COMPETENCY STANDARDS

AGRICULTURAL DRONE OPERATION LEVEL II

AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
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AGRICULTURE, FORESTRY AND FISHERY SECTOR

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COMPETENCY STANDARDS FOR
AGRICULTURAL DRONE OPERATION LEVEL II

Section 1 AGRICULTURAL DRONE OPERATION LEVEL II QUALIFICATIONS

The **AGRICULTURAL DRONE OPERATION LEVEL II** Qualification consists of competencies that a person must achieve to apply agricultural drone safety standards, apply principles of air law to agricultural drone operation, and operate agricultural drone. It focuses on the operation both autonomous and manual drone.

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**
AFF321201	Apply safety measures in farm operations
AFF321202	Use farm tools and equipment
AFF321203	Perform estimation and calculations
CS-AFF611201	Work effectively in the aviation industry
Code	**CORE COMPETENCIES**
CS-AFF834301	Apply agricultural drone safety standards
CS-AFF834302	Apply principles of air law to agricultural drone operation
CS-AFF834303	Operate agricultural drone

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

- Agricultural RPA Pilot
- Agricultural drone operator

SECTION 2 COMPETENCY STANDARDS

These guidelines are set to provide the Technical Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **AGRICULTURAL DRONE OPERATION LEVEL 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.

ELEMENT	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 procedures for the location and	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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	storage of information are used. 1.7 Personal interaction is carried out clearly and concisely.		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	3.1 Effective verbal and non-verbal communication	3.1 Completing work- related documents

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	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 completed according to organizational guidelines.	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	3.2 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

RANGE OF VARIABLES

VARIABLE	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.

ELEMENT	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	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	team members based on company practices. 3.2 Effective and appropriate contributions made to complement team activities and 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.	and decision making 3.4 Team thinking 3.5 Team roles 3.6 Process of team development 3.7 Workplace context	effectively with others 3.3 Deciding as an individual and as a group using group think 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: 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: 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: 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 PROBLEMS**

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.

ELEMENT	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	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating	2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices,

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	appropriate person for decision.	systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	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: 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: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include: 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*** in 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	2.1 Basic SWOT analysis 2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description,	2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	responding to feedback from teachers to assist 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.	Feelings, Evaluation, Analysis, Conclusion, and Action plan)	limitations, likes/ dislikes; through 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: 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: 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.

ELEMENT	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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
			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

VARIABLE	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

VARIABLE	RANGE
	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 attitudes required to present data/information appropriately.

ELEMENT	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	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/ procedures

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	anomalies are identified. 2.4 ***Data analysis techniques*** and procedures are documented. 2.5 Recommendations are made on areas of possible improvement.	range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.3 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	Studied data/information are recorded. Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 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

VARIABLE	RANGE
1. Data analysis techniques	May include: 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 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.

ELEMENT	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.	1.1 OSH preventive and control requirements 1.2 Hierarchy of Controls 1.3 Hazard Prevention and Control 1.4 General OSH principles 1.5 Work standards and procedures 1.6 Safe handling procedures of tools, equipment and materials 1.7 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.	2.1 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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3 Required OSH materials, tools and equipment are arranged/ placed in 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 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.

ELEMENT	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	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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	procedures.		
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
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

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.

ELEMENT	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: • Patience • Honesty • Quality-consciousness • Safety-consciousness • 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: • Patience • Honesty • Quality-consciousness • Safety-consciousness • Resourcefulness	2.1 Communication skills 2.2 Complying with quality procedures 2.3 Following workplace communication protocol
3. Implement cost-effective	3.1 Preservation and optimization of	3.1 Optimization of workplace	3.1 Implementing preservation and

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
operations	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.	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: • Quality-consciousness • Safety-consciousness	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	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	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
	observed 2.4 ***Emergency procedures*** are known and followed to ensure a safe work requirement 2.5 Hazards in the workplace are identified and reported in line with farm guidelines	regulations 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. Safe keep /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. Resource Implications	The following resources should be provided: 2.1 Farm location 2.2 Tools, equipment and outfits appropriate in applying safety measures
3. Method of Assessment	Competency in this unit must be assessed through: 3.1 Practical demonstration 3.2 Third Party Report
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	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	2.1 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
	are followed.	2.9 Codes and Regulations on environmental protection 2.10 Safety and keeping of equipment every after use 2.11 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	Farm equipment include: 1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers
2. Farm tools	Farm tools includes: 2.1 Sickle 2.2 Cutters 2.3 Weighing scales 2.4 Hand tools 2.5 Measuring tools 2.5.1 Garden tools
3. Pre-operation check-up	Pre-operation check–up includes: 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. Resource Implications	The following resources should be provided: 2.1 Service/operational manual of farm tools and equipment 2.2 Tools and equipment 2.3 Farm implements
3. Method of Assessment	Competency in this unit must be assessed through: 3.1 Direct observation 3.2 Practical demonstration 3.3 Third Party Report
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 CALCULATION**

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/ labor 1.2 Estimating quantities of materials and resources required 1.3 Estimating time for job completion 1.4 Performing basic calculation 1.5 Compute percentage 1.6 Convert 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	2.1 Four basic mathematical operation 2.2 System and units of measurement 2.3 Fraction, percentage and ratio 2.4 Material take-off 2.5 Materials costing	2.1 Compute bill of materials 2.2 Compute project cost

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	is checked following work requirements.		

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. Resource Implications	The following resources should be provided: 2.1 Relevant tools and equipment for basic calculation 2.2 Recommended data
3. Method of Assessment	Competency in this unit must be assessed through: 3.1 Practical demonstration 3.2 Written examination
4. Context of Assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : WORK EFFECTIVELY IN THE AVIATION INDUSTRY

UNIT CODE : CS-AFF611201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to determine appropriate work roles, contribute to the planning of activities, work with others and follow work health and safety procedures.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine appropriate work roles within an aviation workplace	1.1 Work instructions, performance requirements, workplace procedures and health and safety requirements are studied when identifying work roles for each team member. 1.2 Contributions are made to the team to assist in determining appropriate work roles and responsibilities required to successfully and safely complete work activities.	1.1 Work instructions 1.2 Performance requirements 1.3 Workplace procedures 1.4 Health and safety requirements 1.5 Roles of team members 1.6 Determination of work roles and responsibilities 1.7 Successful safe and complete work activities 1.8 Communication techniques 1.9 Interpersonal relationship	1.1 Studying work instructions, performance requirements, workplace procedures and health and safety requirements 1.2 Identifying work roles of team member 1.3 Contributing on determining on work roles and responsibilities 1.4 Communication skills 1.5 Interpersonal skills
2. Contribute to planning activities	2.1 Suggestions and information are contributed to assist the planning of work activities and to minimize delays to stakeholders. 2.2 Hazards are identified, risks are assessed and hazard management implemented. 2.3 Safety issues within an aviation	2.1 Gathering of suggestions and information 2.2 Planning work activities 2.3 Identification of hazards 2.4 Risks assessment 2.5 Hazard management 2.6 Safety issues in aviation environment	2.1 Contributing suggestions and information 2.2 Identifying hazards 2.3 Assessing risks 2.4 Managing hazards 2.5 Identifying safety issues within an aviation environment 2.6 Contributing to minimize risks

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	environment are identified and contributions are made to minimize risks to team members.		
3. Work with others	3.1 Correct aviation terminology relevant to the context of work being undertaken is used to communicate with stakeholders. 3.2 Contributions are made to assist in the safe and efficient completion of work activities. 3.3 Within scope of own job role, assistance is given to team members to complete assigned tasks. 3.4 Work tasks are completed in accordance with relevant workplace procedures, industry rules and regulations. 3.5 Factors affecting the efficient completion of a work task are identified and contributions are made to minimize the impact. 3.6 Workplace technology and equipment is operated in accordance with manufacturer instructions, workplace policies and procedures,	3.1 Aviation terminology 3.2 Contributions to safe and efficient work 3.3 Job role and scope of member 3.4 Factors affecting the efficient completion of a work task 3.5 Minimizing impact of factors 3.6 Operation of workplace technology and equipment 3.7 Improve work practices and procedures.	3.1 Using correct aviation terminology 3.2 Making contributions to efficient completion of work 3.3 Giving assistance to complete assigned tasks 3.4 Completing tasks 3.5 Identifying factors affecting efficient completion of work tasks 3.6 Minimizing effect of the factors 3.7 Operating workplace technology and equipment 3.8 Giving contributions to improve work practices and procedures 3.9 Communication skills 3.10 Interpersonal skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	and Work Health and Safety (WHS) regulations. 3.7 Within scope of own job role, contributions are made to the team and supervisors to improve work practices and procedures.		
4. Follow health and safety procedures within an aviation workplace	4.1 Aviation environment and workplace policies and procedures are clarified as required and executed when dealing with accidents, fires and other emergencies. 4.2 Potential causes of incidents are identified and reported based on industry procedures. 4.3 Actions are taken to minimize safety risks to the public and aviation personnel, and the risk of property damage. 4.4 Health and safety procedures for controlling risks are clarified as required, followed and applied in day-to-day work activities. 4.5 Health and safety procedures required for working on agricultural drone are correctly followed. 4.6 Protective clothing is worn and	4.1 Aviation environment and workplace policies and procedures 4.2 Potential causes of incidents 4.3 Actions are taken to minimize safety risks of public and personnel 4.4 Risk of property damage 4.5 Health and safety procedures 4.6 Protective clothing is worn	4.1 Clarifying aviation environment and workplace policies and procedures 4.2 Identifying and reporting potential causes of incidents 4.3 Taking actions to minimize risk of public and aviation personnel 4.4 Clarifying health and safety procedures for controlling risks 4.5 Following health and safety procedures for controlling risks 4.6 Wearing PPE

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	personal protective equipment is correctly used in accordance with workplace procedures.		

NO RANGE OF VARIABLES

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Determined appropriate work roles within an aviation workplace 1.2 Contributed to planning the successful, safe and efficient outcome of a work activity 1.3 Worked with others in the aviation industry 1.4 Followed health and safety procedures within an aviation workplace
2. Resource Implications	The following resources MUST be provided: 2.1 Actual and simulated workplace 2.2 Materials, tools, and equipment needed to perform the required task 2.3 References and manuals
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration/ observation with oral questioning 3.2 Written exam 3.3 Third-Party 3.4 Portfolio
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions

CORE COMPETENCIES

UNIT OF COMPETENCY : **APPLY AGRICULTURAL DRONE SAFETY STANDARDS**

UNIT CODE : **CS-AFF834301**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply safety on pre-operation activities, implement safety on operation and implement aviation safety emergency procedures for agricultural drone.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Apply safety on pre-operation activities	1.1 Area for ***safety standards*** is determined in line with the remotely piloted aircraft system. 1.2 Work tasks are identified in line with the safety standards in remotely piloted aircraft system. 1.3 Hazards are identified and appropriate risk management controls are implemented based on industry protocol. 1.4 Operating ***conditions*** are confirmed according to industry standards. 1.5 Agricultural drone ***restrictions*** are determined according to industry standards. 1.6 Personal protective equipment (PPE) and clothing are worn following OSHS.	1.1 Different work tasks in agricultural drone system 1.2 Implementation of safety standards 1.3 Different hazards in the workplace 1.4 Philippine Civil Aviation Regulation (PCAR)	1.1 Determining area for safety standards 1.2 Identifying work task in line with safety standards Identifying hazards Managing risks Confirming operating conditions Determining agricultural drone restrictions Wearing PPEs. 1.3 Reading labels manual and other basic safety information 1.4 Applying safety standards

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	1.7 Safety standards are applied following Philippine Civil Aviation Regulation (PCAR) 1.8 Safety and operational briefings are received and acknowledged prior to operating around aircraft.		
2. Implement safety on operation	2.1 Access and aviation security procedures are applied following workplace requirements. 2.2 Agricultural drone maneuvering practices are confirmed based on operational manual. 2.3 Agricultural drone safety hazards and zones are confirmed based on aerodrome restricted area. 2.4 Effective individual safety controls are implemented during operations within close proximity to aircraft. 2.5 Normal and emergency aircraft access and egress procedures are confirmed and applied during airside operations. 2.6 Appropriate verbal and non-verbal communication techniques are applied during routine and abnormal operations. 2.7 Safety standards	2.1 Agricultural drone restricted areas of operation 2.2 Agricultural drone maneuvering practices 2.3 Agricultural drone safety hazards and zones 2.4 Effective individual safety controls 2.5 Normal and emergency aircraft access and egress procedures 2.6 Appropriate verbal and non-verbal communication techniques 2.7 Compliance to airside operating conditions and requirements 2.8 Above Ground Level (AGL) 2.9 Aerodrome Reference Point (ARP) 2.10 Philippine Civil Aviation Regulation (PCAR)	2.1 Determining restrictions 2.2 Applying AGL by its standards and approval. 2.3 Applying agricultural drone operations 2.4 Applying safety standards

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	are applied following Philippine Civil Aviation Regulation (PCAR) 2.8 Airside operating conditions and requirements are compiled according to operational requirements.		
3. Implement aviation safety emergency procedures	3.1 Incident and accident is identified and communicated to relevant personnel. 3.2 Individual emergency response actions are taken to preserve own safety. 3.3 Appropriate individual response actions are taken to assist other airside personnel during incidents or accidents. 3.4 Post-incident or accident procedures are clarified and applied, and their implementation is reported to relevant personnel. 3.5 Hazards identified are reported in accordance with workplace procedures.	3.1 Agricultural drone restricted areas of operation 3.2 Above Ground Level (AGL) 3.3 Aerodrome Reference Point (ARP) 3.4 Philippine Civil Aviation Regulation (PCAR) 3.5 Emergency Response Action 3.6 Post-incident or accident procedures 3.7 Hazards and safety procedures	3.1 Identifying and communicating incident and accident 3.2 Taking individual emergency response actions 3.3 Taking appropriate individual response actions 3.4 Implementing post-incident or accident procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Conditions	Conditions may include: 1.1 Terrain 1.2 Weather condition 1.3 Presence of electrical towers 1.4 Obstructions 1.4.1 Trees 1.4.2 Overhead cables 1.5 Plane flight schedules
2. Restrictions	Restriction may include: 2.1 Above Ground Level (AGL) 2.2 Aerodrome Reference Point (ARP)
3. Safety Standards	Safety Standards may include: 3.1 Height 3.2 Landing 3.3 Take-off

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Applied safety on pre-operation activities 1.2 Implemented safety on operation 1.3 implemented aviation safety emergency procedures
2. Resource Implications	The following resources MUST be provided: 2.1 Actual and simulated workplace 2.2 Materials, tools, and equipment needed to perform the required task 2.3 References and manuals
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Practical demonstration/direct observation with oral questioning 3.2 Written examination 3.3 Third party report 3.4 Portfolio
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 : **APPLY PRINCIPLES OF AIR LAW TO AGRICULTURAL DRONE OPERATION**

UNIT CODE : **CS-AFF834302**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to compile aviation documentation, apply flight rules and conditions of flight to agricultural drone operations, apply legislative requirements, apply aerodrome and airspace requirements and report incident and accident emergencies.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Compile aviation documentation	1.1 Flight time recording requirements are accurately transcribed within authorized flight documents. 1.2 Flight time recording requirements are compiled within authorized flight documents. 1.3 Maintenance release requirements and documentation are compiled according to workplace procedures.	1.1 Record keeping requirements for commercial operators 1.2 Type of aviation documentation 1.3 Drone safety rules and requirements 1.4 Air law, air traffic rules and procedures 1.5 Spray report form (for client, FPA, and other third party) 1.6 Philippine Civil Aviation Regulation 1.7 Fertilizers and Pesticides Authority guidelines on spraying chemicals	1.1 Transcribing flight time recording requirements 1.2 Compiling flight time recording requirements 1.3 Compiling maintenance release requirements and documentation 1.4 Communication skills
2. Apply flight rules and flight conditions	2.1 Rules of the air are applied to agricultural drone operations. 2.2 Visual flight rules (VFR) are applied to agricultural drone operations. 2.3 Flight operating requirements for take-off and landing	2.1 Flight rules and conditions 2.2 Rules of the air 2.3 Visual flight rules (VFR) 2.4 Flight operating requirements for take-off and landing 2.5 Philippine Civil Aviation	2.1 Applying rules of the air 2.2 Applying visual flight rules (VFR) 2.3 Applying flight operating requirements for take-off and landing during daylight hours 2.4 Applying PCAR

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	during daylight hours are applied	Regulation 2.6 OSHS	and OSHS
3. Apply operations legislative requirements	3.1 Dangerous goods and miscellaneous payload requirements are applied. 3.2 Legislative responsibilities and requirements of the remote pilot in command (PIC) are identified. 3.3 Legislative requirements of remote pilot before and after flight duties are applied.	3.1 Operations legislative requirements 3.2 Dangerous goods and miscellaneous payload requirements 3.3 Legislative responsibilities and requirements of the remote pilot in command (PIC) 3.4 Legislative requirements of remote pilot before and after	3.1 Applying dangerous goods and miscellaneous payload requirements 3.2 Identifying legislative responsibilities and requirements of the remote pilot in command (PIC) 3.3 Applying legislative requirements of remote pilot before and after flight duties are.
4. Apply aerodrome and airspace requirements	4.1 Aerodrome movement areas, landing areas and markings are identified according to established protocol. 4.2 Prohibited, restricted and danger (PRD) area flight operating conditions are applied following industry procedures. 4.3 Flight information and air traffic service area boundaries and limitations are identified and applied to spraying and spreading operations 4.4 Appropriate reference heights	4.1 Aerodrome and airspace 4.2 Aerodrome movement areas, landing areas and markings 4.3 Prohibited, restricted and danger (PRD) area flight operating conditions 4.4 Flight information and air traffic service area boundaries and limitations 4.5 Appropriate reference heights 4.6 Remote pilot license limitations and privileges	4.1 Identifying aerodrome movement areas, landing areas and markings 4.2 Applying prohibited, restricted and danger (PRD) area flight operating conditions 4.3 Identifying and applying flight information and air traffic service area boundaries and limitations are and to spraying and spreading operations 4.4 Calculating and applying appropriate reference heights

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	are calculated and applied to spraying and spreading operations		
5. Report incident and accident emergencies	5.1 Emergency incident and accident definitions and reporting requirements are outlined. 5.2 Flight incident and accident notification responsibilities of the PIC are determined following workplace procedures 5.3 Report are prepared and submitted to immediate superior following industry procedure	5.1 Incident and accident emergencies 5.2 Emergency incident and accident definitions and reporting requirements 5.3 Flight incident and accident notification responsibilities of the PIC	5.1 Outlining emergency incident and accident definitions and reporting requirements 5.2 Identifying flight incident and accident notification responsibilities of the PIC 5.3 Preparing and submitting report

NO RANGE OF VARIABLES

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Compiled aviation documentation 1.2 Applied flight rules and conditions of flight 1.3 Applied operations legislative requirements 1.4 Applied aerodrome and airspace requirements 1.5 Reported incident and accident emergencies
2. Resource Implications	The following resources MUST be provided: 2.1 Actual and simulated workplace 2.2 Materials, tools, and equipment needed to perform the required task 2.3 References and manuals
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration/ observation with oral questioning 3.2 Written exam 3.3 Third-Party 3.4 Portfolio
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 : OPERATE AGRICULTURAL DRONE

UNIT CODE : CS-AFF834303

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to prepare agricultural drone for spraying operation, carry out pre-launch procedures, launch agricultural drone, manage and control agricultural drone operation, land agricultural drone, recover agricultural drone and perform post-operation activities.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare agricultural drone for spraying operation	1.1 ***Equipment and tools*** are prepared in accordance with manufacturer's specifications 1.2 ***Materials*** are sourced-out and made available according to work requirements. 1.3 ***Spraying system*** is determined according to types of crop. 1.4 ***Agricultural drone setting*** and calibration is done prior to flying based on operation and manufacturer's manual. 1.5 ***Operation mode*** is selected according to operational requirements. 1.6 Loading is assessed and adjusted based on the requirements for flight. 1.7 Applying good agricultural practices on agricultural drone spraying are done following authority's	1.1 Preparation of equipment and tools 1.2 Sourcing of materials -pesticides -fertilizers 1.3 Functions of agricultural drones 1.4 Spraying system composition 1.5 Types of crops 1.6 Features of multi-rotors agricultural drone -Flight platform and Power - Number of Rotors - Multi-rotor drones in other application areas - Agricultural drone composition • Brushless DC Motor • Brushless ESC • Propeller • Lithium Polymer • Balance Charger • Link System - Flight control system	1.1 Preparing equipment and tools 1.2 Sourcing-out and securing materials 1.3 Identifying functions of agricultural drones 1.4 Carrying-out agricultural drone setting and calibration 1.5 Selecting operation mode 1.6 Assessing and adjusting loading 1.7 Applying good agricultural practices on agricultural drone spraying 1.8 Applying safety standards of PCAR 1.9 Wearing PPEs 1.10 Recognizing link communication systems 1.11 Oral communication 1.12 Interpersonal skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	regulations. 1.8 Safety standards are applied following Philippine Civil Aviation Regulation (PCAR) 1.9 ***PPEs*** are worn following OSH.	1.7 Operational mode - Flying modes of multi-rotor agricultural drone - Multi- Rotor Joystick Mode 1.8 Setting and calibration of agricultural drone 1.9 Loading procedure 1.10 Loading requirements per hectare 1.11Good Agricultural Practices for Remotely Piloted Aircraft System (RPAS) for Use as Spraying (FPA Memorandum Circular 28 s. 2018) 1.12Philippine Civil Aviation Regulation (PCAR) 1.13 Personal Protective Equipment (PPEs) and Occupational Safety and Health Standard (OSHS)	
2. Carry out pre-launch procedures	2.1 Site is inspected following ***suitability map***. 2.2 Aerial mapping is done following the industry. 2.3 Environment is surveyed according to operating ***conditions***. 2.4 Updates and information on climatic condition is obtained based on industry standards	2.1 Site inspection and validation 2.2 Measurement of site 2.3 Suitability map 2.4 Aerodynamic Layout 2.5 Surveying the Environment 2.6 Operating conditions 2.7 Updates and information on climatic condition 2.8 Planning method	2.1 Securing suitability map 2.2 Inspecting site 2.3 Carrying-out aerial mapping 2.4 Surveying environment 2.5 Obtaining updates and information on climatic condition 2.6 Selecting flight path planning method 2.7 Following pre-

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.5 Flight path ***planning method*** is selected according to operational requirements. 2.6 Pre-launch briefing is followed based on standard protocol. 2.7 Fail-safe checks are undertaken in accordance with operations manual. 2.8 Pre-flight checklists are completed in accordance with operation manual. 2.9 Agricultural drone is positioned for take-off following industry procedure and operation manual. .	for flight path 2.9 Determination for clear-for-take-off area 2.10 Pre-launch briefing 2.11 Fail-safe checks 2.12 Pre-flight checklists 2.13 Warning signs/ Devices 2.14 Use of Geographic Positioning System (GPS)	launch briefing 2.8 Undertaking fail-safe checks 2.9 Completing pre-flight checklists 2.10 Positioning agricultural drone for take-off 2.11 Communication skills 2.12 Mathematical and mensuration skills 2.13 Using GPS
3. Launch agricultural drone	3.1 Agricultural drone is released from docking station under the control of the remote pilot in preparation for flight. 3.2 Agricultural drone is ***take-off*** following standard procedures and operation manual. 3.3 Flight path ***planning method*** applied according to the site. 3.4 ***Spraying system*** is employed according to crops. 3.5 ***Operation mode*** is applied following industry procedure. 3.6 Safety standards are applied following Philippine	3.1 Release of drone from docking station 3.2 Remote Pilot position 3.3 Procedures on launching of agricultural drone 3.4 Application of flight path planning method - Terrains 3.5 Employment of spraying system -Structure of a hydraulic atomization spraying -Centrifugal atomization 3.6 Aircraft frame components 3.7 App Interface - Menu - Plan a field	3.1 Releasing agricultural drone from docking station 3.2 Launching agricultural drone 3.3 Applying flight path planning method 3.4 Employing spraying system 3.5 Describing structure of a hydraulic atomization spraying 3.6 Determining the characteristics of the entire spray system. 3.7 Differentiating the types of droplet size. 3.8 Recognizing

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	Civil Aviation Regulation (PCAR).	- Execute operation - Error Messages 3.8 Accessories used to detect obstacles 3.9 FPV camera and spotlight. 3.10 Differences of operation modes 3.11 Basic features for manual operation mode 3.12 Basic features for A-B route operation mode 3.13 Basic features for route operation mode 3.14 Occupational Safety and Health Standards (OSHS) 3.15 Philippine Civil Aviation Regulation (PCAR) 3.16 Good Agricultural Practices for Remotely Piloted Aircraft System (RPAS) for Use as Spraying (FPA Memorandum Circular 28 s. 2018)	centrifugal atomization 3.9 Recognizing aircraft frames components 3.10 Utilizing accessories used to detect obstacles 3.11 Utilizing FPV camera and spotlight 3.12 Applying operation mode 3.13 Apply OSHS 3.14 Following PCAR 3.15 Applying good agricultural practices for remotely piloted aircraft system (RPAS) for use as spraying 3.16 Communication skills 3.17 Interpersonal skills
4. Manage and control agricultural drone operation	4.1 Situational awareness, lookout and visual line of sight is maintained following industry protocol. 4.2 Listening watch is maintained in accordance with regulatory requirements. 4.3 Checklist procedures are	4.1 Maintenance of situational awareness, lookout and visual line of sight 4.2 Maintenance of listening watch 4.3 Implementation of checklist procedures 4.4 Amount of efficient spraying and strong-deposition	4.1 Maintaining situational awareness, lookout and visual line of sight 4.2 Maintaining listening watch 4.3 Implementing checklist procedures 4.4 Monitoring and ensuring the

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	implemented during normal agricultural drone operations in accordance with operational requirements. 4.4 Amount of efficient spraying and strong-deposition spray are monitored and ensured according to plan. 4.5 Launch ***emergencies*** are responded based on industry protocol. 4.6 Agricultural drone is escalated in accordance with operational procedures. 4.7 Straight and level flight are ***maintained*** following operational procedures. 4.8 Agricultural drone is turned manually following operation manual. 4.9 Speed in flight is ***controlled*** according to operational procedures. 4.10 Agricultural drone is tethered at the end of flight according to organizational procedures.	spray 4.5 Response to launch emergencies 4.6 Abnormal RPAS operations 4.7 Identification of potential hazards 4.8 Risks mitigation 4.9 Observance of flight path 4.10 Agricultural drone climb checks 4.11 Setting of power, altitude and configuration 4.12 Maintenance of agricultural drone operating limits 4.13 Indications of height change and heading change 4.14 Height awareness 4.15 Recovery to cruise speed 4.16 Completion of checklists and other documentation 4.17 Occupational Safety and Health Standards (OSHS) 4.18 Philippine Civil Aviation Regulation (PCAR) 4.19 Good Agricultural Practices for Remotely Piloted Aircraft System (RPAS) for Use as Spraying (FPA Memorandum Circular 28 s. 2018) .	amount of efficient spraying and strong-deposition spray 4.5 Ensuring the amount of efficient spraying and strong-deposition spray 4.6 Ensuring the amount of spray width and route spacing 4.7 Responding to launch emergencies 4.8 Escalating agricultural drone 4.9 Maintaining straight and level flight 4.10 Analyzing flight attitude 4.11 Turning agricultural drone manually 4.12 Controlling speed in flight 4.13 Assessing flight speed of agricultural drone operation. 4.14 Tethering agricultural drone 4.15 Deciding, implementing, evaluating and revising course of action to achieve safest outcomes 4.16 Applying PCAR

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
			and OSHS 4.17 Applying good agricultural practices for remotely piloted aircraft system (RPAS) for use as spraying 4.18 Communication skills 4.19 Mathematical and mensuration skills
5. Land agricultural drone	5.1 Agricultural drone is ***descended*** following operational requirements. 5.2 Agricultural drone is configured for landing in accordance with manufacturer instructions. 5.3 Landings are conducted in accordance with operations manual procedures 5.4 All mandated checklists are completed according to industry procedures. 5.5 Safety measures are employed based on OSHS. 5.6 Safety standards are applied following Philippine Civil Aviation Regulation (PCAR)	5.1 Procedure of descending 5.2 Configuration of agricultural drone 5.3 Adjustments on altitude and power 5.4 Descent rates 5.5 Levelling of agricultural drone 5.6 Descent position 5.7 Observance of flight path during descents 5.8 Control of operating limits during descents 5.9 Completion of descent checks 5.10 Landing procedures based on agricultural drone type 5.11Allowance for wind velocity during landing 5.12 PCAR 5.13 OSHS	5.1 Descending agricultural drone 5.2 Configuring agricultural drone 5.3 Conducting landing procedures 5.4 Completing all mandated checklists 5.5 Communication skills 5.6 Applying PCAR and OSHS
6. Recover agricultural drone	6.1 Agricultural drone is recovered at a controlled rate of descent following	6.1 Recovery procedures of agricultural drone 6.2 Controlled rate of	6.1 Recovering agricultural drone 6.2 Controlling rate of

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	operation manual. 6.2 Directional control is maintained at all times based on operation manual. 6.3 Bouncing of agricultural drone is minimized in accordance to operation manual. 6.4 Agricultural drone is stopped within the available area with reference to operation manual. 6.5 Post-recovery checks are performed in accordance with approved checklist, manufacturer instructions and operational requirements. 6.6 Safety standards are applied following Philippine Civil Aviation Regulation (PCAR).	descent 6.3 Maintenance of directional control 6.4 Minimizing of bouncing of agricultural drone 6.5 Stoppage of agricultural drone 6.6 Post-recovery checks 6.7 Completion of checklists 6.8 PCAR 6.9 OSHS	descent 6.3 Maintaining directional control 6.4 Minimizing bouncing of agricultural drone 6.5 Stopping agricultural drone 6.6 Performing post-recovery checks 6.7 Communication skills 6.8 Mathematical and mensuration skills
7. Perform post-operation activities	7.1 Agricultural drone is cleaned thoroughly before storage. 7.2 Agricultural drone is kept in dry place based on workplace procedures. 7.3 Batteries are kept based on specification standards. 7.4 Tools and materials are maintained and stored following workplace procedures 7.5 Waste management is employed according environment	7.1 Cleaning of agricultural drone 7.2 Proper storage of agricultural drone 7.3 Battery Storage 7.4 Storage of tools and materials 7.5 Waste management 7.6 Records and documentation 7.7 Philippine Civil Aviation Regulation (PCAR) 7.8 Environment regulations 7.9 Fertilizers and Pesticides Authority	7.1 Cleaning agricultural drone 7.2 Storing agricultural drone 7.3 Keeping batteries 7.4 Maintaining and storing tools and materials 7.5 Managing wastes 7.6 Completing records and documents 7.7 Applying PCAR and OSHS 7.6 Applying FPA guidelines on chemical disposal and

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	regulations 7.6 Records and documentation are completed based on industry protocol. 7.6 Safety standards are applied following Philippine Civil Aviation Regulation (PCAR).	(FPA)guidelines on storage and disposal of pesticides and fertilizers	storage 7.8 Employing environmental regulations 7.9 Practicing communication skills 7.10 Interpersonal skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Equipment, tools and materials	Equipment, tools, and materials may include: 1.1 Equipment 1.1.1 Agricultural drone 1.1.2 Batteries 1.1.3 Chargers 1.2 Tools 1.2.1 T6 Torx Screwdriver 1.2.2 Hexagonal Socket Screwdriver 1.5 1.2.3 Hexagonal Socket Screwdriver 2.0 1.2.4 Hexagonal Socket Screwdriver 2.5 1.2.5 Hexagonal Socket Screwdriver 3.0 1.2.6 Tweezers 1.2.7 Hexagonal Socket Wrench 7.0 1.2.8 Wire Cutters 1.2.9 Needle-nose Pliers 1.2.10 Tin Soldering 1.0 mm
2. Materials	Materials include: 2.1 Prepared pesticide 2.2 Prepared fertilizer
3. Spraying system	Spraying system may include: 3.1 Nozzle Naming 3.2 Extended Range Fan-Type Nozzle 3.3 Droplet Size
4. Agricultural drone setting	Agricultural drone setting may include: 4.1 Identification of crops 4.2 Appropriate nozzle 4.3 Delivery rate 4.4 Flight height
5. Operation mode	Operation mode includes: 5.1 Manual operation mode 5.2 A-B route mode 5.3 Route operation mode
6. PPEs	PPEs may include: 6.1 Cover-all 6.2 Rubber Gloves 6.3 Mask with Respirator 6.4 Head Lamp 6.5 Safety Shoes
7. Suitability map	Suitability map may include: 7.1 Area 7.2 Hectares 7.3 Signals
8. Conditions	Conditions may include: 8.1 Terrain 8.2 Weather condition 8.3 Presence of electrical towers

VARIABLE	RANGE
	8.4 Obstructions 8.4.1 Trees 8.4.2 Power lines and Overhead cables 8.5 Plane flight schedules
9. Taking-off options	Taking-off options include: 9.1 Autonomous (sliding using touch screen) 9.2 Manual (using joystick)
10. Planning method	Planning method includes: 10.1 Flight route plan on remote controller 10.2 Aircraft route plan 10.3 2D Ortho Planning
11. Launch emergencies	Emergencies may include: Operators: 11.1 Hyperthermia 11.2 Chemical Poisoning Environment 11.3 Rain Agricultural drone 11.4 Motor malfunction 11.5 Abnormal agricultural drone operations
12 Maintenance of straight and level flight	12.1 Set power, altitude and configuration 12.2 Identify and respond to indications of height change 12.3 Identify and respond to indications of heading change 12.4 Observe flight path 12.5 Mitigate risks
13. Control agriculture drone speed in flight	13.1 Maintain height awareness 13.2 Recover cruise speed 13.3 Achieve cruise speed while maintaining height awareness
14. Descending procedures	14.1 Adjust altitude and power to achieve descent rates as required. 14.2 Level agricultural drone from a descent position at a nominated altitude 14.3 Observe flight path 14.4 Mitigate risks 14.5 Control operating limits 14.6 Complete descent checks 14.7 Follow regulatory requirements on descending procedures

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared agricultural drone for spraying operation 1.2 Carried out pre-launch procedures 1.3 Launched agricultural drone 1.4 Managed and controlled agricultural drone operation 1.5 Landed agricultural drone 1.6 Recovered agricultural drone 1.7 Performed post-operation activities 1.8 Practiced PCAR, OSHS and FPA guidelines on agricultural drone spraying
2. Resource Implications	The following resources MUST be provided: 2.1 Actual and simulated workplace 2.2 Materials, tools, and equipment needed to perform the required tasks 2.3 References and manuals
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration/ observation with oral questioning 3.2 Written exam 3.4 Third-Party report 3.5 Portfolio
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions

SECTION 3 TRAINING ARRANGEMENTS

3.1 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to enroll in this course should possess the following requirements.

- Must have basic communication skills
- Must have basic arithmetic skills

This list does not include specific institutional requirements such as educational attainment, appropriate work experience, and others that may be required of the trainees by the school or training center delivering the TVET program.

3.2 TRAINER'S QUALIFICATIONS FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR

Trainers who will deliver the training on **AGRICULTURAL DRONE OPERATION LEVEL II** should have the following:

- Must be a holder of any Training of Trainer's Certificate (e.g. Trainer's Methodology Certificate (TMC) OR must be a practicing trainer for two (2) years;
- Must have two (2) years industry experience within five (5) years relevant to Agricultural Remotely Piloted Aircraft Operation; and
- Must be a holder of Remotely Piloted Aircraft (RPA) Controller/Operator Certificate issued by CAAP

Note:

- *Drone (Agricultural) must be registered to CAAP for identification purposes.*
- *Any registered TESDA training provider or any commercial entity partnered with TESDA must have the Operator Certification of CAAP. This certification ensures the compliance of the training institution to the rules and regulation issued by CAAP and their capability in terms of the facility, equipment and the operation as a whole.*

GLOSSARY OF TERMS

1) Agricultural drone	also known as Remotely Piloted Aircraft (RPA) or aircraft.
2) Manual Drone	refers to drone without sensors, with manual input, and has automated flight path.
3) Remotely Piloted Aircraft (RPA)	also known as unmanned aerial vehicle (UAV).

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