

**Course Curricula**  
**Under**  
**SKILL DEVELOPMENT INITIATIVE SCHEME**  
**(SDIS)**

**(Based on Modular Employable Skills)**

**FISHERIES & ALLIED SECTORS**

**Government of India**  
**Ministry of Labour & Employment**  
**Directorate General of Employment & Training**

**Course Curricula for Short Term Courses based on Modular  
Employable Skills (MES) in Fisheries & Allied Sector**

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**List of Members Attended the Trade Committee Meeting on dated**

Sl. No.	Name & Designation	Organisation	
1.	Ms. S.K. P. Sodhi, IAS Secretary(Labour) ),	Andaman & Nicobar Administration	Chairman
2.	Dr. S. Dam Roy Head of Division (Fisheries)	Central Agricultural Research Institute, Port Blair	Member
3.	Dr. C. S. Chaturvedi, Senior Scientist ( Fishing Science)	Central Agricultural Research Institute, Port Blair	Member
4.	Dr. P. Krishnan Scientist	Central Agricultural Research Institute, Port Blair	Member
5.	Dr. N. V. Vinith Kumar Officer – In – Charge	National Institute of Ocean Technology, Port Blair	Member
6.	Ms. J. Mary Leema Technical Officer	National Institute of Ocean Technology, Port Blair	Member
7.	Shri Nagesh Ram, Subject Matter Specialist (Fisheries)	Krishi Vigyan Kendra, CARI, Port Blair	Member
8.	Arif Mohd. Mustafa Assistant Director (Fisheries)	Directorate of Fisheries, A & N Administration, Port Blair	Member
9.	Shri S. K. Talukdar Asst. Fisheries Dev. Officer	Directorate of Fisheries, A & N Administration, Port Blair	Member
10.	T. B. Dinesan Bosun	Directorate of Fisheries, A & N Administration, Port Blair	Member
11.	Shri T. S. Subramanian General Manager (Technical)	MAK Logistics (P) Ltd., Port Blair	Member
12.	Shri C. Raja, ASI/RO	Police Radio, A & N Admnistra- tion, Port Blair	Member
13.	Shri B. Roy, SL/RT	Police Radio, A & N Admnistra- tion, Port Blair	Member
14.	Shri A. Sanyasi Rao	Santoshi Mata Fishermen Co- operative Society, Port Blair	Member
15.	Shri A. Ponnaiah	Wetafor Fishermen Co-operative Society, Port Blair	Member
16.	Shri B. Raja Rao	Youth Fishermen Co-operative Society, Port Blair	Member
17.	D. Suryanarayana	Youth Fishermen Co-operative Society, Port Blair	Member
18.	Mohd. Mansoor, Principal	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
19.	Shri Vennkatesh Ch, VI(RAC)	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
20.	Shri T. Narendra Nath, VI(MMV)	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
21.	Shri Sreechander Das, VI	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
22.	Shri R. Ramchandran, VI	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
23.	Shri L. Senthil, VI	Govt. Industrial Training Insti- tute, A & N Admn., Port Blair	Member
24.	Shri M. K. Parial, Deputy Director,	Foremen Training Institute, Jamshedpur	Member
25.	Shri S. B. Sardar, Training Officer	Central Staff Training & Research Institute, Kolkata	Member

## **Skill Development based on Modular Employable Skills (MES)**

### **Background**

The need for giving emphasis on Skill Development, especially for the educated unemployed youth (both for rural & urban) has been highlighted in various forums. Unfortunately, our country's current education system does not give any emphasis on development of skills. As a result, most of the educated unemployed youths are found wanting in this area, which is becoming their Achilles heel.

As India is on the path of economic development and the share of service sector's contribution to the GDP of the country is increasing (53% of GDP) it is becoming imperative that Government of India along with other nodal agencies play an important role in providing employable skills, with special emphasis on Skills.

Hence, need of the hour is some policy change at Apex level which will address the needs of the changing economy and look at providing mandatory skills training to all educated unemployed youths, with a view to have them gainfully employed. This shift in policy will ultimately benefit all the stake holders, namely the individuals, industry, Government and the economy by way of providing employment, increasing the output/productivity and ultimately resulting in a higher GDP for the nation.

- **Frame work for skill development based on 'Modular Employable Skills (MES)'**

Very few opportunities for skill development are available for the above referred groups (educated unemployed youth). Most of the existing skill development programmes are long term in nature. Poor and less educated persons cannot afford long term training programmes due to higher entry qualifications, opportunity cost, etc. Therefore, a new framework for skill development has been evolved by the DGET to address the employability issues.

The **key features of new framework for skill development** are:

- Demand driven short term training courses based on modular employable skills decided in consultation with Industries.
- Flexible delivery mechanism (part time, week ends, full time)
- Different levels of programmes (foundation level as well as skill up gradation) to meet demands of various target groups
- Central Government will facilitate and promote training while vocational training (VT) providers under the Govt. and Private Sector will provide training
- Optimum utilization of existing infrastructure to make training cost effective.
- Testing of skills of trainees by independent assessing bodies who would not be involved in conduct of the training programme, to ensure that it is done impartially.
- Testing & certification of prior learning (skills of persons acquired informally)

The Short Term courses would be based on "Modular Employable Skills (MES)".

The **concept for the MES** is:

- ✓ Identification of minimum skills set. Which is sufficient to get an employment in the Labour market.
- ✓ It allows skills upgradation, multi skilling, multi entry and exit, vertical mobility and life long learning opportunities in a flexible manner.
- ✓ It also allows recognition of prior learning (certification of skills acquired informally) effectively.
- ✓ The modules in a sector when grouped together could lead to a qualification equivalent to National Trade Certificate or higher.
- ✓ Courses could be available from level 1 to level 3 in different vocations depending upon the need of the employer organisations.
- ✓ MES would benefit different target groups like:
  - Workers seeking certification of their skills acquired informally
  - Workers seeking skill upgradation
  - Early school drop-outs and unemployed
  - Previously child Labour and their family

## INTRODUCTION

Economic growth in India is increasingly supported by robust industrial growth. Fisheries & allied sector is one of the relatively lesser known but significant sectors that support almost all industrial activity. However, notwithstanding its importance and size (INR 4 trillion), it has traditionally not been accorded the attention it deserves as a separate sector in itself. The level of inefficiency in Fisheries & allied sector activities in the country has been very high across all modes.

The required pace of efficiency and quality improvement will demand rapid development of capabilities of Fisheries & allied service providers. And with Fisheries & allied sector being a service oriented sector, skill development will emerge as a key capability.

This lack of focus on developing manpower and skills for the Fisheries & allied sector has resulted in a significant gap in the numbers and quality of manpower in the sector.

This gap, unless addressed urgently, is likely to be a key impediment in the growth of the Fisheries & allied sector in India and in consequence, could impact growth in industry and manufacturing sectors as well.

This underscores the need identifying areas where such manpower and skill gaps are critical, and developing focused action plans to improve the situation.

A look at the required initiatives for manpower development in the sector makes it clear that sustainable development of the sector's manpower requires a collaborative public private effort. The level of commitment demonstrated by each stakeholder would largely determine the direction that the sector heads towards.

### **Age of participants**

The minimum age limit for persons to take part in the scheme is 14 years but there is no upper age limit.

## **Curriculum Development Process**

Following procedure is used for developing course curricula

- Identification of Employable Skills set in a sector based on division of work in the Labour market.
- Development of training modules corresponding to skills set identified so as to provide training for specific & fit for purpose
- Organization of modules in to a Course Matrix indicating vertical and horizontal mobility. The course matrix depicts pictorially relation among various modules, pre requisites for higher level modules and how one can progress from one level to another.
- Development of detailed curriculum and vetting by a trade committee and by the NCVT

(Close involvement of Employers Organizations, State Governments and experts, vocational

Training providers and other stakeholders are ensured at each stage).

## **Development of Core Competencies**

Possession of proper attitudes is one of the most important attributes of a competent person. Without proper attitudes, the performance of a person gets adversely affected. Hence, systematic efforts will be made to develop attitudes during the training programme.

The trainees deal with men, materials and machines. They handle sophisticated tools and instruments. Positive attitudes have to be developed in the trainees by properly guiding them and setting up examples of good attitudes by demonstrated behaviours and by the environment provided during training.

Some important core competencies to be developed are:

1. Communication skills
2. Better usage of English language/Vernacular
3. Presentation skills
4. Self management
5. Resume preparation
6. GD participation/facing techniques
7. Interview facing techniques

Following competencies should also be developed during level-II and higher courses:

1. Ability for planning, organizing and coordinating
2. Creative thinking, problem solving and decision-making
3. Leadership
4. Ability to bear stress
5. Negotiation

## **Duration of the Programme :**

Time taken to gain the qualification will vary according to the pathway taken and will be kept very flexible for persons with different backgrounds and experience.

Duration has been prescribed in hours in the curriculum of individual module, which are based on the content and requirements of a MES Module. However, some persons may take more time than the prescribed time. They should be provided reasonable time to complete the course.

### **Pathways to acquire Qualification:**

**Access to** the qualification could be through:  
An approved training Programme.

### **Methodology**

The training methods to be used should be appropriate to the development of competencies. The focus of the programme is on “performing” and not on “Knowing”. Lecturing will be restricted to the minimum necessary and emphasis to be given for learning through active participation and involvement.

The training methods will be individual centered to make each person a competent one. Opportunities for individual work will be provided. The learning process will be continuously monitored and feedback will be provided on individual basis.

Demonstrations using different models, audio visual aids and equipment will be used intensively.

### **Instructional Media Packages**

In order to maintain quality of training uniformly all over the country, instructional media packages (IMPs) will be developed by the National Instructional Media Institute (NIMI), Chennai.

### **Assessment**

DGE&T will appoint assessing bodies to assess the competencies of the trained persons. The assessing body will be an independent agency, which will not be involved in conducting the training programme. This, in turn, will ensure quality of training and credibility of the scheme. Keeping in view, the target of providing training/testing of one million persons through out the country and to avoid monopoly, more than one assessing bodies will be appointed for a sector or an area.

### **Certificate**

Successful persons will be awarded competency-based certificates issued by **National Council for Vocational Training (NCVT)**.

Course MatrixFISHERIES AND ALLIED SECTOR

<b>Level</b>	<b>Module No</b>	<b>Name of the Module</b>
I	1	<b>Fishing operation</b>
I	2	<b>Operation, Maintenance &amp; Repair of fishing Boat Engines</b>
I	3	<b>Aquarium Fabrication &amp; Maintenance</b>
I	4	<b>Crab Culture &amp; Fattening</b>
I	5	<b>Fish Feed Preparation</b>
I	6	<b>Breeding of Ornamental Fish (Fresh Water)</b>
I	7	<b>Breeding of Carps</b>
I	8	<b>Fish Boat Building</b>
I	9	<b>Multiplication of Aquatic Ornamental Plant</b>
I	10	<b>Operation &amp; Basic Maintenance of Marine Refrigeration Equipment</b>
I	11	<b>Operation &amp; Basic Maintenance of Marine Electronic Equipment</b>
I	12	<b>Mussel Culture</b>
I	13	<b>Shrimp Hatchery</b>
I	14	<b>Shrimp Farming</b>
I	15	<b>Fish Processing</b>
I	16	<b>Preparation of Value Added Seafood Product</b>

**LEVEL - I****MODULE - 1**

<b>Name</b>	: <b>Fishing operation</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: <b>FSH 101</b>
<b>Entry Qualification</b>	: 5 <sup>th</sup> Standard,
<b>Age</b>	: 14 Years ( <b>Min</b> )
<b>Duration</b>	: 480 Hrs

**Terminal Competency**

On successful completion of training one should be able to acquire basic skills for fishing and operating of fishing gears / navigational aids.

<b>Practical</b>	<b>Theory</b>
Familiarization of fishing terminologies.	Concepts on Fishing
Practice on Swimming	Knowledge about waves & tides
Practice on Craft and Gear in Fishing Boat	Concept of Craft & gear Technology.
Operation of Onboard Fish Handling	Principles of fish handling
Safety, use and maintenance of store tools & equipments.	Introduction to different equipments used in boats
Operation in Fishing and Navigational aids.	Knowledge of Navigation and fishing Techniques.
Familiarization with different methods of preservation of nets and their maintenance	Knowledge of Fish net maintenance and fish handling
Visit to a fish processing Industries to understand different handling and processing methods	Introduction to fish processing and preservation methods

**Tools and equipments:**

1. Boat 40 feet long equipped with multiple kind of fishing equipment
2. Fishing gear models - Seines, gill nets, Traps, lines
3. Ice Boxes
4. Cut model Marine Engines Outboard and Inboard.
5. Navigation Equipment - GPS, Echo Sounder, Compass, VHF Radio
6. Various types of safety Equipments , life jackets etc
7. Radar reflector
8. Twines, needle, different size of hooks & lines, netting material

**LEVEL - I**  
**MODULE - 2**

**Name** : Operation, Maintenance & Repair of Fishing Boat Engines  
**CODE** : FSH 102  
**Sector** : Fisheries & allied sector  
**Entry Qualification** : 8<sup>th</sup> Standard  
**Age** : 16 Years  
**Duration** : 360 Hrs

**Terminal Competency**

On successful completion of training one should be able to independently operate fishing boat engines and also attend minor repairs and regular maintenance of boat engines.

Practical	Theory
Practice on personal hygiene and Safety; Use and maintenance of store tools & equipments.	Knowledge of tools and other equipments.
Practice on starting and maintaining Two Stroke and Four Stroke Marine Engines.	Working Knowledge of Two stroke and Four stroke Engines.
Practice on fuelling and its functions	Knowledge of Fuel line and its connections.
Practice on overhauling of Engine and its cooling systems	Knowledge of Engine cooling system.
Practice on Overhauling of transmission systems	Importance of Lubrication system
Practice on fixing of Electrical systems in the Engine.	Knowledge of Transmission system and Electrical fittings, wiring etc in the engine.

**Tools and equipments:- As required.**

1	Steel tool Box with Lock &Key (Folding Type) Size 400 x 200 x 150 mm	32	Micrometer outside 0-25mm,25-50mm.50-75mm,75-100mm
2	Steel Rule 15cm.English and metric	33	Piston ring filer
3	Screw Driver 20cm x 9mm Blade	34	Micrometer inside 25-50,50-75,75-150mm with extension rod
4	Screw Driver 30cm x 9mm Blade	35	Dial indicator to read 0.01 mm
5	Spanner DE set of 12 pieces (6mm to 32mm)	36	Spanner, ring offset set of 6(SAE) 2 sets
6	Chisel cold flat 20mm	37	Spanner for spark plugs 14mm
7	Ring spanner set of 12 pieces (6mm to 32mm)	38	Spanner, adjustable 20cm

8	Feeler gauge 20 blades (metric)	39	Chain and pulley block 3000kg capacity
9	Pliers combination	40	Spanners socket of 8 with handle bar and ratchet
10	Hand file 20cm.second cut	41	Stud remover
11	Allen key set of 12 pieces (2mm to 14mm)	42	Oil can 0.5-liter cap
12	Philips screw driver type set of 5 pieces 100mm to 300mm 14 sets 34 spanner, ring~ offset set.	43	Torque wrench set of 3 nos.
13	Center punch 10mm dia x 100 mm.	44	Vice grip pliers
14	Engineer's square 15cm blade.	45	Work bench each 250x 120x60 with 4 bench vices 12cm jaw
15	Chisels cross cut 200 x 6mm	46	Pullers screw powered 2mm with bearing puller attachment
16	Ball peen hammer 0.5kg	47	Spanner off set double ended set of 7 pieces (6mm-17mm)
17	Hacksaw frame adjustable for 30cm blade.	48	' V' block 75x38mm pair with clamps
18	Engineer's stethoscope 14 screw driver 30cm x 9mm blade	49	Tachometer- to read up to 5000rpm
19	"Hand vice 37mm	50	Piston ring compressor & ring expander
20	Cleaning tray-aluminum 45 x 30cm	51	Battery 12V
21	Valve spring compressor	52	Hydrometer
22	Drill twist (assorted)	53	Piston ring compressors
23	Taps and dies complete set in a box (metric) with handle	54	Valve spring lifter
24	Hollow punch set of seven pieces 6mm to 15mm I set	55	Vernier caliper 250 or 200mm inside, outside & depth
25	Tool valve grinding, suction type (consumable tool)	56	Vacuum gauge to read 0 to 760mm of hg
26	Fuel feed pump I no.	57	Compression testing gauge to read 0 to 115 kg/sq cm.
27	Surface plate 60 x 6~cm	58	Valve key inserter I no.
28	Bearing puller screw powered/hydraulic with	59	Fuel injection pump one with pneumatic governor one with R Q

	attachment max spread 80,200and300mm		governor and one with R.S.C. governor
29	Valve seat cutting tools complete with guides and pilot bar (all angles) in a box	60	Injectors of diesel engines
30	Cylinder bore gauge capacity 50to 150mm	61	Fuel feed pump
31	Hammer cooper I kg with handle I no.		

**General machineries:- One each**

1	Marine Diesel engine (4 stroke, multi cylinder) of different makes in running condition	7	Battery charger 6v-18v
2	Cut model of 4 stroke marine diesel engine on stand	8	Injector testing set (hand operated)
3	Common rail diesel injection vehicle on a stand with workshop manuals	9	Engine scanner
4	Electric pedestal grinder with two 18cm wheel	10	Injector dismantling jig with mounting bench
5	Drilling machine bench to drill up to 12mm dia	11	Engine cranker with 12v and 24v Ac to DC power supply system
6	Portable electric drill 6mm		

**LEVEL - I****MODULE - 3**

<b>Name</b>	: <b>Aquarium Fabrication and Maintenance</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: FSH 103
<b>Entry Qualification</b>	: 5 <sup>th</sup> Standard
<b>Age</b>	: 14 Years of age.
<b>Duration</b>	: 360 Hrs

**Terminal competencies:**

On successful completion of training one should be able to Independently design, fabricate and maintain freshwater and marine aquaria

<b>Practical</b>	<b>Theory</b>
Demonstration on aquaria and it's construction	Principles of aquarium keeping and familiarization with aquarium fishes.
	Types of aquarium(Freshwater / marine; Indoor/outdoor, etc)
	Familiarisation with tools & Equipments
Practice in making wooden and steel frames.	Concept of development of surfaces.
Practice in Glass cutting, Etching, Gluing, dressing' of sharp edges, groove cutting, hole making etc.	Methods of marking & cutting techniques with dimensions.
Practice in assembly of glass tank and frame and testing.	Assembly of glass edges techniques, Gluing techniques and dressing methods.
Preparation different kind of wooden roofs / hoods	Knowledge in hood preparation using wood and steel
Installation practice on aerators, sand bed preparation, Bedding of pellets	Knowledge of Aquarium water pumps, identifying sands and stone-pellets
Installation of cleaning devices, different types. Planting of aquatic plants & other artifacts.	Working knowledge of cleaning devices and selection of aquatic plants and preservation.
Methods of aquarium electrification	Knowledge of aquarium lighting and other installations.
Preparation and installation of aquarium items in brick work tank	Basic knowledge of arithmetic calculation and Selection of aquarium for indoor & outdoor
Using water quality testing kits and tools	Principles of water quality management and feed management
Practice on methods of fish quarantine and use of chemotherapy	Basic knowledge of common fish diseases - their diagnosis and treatment

**Tools and equipments: As per requirements**

Sl.NO.	DESCRIPTION	EQUIPMENTS
1	Aquarium	Glass/ acrylic Aquarium stand Hood and Lighting Aquarium gravel
2	Testing and monitoring	Thermometer Water test kit Net Heater PH meter
3	Decorations	Rocks Plants
4	Biological Aquarium Filtration	Sponge filters Under gravel filters Canister filters Standard Power filters
5	Mechanical Water Filtration	Canister filters power filters Under gravel filters
6	Chemical Aquarium Filtration	Canister filters (for activated carbon) power filters(for activated carbon) Ammono-chips for removing ammonia Nitra-zorb for removing nitrates Phos-zorb for removing phosphates
7	Fish health	Readymade slides of common fish disease causing agents

## LEVEL - I

MODULE- 4

NAME : Crab Culture and Fattening

SECTOR : Fisheries &amp; allied sector

CODE : FSH 104

ENTRY QUALIFICATION: 5<sup>th</sup> Std.

Age: 14 Years

DURATION: 240Hrs

**Terminal competency:**

On successful completion of training one should be able to culture and fatten the crabs.

Practical	Theory
<ul style="list-style-type: none"> <li>• Identification of different crabs</li> <li>• Site selection and design of proper enclosures</li> <li>• Analysis of hydrographical parameters</li> <li>• Identification of culturable crabs</li> <li>• Practice on collection and transportation of crab juveniles &amp; monitoring</li> <li>• Practice on water quality testing kits</li> <li>• Practice on harvesting; handling of live crabs and its transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to culturable crabs</li> <li>• Importance of pond design and construction</li> <li>• Water quality management; Water exchange</li> <li>• Collection and transportation of juveniles; acclimatization; stocking, feeding &amp; maintenance.</li> <li>• Method of culture / fattening of crabs</li> <li>• Methods of harvesting and transportation of crabs; Crab marketing</li> </ul>

**Tools and equipments : As per requirements**

SI.NO	TYPE	DESCRIPTION
1	Building & civil works	Design of sluice gate / fume pipe etc.
		Drainage pit and net work
		Water supply net work
		Filtration system / outlet
		Electrification and Installation
		Asbestos cement flat sheets
2	Machinery & Equipments	Pump House , Pump (3 HP), crab lift net.
		water pipes
		8 inch elbow PVC pipe

**LEVEL - I****MODULE - 5**

<b>NAME</b>	<b>Fish Feed preparation</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	<b>FSH 105</b>
<b>ENTRY QUALIFICATION</b>	5 <sup>th</sup> Standard
<b>AGE</b>	14 years
<b>DURATION</b>	240 Hrs

**Terminal competencies**

On successful completion of training one should be able to prepare formulated feeds.

<b>PRACTICAL</b>	<b>THEORY</b>
Identification and sourcing of common feed ingredients	Knowledge on conventional and non-conventional feed ingredients
	Types of feed
	Essentials of feed formulation
Practice in the operation of different feed equipments	Knowledge on equipments used for feed preparation
Practice in calculating different parameters	Parameters for measuring feed efficiency
Practice in preparation of formulated feed and their packing	Feed storage, packing, and marketing

**Tools and equipments**

<b>SI.NO.</b>	<b>DESCRIPTION</b>	
1	Feed palletizer	1
2	Mechanical drier	1
3	Grinder	1
4	Mini feed mill	1
5	Pressure cooker, gas stove	1 each
6.	Balance (electronic)	1
7	Mono pan balance (1 – 10 kg)	1

**LEVEL - I**  
**MODULE - 6**

<b>NAME</b>	<b>Breeding of Ornamental Fish (Freshwater)</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	<b>FSH 106</b>
<b>ENTRY QUALIFICATION</b>	5th Standard
<b>AGE</b>	14 years
<b>DURATION</b>	240 Hrs

**TERMINAL COMPETENCY:**

On successful completion of the training, one should be able to breed fresh water Ornamental Fishes

**CONTENTS:**

<b>PRACTICAL</b>	<b>THEORY</b>
Arrangement of tank & aeration system	<ul style="list-style-type: none"> <li>• Skill on breed fish type</li> </ul>
Requirements, design of breed tank	<ul style="list-style-type: none"> <li>• Introduction to freshwater ornamental fishes and their breeding habit Brood stock development breeding</li> </ul>
Setting up of tank, aeration, water exchange	<ul style="list-style-type: none"> <li>• Breeding technique and seed production</li> </ul>
Brood fish identification (male& female) and breeding techniques.	<ul style="list-style-type: none"> <li>• Water quantity management</li> <li>• Larval rearing</li> <li>• Assemblage of breeding system, Tank requirement &amp; economics</li> </ul>
Transportation, packaging and marketing.	

**TOOLS AND EQUIPMENTS :**

<b>Sl.N</b>	<b>DESCRIPTION</b>	<b>QUANTITY</b>
1	Breeding tank{6' x 3' x 1'6", cemented) , live feed culture tank	4nos each
2	Oxygen cylinder with accessories	2nos
3	Glass wares	20nos
4	Different types of nets	10nos
5	Plastic pools	5nos
5	Perforated plastic breeding basket	20nos
7.	Microscope	1
8	water quality kit	1

**Machineries & other investments : As per requirements**

<b>SI.NO.</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
1	Building & civil works	Hatchery shed with A/C sheet roofing & side
		Wall - 330 (sq. m.)
		Tank volumes (lts) 60000
		Flooring (sq. m.) 200
		Drainage pit and network
		Water supply net work
		Filtration system / outlet
		Electrification and installation
2	Machinery & Equipments	Air blower ( 3 hp x 1 no. )
		DG Set ( 8 hp with 6/8 KVA alternator )
		Heater
		Sand filter
		Pump ( 3 HP )
		Tube well
		Pump House

**LEVEL - I****MODULE -7**

<b>NAME</b>	<b>Breeding of carps</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	FSH 107
<b>ENTRY QUALIFICATION</b>	5th Standard,
<b>AGE</b>	14 Years
<b>DURATION</b>	240Hrs

**TERMINAL COMPETENCY :**

On completion of training one should be able to independently breed Indian Major Carp & Exotic Carp

**CONTENTS:**

<b>Practical</b>	<b>Theory</b>
<ul style="list-style-type: none"> <li>• Selection and identification of fish</li> <li>• Ponds requirement and design</li> <li>• Nursery/ rearing pond preparation</li> <li>• Identification of brooders (male and Female)</li> <li>• Nursery pond management</li> <li>• Induce breeding techniques</li> <li>• Rearing of fish seed</li> <li>• Water quality monitoring using water testing kits.</li> <li>• Fish seed packing</li> <li>• Fish seed transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to Indian major carps, minor carps and exotic carps and their breeding habits.</li> <li>• Brood stock development, feeding and health management.</li> <li>• Breeding techniques</li> <li>• Water quality management</li> <li>• Nursery pond management</li> <li>• Fish seed packing and transportation and marketing.</li> </ul>

**SPECIFIC TOOLS AND EQUIPMENTS (Suggested)**

S.No.	Description oif items	Quantity
	Brooder collection net	01 Nos
	Fry collection net	01
	Fingerling collection net	01
	Plankton net	06
	Breeding equipments	5 sets
	Soil testing kit	5 sets
	Water testing kit	05 sets

	PH meter	02
	Thermometer	05
	Inducing agent / hormones	As required
	Breeding hapa	10 nos
	Hatching hapa (inner and Outer)	40 nos each
	Packing material (Polythene bags, threads and rubber bands)	As required
	Water Pump 5 HP diesel	02 Nos
	Oxygen cylinder with accessories	02 Nos
	Balance	01 no.
<b>Others Investments</b>		
	Brooder Pond (30x20x3 mtrs)	02 Nos
	Nursery Pond (15x15x1.5 mtrs)	10 Nos
	Cemented Nursery pond (10x4x1.5 Mtrs)	06 Nos (if required)
	Air Blower	01 No

**Level -I**  
**Module - 8**

<b>Name</b>	: <b>Fishing Boat Building</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: FSH 108
<b>Entry Qualification</b>	: 5 <sup>th</sup> Standard
<b>Age</b>	: 18 Years
<b>Duration</b>	: 480 Hrs.

**Terminal Competency :** On successful completion of training one should be able to acquire the skill of boat building & repairing.

**Course Details**

SI.No	Practical	Theory
1	Basic Skill of Carpentry Work	<ul style="list-style-type: none"> <li>• Introduction to different types of wooden boat and their design</li> <li>• Kinds of wood, soft and hard wood, different kinds of joints, over 15 models of joints, drawing of joints, cutting of wood for joints</li> </ul>
2	Common skill in small Furniture Making like Table, Stool, cupboard etc	<ul style="list-style-type: none"> <li>• Manufacturing method of door frames - starting from I' Square joints, different models of furniture, manufacturing stool and frames, small table manufacturing, table with drawer and cupboard.</li> </ul>
3	Ply wood Boat Work	<ul style="list-style-type: none"> <li>• Different models of plywood craft, photos, drawing, cutting, making of joints, bottom fitting, floor board fitting, bud joints, wood work etc.</li> </ul>
4	FRP Boat Work	<ul style="list-style-type: none"> <li>• Use of FRP materials to make FRP boats of moulded one (marine and fresh water)</li> <li>• Cut model of different boats</li> </ul>

**Tools and Equipments**

Power Tools & Materials	Hand Tools
Drilling Machine, Jigsaw, Electric Plainer, Small Sanding Machine.	Chizhil (1/2 inch to 5 inch), point clizhil, tri-square, hammer, cutting player, plainer, wood file, measuring tape, hand saw, steel scale, hack saw, bench vice, triangle file, sharpening stone, screw driver, kitty, wood, etc .....
Ply Woods, FRP Raw materials, Ordinary woods different size.	

**Level -I****MODULE - 9**

<b>Name</b>	:	<b>Multiplication of aquatic Ornamental Plant</b>
<b>Sector</b>	:	Fisheries & allied sector
<b>Code</b>	:	FSH 109
<b>Qualification</b>	:	5 <sup>th</sup> Standard
<b>Age</b>	:	14 Years
<b>Duration</b>	:	240 Hrs

**Terminal Competencies :** After completion of the course, one should be able to multiply aquatic ornamental plants

<b>Practical</b>	<b>Theory</b>
Differentiating Floating type plant and submerged plants	Introduction to aquatic plant & treatment
Planting of Floating type plant in tank and its protection.	Knowledge in the Ecological system of plant and fish.
Planting submerged type plant in a tank and its care	Different kinds of water plants and its selection.
Choosing and selection of healthy plants for the aquarium and its set up	Knowledge in Floating type and submerged plants
Anti Infection process of plants before planting in aquarium.	Knowledge in Anti infection process before planting in aquarium

**Tools and equipments : As per requirements.**

1. Glass Tank 4' x 2'x 2'
2. Brick Tank 3'x 3'
3. Pallets & sand etc for arranging beds.
4. Airators and pumps
5. Artificial sprinkling system.
6. Different types Plants like Mercelia,
7. Eccainodorous, Hydrilla, Valisnaria,
8. Ikornia , Pitsia etc.
9. Different types of Ornamental fish

**MODULE - 10**

<b>Name</b>	: <b>Operation and Basic maintenance of Marine Refrigeration Equipments</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: FSH 110
<b>Entry Qualification</b>	: 5 <sup>th</sup> Standard
<b>Age</b>	: 14 years
<b>Duration</b>	: 240 Hrs

**Terminal Competency:** On successful completion of the course, one should be able to operate and maintain the marine refrigeration equipments

<b>Practical</b>	<b>Theory</b>
<ul style="list-style-type: none"> <li>• Safety Practice in Using the Refrigeration system and cleanness.</li> </ul>	<ul style="list-style-type: none"> <li>• -Importance of Refrigeration</li> </ul>
<ul style="list-style-type: none"> <li>• Visualizing the different components in the refrigeration system.</li> </ul>	<ul style="list-style-type: none"> <li>• -History of Refrigeration</li> </ul>
<ul style="list-style-type: none"> <li>• Usage of leak detection instruments.</li> </ul>	<ul style="list-style-type: none"> <li>• -Use and scope of Refrigeration.</li> </ul>
<ul style="list-style-type: none"> <li>• Experiencing in the working of the individual components.</li> </ul>	<ul style="list-style-type: none"> <li>• -Use of Refrigeration in the fishing field.</li> </ul>
<ul style="list-style-type: none"> <li>• -Practical visit on different Fishing Vessel with refrigeration plant.</li> </ul>	<ul style="list-style-type: none"> <li>• -General application of Refrigeration in day-to- day life.</li> <li>• -Introduction to trouble shooting.</li> </ul>
<ul style="list-style-type: none"> <li>• -Visit to the Ice factory.</li> </ul>	<ul style="list-style-type: none"> <li>• -Definition and principle of Refrigeration.</li> </ul>
<ul style="list-style-type: none"> <li>• - Visit to fish processing plant</li> </ul>	<ul style="list-style-type: none"> <li>• -Fish spoilage and preservation.</li> <li>• Method of Refrigeration, Ice Refrigeration,</li> <li>• Different types of ice and method of production.</li> </ul>
<ul style="list-style-type: none"> <li>• -Preparation and starting of the small refrigeration plant.</li> </ul>	<ul style="list-style-type: none"> <li>• -Types of freezing</li> </ul>
<ul style="list-style-type: none"> <li>• -Demonstration and use of refrigeration tools</li> </ul>	<ul style="list-style-type: none"> <li>• -Important components of refrigeration common to all methods.</li> <li>• -Up keep and operation of refrigeration plant and systems.</li> <li>• -Refrigerants and its impact on environment</li> </ul>

**TOOLS & EQUIPMENTS: As per requirements.**

- I. Small Refrigeration plant (vapor compression) (ITR)
4. Different types of compressors (Reciprocating, Rotary suitable for 1 2 TR)
5. Different types of Expansion Valves (Thermostatic Expansion valves, Automatic, Hand operated).
4. Heat exchangers / Condensers (Air cooled and Water cooled).
5. Evaporators (Fin type, Plate type, Tube in tube, Shell and tube (Any capacity)
6. Flaring tool kit (Refrigeration) .
7. Vacuum pump.
8. Refrigerant charging pipe with Gauge.
9. General tools and Spanners.
10. Refrigerant gas with cylinder.

**Level -I****Module - 11**

<b>Name</b>	: <b>Operation and Basic Maintenance of Marine Electronic Equipment</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: FSH 111
<b>Entry Qualification</b>	: 8 <sup>TH</sup> Standard
<b>Age</b>	: 18 years
<b>Duration</b>	: 240 Hrs.

**Terminal Competencies:** After completion of the course one should be able to operate VHF and HF equipment for communication network.

<b>PRACTICAL</b>	<b>THEORY</b>
Safety precautions of handling the electronic Equipments and up keeping the cleanness.	Introduction to Marine Electronic equipment.
Correct use and operation of VHF Communication equipments	Enhancement of Fish productivity and profitability through the use of Electronic equipments on board fishing vessels.
Correct use and operation of HF communication equipments.	Knowledge in Communication Equipments like VHF, HF equipments
Use and operation of Echo Sounder.	Knowledge of fish finding equipments - Echo sounder.
Use and operation of GPS	Knowledge of Navigation equipments (Global positioning system)
Use and operation of EPIRB, (Emergency Position Indicating Radio Beacon)	Knowledge of Safety equipments-
Use of different power supplies for the equipments	EPIRB (Emergency Position Indicating Radio Beacon)
Handling and maintenance of Lead Acid Batteries and Charging system	Knowledge of power supplies used and their source
Correct use of Hydrometer, High rate discharge cell tester, Battery tester	Knowledge of Lead Acid Battery
Safety precautions while handling batteries	Care and maintenance of Lead Acid Battery
Daily and weekly maintenance of equipments	Knowledge of Basic preventive maintenance on Electronic Equipments

**Equipment / Tools ( suggested):                      As per requirements**

- I. Marine VHF Set - I No
2. Marine HF communication set 250 wats
3. GPS desk type model
4. Colour video Echo Sounder
5. EPIRB, SART, Navtex
6. Marine Radar 50 N mile
7. Lead Acid Battery 12 v, 25 plates, 180 AH, - 2 Nos.
8. Hydrometer, HRDCT, Battery Tester
9. Multimeter
10. Soldering Iron 25 wats
- II. Tools, screw driver set, PCB's
12. Electronic Components like Resisters, Capacitors, Ie's, Inductors, Transformer etc.

**MODULE – 12**

<b>NAME</b>	<b>Mussel Culture</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	FSH 112
<b>ENTRY QUALIFICATION</b>	5th Standard
<b>AGE</b>	14 Years
<b>DURATION</b>	240 Hrs

**TERMINAL COMPETENCY :** On completion of the course, one should be able to culture the mussels

<b>PRACTICAL</b>	<b>THEORY</b>
Experiment the following <ul style="list-style-type: none"> <li>• Sea Farming</li> <li>• Estuarine farming</li> <li>• Rope culture</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction to mussels and their biology &amp; habitat.</li> <li>• Spat collection / abundance availability</li> <li>• Farming models (rope culture, raft culture &amp; rack culture)</li> <li>• Marine habitat and hydrographical parameters.</li> <li>• Grading, depuration &amp; harvesting of Mussels</li> <li>• Processing</li> </ul>

<b>Sl.No.</b>	<b>TYPE</b>	<b>DESCRIPTION</b>
1	General equipment	Bamboo poles Polypropylene Rope ( 10 mm thickness ) Coir Rope ( 10 mm thickness) Tarpaulin Nylon Net Seed cost 70 bags Anchor, oyster shells etc.,

**Level -I****Module 13**

<b>Name of the Module</b>	: <b>Shrimp Hatchery</b>
<b>Sector</b>	: Fisheries & allied sector
<b>Code</b>	: FSH 113
<b>Entry Qualification</b>	: 5 <sup>th</sup> Standard
<b>Age</b>	: 14 years
<b>Duration</b>	: 480 Hrs.

**Terminal competency** : After completion of the course, one should be able to produce shrimp seeds

<b>THEORY</b>	<b>PRACTICAL</b>
<ul style="list-style-type: none"> <li>• Introduction to shrimp culture and the need for hatcheries</li> <li>• Water quality Management</li> <li>• Disease monitoring and treatment</li> <li>• Introduction to live feed culture.</li> <li>• Introduction to microalgal culture</li> <li>• Maintenance of breeders</li> <li>• Hatching of nauplii</li> <li>• Rearing of shrimp larvae from Nauplii to PL (Post larvae).</li> </ul>	<ul style="list-style-type: none"> <li>• Shrimp breeder maintenance</li> <li>• Shrimp breeder feeding.</li> <li>• Artemia hatching.</li> <li>• Microalgal culture.</li> <li>• Collection &amp; maintenance of breeders for hatching.</li> <li>• Collection and cleaning of eggs and hatching of eggs to nauplii.</li> <li>• Collection of nauplii and transferring them to rearing tanks</li> <li>• Seed packing &amp; transportation.</li> </ul>

**List of equipments**

<b>SL. NO.</b>	<b>NAME OF THE EQUIPMENT</b>	<b>QUANTITY</b>
1.	Maturation tank - circular/rectangular - 5 ton capacity - cement should be covered with black cloth or tarpaulin	1
2.	Spawning tank - FRP circular / rectangular - 5 ton capacity - cement with epoxy coating	3
3.	Larval rearing tank - circular / rectangular - 5 ton capacity - cement with epoxy coating	2
4.	Algal culture set up <ol style="list-style-type: none"> <li>1. Galvanized iron shelf / wooden shelf</li> <li>2. Glass conical flask - 50 ml.</li> <li>3. Glass conical flask - 250 ml, 1 litre, 2 L</li> <li>4. Glass carbuoy - 20 L</li> <li>5. FRP tank for algal culture (1ton)</li> </ol>	1 10 nos. 5 nos. each 5 nos. 3 nos.
5.	Artemia culture <ol style="list-style-type: none"> <li>1. Conical FRP tank for artemia culture - 250L capacity</li> </ol>	2

	2. Buckets 3. Scoop nets	5 5
6.	Larval Hatching 1. Conical FRP tanks 250 L 2. Scoop net, plastic basin	3 6 nos. each
7.	Sea water intake system and Aeration 1. Marine Pump (5 or 10 HP) 2. Over head tank (10 ton) 3. Pressurized sand filter 4. Carbon filter 5. Chlorinator 6. UV set up 7. Water intake pipeline 8. Water Hose 9. Aeration line 10. Air blower	1 1 1 1 1 1   1
8.	Harvesting Water exchange net Harvesting net	3 3
9.	Pacing and transportation 1. Oxygen cylinder 2. Polythene bag 3. Carton box with insulation 4. larval holding net 5. Small scoop for larvae measuring	1   3 4
10.	Water Quality Monitoring 1. Refractometer 2. pH meter 3. DO Probe / meter 4. Temperature probe 5. Microscope 6. Chlorine testing kit 7. Buckets and basins	1 1 1 1 1 5 12 nos. each

**Level -I**  
**Module 14**

<b>Name of the Module</b>	<b>: Shrimp Farming</b>
Sector	: Fisheries & allied sector
Code	: FSH 114
Entry Qualification	: 5 <sup>th</sup> Standard
Age	: 14 years
Duration	: 240Hrs.

**Terminal competency** : After completion of the course, one should be able to grow Shrimp.

THEORY	PRACTICAL
<ul style="list-style-type: none"> <li>• Introduction to shrimp farming</li> <li>• Water quality Management</li> <li>• Disease monitoring and treatment</li> <li>• Familiarisation with feeding process</li> <li>• Traditional culture &amp; stocking rate</li> <li>• Algal feeds, formulated feeds</li> <li>• Pond cleaning &amp; Harvesting</li> </ul>	<ul style="list-style-type: none"> <li>• Larvae acclimatization</li> <li>• DO checking</li> <li>• pH checking</li> <li>• Salinity checking</li> <li>• Feed monitoring</li> <li>• Growth monitoring</li> <li>• Feeding (time and how)</li> <li>• Disease monitoring and treatment</li> <li>• Harvesting and transportation</li> <li>• Visiting shrimp farm and in-house training</li> </ul>

### Tools & Equipments

1. Sea water intake system and Aeration	1
2. Marine Pump (5 HP)	1
3. Over head tank (10 ton)	1
4. Pressurized sand filter	1
5. Carbon filter	1
6. Chlorinator	1
7. UV set up	1
8. Water intake pipeline	1
9. Water Hose	1
10. Aeration line	1
11. Air blower	1
12. Water exchange net	3
13. Harvesting net	3
14. Oxygen cylinder	1

15. Polythene bag	1
16. Carton box with insulation	
17. larval holding net	
18. Small scoop for larvae measuring	3
	4
19. Water Quality Monitoring	
20. Refractometer	1
21. pH meter	1
22. DO Probe / meter	1
23. Temperature probe	1
24. Microscope	1
25. Chlorine testing kit	5
26. Buckets and basins	12 nos. each

**Level -I****MODULE - 15**

<b>NAME</b>	<b>Fish Processing</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	FSH 115
<b>ENTRY QUALIFICATION</b>	8th std
<b>DURATION</b>	480Hrs

**TERMINAL COMPETENCY:**

On successful completion of the course , one should be Able to understand to principles of fish processing and carryout independently different processing methods like smocking, salting and drying.

<b>PRACTICAL</b>	<b>THEORY</b>
<ul style="list-style-type: none"> <li>• Identification of locally available fishes ; practice hygiene handling of fish;</li> <li>• Organoleptic evaluation.</li> <li>• Design of solar tent drier, scaffolding, indigenous structure for hygienic drying .</li> <li>• Selection of fishes for different methods of salting practice.</li> <li>• Practice smoking of locally available fishes.</li> <li>• Practice marina ding</li> <li>• Practice in packing fishes; organoleptic evaluation of fish products.</li> <li>• Visit to a cannery</li> </ul>	<ul style="list-style-type: none"> <li>• Principle of fish processing</li> <li>• Raw material – evaluation</li> <li>• Fish handling – introduction</li> <li>• Drying: methods, principles</li> <li>• Salting: dry /wet salting principle and methods.</li> <li>• Smoking: principle, method (hot / cold smoking)</li> <li>• Marinading: Principle &amp; Methods.</li> <li>• Storage of processed fish and quality assessment of finished products.</li> <li>• Canning: Principles &amp; Scope</li> </ul>

Equipments / facilities:

- Drying platform
- Model for Solar tent drier, scaffolding etc.,
- Miniature Cement tanks for wet salting.
- Tools for quality testing.
- Mechanical drier.
- Smoke kiln

<i>Activity</i>	<i>Type of equipment</i>
Receiving	Crane (Electric~ hoist & generator )
	<b>Crane (2 ton hydraulic)</b>
	Boiler
	Scale
	Slush-ice;~ bag release
	Tole (insulated - 15001b)
	Fork lift
	Tolt~ keeper for forklift (dumping)
	Plastic Shovel
Holding	Ice machine - 5 ton (and enclosure )
	Ice machine - 10 ton (enclosure)
General processing	Tale dumper
	Pallet jack
	Double Hopper
	Feed chute and receiving table
	Processing line belt conveyor
	Process line-pocket conveyor (belt)
	Rinse tank
	Table - grindings with bins
	Boxing Roller - (5' X 2' section)
	Knife - 8"
	Steel
	Knife sharpner
	Hand truck
	Utility tube and lid
	Tub cart
	Sink-hand wash
	Sink-3 compartment
	Eye wash system
	Rubber mat (to stand on )
H & G processing	Header - (automatic)
Fillet processing	Fillet machine
	Splitter
	Fillet line ( belt driven)
	Pinbone machine (5-10 fish/min)
	Pinbone trim line, belt driven (5ft.)
Smoking	Smoker-horizontal flow - 500 Ib cap
	Smoker - vertical flow-500 lb Cap
	Fish screens ( 1 set of 14)
	Extra truck and screens ( 14 tier )
	Chart recorder

	Drum & lid (Make / store brine )
	Dolly (6 tub capacity )
	Tub (brine fish)
	Auto injector - 16/64 needle
	Auto injector 2nd needle set

<i>Activity</i>	<i>Type of equipment</i>	
Freezing Chilling	Chiller	
	B111~1 Freezer (20,000 lbs/ day)	
	Freezer cold storage	
	Freezer van - used (cold storage)	
	Truck & rack to hold fish	
	Glozing bin (dip-Spray	
	Gel machine with bag-, sealer 3	
	Gel ice freezer	
	Canning	Retort with controls
		Retort boiler (used)
Can seamer		
Cart dolly		
Hoist system		
Meat cutting	Knife - 6" 2	
	Knife 12" 2"	
	Knife Scabbard	
	Racks for holding utensils	
	Band -saw	
	Saw blade	
	Meat slicer	
	Bench scalc	
	Spice scale	
	Meat hand saw	
	Hand saw blade	
	Meal lugger (tub)	
	]olly-6 lug capacity	
	Dolly - 2 lug capacity	
	Bone scraper	
	Block scrapers	
	Ham Pump (Multi-needle injector)	
	Meat grinding sluffing	Grinder
		1/8 inch plate (C1-32)
		3/16 inch plate (C1-32)
1/4 inch platc (C1-32)		
Knife N 1-32		
Mixer 100#		

	Piston stuffer with table
	Stuffing- horn
	Replacement part kit
	Freezer paper dispenser
	Spice scoop - 6 oz
	Spice scoop - 12oz
	Spice scoop - 64 oz
	Stainless steel zip ticr
	Dial thermometer - C150

<i>Activity</i>	<i>Type of equipment</i>
Packaging	Scale - bench ( bench (300 lb)
	Scale stand
	Strapping machine
	Max pac clipper
	Box Stapler
	Vacuum packer - double
Waste disposal	Grinder
	OffnitranSp011 system to grinder
Office Break room	Desk
	Table - office
	Chair
	FAX
	computer
	Copier
	Printer
	Phone
	Filing Cabinet
	Book/Storage Shelf
	Coffee Pot · office
	Bench
	Table break room
	Industrial Coffee POI
	Microwave
	Toaster
	OVC11
	Stove
	Refrigerator/Freezer
	Dishware (set Of 4)
	Flatware (sets <b>Iff</b> 4)
	Plastic garbage cans 1

## Level -I

Module 16

<b>NAME</b>	<b>Preparation of Value added seafood products</b>
<b>SECTOR</b>	Fisheries & allied sector
<b>CODE</b>	FSH 116
<b>ENTRY QUALIFICATION</b>	5 <sup>th</sup> Standard
<b>DURATION</b>	360 Hrs.

**Terminal Competency** : Able to independently perform different methods of value addition to sea foods.

<b>PRACTICAL</b>	<b>THEORY</b>
<ul style="list-style-type: none"> <li>• Identification of locally available fishes; sensory evaluation of raw material.</li> <li>• Identification of different ingredients used for preparation of value added products.</li> <li>• Practice in preparation of fish processed pickles, fish wafers, soup powder, masmin, ready fry fish etc.,</li> </ul>	<ul style="list-style-type: none"> <li>• Value added fish products – range, scope and significance.</li> <li>• Raw materials: Choice of raw material; quality assessment.</li> <li>• Ingredients used for value added product preparation and their role in processing fish.</li> <li>• Principle, methods and development of recipe of value added products : Pickles, fish wafers, fish soup powder, masmin, ready to fry fishes etc.,</li> </ul>

**Equipments / facilities:**

- Working bench with drainage provision - 4 nos.
- Gas stove
- Frying vessels, pan, spoons etc. - Assorted sizes.
- Grinder, Mixie
- Bottle, sealing machine
- Poly bag sealer

<i>Activity</i>	<i>Type of equipment</i>
Freezing Chilling	Chiller
	B111~1 Freezer (20,000 lbs/ day)
	Freezer cold storagc
	Freezer van - used (cold storage)
	Truck & rack to hold fish

	Glozing bin (dip-Spray
	Gel machine with bag-, sealer 3
	Gel ice freezer
Canning	Retort with controls
	Retort boiler (used)
	Can seamer
	Cart dolly
	Hoist system
Meat cutting	Knife - 6" 2
	Knife 12" 2"
	Knife Scabbard
	Racks for holding utensils
	Band -saw
	Saw blade
	Meat slicer
	Bench scale
	Spice scale
	Meat hand saw
	Hand saw blade
	Meal lugger (tub)
	Dolly -6 lug capacity
	Dolly - 2 lug capacity
	Bone scraper
	Block scrapers
	Ham Pump (Multi-needle injector)
Meat grinding	Grinder
sluffing	1/8 inch plate (C1-32)
	3/16 inch plate (C1-32)
	1/4 inch plate (C1-32)
	Knife N 1-32
	Mixer 100#
	Piston stuffer with table
	Stuffing- horn
	Replacement part kit
	Freezer paper dispenser
	Spice scoop - 6 oz
	Spice scoop - 12oz
	Spice scoop - 64 oz
	Stainless steel zip tie
	Dial thermometer - C150

<i>Activity</i>	<i>Type of equipment</i>
Packaging	Scale - bench ( bench (300 lb)

	Scale stand
	Strapping machine
	Max pac clipper
	Box Stapler
	Vacuum packer - double
Waste disposal	Grinder
	OffnitranSp0l1 system to grinder
Office Break room	Desk
	Table - office
	Chair
	FAX
	computer
	Copier
	Printer
	Phone
	Filing Cabinet
	Book/Storage Shelf
	Coffee Pot · office
	Bench
	Table break room
	Industrial Coffee POI
	Microwave
	Toaster
	OVC11
	Stove
	Refrigerator/Freezer
	Dishware (set Of 4)
	Flatware (sets <b>Iff</b> 4)
	Plastic garbage cans 1