Aquaculture Entrepreneurship

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Aquaculture Entrepreneurship	2	0	0	2	Class XII	NIL

Learning Objectives

The Learning Objectives of this course are as follows:

- To give first-hand training on traditional and technology-based Aquaculture.
- To understand the importance of different types of ponds required for aquaculture.
- To understand the requirement of advanced technology for sustainable development of aquaculture in India.
- To gain experience in the management of optimum water quality in the fish production systems.
- To enhance the quality of aquacrops and increase the production.

Learning Outcomes

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

- Identify the useful aquaculture systems for sustainable aquaculture development.
- Recognize the suitable and economically important aquacultural species.
- Understand the importance of aquaculture in nutrition security, poverty elevation and employment generation.

Skill development and job opportunities

After completion of this course students may be

- Employed in various aquaculture related business including prawn and fish farms.
- Fully equipped to start own entrepreneurships in fish farming.

SYLLABUS:

Practical

Unit I: Pond-based Traditional Aquaculture **20 Hours**

Introduction to indigenous pond-based fish culture systems and identification of economically important cultivable finfishes and shellfishes. The impact of aquatic organisms in the production of aquacrops.

Exercises:

1. Designing (layout) and drawing of a self-sustainable Aquaculture farm showing different ponds.

2. Selection and identification of cultivable finfishes and shellfishes (prawns, mussels, crabs).

3. Collection and identification of various freshwater aquatic plants. Understanding of the role of different aquatic plants in aquaculture.

4. Identification of harmful aquatic insects and their remedial measures.

5. The study of diurnal fluctuations of major water quality parameters (*viz*., temperature, pH, dissolved oxygen, ammonia etc.) in a pond.

Unit II: Recirculating Aquaculture System (RAS) 20 Hours

Application of advance technology like, Recirculating Aquaculture System (RAS) for the sustainable development of Aquaculture in India.

Exercises:

1. Designing of a land-based Recirculating Aquaculture System (RAS).

2. Evaluation of various types of filters like, mechanical, chemical and biological filters in the maintenance of water quality in the RAS.

3. The study of role of flow rate and duration of circulation in the maintenance of water quality in the RAS.

4. The monitoring of temperature, pH, dissolved oxygen, ammonia, nitrite, nitrate, phosphate etc. at different hours of water circulation.

5. Culture of various fishes and prawns in the RAS.

6. Visit to a Recirculating Aquaculture System.

Unit III: Aquaponics System 20 Hours

Application of Aquaponics System to grow multiple crops simultaneously and thereby, increases the production of aquacrops in per unit area in a sustainable manner. Thus, enhances the earning of Fish farmers.

Exercises:

1. Designing of an Aquaponics System.

2. Evaluation of role of various types of edible (lettuce, tomato, water spinach etc.) and ornamental plants in the maintenance of ammonia levels in the fish culture units.

4. Identification of microorganisms functioning in the Aquaponics System.

5. Culture of various fishes and prawns in the Aquaponics System.

6. The monitoring of temperature, pH, dissolved oxygen, ammonia, nitrite, nitrate, phosphate etc. in the fish culture units.

7. Visit to an Aquaponics System.

Recommended Readings:

- AOAC, Association of Official Analytical Chemists. 2019. Official Methods of Analysis. Washington, DC: Association of Official Analytical Chemists Inc.

- APHA, American Public Health Association. 2017. Standard Methods for the

Examination of Water and Wastewater. 23rd ed. Washington DC, USA: American Public Health Association, American Water Works Association, Water Environment Federation.

- Chakrabarti, R. and Sharma, J. G. 2008. Aquahouse. New Dimension of Sustainable Aquaculture. DIPAS, Indian Council of Agricultural Research, New Delhi, India.

- Holt, G. J. 2021. Larval Fish Nutrition. Willey-Blackwell, UK.

- ICAR, Indian Council of Agricultural Research. 2013. Handbook of Fisheries and Aquaculture. Directorate of Knowledge Management in Agriculture, Indian Council of Agricultural Research, New Delhi, India.

- Pillay, T. V. R. 2005. Aquaculture. Principles and Practices. Blackwell Publishing, New Delhi, India.

Examination scheme and mode:

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi