Govt. Degree College (Autonomous), Baramulla

Semester 4th **Course - Minor**

Subject: Industrial Fish and Fisheries

Title: Aquaculture **Code: IFFC1422N**

Credit: (4+2) Theory: 04; Practical: 02 Contact Hours: 60 (Th) + 30 (Pr)

Course Objectives:

- *To introduce students to the basic concepts and practices of aquaculture.*
- *To provide knowledge about freshwater fish farming*
- *To understand the basic concepts of mariculture and shellfish aquaculture.*

Expected Learning outcomes:

On completion of the course, the student should be able to:

- *Implement the different types of aquaculture practices.*
- *Understand the importance of aquaculture in generation of self-employment by rearing of fishes in backyard ponds on small as well as on large scale.*

Part 1: Theory (4 Credits)

Unit–I Basics of Aquaculture **(16 hours)**

1.1 Definition and History of aquaculture
1.2 Scope and importance of aquaculture
1.3 Aquaculture practices
  1.3.1 Extensive, Semi-intensive and Intensive aquaculture
  1.3.2 Cage and Pen culture
  1.3.3 Composite fish culture
  1.3.4 Integrated fish farming
1.4 Criteria of selection of Cultivable Fish Species

Unit–II Pre-stocking management of Culture Ponds **(16 hours)**

2.1 Criteria for selection of suitable site for fish farms
2.2 Different types of ponds (Nursery, Rearing and Stocking ponds)
2.3 Layout and construction of a freshwater fish farm
2.4 Preparation of Ponds
  2.4.1 Control of aquatic insects
  2.4.2 Control of aquatic weeds
  2.4.3 Liming of pond
  2.4.4 Fertilization of ponds

Unit-III Stocking and Post-stocking management (16 hours)

3.1 Procurement and stocking of Seeds

3.2. Artificial feeding and its importance in aquaculture. Feeding techniques (manual and Mechanical)

3.3 Manufacture and formulation of fish feed

3.4 Harvesting and marketing of stock

Unit–IV Cultural practices (16 hours)

4.1 Trout Culture – Stripping, Hatchery practices, Nursery rearing, grow-out raceways

4.2 Air breathing fish culture

4.3 Pearl culture

4.4 Freshwater Prawn culture

Part 2: Laboratory Course (2 Credits 64 Hours)

Course Objectives:

- *To demonstrate the carp culture practices*
- *To study the procedure of estimation of physic-chemical parameters of Water sample.*
- *To study the methods of pre-stocking, stocking and post stocking management of culture ponds*

Learning outcomes:

On completion of the course, the student should be able to:

- *Identify different cultivable fish species*
- *Identify and working of different aquaculture equipments*
- *Prepare of fish feed*

1. Estimation of Transparency, pH and Temperature in pond water.
2. Estimation of Dissolved oxygen, Total alkalinity and Total hardness in water samples
3. Morphological study of cultivable fish species
4. Field visit to carp fish farms and hatcheries and prepration of report thereof.
5. Field visit to trout fish farms and hatcheries and prepration of report thereof.
6. On field pond preparation practices – removal of weeds, removal of insects, liming and pond fertilization
7. Acclimatization and stocking of fish seed
8. Formulation of fish feed

SUGGESTED READINGS

1. Parihar, RK: A Handbook Of Fish Biology & Indian Fisheries

2. Gupta SK. and Gupta PC: General and Applied Ichthyology,2006
3. Pandey, Kamleshwar,. Shukla, JP: Fish and Fisheries, 2018
4. Jhingran, VG: Fish and Fisheries of India, Hindusthan Publishing Corporation,New Delhi, 1998
5. Pillay, TVR: Aquaculture Principles and Practices, , Fishing News Books Ltd., London
6. Stickney RR: Principles of Warm Water Aquaculture, John Wiley & SonsInc. 1981
7. Boyd CE: Water Quality Management for Pond Fish Culture, Elsivier Scientific Publishing, 1982
8. Bose AN et.al.: Costal Aquaculture Engineering, Oxford & IBH Publishing Company,1991
9. Rath RK: Freshwater Aquaculture, 3rd Ed., Scientific Publisher, 2018