

**LEARNING OUTCOME BASED VOCATIONAL CURRICULUM**



**SECTOR:  
AGRICULTURE AND ALLIED**

**JOB ROLE:**

**CLASS 11 & 12**

**ORNAMENTAL FISH TECHNICIAN**

**(QUALIFICATION PACK: REF. ID. AGR/Q4910)**



**State Council for Educational Research & Training (SCERT) Kerala**

(Department of General Education, Government of Kerala)

Vidhya Bhavan, Poojappura, Thiruvananthapuram





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**[www.scert.kerala.gov.in](http://www.scert.kerala.gov.in)**



**LEARNING OUTCOME BASED  
VOCATIONAL CURRICULUM**

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## FOREWORD

A collaborative initiative for developing learning outcome based vocational curriculum and courseware aimed at integrating both vocational and general qualifications has been implemented by the State Council of Educational Research and Training (SCERT) Kerala and the PSSCIVE Bhopal. This is intended to open up pathways of career progression for students and the SCERT Kerala is developing curricula under the project as an integral part of Vocationalisation of Education under Samagra Shiksha, approved by the Government of Kerala. Decisive improvement in the teaching-learning process and working competencies through learning outcomes that have been judiciously embedded in the vocational subject is expected to be the major impact that will be brought about by the learning outcome based vocational curriculum.

It is a matter of great pleasure to introduce this learning outcome based vocational curriculum as part of the vocational training package for the job role of Ornamental Fish Technician (AGR/Q4910). The curriculum has been developed for the higher secondary students of vocational education and has been aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF).

The key aim of the curriculum will be to provide children with employability and vocational skills that would in turn aid occupational mobility and lifelong learning. A major transformation in the teaching process is also aimed at, which will be brought about through interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences.

The curriculum has been meticulously developed and judiciously reviewed by a group of experts and their much-valued contributions are immensely acknowledged. The imminent utility of the curriculum will without doubt, be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further enhancement and augmentation to this document.

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We are extremely thankful to Dr. RVG Menon, Chairperson, High Power Committee for the implementation of NSQF in Kerala, Dr. Sukesh Kumar, Former Principal, Government Engineering College Palakkad and Sri. G S Unnikrishnan Nair, Former Director State Agricultural Management and Extension Training Institute (SAMETI), Thiruvananthapuram for their mentorship in the process of developing this document. The contributions made by Dr. Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), PSSCIVE Bhopal in development of the curriculum are duly acknowledged.

We are grateful to the experts for their earnest efforts and contributions in the development of this learning outcome based vocational curriculum. Their names are acknowledged in the list of contributors.

We are grateful to the Vocational Higher Secondary wing of the Directorate of General Education (DGE) Kerala for extending the support to develop this curriculum document on time by providing the service of its teaching staff.



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## 1. COURSE OVERVIEW

**COURSE TITLE: ORNAMENTAL FISH TECHNICIAN**

### GENERAL OBJECTIVES

Ornamental fish farming and breeding is a promising field in Fisheries sub sector. Ornamental fish keeping is the second largest hobby in the world. The major job roles identified in this field are Ornamental fish breeder, Ornamental fish rearer, Ornamental fish farmer, Artificial feed technician, Live feed technician, Glass tank fabricator, Aquarium plant rearer etc. After completion of the course the learners should be a skill person in ornamental fish breeding, rearing, farm management and tank fabrication.

On successful completion of this course, the learners are expected to develop skills in ;

- ornamental fish breeding
- ornamental fish rearing
- ornamental fish farm management
- setting an ornamental fish culture unit
- live feed culture
- artificial feed preparation and
- setting start up in ornamental fish culture/live feed

### COURSE OUTCOMES

*On completion of the course, students should be able to;*

- ✓ apply effective oral and written communication skills to interact with people and customers;
- ✓ identify the principal components of a computer system;
- ✓ demonstrate the basic skills of using computer;
- ✓ demonstrate self-management skills;
- ✓ demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- ✓ demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ identify the common varieties, trends and present status of ornamental fish trade in India
- ✓ develop skill in design and Layout of an ornamental fish culture unit
- ✓ develop skill in fabrication and setting of different types of tanks.
- ✓ perform pre stocking, stocking and post stocking management.
- ✓ develop skill in preparation of live and formulated feeds and feeding
- ✓ identify common aquarium plants and its role in ornamental fish culture.
- ✓ develop skills in breeding and rearing of live bearers.

- ✓ develop skill in breeding and rearing of egg layers.
- ✓ identification of common ornamental fish diseases and their management
- ✓ prepare a bankable project for self-employment
- ✓ develop skills in safety at workplace

**COURSE REQUIREMENTS:**

The learner should have the basic knowledge of science.

COURSE DURATION: 600 hrs

Class 11	300 hrs
Class 12	300 hrs
<b>Total</b>	<b>600 hrs</b>

**2. SCHEME OF UNITS**

*The unit-wise distribution of hours and scores for Class 11 is as follows:*

<b>CLASS 11</b>			
	<b>Units</b>	<b>No. of Hours for Theory and Practical = 300</b>	<b>Max. scores for Theory and Practical =100</b>
<b>Part A</b>	<b>Employability Skills</b>		
1.	Communication Skills – III	25	10
2.	Self-management Skills – III	25	
3.	Information and Communication Technology Skills – III	20	
4.	Entrepreneurial Skills – III	25	
5.	Green Skills – III	15	
	<b>Total</b>	<b>110</b>	<b>10</b>
<b>Part B</b>	<b>Vocational Skills</b>		
6.	Introduction to ornamental fish industry	11	40
7.	Design and layout of an ornamental fish culture unit	32	
8.	Fabrication and setting of different types of tanks	33	
9.	Ornamental fish farm management	37	
10.	Ornamental fish nutrition	52	
	<b>Total</b>	<b>165</b>	<b>40</b>
<b>Part C</b>	<b>Practical Work</b>		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	<b>Total</b>	<b>10</b>	<b>35</b>

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<b>Part D</b>	<b>Project Work/Field Visit/ OJT</b>		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	<b>Total</b>	<b>15</b>	<b>15</b>
	<b>Grand Total</b>	<b>300</b>	<b>100</b>

The unit-wise distribution of hours and scores for Class 12 is as follows:

CLASS 12			
	Units	No. of Hours for Theory and Practical =300	Max. scores for Theory and Practical = 100
<b>Part A</b>	<b>Employability Skills</b>		
1.	Communication Skills – IV	25	10
2.	Self-management Skills – IV	25	
3.	Information and Communication Technology Skills – IV	20	
4.	Entrepreneurial Skills – IV	25	
5.	Green Skills – IV	15	
	Total	110	10
<b>Part B</b>	<b>Vocational Skills</b>		
6.	Aquarium plants	12	40
7.	Breeding and rearing of live bearers	47	
8.	Breeding and rearing of egg layers	47	
9.	Fish health management	37	
10.	Entrepreneurship development in ornamental fish culture	17	
11.	Health and Safety at Work	05	
	Total	165	40
<b>Part C</b>	<b>Practical Work</b>		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
<b>Part D</b>	<b>Project Work/Field Visit/OJT</b>		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	<b>Total</b>	<b>15</b>	<b>15</b>
	<b>Grand Total</b>	<b>300</b>	<b>100</b>

### 3. LEARNING OUTCOME BASED ACTIVITIES

Classroom, Laboratory/workshop and field are the key spots where teaching and learning take place. Classroom and laboratory-based teaching and learning facilitate knowledge creation whereas field visits open venues for free interaction with experts and also helps acquaint learners with various tools, materials, equipment procedures and operations in the workplace. While considering these intensified ways of knowledge acquisition, emphasis should also be laid on the occupational safety, health and hygiene of the participants.

### **Classroom activities**

Classroom activities are mainly interactive lecture sessions, followed by discussions and doubt clarifications. Classes are handled by trained vocational teachers and this is considered as an integral part of the course. The most attractive feature of the class is that the classes are in tune with the outcome-based curriculum. Teaching learning processes are well planned and implemented. Teaching learning materials such as audio-visual materials, colour slides, charts, diagrams, models, exhibits, handouts, on-line teaching materials etc., have been incorporated in accordance with the topic and this may help the teachers to impart the content in an effective manner.

### **Practical work in Laboratory / Workshop**

Practical work is usually performed to enhance the skills of the learners which are indeed essential for them to become specialized technicians. Practical sessions may include hands on training, simulation training, role-play, case-based studies and exercises. Equipment and other appliances are available for use in abundance. Trained personnel teach and exercise specialized techniques. Practical classes involving laboratory/workshop are well planned with tools, equipment, materials and also other skill acquisition activities. Vocational teachers should submit the plan of laboratory/workshop work in advance to the head of the institution and get it sanctioned prior to use.

### **Field visits/ Educational Tour**

Field visit is one of the ways and means of learning outside the classroom. It promotes knowledge acquisition by giving opportunity to learners to interact with renowned experts and to make observations of the activities performed by them. An observation check list may help the students to ensure the collection of required information and its analysis for further use. This may be developed with the help of vocational teachers who are in charge of outdoor learning activities. All the field visits are well planned by taking into consideration of the learning requirements, distance to travel, time, health and hygiene. The Principal and teachers should plan to implement at least three field visits within a year by making all necessary arrangements.

### **Virtual Field Visits, Expert Interactions and Practical Activities**

With the rapid potentials offered by information technology in digital classrooms, the extent of virtual field visits, online expert interactions and online demonstrations cum practical activities can be worked out. It may be helpful amid the current Covid 19 pandemic scenario. A State level cluster of teachers and experts in the concerned subject can be pooled together for the purpose. The guidelines for such activities can be issued by the concerned SCERTs.

**Suggested Topics for Expert Interaction**

1. Scope and prospects of ornamental fish industry
2. Design of a small scale ornamental fish culture unit
3. Glass tank making
4. Aquarium accessories and setting
5. Ornamental fish farm management and water quality analysis
6. Live feed culture for ornamental fish larvae and brooders
7. Artificial ornamental fish feed preparation.
8. Aquarium plants and its role in ornamental fish farming.
9. Breeding and rearing of live bearers
10. Breeding and rearing of egg layers.
11. Ornamental fish health management.
12. Preparation of a bankable project for establishing an ornamental fish culture unit.

**4. ASSESSMENT AND CERTIFICATION**

The National Skill Qualification Framework (NSQF) is based on outcomes rather than inputs referred by the National Occupation Standards (NOSs). Learning outcomes, as per the NSQF level descriptors, include the Process, Professional Knowledge, Professional Skills, Core Skills and Responsibility. Knowledge in the job of a learner shall be the basis of assessment. It would also be considered if the learning program undertaken by the learner has delivered the required output. Certification is based on required standards so that the learner and the employer could come to know about the competency attained in the vocational subject/ course. In order to make the assessment reliable, valid, flexible, convenient, cost effective, fair and transparent standardised assessment tools are to be used. Technology assisted assessment process is in vogue now.

**Knowledge Assessment (Theory)**

Knowledge Assessment usually includes two components – Internal Assessment and External Assessment. External assessment includes theory examination conducted by the concerned examination Boards. Tools for assessment contain components for testing the application of knowledge. Knowledge testing can be performed by making use of either objective or short answer type paper-based test. Source of the questions should be the content of the curriculum.

## Written Test

A group, comprising of academicians, experts from existing vocational subject experts / teachers, subject experts from University/ College or from the industry prepare theory question paper for the vocational subjects. A panel of experts for question paper setting and conducting examination should be formed by the respective central / state boards. Written tests allow the learners to demonstrate that they have acquired the necessary knowledge and skill in the given topics.

*The blue print for the question paper may be as follows:*

**Duration: 3 hrs**

**Maximum scores: 50**

No. of Questions					
	Typology of Question	Very Short Answer (1 score)	Short Answer (2 scores)	Long Answer (3 scores)	Scores
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	3	3	3	18
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	4	3	19
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	2	1	07
4.	High Order Thinking Skills – (Analysis and Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	2	0	04
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	<b>Total</b>	<b>5x1=5</b>	<b>12x2=24</b>	<b>7x3=21</b>	<b>50 (24 questions)</b>



### **Skill Assessment (Practical)**

Skill assessment should be done by considering the practical demonstration of skills by the candidate. It is assessed by making use of a competency checklist prepared by experts. The competency checklist should be developed as per the National Occupation Standards (NOSs). This should be in tune with the qualification pack for the Job Role to ensure necessary consistency in the quality of assessment across different sectors and institutions. As per the performance criteria defined in the National Occupation Standards, the students have to demonstrate their competencies in front of the examiners. Assessment will indicate whether they are competent or incompetent. The assessors assessing the skills of the students should possess enough industrial experience and should have undergone a rigorous training in assessment principles and practices. The Sector Skill Councils (SSCs) should ensure that the assessors are given the required training on the assessment of competencies.

The demonstration of knowledge and skill in performing a task of the learners, is the purpose of the practical examination. This include practical examination where hands on experience will be displayed and a viva voce. A team of two evaluators, one a subject teacher and the other an expert from the relevant industry certified by the relevant Board or SSCs concerned can conduct practical examination as well as viva voce.

### **Project Work**

Project is an efficient strategy to assess the practical skills acquired along a certain timeline. Project is chosen and given to candidates only on the basis of their capabilities, because it needs specific skills. It is performed step by step and the first and foremost step is classroom discussion and selection of the topic for the project. After fixing the topic and objectives, the methodology of the project work should be decided during the classroom discussions. Monitoring and evaluation should be done at each stage. Proper feedback shall be provided to the learners for improvement and innovation. Field visits can be organized as part of the project work. The data collected may be used for presentations and report writing. Accuracy of the data is to be ensured. The entire project work is maintained as a practical work file or as student's portfolio.

### **Student Portfolio**

It is a document that supports the candidate claim of competencies acquired as a part of the teaching learning process. The student portfolio is a compilation of project reports, articles, photos of products prepared by the student.

### **Viva Voce**

Viva voce provides chance to each candidate to demonstrate communication skills and content knowledge. It is a way of obtaining feedback on the student's experience, learning, project work

and field visit. Audio visual recording of the whole procedure can be done for future reference and documentation. A Board, including external examiners, is constituted as per the norms which in turn should be suitably adapted to the specific requirement of the vocational subjects.

The central/state examination board for secondary education and the respective Sector Skill Councils can certify the competencies of the learner upon the successful completion of the course.

## 5. UNIT CONTENTS

<b>CLASS 11</b>		
<b>Part A: Employability Skills</b>		
<b>Sl.No.</b>	<b>Units</b>	<b>Duration (hrs)</b>
<b>1</b>	Communication Skills- III	25
<b>2</b>	Self-management Skills – III	25
<b>3</b>	Information and Communication Technology Skills - III	20
<b>4</b>	Entrepreneurial Skills – III	25
<b>5</b>	Green Skills – III	15
	<b>Total</b>	<b>110</b>

<b>Unit 1: Communication Skill– III</b>			
<b>Expected Learning Outcome</b>	<b>Theory (10 hrs)</b>	<b>Practical (15 hrs)</b>	<b>Duration (25 hrs)</b>
1. Demonstrate knowledge of various methods of communication	<ul style="list-style-type: none"> <li>• Methods of communication</li> <li>• Verbal</li> <li>• Non-verbal</li> <li>• Visual</li> </ul>	<ul style="list-style-type: none"> <li>• Writing pros and cons of written, verbal and non-verbal communication</li> <li>• Listing do's and don'ts for avoiding common body language mistakes</li> </ul>	05
2. Identify specific communication styles	<ul style="list-style-type: none"> <li>• Communication styles- assertive, aggressive, passive-aggressive, submissive, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Observing and sharing communication styles of friends, teachers and family members and adapting the best practices</li> <li>• Roleplays on communication styles.</li> </ul>	10
3. Demonstrate basic writing skills	<ul style="list-style-type: none"> <li>• Writing skills to the following:</li> <li>• Sentence</li> <li>• Phrase</li> <li>• Kinds of Sentences</li> <li>• Parts of Sentence</li> <li>• Parts of Speech</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practice of writing sentences and paragraphs on topics related to the subject</li> </ul>	10

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	<ul style="list-style-type: none"> <li>• Articles</li> <li>• Construction of a Paragraph</li> </ul>		
<b>Total</b>			<b>25</b>

Unit 2: Self-Management – III			
Expected Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Demonstrate impressive appearance and grooming	<ul style="list-style-type: none"> <li>• Describe the importance of dressing appropriately, looking decent and positive body language</li> <li>• Describe the term grooming</li> <li>• Prepare a personal grooming checklist</li> <li>• Describe the techniques of self- exploration</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration of impressive appearance and groomed personality</li> <li>• Demonstration of the ability to self-explore</li> </ul>	10
2. Demonstrate team work skills	<ul style="list-style-type: none"> <li>• Describe the important factors that influence in team building</li> <li>• Describe factors influencing team work</li> </ul>	<ul style="list-style-type: none"> <li>• Group discussion on qualities of a good team</li> <li>• Group discussion on strategies that are adopted for team building and team work</li> </ul>	10
3. Apply time management strategies and techniques	<ul style="list-style-type: none"> <li>• Meaning and importance of time management – setting and prioritizing goals, creating a schedule, making lists of tasks, balancing work and leisure, using different optimization tools to break large tasks into smaller tasks.</li> </ul>	<ul style="list-style-type: none"> <li>• Game on time management</li> <li>• Checklist preparation</li> <li>• To-do-list preparation</li> </ul>	05
<b>Total</b>			<b>25</b>

Unit 3: Information and Communication Technology - III			
Expected Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 hrs)
1. Create a document on word processor	<ul style="list-style-type: none"> <li>• Introduction to word processing.</li> <li>• Software packages for word processing.</li> <li>• Opening and exiting the word processor.</li> <li>• Creating a document</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practice of the following:</li> <li>• Listing the features of word processing</li> <li>• Listing the software packages for word processing</li> <li>• Opening and exit the word processor</li> <li>• Creating a document</li> </ul>	10

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2. Edit, save and print a document in word processor	<ul style="list-style-type: none"> <li>• Editing text</li> <li>• Wrapping and aligning the text</li> <li>• Font size, type and face</li> <li>• Header and Footer</li> <li>• Auto correct</li> <li>• Numbering and bullet</li> <li>• Creating table</li> <li>• Find and replace</li> <li>• Page numbering</li> <li>• Printing document</li> <li>• Saving a document in various formats</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practising the following:</li> <li>• Editing the text</li> <li>• Word wrapping and alignment</li> <li>• Changing font type, size and face</li> <li>• Inserting header and footer</li> <li>• Removing header and footer</li> <li>• Using autocorrect option</li> <li>• Insert page numbers and bullet</li> <li>• Save and print a document</li> </ul>	10
<b>Total</b>			<b>20</b>

<b>Unit 4: Entrepreneurial Skills – III</b>			
<b>Expected Learning Outcome</b>	<b>Theory (10 hrs)</b>	<b>Practical (15 hrs)</b>	<b>Duration (25 hrs)</b>
1. Describe the significance of entrepreneurial values and attitude	<ul style="list-style-type: none"> <li>• Values in general and entrepreneurial values</li> <li>• Entrepreneurial value orientation with respect to innovativeness, independence, outstanding performance and respect for work</li> </ul>	<ul style="list-style-type: none"> <li>• Listing of entrepreneurial values by the students.</li> <li>• Group work on identification of entrepreneurial values and their roles after listing or reading 2-3 stories of successful entrepreneur</li> <li>• Exhibiting entrepreneurial values in Ice breaking, rapport building, group work and home assignments</li> </ul>	10
2. Demonstrate the knowledge of attitudinal changes required to become an entrepreneur	<ul style="list-style-type: none"> <li>• Attitudes in general and entrepreneurial attitudes</li> <li>• Using imagination/ intuition</li> <li>• Tendency to take moderate risk</li> <li>• Enjoying freedom of expression and action</li> <li>• Looking for economic opportunities</li> <li>• Believing that we can</li> </ul>	<ul style="list-style-type: none"> <li>• Preparing a list of factors that influence attitude in general and entrepreneurial attitude</li> <li>• Demonstrating and identifying own entrepreneurial attitudes during the following micro lab activities like</li> </ul>	15

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	change the environment <ul style="list-style-type: none"> <li>• Analyzing situation and planning action</li> <li>• Involving in activity</li> </ul>	thematic appreciation test <ul style="list-style-type: none"> <li>• Preparing a short write-up on “who am I”</li> <li>• Take up a product and suggest how its features can be improved</li> <li>• Group activity for suggesting brand names, names of enterprises, etc.</li> </ul>	
<b>Total</b>			<b>25</b>

### Unit 5: Green Skills – III

Expected Learning Outcomes	Theory (07 hrs)	Practical (08 hrs)	Duration (15 hrs)
1. Describe importance of main sector of green economy	<ul style="list-style-type: none"> <li>• Main sectors of green economy- E-waste management, green transportation, renewal energy, green construction, water management</li> <li>• Policy initiatives for greening economy in India</li> </ul>	<ul style="list-style-type: none"> <li>• Preparing a poster on any one of the sectors of green economy</li> <li>• Writing a two-page essay on important initiatives taken in India for promoting green economy</li> </ul>	08
2. Describe the major green Sectors/Areas and the role of various stakeholder in green economy	<ul style="list-style-type: none"> <li>• Stakeholders in green economy</li> <li>• Role of government and private agencies in greening cities, buildings, tourism, industry, transport, renewable energy, waste management, agriculture, water, forests and fisheries</li> </ul>	<ul style="list-style-type: none"> <li>• Preparing posters on green Sectors/Areas: cities, buildings, tourism, industry, transport, renewable energy, waste management, agriculture, water, forests and fisheries</li> </ul>	07
<b>Total</b>			<b>15</b>

### Part B : Vocational Skills

Sl.No.	Units	Duration (Hrs)
<b>1</b>	Introduction to Ornamental Fish Industry	11
<b>2</b>	Design and Layout of an ornamental fish culture unit	32
<b>3</b>	Fabrication and setting of different types of tanks.	33
<b>4</b>	Ornamental Fish Farm Management	37
<b>5</b>	Ornamental Fish Nutrition	52
<b>Total</b>		<b>165</b>

Unit 1: Introduction to Ornamental Fish Industry			
Expected Learning Outcome	Theory (4 hrs)	Practical (07 hrs)	Duration (11hrs)
1. Explain the scope and importance of ornamental fish trade.	<ul style="list-style-type: none"> <li>Present scenario of Ornamental Fish trade in the world</li> <li>Present status of ornamental fish farming and trade in India</li> <li>Strategies for improvement of ornamental fish industry in India</li> </ul>	<ul style="list-style-type: none"> <li>Collection of data from MPEDA journal</li> <li>Interpretation of data using graphs</li> </ul>	4
2. Identify commercially important ornamental fish species.	<ul style="list-style-type: none"> <li>Criteria for selection of species</li> <li>Classification of ornamental fishes based on                             <ul style="list-style-type: none"> <li>place of origin (Indigenous, Exotic)</li> <li>habitat (marine, freshwater and brackish water)</li> <li>method of reproduction (Livebearers, Egg layers)</li> </ul> </li> <li>Important families of ornamental fishes                             <ul style="list-style-type: none"> <li>Fresh-water Cyprinidae, Characidae, Cichlidae, Osphronemidae, Cobitidae, Poeciliidae</li> <li>Marine Pomacentridae, Chaetodontidae, Acanthuridae, Serranidae, Labridae</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Enlist commercially important</li> <li>Indigenous ornamental fishes</li> <li>Exotic fresh water ornamental fishes</li> <li>Marine ornamental fishes</li> </ul>	7
<b>Total</b>			<b>11</b>

Unit 2: Design and Layout of an Ornamental Fish Culture Unit			
Expected Learning Outcome	Theory (12 hrs)	Practical (20 hrs)	Duration (32 hrs)
1. Prepare a layout of small-scale ornamental fish breeding and rearing unit	<ul style="list-style-type: none"> <li>Criteria for selection of suitable site for fresh water ornamental fish culture unit.</li> <li>List out components required for a small scale breeding and rearing unit.</li> <li>List out facilities required for water treatment and</li> </ul>	<ul style="list-style-type: none"> <li>Site Survey and Layout preparation</li> </ul>	8

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	storage in ornamental fish hatchery and farm		
2. Prepare a layout of Live feed culture unit	<ul style="list-style-type: none"> <li>List out facilities required for Algal culture, Rotifer, Copepod, cladoceran Artemia and different types of worms.</li> </ul>	<ul style="list-style-type: none"> <li>List the facilities and prepare a layout of a live feed unit</li> </ul>	8
3. Prepare a layout for quarantine unit	<ul style="list-style-type: none"> <li>Enlist facilities required for a quarantine unit</li> </ul>	<ul style="list-style-type: none"> <li>List the facilities and prepare a layout of a quarantine unit</li> </ul>	8
4. Prepare a layout of Conditioning and Packing unit	<ul style="list-style-type: none"> <li>List out the infrastructure facilities required for conditioning and packing unit</li> </ul>	<ul style="list-style-type: none"> <li>List the facilities and prepare a layout of packing unit</li> </ul>	8
<b>Total</b>			<b>32</b>

### Unit 3: Fabrication and setting of different types of tanks

Expected Learning Outcome	Theory (12 hrs)	Practical (21 hrs)	Duration (33hrs)
1. Develop skill in the fabrication of glass tanks of different shapes and size	<ul style="list-style-type: none"> <li>Types of glasses used for the construction of Aquarium tanks</li> <li>Selection of glass panels for tank construction</li> <li>Cleaning of glass panels</li> <li>Fabrication of glass tanks</li> </ul>	<ul style="list-style-type: none"> <li>Fabrication of glass tanks</li> </ul>	12
2. Develop skill in the fabrication of Silpaulin tanks for ornamental fish culture unit.	<ul style="list-style-type: none"> <li>Merits and demerits of Silpaulin tanks.</li> <li>Selection of material</li> <li>Land preparation</li> <li>Laying Silpaulin sheets</li> </ul>	<ul style="list-style-type: none"> <li>Demonstration of Silpaulin tank fabrication</li> </ul>	5
3. Explain various parts of recirculatory aquaculture system.	<ul style="list-style-type: none"> <li>Working principle of RAS.</li> <li>Different components of RAS and its function</li> </ul>	<ul style="list-style-type: none"> <li>Prepare a lay out and label different components of RAS</li> </ul>	4
4. Demonstrate cleaning and disinfection of tanks for stocking.	<ul style="list-style-type: none"> <li>Importance of cleaning and disinfection.</li> <li>Different types of chemicals used for cleaning and disinfection.</li> <li>Methods of disinfection.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstration of cleaning and disinfection</li> </ul>	6

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5. Develop skill in setting of aquarium tanks with different accessories like aerators and filters	<ul style="list-style-type: none"> <li>• Selection of aerators, aeration grids, setting and working of different types of filters</li> <li>• Slow sand filter</li> <li>• Pressure sand filter</li> <li>• Cartridge filter</li> <li>• UV filter</li> <li>• Biological filter.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate setting of aquarium tanks with aeration systems and filters.</li> </ul>	6
<b>Total</b>			<b>33</b>

Unit 4: Ornamental Fish Farm Management			
Expected Learning Outcome	Theory (16 hrs)	Practical (21 hrs)	Duration (37 hrs)
1. Perform prestocking management in culture ponds.	<ul style="list-style-type: none"> <li>• Explain the eradication of Weeds, Pests and Predators in fish culture ponds.</li> <li>• Explain the method of Pond fertilization for production of live foods</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration of steps in prestocking management.</li> <li>• Calculation of dosage of weedicide, pesticide, lime and fertilizer</li> </ul>	9
2. Develop skill in quarantining and acclimatization of ornamental fishes	<ul style="list-style-type: none"> <li>• Explain quarantine procedure.</li> <li>• Explain the process acclimatization</li> </ul>	<ul style="list-style-type: none"> <li>• Practice quarantine procedure</li> <li>• Practice acclimatization procedure</li> </ul>	7
3. Perform stocking in ponds	<ul style="list-style-type: none"> <li>• Selection of seed</li> <li>• stocking density</li> <li>• Biomass calculation and stocking</li> </ul>	<ul style="list-style-type: none"> <li>• Practice calculation of stocking density, Biomass</li> <li>• Practice selection of seed and stocking</li> </ul>	7
4. Develop skill in water quality analysis	<ul style="list-style-type: none"> <li>• Important water quality parameters (pH, Alkalinity, Ammonia, Nitrate, Nitrite)</li> <li>• Transparency and its role in productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Practice water quality analysis</li> <li>• Practice estimation of transparency</li> </ul>	14
<b>Total</b>			<b>37</b>

Unit 5: Ornamental Fish Nutrition			
Expected Learning Outcomes	Theory (21hrs)	Practical (31hrs)	Duration (52hrs)
1. List out nutritional requirements of ornamental fishes according to life stages	<ul style="list-style-type: none"> <li>• Nutritional requirement of early larvae, juveniles and brood stock.</li> <li>• Nutritional requirement for herbivorous and carnivorous fishes.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop charts on nutritional requirements of gold fish, Angel and Guppy</li> </ul>	5
2. Develop skill in	<ul style="list-style-type: none"> <li>• Classification of</li> </ul>	<ul style="list-style-type: none"> <li>• Selection of ingredients</li> </ul>	



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formulated feed preparation using locally available ingredients	<ul style="list-style-type: none"> <li>ingredients (energy source, Protein source and Fat source)</li> <li>• Procedure for feed formulation</li> <li>• Preparation of feed</li> </ul>	<ul style="list-style-type: none"> <li>• Feed formulation</li> <li>• Practice on feed preparation.</li> </ul>	11
3. Identify the important live feeds and explain its significance in ornamental fish culture	<ul style="list-style-type: none"> <li>• Importance of live feeds in ornamental fish culture</li> <li>• Criteria for selection of live feeds</li> <li>• classification of Common live feeds (phytoplankton, Zooplankton, Protozoans, Worms)</li> </ul>	<ul style="list-style-type: none"> <li>• Draw the figure of live feeds in activity book (Chlorella, Rotifer, Moina, Copepod, Worms)</li> </ul>	8
4. Develop skill in live feed culture for ornamental fishes	<ul style="list-style-type: none"> <li>• Cleaning of glassware and utensils for live feed culture</li> <li>• Preparation of microalgal culture media.</li> <li>• Microalgal culture methodology</li> <li>• Culture methods of Rotifer, Moina, Artemia and worms.</li> <li>• Harvesting Methods</li> </ul>	<ul style="list-style-type: none"> <li>• Cleaning of glassware and utensils</li> <li>• Preparation of microalgal culture media</li> <li>• Culture and maintenance of microalgae</li> <li>• Culture of live feeds</li> </ul>	20
5. Demonstrate feeding of fish larvae and brood stock fishes using live feeds and artificial feeds.	<ul style="list-style-type: none"> <li>• Harvesting methods of live feeds.</li> <li>• Feeding methods of live feed according to mouth size</li> <li>• Feeding schedule of live feeds and artificial feeds for fish larvae and brood stock fishes</li> </ul>	<ul style="list-style-type: none"> <li>• Practice, collection, washing and feeding of live feed</li> <li>• Practice feeding of artificial feeds</li> </ul>	8
<b>Total</b>			<b>52</b>

### CLASS 12

#### Part A: Employability Skills

Sl.No.	Units	Duration (hrs)
1	Communication Skills- IV	25
2	Self-management Skills - IV	25
3	Information and Communication Technology Skills - IV	20
4	Entrepreneurial Skills - IV	25
5	Green Skills - IV	15
	<b>Total</b>	<b>110</b>

<b>Unit 1: Communication Skills - IV</b>			
<b>Expected Learning Outcome</b>	<b>Theory (10 hrs)</b>	<b>Practical (15 hrs)</b>	<b>Duration (25 hrs)</b>
1. Describe the steps to active listening skills	<ul style="list-style-type: none"> <li>• Importance of active listening at workplace</li> <li>• Steps to active listening</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration of the key aspects of becoming active listener</li> <li>• Preparing posters of steps for active listening</li> </ul>	10
2. Demonstrate basic writing skills	<ul style="list-style-type: none"> <li>• Writing skills to the following:</li> <li>• Sentence</li> <li>• Phrase</li> <li>• Kinds of Sentences</li> <li>• Parts of Sentence</li> <li>• Parts of Speech</li> <li>• Articles</li> <li>• Construction of a Paragraph</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practice of writing sentences and paragraphs on topics related to the subject</li> </ul>	15
<b>Total</b>			<b>25</b>

<b>Unit 2: Self-Management Skills – IV</b>			
<b>Expected Learning Outcome</b>	<b>Theory (10 hrs)</b>	<b>Practical (15 hrs)</b>	<b>Duration (25 hrs)</b>
1. Describe the various factors influencing self-motivation	<ul style="list-style-type: none"> <li>• Finding and listing motives (needs and desires);</li> <li>• Finding sources of motivation and inspiration (music, books, activities); expansive thoughts; living fully in the present moment; dreaming big</li> </ul>	<ul style="list-style-type: none"> <li>• Group discussion on identifying needs and desire</li> <li>• Discussion on sources of motivation and inspiration</li> </ul>	10
2. Describe the basic personality traits, types and disorders	<ul style="list-style-type: none"> <li>• Describe the meaning of personality</li> <li>• Describe how personality influence others</li> <li>• Describe basic personality traits</li> <li>• Describe common personality disorders- paranoid, antisocial, schizoid, borderline, narcissistic, avoidant, dependent and obsessive</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the knowledge of different personality types</li> </ul>	15
<b>Total</b>			<b>25</b>

Unit 3: Information and Communication Technology Skills - IV			
Expected Learning Outcome	Theory (06 hrs)	Practical (14 hrs)	Duration (20 hrs)
1. Perform tabulation using spreadsheet application	<ul style="list-style-type: none"> <li>• Introduction to spreadsheet application</li> <li>• Spreadsheet applications</li> <li>• Creating a new worksheet</li> <li>• Opening workbook and entering text</li> <li>• Resizing fonts and styles</li> <li>• Copying and moving</li> <li>• Filter and sorting</li> <li>• Formulas and functions</li> <li>• Password protection.</li> <li>• Printing a spreadsheet.</li> <li>• Saving a spreadsheet in various formats.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practice on the following:</li> <li>• Introduction to the spreadsheet application</li> <li>• Listing the spreadsheet applications</li> <li>• Creating a new worksheet</li> <li>• Opening the workbook and enter text</li> <li>• Resizing fonts and styles</li> <li>• Copying and move the cell data</li> <li>• Sorting and Filter the data</li> <li>• Applying elementary formulas and functions</li> <li>• Protecting the spreadsheet with password</li> <li>• Printing a spreadsheet</li> <li>• Saving the spreadsheet in various formats.</li> </ul>	10
2. Prepare presentation using presentation application	<ul style="list-style-type: none"> <li>• Introduction to presentation</li> <li>• Software packages for presentation</li> <li>• Creating a new presentation</li> <li>• Adding a slide</li> <li>• Deleting a slide</li> <li>• Entering and editing text</li> <li>• Formatting text</li> <li>• Inserting clipart and images</li> <li>• Slide layout</li> <li>• Saving a presentation</li> <li>• Printing a presentation document.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration and practice on the following:</li> <li>• Listing the software packages for presentation</li> <li>• Explaining the features of presentation</li> <li>• Creating a new presentation</li> <li>• Adding a slide to presentation.</li> <li>• Deleting a slide</li> <li>• Entering and edit text</li> <li>• Formatting text</li> <li>• Inserting clipart and images</li> <li>• Sliding layout</li> <li>• Saving a presentation</li> <li>• Printing a presentation document</li> </ul>	10
<b>Total</b>			<b>20</b>

<b>Unit 4: Entrepreneurial Skills - IV</b>			
<b>Expected Learning Outcome</b>	<b>Theory (10 hrs)</b>	<b>Practical (15 hrs)</b>	<b>Duration (25 hrs)</b>
1. Identify the general and entrepreneurial behavioural competencies	<ul style="list-style-type: none"> <li>Barriers to becoming entrepreneur</li> <li>Behavioural and entrepreneurial competencies – adaptability/decisiveness, initiative/perseverance, interpersonal skills, organizational skills, stress management, valuing service and diversity</li> </ul>	<ul style="list-style-type: none"> <li>Administering self-rating questionnaire and score responses on each of the competencies</li> <li>Collect small story/ anecdote of prominent successful entrepreneurs</li> <li>Identify entrepreneurial competencies reflected in each story and connect it to the definition of behavioural competencies</li> <li>Preparation of competencies profile of students</li> </ul>	10
2. Demonstrate the knowledge of self-assessment of behavioural competencies	<ul style="list-style-type: none"> <li>Entrepreneurial competencies in particular: self-confidence, initiative, seeing and acting on opportunities, concern for quality, goal setting and risk taking, problem solving and creativity, systematic planning and efficiency, information seeking, persistence, influencing and negotiating, team building</li> </ul>	<ul style="list-style-type: none"> <li>Games and exercises on changing entrepreneurial behaviour and development of competencies for enhancing self-confidence, problem solving, goal setting, information seeking, team building and creativity</li> </ul>	15
<b>Total</b>			<b>25</b>

<b>Unit 5: Green Skills - IV</b>			
<b>Expected Learning Outcome</b>	<b>Theory (05 hrs)</b>	<b>Practical (10 hrs)</b>	<b>Duration (15 hrs)</b>
1. Identify the role and importance of green jobs in	<ul style="list-style-type: none"> <li>Role of green jobs in toxin-free homes,</li> </ul>	<ul style="list-style-type: none"> <li>Listing of green jobs and preparation of</li> </ul>	15

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different sectors	<ul style="list-style-type: none"> <li>• Green organic gardening, public transport and energy conservation,</li> <li>• Green jobs in water conservation</li> <li>• Green jobs in solar and wind power, waste reduction, reuse and recycling of wastes,</li> <li>• Green jobs in green tourism</li> <li>• Green jobs in building and construction</li> <li>• Green jobs in appropriate technology</li> <li>• Role of green jobs in Improving energy and raw materials use</li> <li>• Role of green jobs in limiting greenhouse gas emissions</li> <li>• Role of green jobs minimizing waste and pollution</li> <li>• Role of green jobs in protecting and restoring ecosystems</li> <li>• Role of green jobs in support adaptation to the effects of climate change</li> </ul>	<p>posters on green job profiles</p> <ul style="list-style-type: none"> <li>• Prepare posters on green jobs.</li> </ul>	
<b>Total</b>			<b>15</b>

### Part B–Vocational Skills

Sl.No.	Units	Duration (hrs)
<b>1</b>	Aquarium Plants	12
<b>2</b>	Breeding and rearing of live bearers	47
<b>3</b>	Breeding and rearing of egg layers	47
<b>4</b>	Ornamental fish health management	37
<b>5</b>	Entrepreneurship development in ornamental fish culture	17
<b>6</b>	Health and Safety at workplace	05
<b>Total</b>		<b>165</b>

### Unit 1: Aquarium Plants

Expected Learning Outcome	Theory (6 hrs)	Practical (6 hrs)	Duration (12 hrs)
1. Identify common aquarium plants for ornamental fish breeding	<ul style="list-style-type: none"> <li>• List out common aquarium plants (Valisneria, Hydrilla, Najas, Myriophyllum, Echinodorus, Ceratophyllum)</li> </ul>	<ul style="list-style-type: none"> <li>• Collection of live plants and preparation of herbarium.</li> </ul>	4
2. Explain the role of aquarium plants in	<ul style="list-style-type: none"> <li>• Role of aquarium plants -Egg collectors</li> </ul>	<ul style="list-style-type: none"> <li>• List out various plants used for</li> </ul>	4

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water quality management	<ul style="list-style-type: none"> <li>-Increase beauty</li> <li>-Increase water quality</li> <li>-Nitrogen cycle</li> <li>-Photosynthesis</li> </ul>	breeding of ornamental fishes	
3. Develop skill in maintaining aquarium plants	<ul style="list-style-type: none"> <li>• Collection of plants from wild and shop</li> <li>• Disinfection of plants (KMNO<sub>4</sub> &amp; salt)</li> <li>• Maintenance of plant (planting, fertilizing, pruning)</li> </ul>	<ul style="list-style-type: none"> <li>• Practice disinfection of aquarium plants</li> </ul>	4
<b>Total</b>			<b>12</b>

Unit 2: Breeding and Rearing of Live Bearers			
Expected Learning Outcome	Theory (17 hrs)	Practical (30 hrs)	Duration (47 hrs)
1. Identify male and female of guppy, platy, molly and sword tail	<ul style="list-style-type: none"> <li>• Explain the difference between male and female guppy.</li> <li>• Explain the difference between male and female platy.</li> <li>• Explain the difference between male and female molly.</li> <li>• Explain the difference between male and female sword tail.</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of the male and female done by examination (external morphology) of live and dead specimen.</li> </ul>	10
2. Develop skill in brood stock management of livebearers	<ul style="list-style-type: none"> <li>• Explain the various steps involved in brood stock management from collection of brooders, quarantining, stocking and feeding.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the various steps involved in brood stock management - collection of brooders, quarantining, stocking and feeding</li> </ul>	11
3. Develop skill in setting of breeding tanks	<ul style="list-style-type: none"> <li>• Explain the different methods of setting the breeding tank</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the method of setting the breeding tank</li> </ul>	11
4. Develop skill in larval rearing of live bearers	<ul style="list-style-type: none"> <li>• Explain the different methods of larval rearing of livebearers</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the methods of larval rearing of livebearers</li> </ul>	8
5. Develop skill in conditioning of fish for packing and transportation	<ul style="list-style-type: none"> <li>• Explain the steps involved in conditioning and packing of fish for transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the method of conditioning and packing of fish for transportation</li> </ul>	7
<b>Total</b>			<b>47</b>

<b>Unit 3: Breeding and Rearing of Egg Layers</b>			
<b>Expected Learning Outcome</b>	<b>Theory (17 hrs)</b>	<b>Practical (30 hrs)</b>	<b>Duration (47 hrs)</b>
1. Identify male and female of gold fish and angel fish	<ul style="list-style-type: none"> <li>• Explain the difference between male and female gold fish</li> <li>• Explain the difference between male and female angel fish.</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of the male and female done by examination (external morphology) of live and dead specimen.</li> </ul>	10
2. Develop skill in brood stock management of egg layers.	<ul style="list-style-type: none"> <li>• Explain the various steps involved in brood stock management from collection of brooders, quarantining, stocking and feeding.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the various steps involved in brood stock management - collection of brooders, quarantining, stocking and feeding</li> </ul>	11
3. Develop skill in setting of breeding tanks	<ul style="list-style-type: none"> <li>• Explain the different methods involved in the setting of the breeding tank of gold fish</li> <li>• The setting of the breeding tank of angel fish.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the method of setting of the breeding tank.</li> </ul>	11
4. Develop skill in larval rearing of egg layers	<ul style="list-style-type: none"> <li>• Explain the different methods of larval rearing of egg layers</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the methods of larval rearing of egg layers</li> </ul>	8
5. Develop skill in conditioning of fish for packing and transportation	<ul style="list-style-type: none"> <li>• Explain the steps involved in conditioning and packing of fish for transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Practice the method of conditioning and packing of fish for transportation</li> </ul>	7
<b>Total</b>			<b>47</b>

<b>Unit 4: Fish Health Management</b>			
<b>Expected Learning Outcome</b>	<b>Theory (15hrs)</b>	<b>Practical (22 hrs)</b>	<b>Duration (37 hrs)</b>
1. Identify common bacterial, fungal, viral, protozoan and parasitic infections found in Ornamental fishes.	<ul style="list-style-type: none"> <li>• List out common fish diseases caused by Bacteria, Fungus, Virus, Protozoa and parasites</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnosis of disease by symptoms.</li> </ul>	13
2. Develop skills in applying prophylactic measures in aquariums.	<ul style="list-style-type: none"> <li>• Explain quarantine, hospital tanks, biosecurity, Water quality management, proper nutrition and proper feeding.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice quarantine, biosecurity, water quality management, and feeding</li> </ul>	12

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3. Develop skills in the application of therapeutics in aquariums	<ul style="list-style-type: none"> <li>List out commonly used antibiotics, and chemicals for treatment and its dosage</li> <li>Oxytetracyclin, Common salt, KMnO<sub>4</sub>, Formalin, Malachite green and <i>Murivenna</i></li> </ul>	<ul style="list-style-type: none"> <li>Practice the use of antibiotics and chemicals and calculation of its dosage.</li> </ul>	12
<b>Total</b>			<b>37</b>

Unit 5: Entrepreneurship Development in Ornamental Fish Culture			
Expected Learning Outcome	Theory (08hrs)	Practical (09 hrs)	Duration (17hrs)
1. List the infrastructural facilities required for an ornamental fish breeding and rearing unit	<ul style="list-style-type: none"> <li>Fixed assets (Land, Buildings, machineries/equipment, Tanks etc.)</li> <li>Variable cost (raw material)</li> <li>Operational expenses (Salary, brood stock, feed, electricity, packing, transportation etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Visit to Ornamental fish culture units and collect data for economic analysis</li> </ul>	5
2. Explain the role of Start-ups in the aquarium industry	<ul style="list-style-type: none"> <li>Role of Kerala Start-up Mission (KSUM) and National Institute of Agricultural Extension Management (MANAGE). Incubation centres</li> </ul>	<ul style="list-style-type: none"> <li>Prepare a proposal for start-up</li> </ul>	4
3. Prepare a model bankable project for establishing an ornamental fish culture unit.	<ul style="list-style-type: none"> <li>Based on the listed infrastructural facilities and their price, explain the method of preparing a model project for establishing ornamental fish breeding and rearing unit.</li> </ul>	<ul style="list-style-type: none"> <li>Prepare a bankable project</li> </ul>	5
4. List out organizations giving assistance to ornamental fish culture unit.	<ul style="list-style-type: none"> <li>Department of Fisheries, Kerala</li> <li>KAVIL</li> <li>MPEDA</li> <li>NFDB</li> <li>CMFRI</li> </ul>	<ul style="list-style-type: none"> <li>Visit organisations and</li> <li>Collect data of various schemes</li> </ul>	3
<b>Total</b>			<b>17</b>

Unit 6: Health and Safety at Workplace			
Expected Learning Outcome	Theory (02hrs)	Practical (03 hrs)	Duration (05hrs)
1 Explain safety , security, green protocol, personal hygiene and sanitation measures to be taken at	<ul style="list-style-type: none"> <li>Meaning of safety and security.</li> <li>Major safety and security requirements.</li> </ul>	<ul style="list-style-type: none"> <li>List out various safety equipment</li> <li>Practice safety measures according</li> </ul>	3



work place.	<ul style="list-style-type: none"> <li>• List of major safety equipment..</li> <li>• Basic safety checks for equipment.</li> <li>• Meaning of risk and major risk factors.</li> <li>• Importance of protective clothing and gears at work place.</li> <li>• Mention green protocol and application of green protocol</li> <li>• Importance of personal hygiene and sanitation.</li> </ul>	<p>to the situations.</p> <ul style="list-style-type: none"> <li>• List out major risk factors and make awareness posters.</li> <li>• Prepare a chart on green protocol to be followed with in industry.</li> <li>• Prepare a chart on personal hygiene.</li> <li>• Prepare an action plan for sanitation.</li> </ul>	
2 Explain reporting of accidents and emergencies	<ul style="list-style-type: none"> <li>• Meaning of accidents and emergencies.</li> <li>• First Aids to be given at situations of accidents and emergencies.</li> <li>• Reporting of accidents and emergencies</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare posters on first aids given at emergency situation.</li> <li>• Prepare posters on managing emergency</li> </ul>	2
<b>Total</b>			<b>5</b>

## **6. ORGANISATION OF FIELD VISITS/ON-THE-JOB TRAINING**

In a year, at least 3 field visits/educational tours should be organized for the students to expose them to the activities in the workplace. Visit an ornamental fish culture unit and observe the following: Location, Site, Species, Breeding units, rearing units, larval rearing system, Live feed culture units, quarantine sections, Conditioning and packing section, working of various types of filters, aeration system and water treatment. During the visit students should obtain the following observation from the owner or supervisor of the ornamental fish breeding unit.

1. Lay out of the farm
2. Species cultured
3. Total production
2. Number of cycles
3. Marketing procedure
4. Man power requirement
5. Total capital investment
6. Total cost of production
7. Total annual income
8. Profit/Loss (Annual)
12. Challenges faced by the farmers

On-the-job training of at least 80 hours is to be organised by the institution to provide hands-on training to the students.

## **7. LIST OF EQUIPMENT AND MATERIALS**

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

Sl.No.	Item	Sl.No.	Item
1	Glass size 24 x 12 x 12 inches (4mm)	28	Fibre tank (100 litre)
2	Silicon sealant	29	Plastic bucket (20 litre)
3	Gun	30	Plastic mug (1 litre)
4	Silpaulin 12 x 12m (GSM)	31	Scoop net large
5	Seechi disc	32	Scoop net medium
6	Water quality testing kit	33	Scoop net small
7	Salino meter	34	Gas stove with connection
8	Measuring Tape 30 m	35	Cooker 10 litre
9	Meter scale	36	Plastic basin
10	PVC Pipe ½” (3 length)	37	1/2” hose
11	Bend, T, Elbow	38	Garden hose
12	Stopper	39	1/2” motor with fittings
13	Control valve	40	knife
14	Air control valve	41	Scissors
15	Aeration tube	42	Oxygen cylinder with opener
16	Air stone	43	Aquarium heater
17	Lead weight	44	Generator
18	+, -, T connection	45	Breeding trap / Nets
19	Small aerator	46	Weighing balance (1-5kg)
20	Sponge filter	47	Weighing balance (1-2kg)
21	Cartridge fitter with candle (small type)	48	Weighing balance (0-1kg)
22	UV lamp filter (Small type)	49	Scrubber
23	Extruder	50	Thermocol
24	Black silpaulin sheet (12 x 12)		
25	Solar drier (Small size)		
26	Microscope		
27	Artemia harvesting net		

## 8. LIST OF CONTRIBUTORS

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