

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**

These are the list of specializations and their pre-requisites.

	<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	Animal Production (NC II)	480 hours	
2.	Aquaculture (NC II)	320 hours	
3.	Artificial Insemination (Ruminants) (NC II)	160 hours	Animal Production
4.	Artificial Insemination (Swine) (NC II)	160 hours	Animal Production
5.	Crop Production (NC I)	320 hours	
6.	Fish Nursery Operation (NC II)	160 hours	
7.	Fish or Shrimp Grow Out Operation (Non NC)	160 hours	Aquaculture
8.	Fish Wharf Operation (NC I)	160 hours	Fish or Shrimp Grow Out Operation
9.	Food (Fish) Processing (NC II)	640 hours	
10.	Horticulture (NC II)	640 hours	
11.	Landscape Installation and Maintenance (NC II)	320 hours	Crop Production
12.	Organic Agriculture (NC II)	320 hours	Crop Production
13.	Pest Management (NC II)	320 hours	Crop Production
14.	Rice Machinery Operation (NC II)	320 hours	Crop Production
15.	Slaughtering Operation (NC II)	160 hours	Animal Production
1.	Beauty/Nail Care (NC II)	160 hours	40 hours of the subject during exploratory Grade 7/8
2.	Attractions and Theme Parks (NC II)	160 hours	
3.	Bread and Pastry Production (NC II)	160 hours	
4.	Caregiving (NC II)	640 hours	40 hours of the subject during exploratory Grade 7/8
5.	Cookery (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
6.	Dressmaking (NC II)	320 hours	
7.	Food and Beverage Services (NC II)	160 hours	
8.	Front Office Services (NC II)	160 hours	40 hours of the subject during exploratory Grade 7/8
9.	Hairdressing (NC II)	320 hours	
10.	Handicraft (Basketry, Macrame) (Non-NC)	160 hours	
11.	Handicraft (Fashion Accessories, Paper Craft) (Non-NC)	160 hours	
12.	Handicraft (Needlecraft) (Non-NC)	160 hours	
13.	Handicraft (Woodcraft, Leathercraft) (Non-NC)	160 hours	
14.	Household Services (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
15.	Housekeeping (NC II)	160 hours	
16.	Tailoring (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
17.	Tour Guiding Services (NC II)	160 hours	
18.	Tourism Promotion Services (NC II)	160 hours	
19.	Travel Services (NC II)	160 hours	
20.	Wellness Massage (NC II)	160 hours	

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**

		<b>Specialization</b>	<b>Number of Hours</b>	<b>Pre-requisite</b>
1.	<b>ICT</b>	Computer Hardware Servicing (NC II)	320 hours	
2.		Animation (NC II)	320 hours	
3.		Computer Programming (NC IV)	320 hours	
4.		Contact Center Services (NC II)	320 hours	
5.		Illustration (NC II)	320 hours	
6.		Medical Transcription (NC II)	320 hours	
7.		Technical Drafting (NC II)	320 hours	
1.	<b>INDUSTRIAL ARTS</b>	Automotive Servicing (NC I)	640 hours	
2.		Carpentry (NC II)	640 hours	
3.		Consumer Electronics Servicing (NC II)	640 hours	
4.		Electrical Installation and Maintenance (NC II)	640 hours	
5.		Masonry (NC II)	320 hours	
6.		Plumbing (NC I)	320 hours	
7.		Plumbing (NC II)	320 hours	Plumbing (NC I)
8.		Refrigeration and Airconditioning Servicing (NC II)	640 hours	
9.		Shielded Metal Arc Welding (NC I)	320 hours	
10.		Shielded Metal Arc Welding (NC II)	320 hours	Shielded Metal Arc Welding (NC I)
11.		Tile Setting (NC II)	320 hours	

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**  
(160 hours)

**Course Description:**

This is a specialization course which leads to **Aquaculture** National Certificate II (NC II). It covers one core competency that a high school student ought to possess, Operate Fish Nursery. The preliminaries of this specialization course include the following: 1) discussion on the relevance of the course; 2) explanation of key concepts relative to the course and 3) exploration on career opportunities.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
<b>Introduction</b> <ol style="list-style-type: none"> <li>Basic concepts in aquaculture</li> <li>Relevance of the course</li> <li>Career opportunities</li> </ol>	The learner demonstrates understanding of basic concepts and underlying theories in aquaculture.	The learner independently demonstrates common competencies in aquaculture as prescribed in the TESDA Training Regulation	<ol style="list-style-type: none"> <li>Explain basic concepts in aquaculture</li> <li>Discuss the relevance of the course</li> <li>Specialize on opportunities for Aquaculture as a career or source of extra income</li> </ol>	
<b>PERSONAL ENTREPRENEURIAL COMPETENCIES (PECS)</b>				
<ol style="list-style-type: none"> <li>Assessment of Personal Competencies and Skills (PECs) vis-à-vis a practicing entrepreneur/employee in a province. <ol style="list-style-type: none"> <li>Characteristics</li> <li>Attributes</li> <li>Lifestyle</li> <li>Skills</li> <li>Traits</li> </ol> </li> <li>Analysis of PECs in relation to a practitioner</li> <li>Strengthening and further development of one's PECS</li> </ol>	The learner demonstrates understanding of one's Personal Competencies and Skills (PECs) in Aquaculture.	The learner independently creates a plan of action that strengthens/ further develops one's PECs in Aquaculture.	<b>LO 1. Develop and strengthen personal competencies and skills (PECs) needed in Aquaculture</b> <ol style="list-style-type: none"> <li>Identify areas for improvement, development and growth</li> <li>Align one's PECs according to his/her business/career choice</li> <li>Create a plan of action that ensures success of his/her business/career choice</li> </ol>	<b>TLE_ PECS9-12-00-1</b>
<b>ENVIRONMENT AND MARKET</b>				
<ol style="list-style-type: none"> <li>Product Development</li> <li>Key concepts of developing a product</li> <li>Finding Value</li> <li>Innovation</li> </ol>	The learner demonstrates understanding of environment and market in Aquaculture in one's province.	The learner independently creates a business vicinity map reflective of potential Aquaculture market within the province.	<b>LO 1. Develop a product/service in Aquaculture</b> <ol style="list-style-type: none"> <li>Identify what is of "Value" to the customer</li> <li>Identify the customer to sell to</li> </ol>	<b>TLE_EM9-12-00-1</b>

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**

AGRI-FISHERY ARTS				
AQUACULTURE (FISH NURSERY OPERATION)				
CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
4.1. Unique Selling Proposition (USP)			1.3. Explain what makes a product unique and competitive 1.4. Apply creativity and innovative techniques to develop marketable product 1.5. Employ a Unique Selling Proposition (USP) to the product/service	
5. Selecting Business Idea 6. Key concepts of Selecting a Business Idea 6.1. Criteria 6.2. Techniques			<b>LO 2. Select a business idea based on the criteria and techniques set</b> 2.1. Enumerate various criteria and steps in selecting a business idea 2.2. Apply the criteria/steps in selecting a viable business idea 2.3. Determine a business idea based on the criteria/techniques set	<b>TLE_ EM9-12-00-2</b>
7. Branding			<b>LO 3. Develop a brand for the product</b> 3.1. Identify the benefits of having a good brand 3.2. Enumerate recognizable brands in the town/province 3.3. Enumerate the criteria for developing a brand 3.4. Generate a clear appealing product brand	<b>TLE_ EM9-12-00-3</b>
<b>QUARTER 1 : PREPARE AND MAINTAIN FISH NURSERIES (PM)</b> ( <i>Note: Research components should be included in all activities</i> )				
1. Proper use of tools and equipment 2. Safe keeping of equipment every after use 3. Principles of soil tilling and drying 4. Type and amount of Lime 5. Pest and predator control 6. Type and amount of Fertilizers	The learner demonstrates understanding on the underlying concepts and principles in the preparation and maintenance of fish/shrimp nurseries based on industry standards.	The learner independently performs proper preparation and maintenance of fish/shrimp nurseries based on industry standards.	<b>LO 1. Prepare and maintain fish/shrimp nurseries</b> 1.1. Select appropriate tools, equipment and materials 1.2. Dry the pond 1.3. Repair & plow the soil and dried again 1.4. Harrow and dry the soil	<b>TLE_AFFN9-12PM-Ia-j-1</b>

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
7. Principles of Natural Food Growing 8. Types and setting-up of aerator/agitators 9. Stocking Rate 10. Water quality parameters 11. Principles of proper handling, transporting and stocking of fishes 12. Acclimatization 13. Proper disposal of packing materials			1.5. Select and apply lime 1.6. Select and apply predator and pest control 1.7. Grow the natural food 1.8. Select fertilizer and compute rate application 1.9. Set-up aerators/agitators 1.10. Determine water quality parameters i.e. D.O., Transparency, Nitrates, Ammonia and temperature are determined prior to stocking of fry 1.11. Observe care in handling, transporting and stocking of fishes	
<b>QUARTER 2 : FEEDS AND FEEDING (FF)</b>				
1. Proper storage of feeds 2. Time and Frequency of Feeding 3. Method of Feeding (Manual and Mechanical) 4. The economic and environmental effects of underfeeding and overfeeding 5. Feed Composition 6. Feed Formulation using the Pearson Square Method 7. Daily Feed Ration	The learner demonstrates understanding on the underlying concepts and principles in Fish Feeds and Feeding.	The learner independently performs proper selection, application and storage of fish/shrimp feeds based on industry standards.	<b>LO 1. Feeds and Feeding</b> 1.1. Store feeds properly 1.2. Analyze the effect of time and frequency of feeding 1.3. Apply the principles of manual and mechanical feeding 1.4. Determine the economic and environmental impact of improper feeding 1.5. Sample and analyze composition of commercial feeds 1.6. Formulate feed with the desired Crude Protein content using locally-available ingredients 1.7. Compute daily feed ration	<b>TLE_AFFN9-12FF-IIa-j-1</b>
<b>QUARTER 3 : WATER QUALITY AND FISH HEALTH MANAGEMENT (WF)</b>				
1. Physio-chemical parameters 2. Tools and equipment used in water analysis 3. Types and symptoms of common fish diseases	The learner demonstrates understanding on the underlying concepts and principles in monitoring water quality and managing	The learner independently performs monitoring water quality and managing fish health proper based on industry standards.	<b>LO 1. Water Quality</b> 1.1. Monitor water quality 1.2. Maintain Optimum Water Quality	<b>TLE_AFFN9-12WF-IIIa-j-1</b>

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
4. Detection of infected fishes 5. Prophylactic treatment and safety procedures 6. Proper handling and disposal of chemicals 7. Preventive pest and disease procedures	fish health.		<b>LO 2. Fish Health Management</b> 2.1. Monitor and observe occurrence of diseases 2.2. Diagnose infected fish 2.3. Identify appropriate treatment 2.4. Practice preventive measures against disease	<b>TLE_AFFN9-12WF-IIIa-j-2</b>
<b>QUARTER 4 : HARVEST AND POST-HARVEST HANDLING (HH)</b>				
1. Materials, tools and equipment in harvesting, grading, counting, packing and transporting of fingerlings 2. Principles of harvesting, grading, counting, packing and transporting of fingerlings 3. Safety procedures in harvesting, grading, counting, packing and transporting of fingerlings	The learner demonstrates understanding on the underlying concepts and principles in harvesting, grading, counting, packing and transporting of fingerlings.	The learner independently performs harvesting, grading, counting, packing and transporting of fingerlings based on industry standards.	<b>LO 1. Harvest and Post-Harvest Handling</b> 1.1. Schedule harvest 1.2. Prepare harvesting materials and supplies required in the harvest operation 1.3. Observe proper handling while harvesting 1.4. Demonstrate proper grading, counting and packing of live fish	<b>TLE_AFFN9-12HH-IVa-j-1</b>

**K to12 BASIC EDUCATION CURRICULUM**  
**JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIONAL-LIVELIHOOD TRACK**  
**AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)**  
**Code Book Legend**

**Sample: TLE\_AFFN9-12HH-IVa-j-1**

LEGEND		SAMPLE	
<b>First Entry</b>	Learning Area and Strand/ Subject or Specialization	Technology and Livelihood Education_Agri-Fishery Animal Production	<b>TLE_AFFN9-12</b>
	Grade Level	Grade 9/10/11/12	
<b>Uppercase Letter/s</b>	Domain/Content/ Component/ Topic	Principles of harvesting, grading, counting, packing and transporting of fingerlings	<b>HH</b>
			-
<b>Roman Numeral</b> <i>*Zero if no specific quarter</i>	Quarter	Fourth Quarter	<b>IV</b>
<b>Lowercase Letter/s</b> <i>*Put a hyphen (-) in between letters to indicate more than a specific week</i>	Week	Week One to Ten	<b>a-j</b>
			-
<b>Arabic Number</b>	Competency	Demonstrate proper grading, counting and packing of live fish	<b>1</b>

DOMAIN/ COMPONENT	CODE
Personal Entrepreneurial Skills	PECS
Environment and Marketing	EM
Fish Nursery Operation	FN
Prepare and Maintain Aquaculture Facilities	PM
Feeds and Feeding	FF
Water Quality and Fish Health Management	WF
Water Quality and Fish Health Management	HH

Technology-Livelihood Education and Technical-Vocational Track specializations may be taken between Grades 9 to 12.

Schools may offer specializations from the four strands as long as the minimum number of hours for each specialization is met.

Please refer to the sample Curriculum Map on the next page for the number of semesters per Agri-Fishery Arts specialization and those that have pre-requisites. Curriculum Maps may be modified according to specializations offered by a school.

**K to12 BASIC EDUCATION CURRICULUM  
LOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL- TECHNICAL-VOCATIO  
AGRI–FISHERY ARTS – AQUACULTURE (FISH NURSERY OPERATION)  
SAMPLE AGRICULTURE AND FISHERY ARTS CURRICULUM MAP**

No.	Grade 7/8 (Exploratory)			Grade 9	Grade 10	Grade 11	Grade 12				
1	EXPLORATORY			Crop Production (NC I)	4 semesters	*Landscape Installation and Maintenance (NC II)					
2						4 semesters					
3						*Pest Management (NC II)					
4						4 semesters					
5						*Rice Machinery Operation (NC II)					
6				4 semesters							
7				*Organic Agriculture (NC II)							
8				4 semesters							
9				Animal Production (NC II)		6 semesters	*Artificial Insemination: Swine (NC II)	2 sems			
10				Horticulture (NC II)			8 semesters				
11				Food (Fish) Processing (NC II)			8 semesters				
12				4 semesters		Aquaculture (NC II)	4 semesters	Fish Nursery Operation (NC II)	2 sems	*Fish or Shrimp Grow Out Operation (Non NC)	2 sems
13										*Fish Wharf Operation (NC I)	2 sems

\*Please note that these subjects have prerequisites mentioned in the CG.