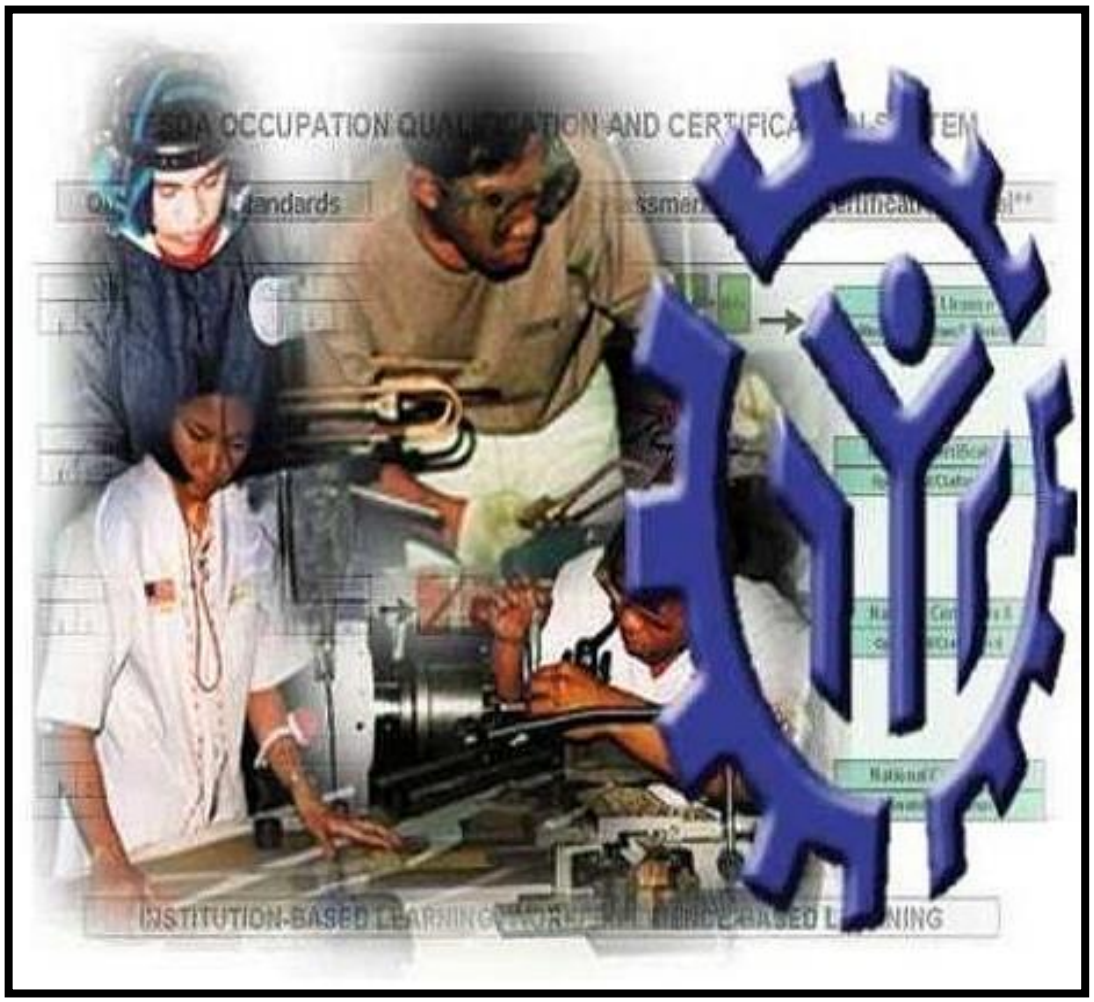
TRAINING REGULATIONS

AQUACULTURE (GROW-OUT OPERATION)
NC II



AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
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Section 22, “Establishment and Administration of the National Trade Skills Standards” of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skills standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1 Competency assessment and certification;
2 Registration and delivery of training programs; and
3 Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 **Definition of Qualification** – describes the qualification and defines the competencies that comprise the qualification.

Section 2 **Competency Standards** was revised to include the Required Knowledge and Required Skills per element. These fields explicitly state the required knowledge and skills for competent performance of a unit of competency in an informed and effective manner. These also emphasize the application of knowledge and skills to situations where understanding is converted into a workplace outcome.

Section 3 **Training Arrangements** - contain information and requirements which serve as bases for training providers in designing and delivering competency-based curriculum for the qualification. The revisions to section 3 entail identifying the Learning Activities leading to achievement of the identified Learning Outcome per unit of competency.

Section 4 **Assessment and Certification Arrangements** - describe the policies governing assessment and certification procedures for the qualification.

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TRAINING REGULATIONS FOR
AQUACULTURE (GROW-OUT OPERATION) NC II

SECTION 1 AQUACULTURE (GROW-OUT OPERATION) NC II QUALIFICATION

The **AQUACULTURE (GROW-OUT OPERATION) NC II Qualification** consists of competencies that a person must achieve to conduct site selection and pond preparations, perform nursery operations, produce aquaculture commodities and carry out post - production activities. This also includes competencies to grow commercially viable aquaculture species in brackish, freshwater and marine ecosystems, except tilapia and seaweed.

This Qualification is packaged from the competency` map of the Agriculture, Forestry and Fishery Sector as shown in Annex A.

The Units of Competency comprising this Qualification include the following:

Code	BASIC COMPETENCIES
400311210	Participate in workplace communication
400311211	Work in team environment
400311212	Solve/address general workplace problems
400311213	Develop career and life decisions
400311214	Contribute to workplace innovation
400311215	Present relevant information
400311216	Practice occupational safety and health policies and procedures
400311217	Exercise efficient and effective sustainable practices in the workplace
400311218	Practice entrepreneurial skills in the workplace
Code	**COMMON COMPETENCIES**
AFF 321201	Apply safety measures in farm operations
AFF321202	Use farm tools and equipment
AFF321203	Perform estimation and basic calculation
Code	**CORE COMPETENCIES**
AFF622314	Conduct site selection and pond preparations
AFF622315	Perform nursery operations
AFF622316	Produce aquaculture commodities
AFF622317	Carry out post-production activities

A person who has achieved this Qualification is competent to be:

- **Aquaculture Worker**
- **Grow-out operator**

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **AQUACULTURE (GROW-OUT OPERATION) NC II.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 400311210

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace 1.7 procedures for the 1.8 location and ***storage*** 1.9 of information are used 1.10 Personal interaction is carried out clearly and concisely	1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette	1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace 1.7 Gathering and providing basic information in response to workplace requirements 1.8 Basic business writing skills 1.9 Interpersonal skills in the workplace

			1.10 Active-listening skills
2. Perform duties following workplace instructions -	2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines 2.2 Routine written instruction are followed based on established procedures 2.3 Feedback is given to workplace supervisor based instructions/ information received 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from ***appropriate sources*** 2.6 Meetings outcomes are interpreted and implemented	2.1 Effective verbal and non-verbal communication 2.2 Different modes of communication 2.3 Medium of communication in the workplace 2.4 Organizational/ Workplace policies 2.5 Communication procedures and systems 2.6 Lines of communication 2.7 Technology relevant to the enterprise and the individual's work responsibilities 2.8 Effective questioning techniques (clarifying and probing) 2.9 Workplace etiquette	2.1 Following simple spoken instructions 2.2 Performing routine workplace duties following simple written notices 2.3 Participating in workplace meetings and discussions 2.4 Completing work-related documents 2.5 Estimating, calculating and recording routine workplace measures 2.6 Relating/ Responding to people of various levels in the workplace 2.7 Gathering and providing information in response to workplace requirements 2.8 Basic questioning/ querying 2.9 Skills in reading for information 2.10 Skills in locating
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Errors in recording information on forms/ documents are identified and acted upon 3.4 Reporting requirements to supervisor are	3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities	3.1 Completing work-related documents 3.2 Applying operations of addition, subtraction, division and multiplication 3.3 Gathering and providing information in response to workplace requirements 3.4 Effective record keeping skills

	completed according to organizational guidelines		

RANGE OF VARIABLES

VARIABLES	RANGE
1. Appropriate sources	May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies
2. Medium	May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace)
3. Storage	May include: 3.1. Manual filing system 3.2. Computer-based filing system
4. Workplace interactions	May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams
5. Forms	May include: 5.1. HR/Personnel forms, telephone message forms, safety reports

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared written communication following standard format of the organization 1.2 Accessed information using workplace communication equipment/systems 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1. Fax machine 2.2. Telephone 2.3. Notebook 2.4. Writing materials 2.5. Computer with Internet connection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration with oral questioning 3.2. Interview 3.3. Written test 3.4. Third-party report
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through an accredited institution

UNIT OF COMPETENCY : WORK IN A TEAM ENVIRONMENT

UNIT CODE : 400311211

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify one's roles and responsibilities as a member of a team.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Describe team role and scope	1.1 The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified 2.2 Roles and objectives of the team is identified from available ***sources of information*** 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization
3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to complement team activities and	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking 3.5 Team roles 3.6 Process of team development	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an individual and as a group using group think

	objectives, based on ***workplace context*** 3.3 Protocols in reporting are observed based on standard company practices. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives	3.7 Workplace context	strategies and techniques 3.4 Contributing to Resolution of issues and concerns -

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	May include but not limited to: 1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	May include but not limited to: 2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	May include but not limited to: 3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Worked in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job
2. Resource Implications	**The following resources should be provided:** 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Role play involving the participation of individual member to the attainment of organizational goal 3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.3 Socio-drama and socio-metric methods 3.4 Sensitivity techniques 3.5 Written Test
4. Context for Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : SOLVE/ADDRESS GENERAL WORKPLACE

UNIT CODE : 400311212

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify routine problems	1.1 Routine **problems or procedural problem** areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented	1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions	1.1 Identifying current industry hardware and software products and services 1.2 Identifying current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identifying current industry standard diagnostic tools 1.4 Describing common malfunctions and resolutions. 1.5 Determining the root cause of a routine malfunction

2. Look for solutions to routine problems	2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, ***documented***, ranked and presented to ***appropriate person*** for decision	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices, processes and procedures. 2.3 Identifying operating system 2.4 Identifying current industry standard diagnostic tools 2.5 Describing common malfunctions and resolutions. 2.6 Determining the root cause of a routine malfunction
3. Recommend solutions to problems	3.1 Implementation of solutions are **planned** 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation	3.1 Standard procedures 3.2 Documentation produce	3.1 Producing documentation that recommends solutions to problems 3.2 Following established procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include but not limited to: 1.1 Routine/non – routine processes and quality problems 1.2 Equipment selection, availability and failure 1.3 Teamwork and work allocation problem 1.4 Safety and emergency situations and incidents 1.5 Work-related problems outside of own work area
2. Appropriate person	May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined the root cause of a routine problem 1.2 Identified solutions to procedural problems. 1.3 Produced documentation that recommends solutions to problems. 1.4 Followed established procedures. 1.5 Referred unresolved problems to support persons.
2. Resource Implications	2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Case Formulation 3.2 Life Narrative Inquiry 3.3 Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : DEVELOP CAREER AND LIFE DECISIONS

UNIT CODE : 400311213

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes in managing one's emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Manage one's emotion	1.1 **Self-management strategies** are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and **unpleasant situation i**n the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Managing properly one's emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace
2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to feedback from teachers to assist	2.1 Basic SWOT analysis 2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis,	2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of limitations, likes/ dislikes; through

	them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored 2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted	Conclusion, and Action plan)	showing of self-confidence 2.3 Demonstrating self-acceptance and being able to accept challenges
3. Boost self-confidence and develop self-regulation	3.1 Efforts for continuous self-improvement are demonstrated 3.2 Counter-productive tendencies at work are eliminated 3.3 Positive outlook in life are maintained.	3.1 Four components of self-regulation based on Self-Regulation Theory (SRT) 3.2 Personality development concepts 3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)	3.1 Performing effective communication skills – reading, writing, conversing skills 3.2 Showing affective skills – flexibility, adaptability, etc. 3.3 Self-assessment for determining one's strengths and weaknesses

RANGE OF VARIABLES

VARIABLE	RANGE
1. Self-management strategies	**May include but not limited to:** 1.1 Seeking assistance in the form of job coaching or mentoring 1.2 Continuing dialogue to tackle workplace grievances 1.3 Collective negotiation/bargaining for better working conditions 1.4 Share your goals to improve with a trusted co-worker or supervisor 1.5 Make a negativity log of every instance when you catch yourself complaining to others 1.6 Make lists and schedules for necessary activities
2. Unpleasant situation	**May include but not limited to:** 2.1 Job burn-out 2.2 Drug dependence 2.3 Sulking

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Express emotions appropriately 1.2 Work independently and show initiative 1.3 Consistently demonstrate self-confidence and self-discipline
2. Resource Implications	**The following resources should be provided:** 2.1. Access to workplace and resource s 2.2. Case studies
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration or simulation with oral questioning 3.2. Case problems involving work improvement and sustainability issues 3.3. Third-party report
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : CONTRIBUTE TO WORKPLACE INNOVATION

UNIT CODE : 400311214

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to make a pro-active and positive contribution to workplace innovation.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify opportunities to do things better.	1.1 ***Opportunities for improvement*** are identified proactively in own area of work. 1.2 ***Information*** are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea.	1.1 Roles of individuals in suggesting and making improvements. 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people.	1.1 Identifying opportunities to improve and to do things better. Involvement. 1.2 Identifying the positive impacts and the challenges of change and innovation. 1.3 Identifying examples of the types of changes that are within and outside own scope of responsibility
2. Discuss and develop ideas with others	2.1 ***People who could provide input*** to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback. 2.5 ***Critical inquiry method*** is used to discuss and develop ideas with others.	2.1 Roles of individuals in suggesting and making improvements. 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people.	2.1 Identifying opportunities to improve and to do things better. Involvement. 2.2 Identifying the positive impacts and the challenges of change and innovation. 2.3 Providing examples of the types of changes that are within and outside own scope of responsibility 2.4 Communicating ideas for change through small group discussions and meetings.

3. Integrate ideas for change in the workplace.	3.1 Critical inquiry method is used to integrate different ideas for change of key people. 3.2 Summarizing, analyzing and generalizing skills are used to extract salient points in the pool of ideas. 3.3 ***Reporting skills*** are likewise used to communicate results. 3.4 ***Current Issues and concerns*** on the systems, processes and procedures, as well as the need for simple innovative practices are identified.	3.1 Roles of individuals in suggesting and making improvements. 3.2 Positive impacts and challenges in innovation. 3.3 Types of changes and responsibility. 3.4 Seven habits of highly effective people. 3.5 Basic research skills.	3.1 Identifying opportunities to improve and to do things better. Involvement. 3.2 Identifying the positive impacts and the challenges of change and innovation. 3.3 Providing examples of the types of changes that are within and outside own scope of responsibility. 3.4 Communicating ideas for change through small group discussions and meetings. 3.5 Demonstrating skills in analysis and interpretation of data.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Opportunities for improvement	May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices.
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and required to present data/information appropriately.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather data/ information	1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope	1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct	1.1 Describing organisational protocols relating to client liaison 1.2 Protecting confidentiality 1.3 Describing accuracy 1.4 Computing business mathematics and statistics 1.5 Describing data analysis techniques/ procedures 1.6 Reporting requirements to a range of audiences 1.7 Stating legislation, policy and procedures relating to the conduct of evaluations 1.8 Stating organisational values, ethics and codes of conduct

2. Assess gathered data/ information	2.1 Validity of data/ information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 ***Data analysis techniques*** and procedures are documented 2.5 Recommendations are made on areas of possible improvement.	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Stating legislation, policy and procedures relating to the conduct of evaluations 2.5 Stating organisational values, ethics and codes of conduct
3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics and codes of conduct	3.1 Describing data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Stating legislation, policy and procedures relating to the conduct of evaluations 3.4 Stating organisational values, ethics and codes of conduct practices

RANGE OF VARIABLES

VARIABLES	RANGE
1. Data analysis techniques	May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determine data / information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied studied data/information These aspects may be best assessed using a range of scenarios what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Resource Implications	**Specific resources for assessment** 2.1. Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Written Test 3.2. Interview 3.3. Portfolio The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : PRACTICE OCCUPATIONAL SAFETY AND HEALTH POLICIES AND PROCEDURES

UNIT CODE : 400311216

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify OSH compliance requirements	1.1 Relevant ***OSH requirements, regulations, policies and procedures*** are identified in accordance with workplace policies and procedures 1.2 OSH activity non-conformities are conveyed to ***appropriate personnel*** 1.3 ***OSH preventive and control requirements*** are identified in accordance with OSH work policies and procedures	..1. OSH preventive and control requirements ..2. Hierarchy of Controls ..3. Hazard Prevention and Control ..4. General OSH principles ..5. Work standards and procedures ..6. Safe handling procedures of tools, equipment and materials ..7. Standard emergency plan and procedures in the workplace	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2 Required OSH materials, tools and equipment are acquired in accordance with workplace policies and procedures 2.3 Required OSH materials, tools and equipment are arranged/ placed in	2.1 Resources necessary to execute hierarchy of controls 2.2 General OSH principles 2.3 Work standards and procedures 2.4 Safe handling procedures of tools, equipment and materials 2.5 Different OSH control measures	2.1 Communication skills 2.2 Estimation skills 2.3 Interpersonal skills 2.4 Critical thinking skills 2.5 Observation skills 2.6 Material, tool and equipment identification skills

	accordance with OSH work standards		
3. Perform tasks in accordance with relevant OSH policies and procedures	3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards 3.3 ***Non-compliance work activities*** are reported to *appropriate personnel*	3.1 OSH work standards 3.2 Industry related work activities 3.3 General OSH principles 3.4 OSH Violations 3.5 Non-compliance work activities	3.1 Communication skills 3.2 Interpersonal skills 3.3 Troubleshooting skills 3.4 Critical thinking skills 3.5 Observation skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Requirements, Regulations, Policies and Procedures	May include: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself
3. OSH Preventive and Control Requirements	May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment
4. Non OSH-Compliance Work Activities	May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Convey OSH work non-conformities to appropriate personnel 1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures 1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures 1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards 1.5. Execute work activities in accordance with OSH work standards 1.6. Report OSH activity non-compliance work activities to appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE

UNIT CODE : 400311217

UNIT DESCRIPTOR : This unit covers knowledge, skills and attitude to identify the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and convey inefficient and ineffective environmental practices

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the efficiency and effectiveness of resource utilization	1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol 1.3 Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established ***environmental work procedures***	1.1 Importance of Environmental Literacy 1.2 Environmental Work Procedures 1.3 Waste Minimization 1.4 Efficient Energy Consumptions	1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills
2. Determine causes of inefficiency and/or ineffectiveness of resource utilization	2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru established environmental procedures	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills

3. Convey inefficient and ineffective environmental practices	3.1 Efficiency and effectiveness of resource utilization are reported to *appropriate personnel* 3.2 Concerns related resource utilization are discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel	3.1 Appropriate Personnel to address the environmental hazards 3.2 Environmental corrective actions	3.1 Written and Oral Communication Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills 3.5 Practice Environmental Awareness

RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Work Procedures	May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Measured required resource utilization in the workplace using appropriate techniques 1.2. Recorded data in accordance with workplace protocol 1.3. Identified causes of inefficiency and/or ineffectiveness through deductive reasoning 1.4. Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures 1.5. Report efficiency and effectives of resource utilization to appropriate personnel 1.6. Clarify feedback on information/concerns raised with appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace 2.2 Tools, materials and equipment relevant to the tasks 2.3 PPE 2.4 Manuals and references
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration 3.2 Oral questioning 3.3 Written examination
4. Context for Assessment	4.1 Competency assessment may occur in workplace or any appropriately simulated environment 4.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE

UNIT CODE : 400311218

UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Apply entrepreneurial workplace best practices	1.1 ***Good practices*** relating to workplace operations are observed and selected following workplace policy. 1.2 Quality procedures and practices are complied with according to workplace requirements. 1.3 Cost-conscious habits in ***resource utilization*** are applied based on industry standards.	1.1 Workplace best practices, policies and criteria 1.2 Resource utilization 1.3 Ways in fostering entrepreneurial attitudes: 1.3.1 Patience 1.3.2 Honesty 1.3.3 Quality-consciousness 1.3.4 Safety-consciousness 1.3.5 Resourcefulness	1.1 Communication skills 1.2 Complying with quality procedures
2. Communicate entrepreneurial workplace best practices	2.1 Observed good practices relating to workplace operations are communicated to **appropriate person**. 2.2 Observed quality procedures and practices are communicated to appropriate person 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards.	2.1 Workplace best practices, policies and criteria 2.2 Resource utilization 2.3 Ways in fostering entrepreneurial attitudes: 2.3.1 Patience 2.3.2 Honesty 2.3.3 Quality-consciousness 2.3.4 Safety-consciousness 2.3.5 Resourcefulness	2.1 Communication skills 2.2 Complying with quality procedures 2.3 Following workplace communication protocol

3. Implement cost-effective operations	3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy 3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements. 3.3 Constructive contributions to office operations are made according to enterprise requirements. 3.4 Ability to work within one's allotted time and finances is sustained.	3.1 Optimization of workplace resources 3.2 5S procedures and concepts 3.3 Criteria for cost-effectiveness 3.4 Workplace productivity 3.5 Impact of entrepreneurial mindset to workplace productivity 3.6 Ways in fostering entrepreneurial attitudes: 3.7 Quality-consciousness 3.8 Safety-consciousness	3.1 Implementing preservation and optimizing workplace resources 3.2 Observing judicious use of workplace tools, equipment and materials 3.3 Making constructive contributions to office operations 3.4 Sustaining ability to work within allotted time and finances

RANGE OF VARIABLES

VARIABLE	RANGE
1.Good practices	May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices
2.Resources utilization	May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated ability to identify and sustain cost-effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace.
2. Resource Implications	The following resources should be provided: 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals 2.3.1 Enterprise procedures manuals 2.3.2 Company quality policy
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Interview 3.2 Third-party report
4.Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY SAFETY MEASURES IN FARM OPERATIONS

UNIT CODE : AFF321201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform safety measures effectively and efficiently. It includes identifying areas, tools, materials, time and place in performing safety measures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine areas of concern for safety measures	1.1 ***Work tasks*** are identified in line with farm operations 1.2 ***Place*** for safety measures are determined in line with farm operations 1.3 ***Time*** for safety measures are determined in line with farm operations 1.4 Appropriate ***tools, materials and outfits*** are prepared in line with job requirements	1.1 Different work tasks in farm operations 1.2 Place and time for implementation of safety measures 1.3 Different hazards in the workplace 1.4 Types of tools, materials and outfits 1.5 Preparation of tools, materials and outfits	1.1 Identifying work tasks in farm operations 1.2 Determining place and time for implementation of safety measures 1.3 Reading labels, manuals and other basic safety information 1.4 Identifying effective/functional tools, materials and outfit 1.5 Preparing tools, materials and outfits 1.6 Discarding defective tools, and materials
2. Apply appropriate safety measures	2.1 Tools and materials are used according to specifications and procedures 2.2 Outfits are worn according to farm requirements 2.3 Effectivity/shelf life/expiration of materials are strictly observed 2.4 ***Emergency procedures*** are known	2.1 Uses and functions of tools 2.2 Outfits and how to wear it. 2.3 Expiration/shelf life of materials 2.4 Proper disposal of expired materials 2.5 Environmental rules and regulations	2.1 Using tools and materials in the workplace 2.2 Wearing of outfits 2.3 Observing expiration/shelf life of materials 2.4 Disposing of expired materials

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	and followed to ensure a safe work requirement 2.5 Hazards in the workplace are identified and reported in line with farm guidelines	2.6 Emergency procedures 2.7 Hazards identification and reporting 2.8 Communication skills 2.9 OSHS	2.5 Following emergency procedures 2.6 Identifying and reporting of hazards in workplace area
3. Safekeep/ dispose tools, materials and outfit	3.1 Used tools and outfit are cleaned after use and stored in designated areas 3.2 Unused materials are properly labeled and stored according to manufacturers recommendation and farm requirements 3.3 Waste materials are disposed according to manufacturers, government and farm requirements	3.1 Procedures of cleaning used tools and outfits 3.2 Label and storage unused materials 3.3 Disposal of wastes materials 3.4 Manufacturers recommendation on keeping materials 3.5 Environmental rules and regulations	3.1 Cleaning used tools and outfit 3.2 Labelling and storing unused materials 3.3 Disposing waste materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work tasks	**Work task may be selected from any of the subsectors:** 1.1 Crop Production 1.2 Post-harvest 1.3 Agri-marketing 1.4 Farm Equipment
2. Place	**May include:** 2.1 Stock room/storage areas/warehouse 2.2 Field/farm/orchard
3. Time	**May include:** 3.1 Fertilizer and pesticides application 3.2 Feed mixing and feeding 3.3 Harvesting and hauling
4. Tools, materials and outfits	**May include** 4.1 Tools 4.1.1 Wrenches 4.1.2 Screw driver 4.1.3 Pliers 4.2 Outfit 4.2.1 Masks 4.2.2 Gloves 4.2.3 Boots 4.2.4 Overall coats 4.2.5 Hat 4.2.6 Eye goggles
5. Emergency procedures	**May include:** 5.1 Location of first aid kit 5.2 Evacuation 5.3 Agencies contract 5.4 Farm emergency procedures
6. Hazards	**May include:** 6.1 Chemical 6.2 Electrical 6.3 Falls

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined areas of concern for safety measures 1.2 Applied appropriate safety measures according to industry requirements 1.3 Prepared tools, materials and outfit needed 1.4 Performed proper disposal of used materials 1.5 Cleaned and stored tools, materials and outfit in designated facilities
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Practical demonstration 2.2 Third Party Report
3. Resource Implications	3.1 Farm location 3.2 Tools, equipment and outfits appropriate in applying safety measures
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : USE FARM TOOLS AND EQUIPMENT

UNIT CODE : AFF321202

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use farm tools and equipment. It includes selection, operation and preventive maintenance of farm tools and equipment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use farm tools	1.1 Appropriate farm tools are identified according to requirement/use 1.2 Farm tools are checked for faults and defective tools reported in accordance with farm procedures 1.3 Appropriate tools are safely used according to job requirements and manufacturers conditions	1.1 Types and uses of farm tools 1.2 Characteristics of functional tools 1.3 Checking tools for defects/faults 1.4 Segregation and reporting defective tools 1.5 Uses of tools and equipment	1.1 Identifying farm tools for the work 1.2 Checking the conditions of tools 1.3 Reporting defective tools 1.4 Using tools
2. Select and operate farm equipment	2.1 Identify appropriate ***farm equipment*** 2.2 Instructional manual of the farm tools and equipment are carefully read prior to operation 2.3 ***Pre-operation check-up*** is conducted in line with manufacturers manual 2.4 Faults in farm equipment are identified and reported in line with farm procedures 2.5 Farm equipment used according to its function 2.6 Safety procedures are followed.	2.1 Types and operations of farm equipment 2.2 Standards operating procedures of farm equipment 2.3 Instructional manual of equipment 2.4 Pre-operation check-up 2.5 Equipment Specification 2.6 Procedures in calibrating and use of equipment 2.7 Equipment faults identification and reporting 2.8 Operation of equipment 2.9 Codes and Regulations on environmental protection Safety and keeping of	2.1 Identifying appropriate farm equipment for the work 2.2 Reading instructional manual. 2.3 Conducting pre-operation check-up 2.4 Identifying faults/defects of farm equipment 2.5 Reporting on defective farm equipment 2.6 Operating farm equipment 2.7 Following safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		equipment every after use 2.10 Safety measures	
3. Perform preventive maintenance	3.1 Tools and equipment are cleaned immediately after use in line with farm procedures 3.2 Routine check-up and maintenance are performed 3.3 Tools and equipment are stored in designated areas in line with farm procedures	3.1 Cleaning procedures of tools and equipment 3.2 Maintenance procedures of farm equipment 3.3 Storage of tools and equipment 3.4 Designated storage areas	3.1 Cleaning tools and equipment 3.2 Performing routinary check-up of tools and equipment 3.3 Maintaining farm equipment 3.4 Storing tools and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Farm equipment	**May include:** 1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers
2. Farm tools	**May include:** 2.1 Sickle 2.2 Cutters 2.3 Weighing scales 2.4 Hand tools 2.5 Measuring tools 2.6 Garden tools
3. Pre-operation check-up	**May include:** 3.1 Tires 3.2 Brake fluid 3.3 Fuel 3.4 Water 3.5 Oil 3.6 Lubricants 3.7 Battery

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Correctly identified appropriate farm tools and equipment 1.2 Operated farm equipment according to manual specification 1.3 Performed preventive maintenance
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Direct observation 2.2 Practical demonstration 2.3 Third Party Report
3. Resource Implications	3.1 Service/operational manual of farm tools and equipment 3.2 Tools and equipment 3.3 Farm implements
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM ESTIMATION AND BASIC CALCULATION2

UNIT CODE : AFF321203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform basic workplace calculations.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform estimation	1.1 Job requirements are identified from written or oral communications 1.2 Quantities of materials and resources required to complete a work task are estimated 1.3 The time needed to complete a work activity is estimated 1.4 Accurate estimate for work completion are made 1.5 Estimate of materials and resources are reported to appropriate person	1.1 Job requirements/ labor needs 1.2 Calculation of quantities of materials and resources required 1.3 Calculation of time for job completion 1.4 Preparation of estimate report 1.5 Basic mathematical operations 1.6 Percentage and ratios 1.7 Unit Conversion	1.1 Identifying job requirements/ 1.2 Estimating quantities of materials and resources required 1.3 Estimating time for job completion 1.4 Performing basic calculation 1.5 Computing percentage 1.6 Converting English to metric systems of measurement 1.7 Preparing estimate report
2. Perform basic workplace calculation	2.1 ***System and units of measurement*** to be followed are ascertained 2.2 Calculation needed to complete work tasks are performed using the ***four basic mathematical operation*** 2.3 Calculate whole fraction, percentage and mixed when are used to complete the instructions 2.4 Number computed is checked following work requirements	2.1 Four basic mathematical operation 2.2 System and units of measurement 2.3 Fraction, percentage and ratio 2.4 Material takeoff 2.5 Materials costing	2.1 Compute bill of materials 2.2 Compute project cost

RANGE OF VARIABLES

VARIABLE	RANGE
1. Four basic mathematical operation	**May include:** 1.1 Addition 1.2 Subtraction 1.3 Multiplication 1.4 Division
2. System of measurement	**May include:** 2.1 English 2.2 Metric
3. Units of measurement	**May include:** 3.1 Area 3.2 Volume 3.3 Weight 3.4 Length

EVIDENCE GUIDE

1.Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed estimation 1.2 Performed basic workplace calculation 1.3 Applied corrective measures as maybe necessary
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Practical demonstration 2.2 Written examination
3. Resource Implications	3.1 Relevant tools and equipment for basic calculation 3.2 Recommended data
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

CORE COMPETENCY

UNIT OF COMPETENCY : CONDUCT SITE SELECTION AND POND PREPARATIONS

UNIT CODE : AFF622314

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to prepare tools, materials and equipment, secure facilities, assist in selecting suitable site and prepare pond

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare tools, materials and equipment	1.1 ***Tools, materials*** and ***equipment*** are checked and cleaned following instructional manual 1.2 Materials are procured according to work requirements 1.3 Defective tools are segregated according to established criteria 1.4 Non-functional equipment is reported to immediate supervisor 1.5 Equipment is calibrated based on manufacturer's manual 1.6 Cast nets are inspected following industry procedures	1.1 Types of tools, materials and equipment 1.2 Identified defective tools and equipment are reported to the supervisor 1.3 Buy needed materials 1.4 Uses and preparation of tools, materials and equipment 1.5 Setting and calibration of equipment 1.6 Inspection cast nets following industry procedures 1.7 Listing of activities 1.8 Record keeping 1.9 Production data 1.10 Inventory of tools 1.11 Estimation of cost of materials and maintenance to buy	1.1 Checking of tools, materials and equipment 1.2 Buying needed tools 1.3 Listing defective tools and equipment 1.4 Reporting defective tools to the supervisor 1.5 Calibrating equipment 1.6 Inspecting cast net
2. Secure facilities	2.1 Storage facilities are prepared following work requirement 2.2 Facilities are checked for fish predators and trespassers 2.3 Biosecurity measures are applied according to GAqP	2.1 Preparation of storage facilities 2.2 Fishpond facilities are always checked 2.3 Installation of screens as prevention for predators.	2.1 Preparing storage facilities 2.2 Checking pond facilities 2.3 Installing screens 2.4 Installing perimeter canal 2.5 Inspecting aquaculture facilities

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.4 Screens are installed to prevent fish predators and unwanted species following industry procedure 2.5 Preventive structures are installed during inclement weather following industry procedures 2.6 ***Aquaculture facilities*** are inspected following GAqP 2.7 Minor repair is performed according to inspection result 2.8 Safety practices are applied following OSHS	2.4 Installations of structures following safety on weather conditions. 2.5 Inspection of aquaculture facilities following GAqP standards. 2.6 Inspection results recognizes minor repair	2.6 Working minor repair 2.7 Applying safety practices
3. Assist in selecting and evaluating suitable site	3.1 Ocular survey is conducted in possible pond site using ***established criteria*** 3.2 Soil samples are collected for analysis based on standard soil sampling procedures 3.3 ***Soil type*** is identified using feel method. 3.4 Checklist is accomplished and submitted to immediate supervisor	3.1 Zero datum 3.2 Pond site evaluation. 3.3 Water contamination and pollution determination. 3.4 Soil samples analysis 3.5 Pond design and construction 3.6 Pond sampling station box 3.7 Pond excavation and leveling 3.8 Water management and exchange 3.9 Program of work and activity listing 3.10 Measurement of water supply volume 3.11 Computation of soil organic matter content	3.1 Selecting ideal pond site 3.2 Sampling of water 3.3 Sampling of soil 3.4 Providing of pond inlet and outlet drainage 3.5 Leveling and excavating of pond

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Prepare pond	4.1 Pond is drained following GAqP 4.2 ***Degassing*** is performed to eliminate organic gasses in the soil according to industry procedures 4.3 ***Pesticide*** is applied to eliminate unwanted species. 4.4 Dikes are repaired following established work procedures 4.5 Vegetating top of dikes is performed according to GAqP 4.6 Lime is applied to increase alkalinity of ponds according to GAqP 4.7 Pond is fertilized to promote the growth of natural food. 4.8 Safety measures are applied following OSHS	4.1 Mechanical and chemical removal methods. 4.2 Harrowing. 4.3 Pond bottom drying 4.4 Vegetating top of dikes 4.5 Water supply and drainage canal screening 4.6 Pond liming 4.7 Pond fertilization 4.8 Total pond draining. 4.9 Program of work and activity listing 4.10 Amount of pesticide, lime and fertilizer computations 4.11 GAqP	4.1 Draining of pond 4.2 Harrowing of pond 4.3 Drying of pond 4.4 Vegetating top of dike 4.5 Screening of gates 4.6 Eliminating predators and un-wanted species. 4.7 Liming of pond 4.8 Fertilizing of pond

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools, materials and equipment	Tools, materials and equipment may include: 1.1 Tools 1.1.1 Scythe 1.1.2 Digging blade 1.1.3 Bolo 1.1.4 Hammer 1.1.5 Wheel borrow 1.1.6 Thumper 1.1.7 Scissor 1.1.8 Saw 1.2 Materials 1.2.1 Fertilizer 1.2.2 Lime 1.2.3 pesticide 1.2.4 Lumber 1.2.5 Cast nets 1.2.6 Pond liner 1.2.7 Vegetable seeds 1.2.8 PPEs 1.2.9 First Aid Kit 1.3 Equipment 1.3.1 Water pump 1.3.2 Aerator 1.3.3 Rotavator 1.3.4 Weighing scale 1.3.5 pH meter 1.3.6 DO meter 1.3.7 Refractometer 1.3.8 Thermometer 1.3.9 Hydrometer
2. Aquaculture facilities	Aquaculture facilities may include: 2.1 dikes 2.2 nets 2.3 frames 2.4 drainage system 2.5 warehouse
3. Established criteria	Established criteria may include: 3.1 flat terrain 3.2 free from contamination and pollution 3.3 adequate water supply 3.4 not prone to flash floods 3.5 in line with the wind direction 3.6 adequate buffer zone
4. Soil type	Soil type may include: 4.1 clay 4.2 clay loam 4.3 loam 4.4 sandy clay

VARIABLE	RANGE
5. Degassing	Degassing may include: 5.1 harrowing 5.2 drying
6. Pesticide	Pesticide includes: 6.1 Organic 6.2 synthetic

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Assisted pond site selection activities 1.2 Provided pond individual water inlet and draining outlet. 1.3 Performed soil required characteristics analysis 1.4 Performed excavation and leveling activities 1.5 Established pond orientation exposing to strong winds and wave action. 1.6 Performed pond draining activities 1.7 Performed elimination of pond predators and un-wanted species. 1.8 Conduct soil harrowing 1.9 Performed pond drying. 1.10 Performed dike repair 1.11 Conducted vegetating on top of dike 1.12 Performed screening pond gates 1.13 Calculated appropriate amount of pesticide, lime and fertilizer 1.14 Conducted pond poisoning 1.15 Conducted pond liming activities 1.16 Conducted pond fertilization 1.17 Practiced OSHS
2. Resource Implications	**The following resources MUST be provided:** 2.1 Simulated or actual pond area 2.2 Tools, materials and equipment relevant to perform required task 2.3 Laboratory area/practical area 2.4 References and manuals 2.5 PPE
3. Methods of Assessment	**Competency may be assessed through:** 3.1 Written Examination 3.2 Demonstration 3.3 Oral Questioning
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM NURSERY OPERATIONS

UNIT CODE : AFF622315

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to inspect fry, water quality and level management acclimatize fry, manage feeding activities, harvest and transfer fingerlings and condition fingerlings

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Inspect fry	1.1 Fry ***behavior and condition*** is checked based on established aquaculture standard 1.2 Percentage of mortalities is determined according to industry procedure 1.3 Sample counting is conducted to determine total quantity of fry 1.4 Record keeping is performed according to workplace procedures	1.1 Physical behavior and condition of fry 1.2 Acceptable mortality allowance 1.3 Quantity fry 1.4 Record keeping 1.5 Visual inspection technique	1.1 Checking of fry condition 1.2 Determining number of mortalities 1.3 Conducting sample counting 1.4 Record keeping 1.5 Applying visual inspection technique
2. Stock fry	2.1 Pond salinity is checked based on industry procedure 2.2 Pond temperature is measured based on workplace procedure 2.3 ***Transport water quality*** is adjusted to pond water quality 2.4 Measuring devices are used according to manufacturer's manual 2.5 Fry is transferred from transport water to pond water	2.1 Measuring devices for water quality 2.2 Uses of water measuring devices	2.1 Checking pond salinity 2.2 Measuring pond temperature 2.3 Conforming fry water salinity to pond water salinity 2.4 Adjusting water temperature of both fry and pond water 2.5 Using measuring devices 2.6 Transferring of fry

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Conduct water level management	3.1 Water level is checked based on the supervisor's instructions 3.2 Water level is monitored according to supervisor's instructions. 3.3 Water level is adjusted according supervisor's instructions	3.1 Water level monitoring and maintenance 3.2 Tide level 3.3 Sizes of stock	3.1 Checking of water level and quality 3.2 Monitoring of water level 3.3 Adjusting of water level
4. Maintain water quality	4.1 Ocular water quality inspection is conducted following established industry practices 4.2 Ocular inspection result is recorded and reported to immediate supervisor 4.3 ***Remedial actions*** are conducted following immediate supervisor's instruction 4.4 Safety practices are applied following OSHS	4.1 Water quality 4.2 Ocular inspection procedure 4.3 Procedure in changing water 4.4 Recording and reporting procedure 4.5 Remedial action procedures 4.6 OSHS	4.1 Conducting ocular water quality inspection 4.2 Recording and reporting ocular inspection result 4.3 Conducting remedial actions 4.4 Applying safety practices following OSHS

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Manage feeding activities	5.1 Quantity of natural food in the pond is determined following industry procedure. 5.2 Natural food consumption is estimated according to volume of fry stocked and quantity of natural food 5.3 ***Feed types*** is determined after the consumption of natural food 5.4 Feeding is conducted based on identified feeding requirement 5.5 Size sampling is done according to Days of Culture (DOC) 5.6 Feeding is adjusted based on ***individual sampling*** 5.7 Record keeping is done following workplace procedure	5.1 Corresponding weight based on DOC 5.2 Feeding management 5.3 Visual inspection on availability of natural food 5.4 Estimation of food consumption 5.5 Feed types and uses 5.6 Required Daily Allowance for feeds 5.7 Days of Culture 5.8 Size Sampling 5.9 Record keeping 5.10 Individual sampling 5.11 Adjustment of feeding 5.12 Frequency of water change 5.13 Feeding requirement	5.1 Stocking of fry 5.2 Determining quality of natural food through color of pond water 5.3 Estimating natural food consumption 5.4 Determining feed requirement 5.5 Conducting feeding 5.6 Performing size sampling 5.7 Adjusting feeds 5.8 Keeping record
6. Harvest and transport fingerlings	6.1 ***Harvesting materials*** and ***equipment*** are prepared based on work requirements 6.2 ***Methods of harvesting*** is applied according to species 6.3 Quantity of harvest is recorded based on workplace procedures 6.4 Prophylaxis treatment is applied prior to transport following GAqP 6.5 Harvested fingerlings are transported following standard modes of transport 6.6 Safety practices are applied based on OSHS	6.1 Types of harvesting materials and equipment 6.2 Uses and preparation of harvesting materials and equipment 6.3 Methods of harvesting 6.4 Record keeping 6.5 Standard modes of Transportation 6.6 OSHS	6.1 Preparing harvest materials and equipment 6.2 Determining methods of harvesting 6.3 Applying methods of harvesting 6.4 Record keeping 6.5 Transporting harvested fingerlings 6.6 Applying OSHS

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
7. Condition fingerlings	7.1 ***Materials and equipment*** for conditioning is prepared following industry procedure 7.2 ***Inspection activities*** are conducted industry standard 7.3 Fingerlings are handled during transport from shore to conditioning cage according to industry procedure 7.4 Fingerlings are stocked in conditioning cage according to industry procedure 7.5 Feeding and monitoring of fingerlings are conducted based on computed feed rate 7.6 Record keeping is conducted following workplace requirement 7.7 Fingerlings are sorted and counted following ***customers' preference*** 7.8 Safety practices are applied according to OSHS	7.1 Types of conditioning materials and equipment 7.2 Uses and preparation of conditioning materials and equipment 7.3 Inspection activities 7.4 Feed rate 7.5 Feeding procedures 7.6 Monitoring procedures 7.7 Proper handling of fingerlings 7.8 Record keeping 7.9 OSHS	7.1 Preparing conditioning materials 7.2 Conducting inspection activities 7.3 Transporting fingerlings 7.4 Stocking fingerlings 7.5 Feeding and monitoring of fingerlings 7.6 Record keeping 7.7 Applying safety practices following OSHS 7.8 Sorting and counting of right-sized fingerlings for grow out cage

RANGE OF VARIABLES

VARIABLE	RANGE
1.Behavior and condition	Behavior and condition may include: 1.1 Swimming movement -slow -swirling -flipping 1.2 changes of color -normal -dark 1.3 uniformity of size
2.Transport water quality	Transport water quality may include: 2.1 Color 2.2 Transparency
3.Remedial actions	Remedial actions may include: 3.1 Changing/draining of water 3.2 Topping-up of water 3.3 Degassing
4. Feed types	Feed types may include: 4.1 Fry/starter mass booster 4.2 Pre-starter pellet 4.3 Crumble
5. Individual sampling	Individual sampling may include: 5.1 Weight 5.2 Length
6.Harvesting materials and equipment	Harvesting materials and equipment may include: 6.1 Seine net (size 32 to 14) 6.2 Hapa net 6.3 Scoop net 6.4 Scoop ladle/dipper 6.5 Plastic container 6.6 Packing transport water 6.7 Packing plastics transport bags 6.8 Rubber bands 6.9 Medical oxygen (95% and up) 6.10 Pump motorized boat 6.11 Truck 6.12 Styrofoam boxes
7.Methods of harvesting	Methods of harvesting may include: 7.1 Feeding and lifting 7.2 Up streaming 7.3 Seining 7.4 Draining
8.Materials and equipment	Materials and equipment may include: 8.1 Conditioning cage/hapa net 8.2 Pump motorized boat 8.3 Oxygen 8.4 Plastic bags 8.5 Hauling box (2X2X3) with agitator 8.6 Rubber bands 8.7 Scoop net 8.8 Scoop ladle

9.Inspection activities	Inspection activities may include: 9.1 Quantity of delivery 9.2 Quality of delivery
10.Customers' preference	Customers' preference may include: 10.1 Size 10.2 Weight 10.3 High value fingerlings

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Inspected fry 1.2 Acclimatized fry 1.3 Managed feeding activities 1.4 Computed feeding ration 1.5 Harvested and transported fingerlings 1.6 Conditioned fingerlings 1.7 Conducted water level management 1.8 Maintained water quality 1.9 Performed grading and sizing of fingerlings
2. Resource Implications	**The following resources MUST be provided:** 2.1 Simulated or actual pond area 2.2 Conditioning cage 2.3 Tools, materials and equipment relevant to perform required tasks 2.4 PPEs 2.5 Manuals and references
3. Methods of Assessment	**Competency may be assessed through:** 3.1 Written exam 3.2 Demonstration/ practical exam 3.3 Oral questioning
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PRODUCE AQUACULTURE COMMODITIES

UNIT CODE : AFF622316

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to conduct stocking, conduct feeding activities, monitor growth progress, perform harvesting activities.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct stocking activities	1.1 Stocks are assessed based on the quality of fingerlings 1.2 Stocks are acclimatized based on GAqP 1.3 Stocks are released following industry procedures	1.1 Computation stocking density 1.2 Process of acclimatization (salinity, temperature) 1.3 Survival rate estimation	1.1 Assessing of stocks 1.2 Acclimatizing of stocks 1.3 Releasing of stocks
2. Conduct feeding activities	2.1 Feed type is determined based on Days of Culture (DOC) 2.2 Amount of feeds are computed according to estimated biomass 2.3 Feeds are prepared and transported from warehouse to ***grow out area*** 2.4 Feeding is conducted based on workplace procedure 2.5 Feeding is adjusted based on growth progress 2.6 Feed forecasting is performed following standard industry practices. 2.7 Safety practices are applied following OSHS.	2.1 Types of feeds 2.2 Computation of feed ration 2.3 Handling of feeds 2.4 Feeding procedures 2.5 Growth stage of aquaculture species 2.6 Feeding adjustments 2.7 Feed forecasting 2.8 Feeding guide 2.9 GAqP 2.10 OSHS	2.1 Determining feed type 2.2 Determining feed volume 2.3 Preparing and transporting of feeds 2.4 Feeding of fingerlings 2.5 Performing feed forecasting 2.6 Using feeding guide 2.7 Swimming and diving 2.8 Applying safety practices

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Monitor growth progress	3.1 Representative sampling is conducted based on established industry practice. 3.2 Estimated average biomass is compared to ideal average body weight 3.3 Computed biomass is used to adjust feed requirement 3.4 Resampling is performed following established enterprise procedure 3.5 Water quality is monitored following industry procedures. 3.6 Safety practices are applied following OSHS.	3.1 Procedure of representative sampling 3.2 Estimation of average biomass 3.3 Using of computed biomass 3.4 Use of weighing scale 3.5 Resampling method 3.6 Feed conversion ratio (FCR) 3.7 Feeding guide 3.8 Use of physico-chemical parameter instruments	3.1 Conducting representative sampling 3.2 Determining estimated average body weight 3.3 Performing analysis 3.4 Adjusting feeding 3.5 Performing resampling 3.6 Utilizing weighing scale 3.7 Using of feeding guide 3.8 Using of physico-chemical parameter instruments 3.9 Swimming and diving 3.10 Applying safety practices
4.Perform harvesting activities	4.1 ***Harvesting tools, materials and equipment*** are prepared according to work requirements 4.2 ***Harvesting methods*** are applied based on established enterprise practices . 4.3 Volume of harvest is recorded according to weight and quantity 4.4 Safety measures are practiced following OSHS	4.1. Types of harvesting tools, materials and equipment 4.2. Time of harvesting 4.3. Weather condition 4.4. Tide Table 4.5. Established criteria in segregating and sorting 4.6. Uses and functions of tools, materials and equipment 4.7. Preparation of tools, materials and equipment 4.8. Different harvesting methods 4.9. Record keeping 4.10. Quantity of ice 4.11. Volume of harvest 4.12. Food Safety Act 4.13. OSHS	4.1. Preparing of harvesting tools, materials and equipment 4.2. Applying harvesting methods 4.3. Practicing Food Safety Act 4.4. Recording of volume of harvest 4.5. Practicing safety measures 4.6. Swimming and diving

RANGE OF VARIABLES

VARIABLE	RANGE
1. Grow –out area	Grow –out area includes: 1.1 Cage 1.2 Pond 1.3 Pen
2. Harvesting tools, materials and equipment	Harvesting tools, materials and equipment may include: Materials: 2.1 Scoop net 2.2 Sein nets 2.3 Styrofoam boxes 2.4 Chilling tanks 2.5 Ice (cracked and crushed) Tools: 2.6 Bolo 2.7 Crab trap 2.8 Transfer crate 2.9 Knife 2.10 Pair of scissors Equipment: 2.11 Weighing scale 2.12 Paddle boat 2.13 Chilling tank 2.14 Chilling boat 2.15 Transfer cage 2.17 Harvesting raft 2.18 Motorized boat 2.19 Transport vehicle
3. Harvesting methods	Harvesting methods may include: 3.1 Scooping 3.2 Lifting 3.3 Seining 3.4 Casting 3.5 Picking 3.6 Draining

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conduct feeding activities 1.2 Monitor growth progress 1.3 Monitor grow out cage 1.4 Perform harvesting activities
2. Resource Implications	**The following resources MUST be provided:** 2.1 Actual or simulated grow out cage, pen and pond areas 2.2 Tools, materials and equipment relevant to the task to be demonstrated 2.3 PPEs 2.4 Manuals and references
3. Methods of Assessment	**Competency may be assessed through:** 3.1 Written exam 3.2 Demonstration 3.3 Oral questioning
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : CARRY OUT POST-PRODUCTION ACTIVITIES

UNIT CODE : AFF622317

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to perform post-harvest activities, restore aquaculture facilities, maintain tools, materials and equipment and complete post-harvest activities

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform post - harvest activities	1.1 ***Post-harvest tools, materials and equipment*** are prepared according to workplace requirement 1.2 Harvested aquaculture commodities are segregated and sorted according to ***established criteria*** 1.3 Harvested aquaculture commodities are ***chilled*** according to species requirement 1.4 Sorted and segregated aquaculture commodities are packed and labeled based on Food Safety Act 1.5 ***Handling*** of aquaculture commodities is applied following GAqP 1.6 Volume of harvest is recorded according to weight and quantity 1.7 Safety measures are practiced following OSHS	1.1 Established criteria in sorting and segregation 1.2 Types of packing materials 1.3 Type of tools, materials and equipment 1.4 Procedure in segregation and sorting 1.5 Uses and functions of tools, materials and equipment 1.6 Preparation of tools, materials and equipment 1.7 Chilling methods 1.8 Packing and labeling procedures 1.9 Quantity of ice 1.10 Volume of harvest 1.11 Record keeping 1.12 Food Safety Act 1.13 OSHS 1.14 GAqP	1.1 Preparing post-harvest tools, materials and equipment 1.2 Segregating and sorting harvested commodities 1.3 Packing and labeling sorted and segregated commodities 1.4 Handling aquaculture commodities 1.5 Recording volume of harvest 1.6 Practicing and applying GAqP and OSHS
2. Restore aquaculture facilities	2.1 Nets are ***maintained*** following standard operating procedures 2.2 Damaged aquaculture facilities are replaced following workplace requirement 2.3 Minor repair is performed based on industry practice.	2.1 Simple carpentry 2.2 Net mending/patching 2.3 Solid Waste Management Act 2.4 3Rs 2.5 5s of Good Housekeeping 2.6 OSHS	2.1 Maintaining of nets 2.2 Replacing of damaged aquaculture facilities 2.3 Performing minor repair 2.4 Practicing waste management

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.4 Waste management is practiced following Solid Waste Management Act 2.5 Safety practices are applied following OSHS		2.5 Applying safety practices
3.2 Maintain tools, materials and equipment	3.1 ***Preventive maintenance*** is practiced following manufacturer's manual 3.2 Excess materials, tools and equipment are stored following workplace requirement 3.3 Tools and equipment are inspected for defect and functionality 3.4 Defective tools and equipment are reported to immediate supervisor	3.1 Different preventive maintenance 3.2 Manufacturer's manual 3.3 Different defects of tools and equipment 3.4 Storage of excess materials, tools and equipment 3.5 Reporting on defective tools and equipment	3.1 Practicing preventive maintenance 3.2 Storing of excess materials, tools and equipment 3.3 Inspecting tools and equipment for defects and functionality 3.4 Reporting defective tools and equipment to immediate supervisor
4.Complete post - production activities	4.1 ***Production data*** are recorded based on industry practice 4.2 Inventory of tools, materials and equipment are conducted following workplace procedure. 4.3 Report is prepared for submission to immediate supervisor based on workplace requirement. 4.4 Improvement in the operation is recommended based on the prepared report.	4.1 Production data 4.2 Record keeping 4.3 Inventory of tools 4.4 Report preparation 4.5 Evaluation of reported data 4.6 Improvement of operation	4.1 Recording of production data 4.2 Conducting inventory of tools, materials and equipment 4.3 Preparing of report 4.4 Evaluating of recorded data 4.5 Recommending improvement of operation

RANGE OF VARIABLES

VARIABLE	RANGE
1. Post-harvest tools, materials and equipment	Post-harvest tools, materials and equipment may include: 1.1Materials: 1.1.1 Tying materials 1.1.2 Crushed ice 1.1.3 Boxes 1.1.4 Sorting crates 1.1.5 Pail 1.1.6 Labeling materials 1.1.7 Plastic 1.1.8 Log book/record book 1.1.9 Pencil 1.1.10 Ballpen 1.1.11 PPEs 1.1.11.1 Long sleeve 1.1.11.2 Gloves 1.1.11.3 Rubber boots 1.1.11.4 Mask 2.1 Tools: 2.2.1 Shovel 2.2.2 Scissor 2.2.3 Sorting table 2.2.4 Calculator 3.1 Equipment: 3.3.1Chilling tank 3.3.2Weighing scale
2. Established criteria	Established criteria may include: 2.1 Size 2.1.1 small 2.1.2 medium 2.1.3 large 2.2 Physical features 2.2.1 hard shell 2.2.2 soft shell
3. Chilling Methods	Chilling methods include: 3.1 Chilling with high temperature 3.2 Chilling with moderate temperature 3.3 Chilling with low temperature
4. Handling	Handling may include: 4.1 Tying of crab 4.2 Bending 4.3 Chilling 4.4 Washing and cleaning
5. Maintenance of net	Maintenance of net may include: 5.1 Washing 5.2 Cleaning 5.3 Mending/Patching 5.4 Air drying

	5.5 Storing
6. Preventive maintenance	Preventive maintenance may include: 6.1 Lubricating 6.2 Calibrating 6.3 Cleaning 6.4 Washing and sanitizing
7. Production data	Production data may include: 7.1 Number of fingerlings cultured 7.2 Mortalities 7.3 Feeds consumption 7.4 Total number of aquaculture commodities harvested 7.5 Total kilos harvested

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Performed post - harvest activities 1.2 Restored aquaculture facilities 1.3 Maintained tools, materials and equipment 1.4 Completed post production activities
2. Resource Implications	**The following resources MUST be provided:** 2.1 Actual or simulated farm areas 2.2 Harvesting tools, materials and equipment need to perform required tasks 2.3 PPEs 2.4 References and manuals
3. Methods of Assessment	**Competency may be assessed through:** 3.1 Written exam 3.2 Demonstration with oral questioning
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3 TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **AQUACULTURE (GROW-OUT OPERATION) NCII.**

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to accompany the curricula.

Course Title: **AQUACULTURE (GROW-OUT OPERATION)** NC Level **NC II**

Nominal Training Duration**:**

37 Hours	Basic Competencies
72 Hours	Common Competencies
301 Hours	Core Competencies
410 Hours	
80 Hours	Supervised Industry Learning (SIL)
490 Hours	**Total Hours**

Course Description:

This course is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve in conducting site selection and pond preparations, performing nursery operations, producing aquaculture commodities and carrying out post- production activities. These competencies are required to an individual who will be engaged in aquaculture, specifically grow-out operation of commercially viable aquaculture species thriving in brackish, freshwater and marine ecosystems, except tilapia and seaweed.

Upon completion of the course, the learners are expected to demonstrate the above-mentioned competencies to be employed. To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES
37 HRS

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

1. Participate in workplace communication	1.1 Obtain and convey workplace information	• Describe Organizational policies
		• Read:
		  ○ Effective communication
		  ○ Written communication
		  ○ Communication procedures and systems
		• Identify:
		  ○ Different modes of communication
		  ○ Medium of communication
		  ○ Flow of communication
		  ○ Available technology relevant to the enterprise and the individual's work responsibilities
		• Prepare different Types of question
		• Gather different sources of information
		• Apply storage system in establishing workplace information
		• Demonstrate Telephone courtesy
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

	1.2 Perform duties following workplace instructions	• Read:
		  ○ Written notices and instructions
		  ○ Workplace interactions and procedures
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Read instructions on work related forms/documents • Perform workplace duties scenario following workplace nstructions			

	1.3 Complete relevant work related documents	• Describe Communication procedures and systems
		• Read:
		  ○ Meeting protocols
		  ○ Nature of workplace meetings
		  ○ Workplace interactions
		  ○ Barriers of communication
		• Read instructions on work related forms/documents
		• Practice:
		  ○ Estimate, calculate and record routine workplace measures
		  ○ Basic mathematical processes of addition, subtraction, division and multiplication
		• Demonstrate office activities in:
		  ○ workplace meetings and discussions scenario
		• Perform workplace duties scenario following simple written notices
		• Follow simple spoken language
		• Identify the different Non-verbal communication
			• Group discussion
			• Lecture
			• Demonstration
			• Role play
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Demonstrate ability to relate to people of social range in the workplace • Gather and provide information in response to workplace requirements • Complete work related documents			
2. Work in a team environment	2.1 Describe team role and scope	• Discussion on team roles and scope • Participate in the discussion: ○ Definition of Team ○ Difference between team and group ○ Objectives and goals of team • Locate needed information from the different sources of information	• Lecture/ Discussion • Group Work • Individual Work • Role Play	• Role Play • Case Study • Written Test	1 Hour
	2.2 Identify one's role and responsibility within team	• Role play: ○ individual role and responsibility • Role Play ○ Understanding Individual differences • Discussion on gender sensitivity	• Role Play • Lecture/ Discussion	• Role Play • Written Test	1 Hour
	2.3 Work as a team member	• Participate in group planning activities • Role play: Communication protocols • Participate in the discussion of standard work procedures and practices	• Group work • Role Play • Lecture/ Discussion	• Role Play • Written Test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
3. Solve/address routine problems	3.1 Identify routine problems	• Determine of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Analyze routine/procedural problems	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
	3.2 Look for solutions to routine problems	• Determine of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Formulate possible solutions to problems and document procedures for reporting	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.3 Recommend solutions to problems	• Discuss standard operating procedures and documentation processes	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
4. Develop Career and Life Decisions	4.1 Manage one's emotion	• Demonstrate self-management strategies that assist in regulating behavior and achieving personal and learning goals • Explain enablers and barriers in achieving personal and career goals • Identify techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc. • Manage properly one's emotions and recognize situations that cannot be changed and accept them and remain professional • Recall instances that demonstrate self- discipline, working independently and showing initiative to achieve personal and career goals	• Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Share experiences that show confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace			
	4.2 Develop reflective practice	• Enumerate strategies to improve one's attitude in the workplace • Explain Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis, Conclusion, and Action plan) • Use basic SWOT analysis as self-assessment strategy • Develop reflective practice through realization of limitations, likes/ dislikes; through showing of self-confidence • Demonstrate self-acceptance and being able to accept challenges	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • 5 Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour
	4.3 Boost self-confidence and develop self-regulation	• Describe the components of self-regulation based on Self-Regulation Theory (SRT) • Explain personality development concepts • Cite self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts) • Perform effective communication skills – reading, writing, conversing skills	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Show affective skills – flexibility, adaptability, etc. • Determine strengths and weaknesses			
5. Contribute to workplace innovation	5.1 Identify opportunities to do things better	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour
	5.2 Discuss and develop ideas with others	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people • Communicate ideas through small group discussions and meetings		• Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	
	5.3 Integrate ideas for change in the workplace	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people • Communicate ideas through small group discussions and meetings • Demonstrate basic skills in data analysis	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
6. Present relevant information	6.1 Gather data/ information	• Lecture and discussion on: - Organisational protocols - Confidentiality and accuracy - Computing for expenses and possible earnings - Legislation, policy and procedures relating to the conduct of evaluations • Reviewing data/ information	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.2 Assess gathered data/ information	• Lecture and discussion on: - Evaluation of gathered information using basic mathematical operation - Organisational values, ethics and codes of conduct - Trends and anomalies • Computing for expenses and possible earning	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours
	6.3 Record and present information	• Lecture and discussion on: - Reporting requirements to a range of audiences - Recommendations for possible improvements • Comparison of interim and final reports' outcomes • Reporting of data findings	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours
7. Practice Occupational Safety And Health Policies And Procedures	7.1 Identify OSH compliance requirements	• Discussion regarding: - Hierarchy of Controls - Hazard Prevention and Controls - Work Standards and Procedures - Personal Protective Equipment	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	7.2 Prepare OSH requirements for compliance	• Identification of required safety materials, tools and equipment • Handling of safety control resources	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	7.3 Perform tasks in accordance with relevant OSH policies and procedures	• Discussion of General OSH Standards and Principles • Performing industry related work activities in accordance with OSH Standards	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	2 Hours
8. Exercise Efficient and Effective Sustainable Practices in the Workplace	8.1 Identify the efficiency and effectiveness of resource utilization	- Discussion on the process how Environmental Policies coherence is achieved • Discussion on Necessary Skills in response to changing environmental policies needs - Waste Skills - Energy Skills - Water Skills - Building Skills - Transport Skills - Material Skills	• Lecture • Group Discussion • Simulation • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	8.2 Determine causes of inefficiency and/or ineffectiveness of resource utilization	• Discussion of Environmental Protection and Resource Efficiency Targets • Analysis on the Relevant Work Procedure	• Lecture • Group Discussion • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	8.3 Convey inefficient and ineffective environmental practices	• Identification of (re)training needs and usage of environment friendly methods and technologies • Identification of environmental corrective actions • Practicing Environment Awareness	• Lecture • Group Discussion • Role Play • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
9. Practice Entrepreneurial Skills in the Workplace	9.1 Apply entrepreneurial workplace best practices	• Determine best entrepreneurial practices • Discussion on Quality procedures and practices • Explain cost consciousness in resource utilization	• Interview • Lecture/Discussion	• Interview • Written Test • Interview	1 Hour
	9.2 Communicate entrepreneurial workplace best practices	• Discussion on communicating entrepreneurial workplace best practices	• Lecture/Discussion	• Written Test • Interview	1 Hour
	9.3 Implement cost-effective operations	• Apply the preservation, optimization and judicious use of workplace resources	• Interview • Lecture/Discussion	• Interview • Written Test • Interview	2 Hours

COMMON COMPETENCIES
72 HRS

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
1.Apply safety measures in farm operations	1.1 Determine areas of concern for safety measures	• Identify work tasks in farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning • Demonstration	(Total-7 hrs) 1 hr
		• Discuss safety measures in a workplace during farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Explain farm operations situations and period when to observe safety	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing •	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Identify appropriate tools	• Lecture	• Written	2 hrs
		• materials and outfits to be used	• Discussion • Incomplete worksheet • Power point presentation • Video presentation	• examination • Interview • Oral questioning • Demonstration	
	1.2 Apply appropriate safety measures	• Prepare tools, materials and outfits for the farm operation	• Lecture • Discussion • Power point presentation • Video presentation • Demonstration •	• Written examination • Interview • Oral questioning • Demonstration	2 hrs
		• Enumerate uses and functions of tools and materials	• Discussion • Power point presentation • Video presentation • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	(Total -11 hrs.) 1 hr
		• Explain procedures of wearing personal protective equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Discuss topics on effectivity, shelf life and expirations of materials to be used.	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Identify the emergency procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	2 hrs
		• Identify hazards in a farm workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	2 hrs
		• Use tools and materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Wear personal protective equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	0.5 hr
		• Prepare report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	0.5 hr
	1.3Safekeep/dispose of tools, materials and outfit	• Explain cleaning and storing procedures of the used tools and outfit	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	(Total 6hrs) 1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• State labelling and storing of unused materials	• Power point presentation • Video presentation • Incomplete worksheet	• examination • Interview • Oral questioning •	1 hr
		• Explain proper wastes disposal	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Clean and store used tools and outfit	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
2.Use farm tools		• Label and store unused materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Dispose waste materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
	2.1 Select and use farm tools	• Identify farm tools	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	(Total -6 hrs) 1 hr
		• Describe faults and defective tools	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Discuss using of tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet • Demonstration • Hands-on		
	2.2 Select and operate farm equipment	• Check farm tools for faults and defects	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Use tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs
		• Identify farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	(Total -19 hrs) 1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Explain importance of reading manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Discuss pre-operation check and its importance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Identify different types of faults in farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Enumerate reporting procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Enumerate procedures in using farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Discuss safety procedures for farm operation	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Read manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Conduct pre-operation check-up	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Report identified faults	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Operate farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on • Field visit	• Written examination • Interview • Oral questioning • Demonstration	8 hrs
		• Follow safety procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.3Perform preventive maintenance	• Enumerate cleaning procedures for tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	(Total -7 hrs) 1 hr
		• Discuss significance of routine check-up and maintenance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Explain procedures in storing tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	1 hr
		• Clean tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	2 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Perform routine check –up and maintenance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
		• Store tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	1 hr
3.Perform estimation and basic calculation	3.1Perform estimation	• Identify job requirements and work task/activity	• Lecture • Discussion	• Written exam • Oral questioning	(Total -8 hrs) 1 hr
		• Identify materials and resources of job requirements	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		• Estimate time to complete work task/activity	• Lecture • Discussion • Demonstration • Video presentation	• Written exam • Oral questioning	2 hrs

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	3.2 Perform basic workplace calculation	• Estimate quantities of materials and resources	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning	2 hrs
		• Prepare and submit bill of materials	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	2 hrs
		• Describe different types of calculation	• Lecture • Discussion	• Written exam • Oral questioning	(Total -8 hrs) 1 hr
		• Discuss different methods of calculation	• Lecture • Discussion	• Written exam • Oral questioning	1 hr

CORE COMPETENCIES
301 HRS

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Conduct pond preparations	1.1 Prepare tools and simple equipment	• Identify tools, materials and equipment • Discuss the uses and functions of tools, materials and equipment • Discuss proper preventive maintenance • Explain checking and cleaning procedures • Explain process of procurement of materials • Describe defective tools • Enumerate segregation procedures • List reporting procedures • Discuss calibration procedures of equipment • Outline inspection procedures of cast nets • Prepare tools and simple equipment	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing	• Written examination • Demonstration • Oral questioning	**(120 Hrs.)** 8 hrs
	1.2 Secure facilities	• Arrange procedures of storage facilities preparation • Identify different fish predators • Explain importance of eradication and prevention of predators • Discuss simple carpentry works • Discuss preventive measure against inclement weather	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field visit	• Written examination • Demonstration • Oral questioning	24 hrs

		• Explain inspection procedures • Discuss GAqP on inspection of Aquaculture facilities • Secure facilities			
	1.3 Assist in selecting and evaluating suitable site	• Describe pond layout • Explain functions of pond layout • Identify different functions of pond compartment • Enumerate soil sample procedures • Explain feel method • Identify soil type • Discuss accomplishing checklist • Assist in selecting and evaluating suitable site	• Power Point presentation • Lecture discussion Demonstration • Film viewing • Role playing • Field visit	• Written examination • Demonstration • Oral questioning	8 hrs
	1.4 Prepare pond	• Discuss GAqP on pond preparation • Enumerate draining procedures • Explain degassing procedures and principles • Explain proper pond poisoning process • Describe dike structure • Explain the importance of vegetating top of dikes • Explain process lime application • Identify types of fertilizer • Discuss process of fertilization • Discuss safety procedures • Prepare pond	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Field visit	• Written examination • Demonstration • Oral questioning	80 hrs
2. Perform nursery operations	2.1 Inspect fry	• Identify fry behavior and condition • Describe visual inspection technique • Identify percentage of mortalities • Explain sample counting	• Power Point presentation • Lecture discussion • Demonstration	• Written examination • Demonstration • Oral questioning	**(112 hrs)** 8 Hours

		• Enumerate record keeping procedures • Inspect fry	• Film viewing • Role playing • Field/farm visit		
	2.2 Stock fry	• Discuss pond salinity • Identify measurement devices Enumerate uses of measuring devices • Discuss measurement of pond temperature • Discuss adjustment of transport water quality • Explain transferring of fry from transport water to pond • Stock fry	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs
	2.3 Conduct water level management	• Discuss water level monitoring and maintenance • Explain adjustment of water level • Discuss tide level • Identify sizes of stock • Conduct water level management	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs
	2.4 Maintain water quality	• Discuss water quality • Explain ocular inspection procedure • Explain procedure of changing water • Explain recording and reporting procedure • Enumerate and discuss remedial action procedures • Maintain water quality	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs

	2.5 Manage feeding activities	• Enumerate steps for computation of natural food quantity • List estimation procedures for natural food consumption • Identify feed types and requirement • Enumerate feeding procedures • Discuss size sampling procedures • Explain procedures of feeding adjustment • Discuss record keeping procedures • Manage feeding activities	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	16 hrs
	2.6 Harvest and transport fingerlings	• Identify harvesting materials and equipment • Identify uses of harvesting materials and equipment • Discuss methods on harvesting • Explain recording procedures • Discuss manner of transport • Discuss packaging procedures • Discuss record keeping procedures • Harvest fingerlings	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	56 hrs
	2.7 Condition fingerlings	• Identify materials and equipment for conditioning • Identify uses of materials and equipment for conditioning • Discuss inspection procedures • Explain handling procedures of fingerlings during transport • Explain fingerlings dispersal procedures • Explain feeding and monitoring procedures • Identify customer's preferences	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs

		• Explain sorting and counting procedures • Discuss record keeping procedures • Condition fingerlings			
3.Produce aquaculture commodities	3.1 Conduct stocking activities	• Identify quality of fingerlings • Explain assessment of stocks • Discuss computation of stocking density • Discuss process of acclimatization • Discuss survival rate estimation • Explain realizing of stocks	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	**(41 hrs)** 8 hrs
	3.2 Conduct feeding activities	• Identify feed types • Discuss computation method • Discuss feeding methods • Identify equipment used for transport • Discuss ways of transporting feeds • Explain feeding procedures • Determine feeding requirements • Discuss feeding adjustments • Discuss feed forecasting procedure • Conduct feeding activities	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Role playing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs
	3.3 Monitor growth progress	• Discuss representative sampling • Discuss method of estimation and comparison of biomass • Explain adjustment of feed requirement • Describe resampling procedures • Explain use of physico-chemical parameter instruments • Monitor growth progress	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8 hrs

	3.4 Perform harvesting activities	• Identify harvesting tools and equipment • Identify uses of harvesting tools and equipment • Explain Food Safety Act • Discuss counting and weighing procedures • Discuss safety procedures • Perform harvesting activities	• Power Point presentation • Lecture discussion • Demonstration • Film viewing • Field/farm visit	• Written examination • Demonstration • Oral questioning	8hrs
4.Carry out post - production activities	4.1 Perform post - harvest activities	• Identify post-harvest tools, materials and equipment • Explain sorting and segregation procedures • Discuss chilling procedures • Identify types of packing materials- • Discuss procedures in packing and labeling • Explain handling methods based from GAqP • Describe record keeping • Enumerate safety measures based on OSHS • Conduct post-harvesting activities	• Lecture • Power Point presentation • Demonstration • Discussion • Illustration • Role playing	• Actual demonstration • Written exam • Oral questioning	**(28 hrs)** 8 hrs
	4.2 Restore aquaculture facilities	• Discuss maintenance of net • Identify damaged aquaculture facilities • Explain replacement procedures • Discuss minor repairs in aquaculture facilities • Identify waste management practices • Restore aquaculture facilities	• Lecture • Power Point presentation • Demonstration • Discussion • Illustration	• Actual demonstration • Written exam • Oral questioning	8 hrs

	4.3 Maintain tools, materials and equipment	• Identify preventive maintenance practices • Identify excess materials, tools and equipment • Discuss storing procedures • Identify types of defects • Explain inspection method • List reporting steps • Maintain tools, materials and equipment	• Lecture • Power Point presentation • Demonstration • Discussion • Illustration •	• Actual demonstration • Written exam • Oral questioning	4 hrs
	4.4 Complete post - production activities	• Identify Feed Conversion Ratio(FCR) • Discuss recording procedures • Discuss inventory procedures • Explain reporting procedures • Identify necessary improvement • Complete post production activities	• Lecture • Power Point presentation • Demonstration • Discussion • Illustration • Role playing •	• Actual demonstration • Written exam • Oral questioning	8 hrs

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (Learning system is driven by competencies written to industry standards)
    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.
    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;
    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.
    f. Training program allows for recognition of prior learning (RPL) or current competencies;
    g. Training completion is based on satisfactory performance of all specified competencies.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1 School/Institution- Based:

    - Dual Training System (DTS)/Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

    - Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

    - Supervised Industry Training (SIT) or on-the-job training (OJT) is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies as prescribed in the training regulations. It is imperative that the deployment of trainees in the workplace is adhered to training programs agreed by the institution and enterprise and status and progress of trainees are closely monitored by the training institutions to prevent opportunity for work exploitation.

- The classroom-based or in-center instruction uses of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based

- Short term programs conducted by non- government organizations NGOs, LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP)

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students who would like to enroll in this course should possess the following requirements:

- Basic communication skills
- Basic mathematical skills

3.4 LIST OF TOOLS, EQUIPMENT AND, MATERIALS

AQUACULTURE (GOW-OUT OPERATION) NC II

Recommended list of tools, equipment and materials for the training of 25 trainees for Aquaculture (Grow - out Operation) NC II.

Up-to-date tools, materials, and equipment of equivalent functions can be used as alternatives. This also applies in consideration of community practices and their availability in the local market.

A. FULL QUALIFICATION

TOOLS	
QTY	**DESCRIPTION**
5 pcs.	Scythe
5 pcs.	Digging blade
5 pcs.	Bolo
5 pcs.	Hammer
5 pcs.	Wheel borrow
5 pcs.	Thumper
5 pcs.	Scissor
5 pcs.	Saw
5 pcs.	Steel Tape
5 pcs.	Try Square
5 pcs.	Chisel
5 pcs.	Shovel
5 pcs.	Rake
5 pcs.	Sickle
5 pcs.	Screwdrivers
5 pcs.	Fliers
5 pcs.	Wrench
5 pcs.	Ruler
5 pcs.	Caliper
5 pcs.	Backpack Sprayer
5 pcs.	Calculator
5 units	Grader
5 pcs.	Knife
5 pcs.	Abacus
5 pcs.	Adjustable range
5 pcs.	Crab trap
5 pcs.	Transfer crate (70kg capacity)

EQUIPMENT	
QTY	**DESCRIPTION**
2 units	Weighing scale
5 pcs.	pH meter
5 pcs.	Refractometer
10pcs.	Thermometer
5 pcs.	Hydrometer
3 units	Oxygen tank with Oxygen hose
5 pcs.	Portable aerators
1 unit	Standby generator
	PPEs
25pairs	Gloves
25pairs	Boots
25pcs.	Masks
25pcs.	Long Sleeve Shirt
25pcs.	Hat
1 unit	Chilling tank (500L)
1 unit	Chilling boat*
1 unit	Truck*
1 unit	Pump boat*
1 unit	Paddle boat*
1 unit	Conditioning cage (10X10m)
1 unit	Transfer cage(5X5X2m)
3 units	Oxygen regulator
1 pc.	DO meter
1 unit	Harvesting raft*`
2 unit	Sorting table

MATERIALS	
QTY	**DESCRIPTION**
1-Li.	Fluids
1-Li.	Lubricants
4 sacks	Organic and inorganic fertilizers
2 sacks	Lime
Bfts	Lumber
1 pc.	Cast Nets
2 packs	Vegetable Seeds
4 pcs.	Hapa nets of different sizes
5 pcs.	Bamboo poles
rolls	Ropes of different sizes
1L	pesticides
100 pcs	Plastic bag (18”X25”X.03”)
5 boxes	Rubber band
30 pcs	Ice (2”X10”)
125000 pcs	Fry (size 3 to 5)
750 pcs	Fingerlings (20 to 50 grams)
25 pcs	Basin (30L capacity-white)
25 pcs	Pail (10L)
25 pcs	Dipper (1L)
25 pcs	Scooper
1pc	Scoop net
1 pc	Hapa net (10X15X3m)
500L	Packing water
1 pc	Polynet (size 17-10X10X5m)
4pcs	B- net (5X5X5m)
10 roll	Straw

MATERIALS	
QTY	**DESCRIPTION**
8 pcs	Styrofoam (60L)
150kg	Fish
25 kg	Shellfish
60 kg	Shrimp
20 kg	Crab
1 roll	Plastic straw
5 pcs	Crate (25kg capacity)
25 pcs	Pail (10L)
25 pcs	Basin (30L)
25 pcs	Dipper (1L)
1 pc	Scoop net (small)
1 pc	Lift net (big)
2 pcs	Cast net
4 pcs	Feed tray
30 pcs	Ice for sampling (2"X10"-)
25 pcs	Styrofoam (50kg capacity)
2 pcs	Spade
2 blocks	Crushed ice for harvesting
1 pc	Ice box (250 kg capacity)
10 pcs	Fish plastic liner
2 pcs	Box (medium size)
200 kg (2 blocks)	Crushed ice
5 pcs	Boxes (50 kg)
5 pcs	plastic liner
5 pcs	Sorting crates
2 pcs	pail(10 L)
5 pcs	Labeling materials
25 pcs	Log book/record book
25 pcs	Pencil
25 pcs	Ballpen

B. PER COC

COC 1: OPERATE AQUACULTURE NURSERY

TOOLS		EQUIPMENT		MATERIALS	
Qty.	**Description**	**Qty.**	**Description**	**Qty.**	**Description**
5 pcs.	Scythe	1 pc.	Water Pump	1 rim & 25 pcs. respectively	paper and pencil
5 pcs.	Digging blade	1 unit	Electric Water Pressurized Pump	1-Li.	Fluids
5 pcs.	Bolo	2 pc.	Fire extinguisher	1-Li.	Lubricants
5 pcs.	Hammer	1 unit	Grass Cutter	4 sacks	Organic and inorganic fertilizers
5 pcs.	Wheel borrow	1 unit	Aerator	2 sacks	Lime
5 pcs.	Thumper	1 unit	Rotavator	bfts	Lumber
5 pcs.	Scissor	2 units	Weighing scale	1 pc.	Cast Nets
5 pcs.	Saw	5 pcs.	pH meter	2 packs	Vegetable Seeds
5 pcs.	Steel Tape	5 pcs.	Refractometer	4 pcs.	Hapa nets of different sizes
5 pcs.	Try Square	10pcs.	Thermometer	5 pcs.	Bamboo poles
5 pcs.	Chisel	5 pcs.	Hydrometer	rolls	Ropes of different sizes
5 pcs.	Shovel	1 tank	Medical oxygen	1L	pesticides

TOOLS		EQUIPMENT		MATERIALS	
Qty.	**Description**	**Qty.**	**Description**	**Qty.**	**Description**
5 pcs.	Rake	5 pcs.	Portable aerators	100 pcs	Plastic bag (18”X25”X.03”)
5 pcs.	Sickle	1 unit	Standby generator	5 boxes	Rubber band
5 pcs.	Screwdrivers		**PPEs**	30 pcs	Ice (2”X10”)
		25pairs	Gloves	125000 pcs	Fry (size 3 to 5)
5 pcs.	Fliers	25pairs	Boots	750 pcs	Fingerlings (20 to 50 grams)
5 pcs.	Wrench	25pcs.	Masks	25 pcs	Basin (30L capacity-white)
5 pcs.	Ruler	25pcs.	Long Sleeve Shirt	25 pcs	Pail (10L)
5 pcs.	Caliper	25pcs.	Hat	25 pcs	Dipper (1L)
5 pcs.	Backpack Sprayer	3 units	Oxygen tank with Oxygen hose	25 pcs	scooper
5 pcs.	Calculator	1 unit	Chilling tank (500L)	1pc	Scoop net
5 pcs.	Grader	1 unit	Truck*	1 pc	Hapa net (10X15X3m)
5 pcs.	scissor	1 unit	Pump boat*	500L	Packing water
5 pcs.	knife	1 unit	Conditioning cage (10X10m)	1 pc	Polynet (size 17-10X10X5m)
5 pcs.	Abacus	3 units	Oxygen regulator	4pcs	B- net (5X5X5m)
5 pcs.	Adjustable range	1 pc.	DO meter	1 roll	straw
				8 pcs	Styrofoam (60L)

COC 2: CONDUCT GROW-OUT OPERATION

TOOLS		EQUIPMENT		MATERIALS	
Qty.	**Description**	**Qty.**	**Description**	**Qty.**	**Description**
5 pcs	bolo	1 unit	Weighing scale(50kg)	150kg	Fish
5 pcs	Crab trap	1 unit	Weighing scale (2kg)	25 kg	Shellfish
5 pcs	Transfer crate (70kg capacity)	1 unit	Paddle boat*	60 kg	Shrimp
5 pcs	knife	2 units	Chilling tank*	20 kg	Crab
5 pcs	Pair of scissors	1 unit	Chilling boat*	1 roll	Plastic straw
5 pcs	Shovel	1 unit	Transfer cage(5X5X2m)	5 pcs	Crate (25kg capacity)
5 pairs	Scissor	1 unit	Harvesting raft*	25 pcs	Pail (10L)
5 pcs	calculator	2 units	Motorized boat*	25 pcs	Basin (30L)
		1 unit	Sorting table	25 pcs	Dipper (1L)
		1 unit	Transport vehicle*	1 pc	scoop net (small)
		2 unit	Chilling tank	1 pc	Lift net (big)
		2 unit	Weighing scale with 1 gram calibration	2 pcs	Cast net
		2 unit	Weighing scale with 10 grams calibration with kg capacity	4 pcs	Feed tray
		2 unit	Sorting table	30 pcs	Ice for sampling (2”X10”-)
			PPEs	25 pcs	Styrofoam (50kg capacity)
		25 pcs	long sleeve	2 pcs	Spade
		25 pcs	gloves	2 blocks	Crushed ice for harvesting
		25 pcs	rubber boots	1 pc	Ice box (250 kg capacity)

		25 pcs	Mask	10 pcs	Fish plastic liner
		25pcs	hats	2 pcs	Box (medium size)
				5 rolls	Straw
				200 kg (2 blocks)	Crushed ice
				5 pcs	Boxes (50 kg)
				5 pcs	plastic liner
				5 pcs	Sorting crates
				2 pcs	pail(10 L)
				5 pcs	Labeling materials
				25 pcs	Log book/record book
				25 pcs	Pencil
				25 pcs	Ballpen

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-farms/companies.

3.4 TRAINING FACILITIES

AQUACULTURE (GROW - OUT OPERATION) NC II

The size of the grow -out operation workshop must be suited on the requirements of the competencies. The class size of 25 students/trainees is reserved for the teaching/ learning and circulation areas as follows:

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
A. **Building (permanent)**			
• Student/Trainee Working Space	7.00 X 9.00	63.00 sq.m	
• Learning Resource Center	5.10 X 6.00	30.60 sq.m	
• Wash room	1.60 X 1.20	1.92 sq.m	
• Comfort room	male: 2.30 X1.20 female:2.30 X1.80 PWD: 1.60 X1.80	9.78 sq.m	
• Facilities/Equipment/ Circulation Area (30% of teaching accommodation)	1.90 X3.00	5.70 sq.m	
• Store Room	1.90 X4.50	8.55 sq.m	**119.55 sq. m.**
B. Experimental Aquaculture Farm **Earthen Ponds**			**10,000 sq. m.**
Grow out area			
Pond			
Pen			
Cage			
TOTAL AREA			**10,119.55 sq.m.**

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner- farms/companies.

3.6 TRAINER'S QUALIFICATIONS FOR AQUACULTURE (Grow-out Operation) NC II

- Must be a holder of National TVET Trainer Certification (NTTC) I in Aquaculture (Grow-out Operation) NC II
- Must have at least 2 years' job/industry experience within the last five (5) years

3.7 INSTITUTIONAL ASSESSMENT

Institutional Assessment is gathering of evidences to determine the achievements of the requirements of the qualification to enable the trainer make judgement whether the trainee is competent or not competent.

SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to a full qualification or employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1 A National Certificate (NC) is issued when a candidate has demonstrated competence on all units of competency in a qualification with a promulgated Training Regulations.

4.1.2 A Certificate of Competency (COC) is issued by the Authority to individuals who were assessed as competent in a single unit or cluster of related units of competency.

COC 1 – OPERATE AQUACULTURE NURSERY

- Conduct site selection and pond preparation –
- Perform nursery operations

COC 2 – CONDUCT GROW-OUT OPERATION

- Conduct site selection and pond preparation
- Produce aquaculture commodities
- Carry out post production activities

4.1.3 Upon accumulation of the COCs acquired, an individual shall be issued the corresponding National Certificate for the Qualification.

4.1.4 Assessment shall cover all competencies, with basic and common integrated or assessed concurrently with the core units of competency.

4.1.5 Any of following are qualified to apply for assessment and certification:

4.1.5.1 Graduates of WTR-, NTR--registered programs or formal/non-formal/informal including industry-based trainings related to hatchery operation.

4.1.5.2 Experienced workers in hatchery operation.

4.1.6 The guidelines on assessment and certification are discussed in detail in the "Procedures Manual on Assessment and Certification" and "Guidelines on the Implementation of the Philippine TVET Competency Assessment and Certification System (PTCACS)".

4.1.7 Individuals wanting to be certified will have to be assessed in accordance with the requirements identified in the relevant unit/s of competency.

4.1.8 The industry shall determine assessment and certification requirements for each qualification with promulgated Training Regulations. It includes the following:

a. Entry requirements for candidates
b. Evidence gathering methods
c. Qualification requirements of competency assessors
d. Specific assessment and certification arrangements as identified by industry

4.1.9 Recognition of Prior Learning (RPL). Candidates who have gained competencies through informal training, previous work or life experiences may apply for recognition in a particular qualification through a recognition/assessment process.

4.1.10 A candidate who fails the assessment for two (2) consecutive times shall be advised to go through a refresher course before taking another assessment.

4.1. COMPETENCY ASSESSMENT REQUISITE

4.2.1 **Self-Assessment Guide**. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a) Identify the candidate's skills and knowledge
b) Highlight gaps in candidate's skills and knowledge
c) Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d) Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior to assessment

4.2.2 **Accredited Assessment Center.** Only Assessment Center accredited by TESDA is authorized to conduct competency assessment. Assessment centers undergo a quality assured procedure for accreditation before they are authorized by TESDA to manage the assessment for National Certification.

- **Accredited Competency Assessor.** Only accredited competency assessor is authorized to conduct assessment of competence. Competency assessors undergo a quality assured system of accreditation procedure before they are authorized by TESDA to assess the competencies of candidates for National Certification.

COMPETENCY MAP FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR
AQUACULTURE (GROW-OUT OPERATION) NC II

ANNEX A

BASIC COMPETENCIES	Receive and respond to workplace communication	Participate in workplace communication	Lead workplace communication	Utilize specialized communication skill	Manage and sustain effective communication strategies
	Work with others	Work in a team environment	Lead small teams	Develop and lead teams	Manage and sustain high performing teams
	Solve/address routine problems	Solve/address general workplace problems	Apply critical thinking and problem solving techniques in the workplace	Perform higher-order thinking processes and apply techniques in the workplace	Evaluate higher order thinking skills and adjust problem solving techniques
	Enhance self-management skills	Develop career and life decisions	Work in a diverse environment	Contribute to the practice of social justice in the workplace	Advocate strategic thinking for global citizenship
	Support innovation	Contribute to workplace innovation	Propose methods of applying learning and innovation in the organization	Manage innovative work instructions	Incorporate innovation into work procedures
	Access and maintain information	Present relevant information	Use information systematically	Manage and evaluate usage of information	Develop systems in managing, and maintaining information
	Follow occupational safety and health policies and procedures	Practice occupational safety and health policies and procedures	Evaluate occupational safety and health work practices	Lead in improvement of occupational safety and health program, policies and procedures	Manage implementation of OSH programs in the workplace
	Apply environmental work standards	Exercise efficient and effective sustainable practices in the workplace	Evaluate environmental work practices	Lead towards improvement of environmental work programs, policies and procedures	Manage implementation of environmental programs in the workplace
	Adopt entrepreneurial mindset in the workplace	Practice entrepreneurial skills in the workplace	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)	Sustain entrepreneurial skills	Develop and sustain a high-performing enterprise

COMMON COMPETENCIES

Apply safety measures in farm operation	Use farm tools and equipment	Perform estimation and basic calculation	Apply basic first aid	Process farm wastes
Perform record keeping	Maintain service records	Conduct Diagnosis	Perform Shop Maintenance	Provide Quality Customer Service
Comply with Quality and Ethical Standards	Perform mensuration and calculations	Maintain tools and equipment	Apply food safety and sanitation	Prevent and fight fire
Comply with Quality and Ethical Standards	Perform mensuration and calculations	Maintain tools and equipment	Apply food safety and sanitation	Prevent and fight fire
Provide first aid treatment on board	Protect marine environment	Comply with emergency procedures	Apply safety measures in farm and nursery operations	Use farm and nursery tools and equipment
Develop and update industry knowledge				

CORE COMPETENCIES

Apply deckhand skills aboard a fishing vessel	Load and unload goods / cargo	Assemble and repair damaged netting	Operate a vessel of up to 3.0 GT	Monitor condition and seaworthiness of a vessel
Perform routine maintenance tasks on a small coastal vessel	Operate and troubleshoot low powered marine engines	Apply weather information when navigating a vessel	Contribute to safe navigation	Apply basic food handling and safety practices
Supervise unloading and loading of net	Evaluate net mending	Administer and monitor net mending	Unload and load fish and fish products	Classify fish and fish products
Operate Seaweed Nursery	Grow-out seaweed	Produce raw dried seaweed	Market seaweed	Conduct site selection and pond preparation
Perform nursery operations	Produce aquaculture commodities	Carry out post production activities	Conduct pre-operational aquaculture activities	Operate tilapia hatchery and nursery
Perform tilapia grow-out	Conduct preparatory activities	Produce natural foods	Conduct broodstock management and spawning	Manage feeding and maintain good health of stock
Complete hatchery operation				

GLOSSARY OF TERMS

Acclimation	Refers to adjusting the prevailing water condition of fish in an environment from lower to higher temperature to optimal temperature, from tower or higher salinity to optimal salinity (like from freshwater to salt water environment), etc.
Average Body Weight	Is the total weight of fish over the number of fish
AD-Libitum	Refers to the mode of providing unlimited fish feeds to fish
AFMA	Agriculture and Fisheries Modernization Act
Aquarium Fish or Ornamental fish	Any fish that can be placed in confinement and with aesthetic value
Artemia	Live food commonly used for fish larvae
BFAR	Bureau of Fisheries and Aquatic Resources
BOD	Biological Oxygen Demand
Brackish Water	Refers to the mixture of freshwater and sea water naturally occurring in estuaries
Brachionus	A rotifer used as larval feed for marine & freshwater fish larvae
Breeder	Sexually mature fish that are used for breeding
Chlorella	A unicellular green algae cultured to serve as food of the zooplankton, rotifers and fry
Conditioning of Breeders	A method wherein the breeders are pampered by providing them nutritious feeds and optimum water conditions to effect the maturity of the fish
D.O. (Dissolved Oxygen)	Refers to a quantity of oxygen mixed with water in the operation of a paddle wheel or the action of air current. The unit of the D.O. is commonly expressed in part per million (ppm).
FCR	Food Conversion Ratio is the Total amount of Feeds consumed over the Net Weight of Fish.
Egg Fertilization	The process of mixing the fish eggs with fish milt either by natural or artificial method.
Fish Nursery	Refers to smaller unit areas of confinement wherein small fish larvae or fish fry are reared. It may either be in ponds, cages, tanks, etc
Fish Pond	An aquaculture facility with an earthen bottom surrounded by dikes, with water inlets and drain outlets.
Fish Cage	Installed in open waters like lakes, dams, rivers and sea-water coves, lagoons, impoundments etc.

Fish Pen	Aquaculture facility in inland areas such as lakes, rivers, darns spring and deep wells devoid of salinity
Fry	Newly hatched fish. Which are transparent, with big, head and does not in any way resemble the adult fish
Grow out	Refers to bigger unit areas of confinement where fingerlings are stocked and grown to marketable size. It may either be in ponds, cages and fish pens.
Hapa Net	An enclosure made of fine mesh net for larvae/fry
Hatchery Operation	Refers to a large production of larvae/fry
Hormones	Are agents, (synthetically or naturally produced) used to fasten growth and induce ovulation and to effect sex reversal in fish.
Incubator	Are hatching facilities where fertilized eggs are hatched.
Mature Breeders	Fishes that are gravid (female) or with milt (male)
Induce Spawning	An artificial propagation method through hormone injection to hasten the maturity of the eggs and trigger spawning
Larvae	Refers to newly hatched fish eggs
Liming	Application of agricultural lime in ponds to elevate soil ph of acidic ponds
Modular Culture Technique	The process of culturing fish in grow-out units in short culture period. This requires one nursery unit in for every grow-out culture unit, thus making 4 to 5 harvests per year in one grow-out unit depending on the market size of fish
OHS	Operating Health Standard
Optimum	Refers to the best environmental condition provided to the fish to effect maximum production
Pathogenic Bacteria	Disease causing bacteria
Ph Meter	Instrument used to measure the hydrogen ions concentration of soil or water
Phytoplankton	Unicellular microscopic algae suspended in water
Sea-Water	Refers to waters with at east 32 ppt salinity
Satiation feeding	Refers to the feed consumption of fish wherein it indicates whether fish is fully filled-up to the gut.
Seine Net	A type of fishing gear made up of nets, ropes, floats and sinkers used to harvest fish
Spawner	Mature female fish or shrimp used for breeding.
Stress	A negative environmental condition caused by biological, physical

	or chemical factors affecting the health, growth and well being of fish
Stripping	An artificial method by gently pressing the belly of male and female brood fish to release eggs and milt
Tanks	A culture system that is made up of cement, glass and plastic of different shapes
Viable	A state or condition where an undertaking or venture in aquaculture results to good performance as to technical and economic profitability of a project
Water Quality	Refers to the over-all physical, chemical and biological parameters of the water
Zooplankton	Animal base food protein

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