Bio-floc Technology

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		
Bio-floc Technology	**2**	**0**	**0**	**2**	Class XII	NIL

Learning Objectives

The Learning Objectives of this course are as follows:

- To learn about the basics of Bio-floc technology and it's important as a skill for self-sustainable and self-employment
- To learn production of fish in the larger scale with minimum use of water source and land to help in the total production of fish for human consumption in India.
- To learn about how to set-up the technology looking into the different conditions and availability of space and training.
- To teach fundamental concept of running this system with the biological knowledge of bacteria culture, water quality management
- To learn the types of fish species, types of feed and feeding, density of fish to be maintain in the particular volume of water etc.

Learning Outcomes

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to gain insight into fish culture using minimum amount of water, land, fish feed and with high biosecurity.
- After studying this course, students will be able to learn and explain about the bio-floc technology and they can set up bio-floc tanks for themselves and for others in the form of industries and entrepreneurship as well as for stat-up with the help of existing Government funding and self funding.
- After studying this course, students will be able to understand and implement bio-floc system and this can be an alternative skill for earning, self-employment, job generation and contribute in large scale fish production which are hygienic, organic and good protein source for human health.

SYLLABUS:

Practical

Unit-I **12 Hours**

Introduction to basics of Bio-floc technology and its applications in aquaculture industry, Standard operating procedure, Microbial Role in Bio-floc System, Design Set-up and installation of Bio-floc system, Biosecurity , Advance over pond aquaculture, basic equipment's and necessary items .

Exercises

1. Inoculation of bacteria and its role in Bio-floc technology.
2. Plankton and microbial analysis of bio-floc.
3. Set-up and Installation of Bio-floc system.

Unit-II **12 Hours**

Optimum water quality parameters and its management. Floc water preparation and floc volume measurement. Monitoring and management of dissolved oxygen, pH, conductivity, temperature, salinity, ammonia, nitrate, nitrite, TDS. Measurement of floc volume and its control. Role of bacteria in management of water quality.

Exercises

1. Analysis of following water quality parameters in Bio-floc culture tanks using kits: temperature, pH, conductivity , salinity, TDS, ammonia, nitrate, nitrite.
2. Water preparation for Bio-floc system.
3. Measurement of floc volume using imhoff cone.

Unit-III **12 Hours**

Suitable species selection, Pre-stocking and post stocking management, Food and feeding management, Production performance, Nursery rearing days, Survival (%), Average body weight at harvest, feed conversion ratio.

Exercise

1. Identification of suitable fish, feeding habits, stocking capacity, growth rate and duration of culture.
2. The study of Feed Conversion Ratio (FCR) and Feed Conversion Efficiency (FCE).

Unit-IV **12 Hours**

C: N ratio management , Nutritional requirements and protein levels in the food.
Source of carbon, calculation of carbon and nitrogen ratio, suitable C:N ration management in the initial floc preparation and during culture days. Selection of species-specific food with optimum protein level, food size, quantity of feed according to per cent body weight, feeding rate.

Exercise

1. Calculation of C: N ratio and its management from the TAN content in the floc water.
2. Mouth size and food size and growth study.

Unit-V **12 Hours**

Disease management and prophylactic treatment, Economics values of fish and its marketing strategies. Common disease in bio-floc, identification of disease its causes, species-specific disease, stress management and treatment. Steps for prevention and protections of possible disease, possible control measures with setup systems by controlling light, temperature etc. Sludge management. Economics values of fish and its marketing strategies. Production capacity and requirements, start-up and entrepreneurship opportunities, funding and grants for setting up from Government.

Exercise

1. Fungal, bacterial, parasitic and viral disease commonly found in bio-floc fish culture system.
2. Identification and economically important fish species for culture in bio-floc system like prawn, other new economic species etc.

3. Write a Project for start-up or entrepreneurship and governmental grants.
4. Visit to hatcheries with super-intensive models.

Recommended Readings:

- Avnimelech, Y. 2015. Bio-floc Technology- a Practical Guidebook. 3rd ed. World Aquaculture Society, USA.

Examination scheme and mode:

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