Procedure of hypophysation to be demonstrated in the practical lab with any edible fish as model)
- e. Viral diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of viral pathogens in fin/ shell fish – one edible specimen can be used for observation of same in the laboratory)
- f. Bacterial diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same in the laboratory)
- g. Fungal diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of Bacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same in the laboratory)

REFERENCES:

- h. Boyd CE 1982. Water Quality Management for Pond Fish Culture. Elsevier Scientific Publishing Company
- i. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
- j. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
- k. <https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871>

Co-Curricular Activities

a. Mandatory:

1. For Teacher: Training of students by the teacher in laboratory/field on Breeding- Induced breeding in carps -hatchery technology of *L. 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 Fieldwork/Project work Report.
3. Max marks for Fieldwork/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.

b. 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 /Shell fish Diseases with eco-friendly material.
5. Assignments, Group discussion, Seminar, Quiz, Collection of Material, Video preparation etc.,
Invited lecture
