COMPETENCY STANDARDS

BOAT BUILDING
(Composite Materials) LEVEL II

MARITIME SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEX), Taguig City, Metro Manila

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BOAT BUILDING (Composite Materials) LEVEL II

SECTION 1 BOAT BUILDING (COMPOSITE MATERIALS) LEVEL II

The **BOAT BUILDING (Composite Materials)** Qualification consists of competencies that a person must achieve to construct a boat: mold for hull and structure, application of paint, installation of navigational equipment, communication, propulsion and electrical wirings including testing and commissioning.

The units of competency comprising this qualification include the following:

CODE NO.	BASIC COMPETENCIES
400311210	Participate in workplace communication
400311211	Work in a 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 NO.	COMMON COMPETENCIES
MEE722201	Apply Safety Practices
MEE721202	Interpret Drawings and Sketches
MEE721203	Perform industry calculations
MEE721204	Contribute to Quality System
MEE721206	Use Hand Tools

CODE NO.	CORE COMPETENCIES
MTMXXXXXX	Prepare materials, tools and equipment
MTMXXXXXX	Construct mold for hull and structures including boat out fittings
MTMXXXXXX	Compound and apply composite materials to form hull and structure
MTMXXXXXX	Unplug mold from hull and structure
MTMXXXXXX	Apply paint in hull and structure
MTMXXXXXX	Install navigation equipment, communication, propulsion and electrical wirings
MTMXXXXXX	Conduct trial and commissioning

A person who has achieved this Qualification is competent to be a –

- ❑ Boat Fitter
- ❑ Boat Laminator
- ❑ Boat Painter
- ❑ Mold builder

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **BOAT BUILDING (Composite Materials) 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.

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

	1.6 Defined workplace procedures for the location and ***storage*** of information are used. 1.7 Personal interaction is carried out clearly and concisely .		1.8 Basic business writing skills 19 Interpersonal skills in the workplace 2.0 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

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Complete relevant work- related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly. 3.2 Workplace data is recorded on standard workplace forms and documents. 3.3 Errors in recording information on forms/ documents are identified and acted upon. 3.4 Reporting requirements to supervisor are completed according to organizational guidelines.	3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities.	3.1 Completing work-related documents 3.2 Applying operations of addition, subtraction, division and multiplication 3.3 Gathering and providing information in response to workplace requirements 3.4 Effective record keeping skills

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY: WORK IN A TEAM ENVIRONMENT

UNIT CODE : 400311211

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

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Describe team role and scope	1.1 The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified. 2.2 Roles and objectives of the team is identified from available ***sources of information.*** 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources.	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to complement team activities and objectives, based on ***workplace context.*** 3.3 Protocols in reporting are observed based on standard company practices. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking 3.5 Team roles 3.6 Process of team development 3.7 Workplace context	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an individual and as a group using group think 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 3.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.4 Socio-drama and socio-metric methods 3.5 Sensitivity techniques 3.6 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.

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

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

RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include: 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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated. 2.2 Progress when seeking and responding to feedback from teachers to assist 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	2.1 Basic SWOT analysis 2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis, Conclusion, and Action plan)	2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of 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.

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

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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. Innovative practices	May include: 1.1 Self-directed support 1.2 Community based services 1.3 Working within a collaborative arrangement 1.4 Making scope of work more efficient
2. Innovation	May include: 2.1 New ideas 2.2 Original ideas 2.3 Different ideas 2.4 Methods or tools

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified need for innovation in the area of work 1.2 Recognized innovative and creative ideas 1.3 Pursed agreement for flexible and innovative ways of working 1.4 Supported individuals and people to access flexible and innovative ways of working
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 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 : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

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

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

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Assess gathered data/ information	2.1 Validity of data/ information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 ***Data analysis techniques*** and procedures are documented 2.5 Recommendations are made on areas of possible improvement.	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Stating legislation, policy and procedures relating to the conduct of evaluations 2.5 Stating organisational values, ethics and codes of conduct

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics and codes of conduct	3.1 Describing data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Stating legislation, policy and procedures relating to the conduct of evaluations 3.4 Stating organisational values, ethics and codes of conduct practices

RANGE OF VARIABLES

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 studies 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: 31.1. Written Test 31.2. Interview 31.3. Portfolio The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

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

UNIT CODE : 400311216

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

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify OSH compliance requirements	1.1 Relevant ***OSH requirements, regulations, policies and procedures*** are identified in accordance with workplace policies and procedures. 1.2 OSH activity non-conformities are conveyed to ***appropriate personnel.*** 1.3 ***OSH preventive and control requirements*** are identified in accordance with OSH work policies and procedures	1.1. 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

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures. 2.2 Required OSH materials, tools and equipment are acquired in accordance with workplace policies and procedures. 2.3 Required OSH materials, tools and equipment are arranged/ placed in accordance with OSH work standards.	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
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 3.3 Interpersonal skills 3.4 Troubleshooting skills 3.5 Critical thinking skills 3.6 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 procedures.	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills

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

RANGE OF VARIABLES

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

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

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

COMMON COMPETENCIES

UNIT TITLE : APPLY SAFETY PRACTICES

UNIT CODE : MEE721201

UNIT DESCRIPTOR : This unit covers the competencies required to apply safety practices in the workplace.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify hazardous area	1.1. ***Hazards*** are identified correctly in accordance with OHS principles 1.2. Safety signs and symbols are identified and adhered to. 1.3 Emergency Equipment location are identified	1.1 symbols and 1.2 Safety precautionary measures 1.3Housekeeping 1.4 Machine tools 1.5 First aid 1.6 Engineering materials 1.7 Fire extinguishers	1.1 Operating machine tools 1.2 Handling tools and materials 1.3 Communicating with superiors and co-workers 1.4 Interpreting instructions
2. Use protective clothing and devices	2.1 Appropriate ***protective clothing and devices*** are selected and used in accordance with OHS requirements or industry/company policy 2.2 Testing of all safety equipment prior to use 2.3.Proper donning of all safety equipment	2.1. Shop safety signs, symbols and alarms 2.2. Safety precautionary measures 2.3. Housekeeping 2.4 Machine tools 2.5. First aid 2.6. Engineering materials 2.7. Fire extinguisher	2.1 Operating machine tools 2.2 Handling tools and materials 2.3 Communicating with superiors and co-workers 2.4 Interpreting instructions

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Perform safe handling of tools, equipment and materials	3.1 Safety procedures for pre-use check and operation of tools and equipment are followed in accordance with industry/ company policies. 3.2 Tools, equipment and materials are handled safely in accordance with OHS requirements and industry/ company policies 3.3 Machines operations must be based in maker's manual and all initial safety checks must be carried out	3.1 Shop safety signs, symbols and alarms 3.2 Safety precautionary measures 3.2 Housekeeping 3.3 Machine tools 3.4 First aid 3.5 Engineering materials 3.6 Fire extinguishers	3.1 Operating machine tools 3.2 Handling tools and materials 3.3 Communicating with superiors and co-workers 3.4 Interpreting instructions
4. Perform first aid	4.1 First aid treatment of ***injuries*** are carried out according to recommended procedures 4.2 Safety practice must be well established as precautions 4.3 Sounding of alarms for emergency situation must be posted	4.1 Shop safety signs, symbols and alarms 4.2 Safety precautionary measures 4.3Housekeeping 4.4 Machine tools 4.5 First aid 4.6 Engineering materials 4.7 Fire extinguishers	4.1 Operating machine tools 4.2 Handling tools and materials 4.3 Communicating with superiors and co-workers 4.4 Interpreting instructions
5. Use fire Extinguisher	5.1 ***Fire Extinguisher*** selected and operated correctly according to the ***type of fire***	5.1 Shop safety signs, symbols and alarms 5.2 Safety precautionary measures	5.1 Operating machine tools 5.2 Handling tools and materials

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	5.2 Fire alarm/ announcement mustering point must be established 5.3 Portable fire extinguishers type and usage must conform with industry standard	5.3 Housekeeping 5.4 Machine tools 5.5 First aid 5.6 Engineering materials 5.7 Fire extinguishers	5.3 Communicating with superiors and co-workers 5.4 Interpreting instructions

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hazards	May include: 1.1 Cluttered tools and materials 1.2 Skin contact with chemical 1.3 No proper ventilation. 1.4 Sharp edges
2. Protective Clothing and devices	May include: 2.1 safety glasses/goggles 2.2 safety shoes 2.3 overalls 2.4 cap 2.5 gloves
3. Injuries	May include: 3.1 chemical burns 3.2 fractures 3.3 cuts and abrasions 3.4 poisoning 3.5 foreign bodies in the eye 3.6 concussion 3.7 shock
4. Fire Extinguisher	May include: 4.1 Class A extinguisher to put up fires in ordinary combustibles such as wood and paper 4.2 Class B extinguisher for use on flammable liquid like grease, gasoline and oil 4.3 Class C for use on electrical fires 4.4 Class D extinguisher for use on flammable metals
5. Type of fires	May include: 5.1 common combustibles (wood, cloth, paper, rubber and plastic) 5.2 flammable liquids (gasoline, oil, solvents, paints, etc.) 5.3 energized electrical equipment (wiring, fuse boxes, circuit breakers, appliances, etc.

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 identified hazardous area 1.2 used protective clothing and devices 1.3 handled tools, equipment and materials properly 1.4 performed first aid 1.5 used fire extinguisher
2. Resource implications	The following resources must be provided: 2.1 Tools, equipment and facilities appropriate to processes or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Demonstration 3.2 Written or oral short answer questions
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : INTERPRET DRAWINGS AND SKETCHES

UNIT CODE : MEE721202

UNIT DESCRIPTOR : This unit covers the competencies required to read and interpret drawings and sketches.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret technical drawing	1.1 Dimensions identified as appropriate. 1.2 Instructions identified and followed as required. 1.3 Material requirements identified as required. 1.4 Symbols recognized as appropriate in the ***drawing/ sketch***. 1.5 ***Tolerance,*** limits and fits identified in the drawing.	1.1 Alphabet of lines 1.2 Projections 1.3 Drawing symbols 1.4 Dimensioning techniques 1.5 Tolerance, limits and fits 1.6 Engineering materials 1.7 Drawing tools and supplies 1.8 AWF-CWCS/ ISO 9606-1 / AWS D1.1 / ASME IX.	1.1 Identifying dimension 1.2 Identifying instruction 1.3 Identifying material 1.4 Recognizing symbols in the drawing 1.5 Identifying tolerance, limits and fits
2. Interpret details from freehand sketch	2.1 Dimensions identified as appropriate. 2.2 Instructions identified and followed as required. 2.3 Material requirements identified as required. 2.4 Symbols recognized as appropriate in the drawing.	2.1 Alphabet of lines 2.2 Projections 2.3 Drawing symbols 2.4 Dimensioning techniques 2.5 Tolerance, limits and fits 2.6 Engineering materials 2.7 Drawing tools and supplies 2.8 AWF-CWCS/ ISO 9606-1 / AWS D1.1 / ASME IX.	2.1 Identifying dimensions 2.2 Identifying instruction 2.3 Identifying material requirements 2.4 Recognizing symbols

RANGE OF VARIABLES

VARIABLE	RANGE
1. Drawing/sketch	May include: 1.1 Perspective 1.2 Joint design 1.3 Welding symbols
2. Tolerance	May include: 2.1 General tolerance 2.2 Groove Angle 2.3 Root pass 2.4 Root Opening

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate interpreted: 1.1 Drawings 1.2 Sketches.
2. Resource implications	The following resources must be provided: 2.1 Drawings or plans 2.2 Sketches 2.3 Measuring tools
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Direct observation 3.2Written or oral short answer questions 3.3 Demonstration
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM INDUSTRY CALCULATIONS

UNIT CODE : MEE721203

UNIT DESCRIPTOR : This unit covers the competencies required to perform basic calculations using the four fundamental operations.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform four fundamental operations.	1.1 Simple calculations are performed using ***four fundamental operations***. 1.2 Correct formula are applied to isolate the variable required. 1.3 Simple transposition of variables in the formulae is carried out. 1.4 Unknown variables are solved correctly.	1.1 Linear measurement 1.2 Geometrical measurement 1.3 Ratio and proportion 1.4 Area	1.1 Performing Calculation
2. Perform conversion of units	2.1 Familiarity to English system of measurement is required 2.2 Understanding to the metric system is necessary. 2.3 ***Units*** are converted to the required figure using the given formulae	2.1 English Systems of Measurement 2.2 Metric System of Measurement 2.3 Conversion of units from English to metric and/or vice versa	2.1 Performing Calculation
3. Perform calculations on algebraic expressions	3.1 Simple calculations are performed on algebraic expressions using four fundamental operations. 3.2 Simple transposition of formulae are carried out to isolate the variable required, involving the four	3.1 Algebraic expressions 3.2 Four fundamental operations	3.1 Performing Calculation

	fundamental operations. 3.3 Where appropriate, formulae are constructed to enable problems to be solved. 3.4 Equations involving on unknown solved correctly.		
4. Compute percentage and ratio	4.1 Percentages are computed using appropriate formula. 4.2 Ratio and proportion are computed using appropriate formula.	4.1 Computing percentage 4.2 Ratio and proportion	4.1 Performing Calculation

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring tools	May include: 1.1 Try square 1.2 Steel rule 1.3 Tape measure
2. Four fundamental operations	May include: 2.1 Addition 2.2 Subtraction 2.3 Multiplication 2.4 Division
3 Units	May include: 3.1 English System 3.2 Metric System

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Selected and used measuring tools. 1.2 Cleaned and stored using measuring tools 1.3 Used four fundamental operations 1.4 Performed conversion of units
2. Resource implications	The following resources must be provided 2.1 Tools and facilities appropriate to processes or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency must be assessed through: 3.1 Written or oral short answer questions 3.2 Practical exercises
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

UNIT TITLE : CONTRIBUTE TO QUALITY SYSTEM

UNIT CODE : MEE721204

UNIT DESCRIPTION : This unit involves competence required to inspect work against specification and standards and apply quality standards to work.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Inspect work done	1.1. Appropriate inspections are conducted to ensure company ***quality systems and procedures*** are maintained/followed 1.2. Jobs specifications/work order and quality standards are identified. 1.3. Faults/Defects are identified and rectified according to company procedures.	1.1 Communication/ feedback methods-written and verbal 1.2 Company systems, processes and work quality requirements 1.3 Work inspection techniques 1.4 Quality assurance principles 1.5 Safety precautionary measures 1.6 Handling materials, tools and equipment	1.1 Problem solving skills 1.2 Communicating with superiors and co-workers 1.3 Interpreting job specification and work order
2. Apply quality standards to work	2.1. Inspections are conducted throughout the manufacturing processes to ensure quality standards are maintained. 2.2. Appropriate quality standards are applied throughout the production/ fabrication process. 2.3. All activities are coordinated throughout the	2.1 Communication/ feedback methods-written and verbal 2.2 Company systems, processes and work quality requirements 2.3 Work inspection techniques 2.4 Quality assurance principles 2.5 Safety precautionary measures 2.6 Handling materials, tools and equipment	2.1 Problem solving skills 2.2 Communicating with superiors and co-workers 2.3 Interpreting job specification and work order

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	workplace to ensure efficient quality work outcomes. 2.4. Records of work quality are maintained according to the company requirements.		
3. Protect company property and customer interests	3.1. Possible damage to ***company property*** is avoided by adherence to company quality procedures. 3.2. Quality of work is reviewed to ensure customer requirements and ***company standards*** are met. 3.3. Handling of all tools and equipment must in accordance with maker's manual	3.1 Communication/ feedback methods-written and verbal 3.2 Company systems, processes and work quality requirements 3.3 Work inspection techniques 3.4 Quality assurance principles 3.5 Safety precautionary measures 3.6 Handling materials, tools and equipment	3.1 Problem solving skills 3.2 Communicating with superiors and co-workers 3.3 Interpreting job specification and work order

RANGE OF VARIABLES

VARIABLE	RANGE
1. Quality system and procedures	May include: 1.1 work instructions 1.2 safe work procedures 1.3 product specifications 1.4 equipment maintenance schedules 1.5 technical procedures adopted or specifically prepared standards 1.6 company/industry rules
2. Company property	May include: 2.1 production and/or fabrication equipment 2.2 hand and power tools 2.3 OH&S paraphernalia 2.4 Facilities
3. Company Standards	May include: 3.1 Company quality system 3.2 Equipment manufacturer's instruction 3.3 OH & S Guidelines

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 inspected work done against specification 1.2 applied quality standards to work 1.3 protected company property and customer interests
2. Resource implications	The following resources must be provided 2.1 Tools, equipment and facilities appropriate to processes or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency must be assessed through: 3.1 Demonstration 3.2 Written or oral short answer questions
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : USE HAND TOOLS

UNIT CODE : MEE721205

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on the safe use, handling and maintenance of tools.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select hand tools	1.1 ***Hand tools*** selected are appropriate to the requirements of the ***task***. 1.2 Unsafe or defective tools are identified and marked for repair according to procedure. 1.3 Tools are tested prior to every use	1.1 Types and uses of hand tools 1.2 Hand tool defects 1.3 Procedure, principles and techniques in maintenance of hand tools	1.1 Handling tools and materials 1.2 Communicating with superiors and co-workers 1.3 Interpreting instructions
2. Use hand tools	2.1 Hand tools are used to produce the desired outcomes to job specifications. 2.2 Task performed in accordance with company or industry safety procedure. 2.3 Use of tools as per maker's manual should be followed	2.1 Types and uses of hand tools 2.2 Hand tool defects 2.3 Procedure, principles and techniques in maintenance of hand tools	2.1 Handling tools and materials 2.2 Communicating with superiors and co-workers 2.3 Interpreting instructions
3. Maintain hand tools	3.1 ***Routine maintenance*** of hand tools is undertaken according to standard operating procedures, principles and techniques. 3.2. Hand tools are stored in designated location	3.1 Types and uses of hand tools 3.2 Hand tool defects 3.3 Procedure, principles and techniques in maintenance of hand tools	3.1 Handling tools and materials 3.2 Communicating with superiors and co-workers 3.3 Interpreting instructions

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	in accordance with manufacturer's instruction/standard operating procedure. 3.3 Proper Maintenance of tools after each use		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hand tools	May include: 1.1 Jigsaws 1.2 Hammers (ball peen, chipping) 1.3 Planer 1.4 Buffer 1.5 Screwdrivers 1.6 Wrenches 1.7 Scrapers 1.8 Chisels 1.9 Files 1.10 Clamps
2. Task	May include: 2.1 Adjusting 2.2 Dismantling 2.3 Assembling 2.4 Finishing of item or components
3. Routine maintenance	May include: 3.1 Cleaning 3.2 Lubricating 3.3 Tightening 3.4 Simple tool repair 3.5 Hand sharpening

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 Selected and used hand tools appropriate to the job 1.2 Performed routine maintenance and storage of hand tools
2. Resource implications	The following resources must be provided 2.1 Tools, equipment and facilities appropriate to the process or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Demonstration 3.2 Written or oral short answer questions
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

CORE COMPETENCIES

UNIT OF COMPETENCY: PREPARE MATERIALS, TOOLS AND EQUIPMENT

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to prepare materials, tools and equipment in constructing boat using composite materials.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work.	1.1 ***Personal Protective Equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** 1.3 ***Work plan*** is produced in accordance with work instruction 1.4 Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5 ***Materials, tools and equipment*** are identified in accordance with job requirements 1.6 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications 1.3 Manufacturer's product specifications and instructions 1.4 Pattern development 1.5 Adherence to work requirements 1.6 Surface treatment methods 1.7 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.8 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1 Communication skills 1.2 Estimating of materials and tools 1.3 Handling of materials 1.4 Making pattern 1.5 Mixing and applying of surface treatment methods

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Prepare and handle composite materials, mold for hull and structure	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Mold materials for hull and structure are readied and checked in line with job requirements. 2.3 Safe handling of ***composite materials*** is checked in line with job requirements. 2.4 Composite materials are laid out in line with work instruction 2.5 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.6 Required output is completed as specified by the immediate supervisor based on work schedule.	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.2 Applied Mathematics 2.3 Green Building 2.4 Concept relative to Construction (3R, 5S) 2.5 Work drawing and instructions 2.6 Procedures in laying-out on plain and curved surfaces 2.7 Factors affecting productivity 2.8 Productivity work measurements 2.9 Ways of improving productivity 2.10 Adherence to work requirements	2.1Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in lay-out of mold area 2.4 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Perform housekeeping	3.1 Occupational health, safety and environmental plans are complied. 3.2 Waste materials are reported following Occupational health and safety/ environmental management plans. 3.3 Unused and excess materials are returned to warehouse following company standard and operating procedures. 3.4 Equipment and tools are returned to warehouse after work completion. 3.5 Environmental and safety reports are prepared and submitted following management plans.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Equipment and tools specification 3.3 DENR standards and regulatory requirements 3.4 Waste segregation 5S 3.5 Material description 3.6 Adherence to work requirements	3.1 Following occupational health and safety / environmental management plans 3.2 Performing housekeeping

RANGE OF VARIABLES

VARIABLE	RANGE
1. Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2. Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3. Work plan	May include: 3.1 Work instructions 3.2 Specifications 3.3 Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1 Quality of materials 4.2 Quality of mold surface 4.3 Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1 Protective clothing and equipment 5.2 Use of tools 5.3 Handling of materials 5.4 Hazardous materials 5.5 Working platforms
6. Materials	May include : 6.1 Plywood 6.2 Composite Materials (resin, fiber mat 300, hardener fiber mat 450) 6.3 Adhesive 6.4 Nails 6.5 Srews 6.6 Sand paper 6.7 Sanding Disc 6.8 Rags 6.9 Paint 6.10 Paint thinner

	6.11 Electrical tape 6.12 Electrical wire 6.13 Insulator 6.14 Polish 6.15 Woven roving 6.16 Gel coat 6.17 Wax 6.18 Cutting disc
7. Tools and equipment	May include: Tools: 7.1 Measuring cup 7.2 Straight edge 7.3 C-clamps 7.4 Paint rollers 7.5 Paint brush 7.6 Sander 7.7 Pail (1 gal.) 7.8 Cutting tools (scissor) 7.9 Adjustable wrench 7.10 Screw Driver (flat & star) 7.11 Carpenter Hammer 7.12 Drill bit 7.13 Rubber mallet 7.14 Chisel 7.15 Plastic wedge 7.16 Multi-tester 7.17 Cutter 7.18 Pliers 7.19 Wrench 7.20 Tape measure 7.21 Sanding tools Equipment: 7.22. Chain Block and Sling 7.23. A-Frame 7.24. Paint sprayer 7.25. Air Compressor 7.26. Buffer 7.27. Hand Drill 7.28 Sander 7.29 Blower 7.30 Welding machine

	7.31 Oxy acetylene cutting outfit 7.32 Jigsaw
8. Composite materials	May include: 8.1 Fiber mat 300 8.2 Resin 8.3 Hardener fiber mat 450

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Prepared work area. 1.2 Selected and used appropriate processes, tools and equipment to carry out task 1.3 Identified functional and non-functional tools and equipment 1.4 Replaced defective tools, equipment and their accessories 1.5 Observed and applied safe handling of tools and equipment and safety work practices 1.7 Maintained workplace in accordance with OSHA regulations 1.8 Stored tools and equipment safely in appropriate locations and in accordance with company practices
2. Resource implications	The following resources should be provided: 2.1 Workplace 2.2 Maintenance schedule 2.3 Maintenance materials, tools and equipment relevant to the proposed activity/task
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with Oral Questioning
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY: CONSTRUCT MOLD FOR HULL AND STRUCTURES INCLUDING BOAT OUT FITTINGS

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in constructing mold for hull and structures of boat including boat out fittings.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with *job requirements* 1.3 ***Work plan*** is produced in accordance with work instruction 1.4 Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5 ***Materials, tools*** **and equipment** are identified in accordance with job requirements	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications 1.3 Manufacturer's product specifications and instructions 1.4 Pattern development 1.5 Adherence to work requirements Surface treatment methods 1.6 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.7 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1Communication skills 1.2 Estimating of materials and tools 1.3 Handling of materials 1.4 Making pattern 1.5 Mixing and applying of surface treatment methods

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Assemble mold for hull	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Construction of mold is checked in line with job requirements. 2.3 Mold are laid-out in line with work instruction. 2.4 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.5 Required output is completed as specified by the immediate supervisor based on work schedule.	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.2 Applied Mathematics 2.3 Green Building Concept relative to Construction (3R, 5S) 2.4 Work drawing and instructions Procedures in laying-out on plain and curved surfaces 2.5 Factors affecting productivity 2.6 Productivity work measurements 2.7 Ways of improving productivity 2.8 Adherence to work requirements	2.1Communication skills Applying mensuration 2.1 Applying productive methods and techniques in lay-out of mold area 2.3 Implementing 3R and 5S
3. Assemble mold for structures and out fittings	3.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 3.2 Construction of mold is checked in line with job requirements. 3.3 Boat out-fittings are installed according to lay-out plan 3.4 Railings, mooring bits and masts are installed according to lay out plan. 3.5 Mold are laid-out in	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Applied Mathematics 3.3 Green Building Concept relative to Construction (3R, 5S) 3.4 Work drawing and instructions 3.5 Procedures in laying-out on plain	3.1Communication skills Applying mensuration 3.2 Applying productive methods and techniques in lay-out of mold are 3.3 Implementing 3R and 5S

	line with work instruction. 3.6 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 3.7 Required output is completed as specified by the immediate supervisor based on work schedule	and curved surfaces 3.6 Installation of boat out fittings 3.7 Factors affecting productivity 3.8 Productivity work measurements 3.9 Ways of improving productivity 3.10Adherence to work requirements	
4. Mix and cure composite materials	4.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupationa Safety and Health Standards 4.2 Mixed composite materials are laid-out in line with work instruction 4.3 Cured composite materials are checked in line with job requirements. 4.4 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 4.5 Required output is completed as specified by the immediate supervisor based on work schedule.	4.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 4.2 Applied Mathematics 4.3 Green Building Concept relative to Construction (3R, 5S) 4.4 Work drawing and instructions 4.5 Procedures in laying-out on plain and curved surfaces 4.6 Procedures in mixing and curing of composite materials 4.6 Factors affecting productivity 4.7 Productivity work measurements 4.8 Ways of improving productivity Adherence to work requirements	4.1Communication skills 4.2 Applying mensuration 4.3 Applying productive methods and techniques in lay-out of mold area 4.4 Implementing 3R and 5S
5. Perform housekeeping	5.1Occupational health, safety and environmental plans are complied. 5.2Waste materials are reported following Occupational health and	5.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry	5.1Communication skills 5.2 Applying productive cutting methods and techniques 5.3 Application and

	safety/ environmental management plans. 5.3 Unused and excess materials are returned to warehouse following company standard and operating procedures. 5.4 Equipment and tools are returned to warehouse after work completion. 5.5 Environmental and safety reports are prepared and submitted following management plans.	5.2 Green Building Concept relative to Construction (3R, 5S) 5.3 Applied mathematics 5.4 Compliance with quality requirement 5.5 Waste management 5.6 Types of wood cutters 5.7 Cutting methods and techniques 5.8 Factors affecting productivity 5.9 Productivity work measurements 5.10 Ways of improving productivity 5.11 Adherence to work requirements	operation of tools 5.4 Handling of materials 5.5 Applying productive methods and techniques in cutting woods 5.6 Implementing 3R and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
1. Job requirements	May include: 2.1. Approved working drawings 2.2. Work instructions 2.3. Specifications 2.4. Setting out procedures 2.5. Application procedures 2.6. Workplace operations and procedures
3. Work plan	May include: 3.1. Work instructions Specifications 3.2. Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1. Quality of materials 4.2. Quality of mold surface 4.3. Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1. Protective clothing and equipment 5.2. Use of tools 5.3. Handling of materials 5.4. Hazardous materials 5.5. Working platforms
6. Materials	May include : 6.1. Plywood 6.2. Adhesive 6.3. Nails 6.4. Screws 6.5. Sanding disc 6.6. Sand paper

7. Tools	May include: 7.1. Straight edge 7.2. C-clamps 7.3. Cutting tools (scissor) 7.4. Adjustable Wrench 7.5. Screw driver (flat & star) 7.6. Carpenter Hammer 7.7. Hand drill 7.8. Drill bit 7.9. Tape measure
8. Equipment	8.1. Oxy acetylene cutting outfit 8.2. Welding machine 8.3. Hand drill 8.4. Jigsaw

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Inspected boat drawing according to specifications 1.2 Obtained accurate measurements conforming to given metrics and tolerances and established installation guidelines 1.3 Used correct measuring tools 1.4 Laid-out mold in line with work instruction. 1.5 Installed boat out-fittings according to lay-out plan 1.6 Observed safety measures applicable to worksite operation 1.7 Communicated effectively with others to ensure effective work operation 1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided: 2.1 Tools, equipment and facilities 2.2 Consumable materials 2.3 Charts and table
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with Oral Questioning 3.2 Written Test
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY: COMPOUND AND APPLY COMPOSITE MATERIALS TO FORM HULL AND STRUCTURE

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to compound and apply composite materials for hull and structure.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** 1.3 ***Work plan*** is produced in accordance with work instruction 1.4 Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5 ***Materials, tools and equipment*** are identified in accordance with job requirements 1.6 ***Surface treatment method*** is selected and used as per work requirements 1.7 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications 1.3 Manufacturer's product specifications and instructions 1.4 Pattern development 1.5 Adherence to work requirements 1.6 Surface treatment methods 1.7 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.8 Gender Equality as per Phil Constitution 1987 Sec 14, Art	1.1 Communication skills 1.2 Estimating of materials and tools Handling of materials 1.3 Making pattern 1.4 Mixing and applying of surface treatment methods

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Mix and apply composite materials	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Mold are laid-out in line with work instruction. 2.3 Surface area of mold is checked in line with job requirements. 2.4 Mixing ratio accuracy is applied and checked as per manufacturer's specification. 2.5 Composite materials are applied as per manufacturer's instruction 2.6 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.7 Required output is completed as specified by the immediate supervisor based on work schedule.	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.3 Applied Mathematics 2.3 Green Building Concept relative to Construction (3R, 5S) 2.4 Work drawing and instructions 2.5 Lay out and apply composite materials 2.6 Productivity work measurements Ways of improving productivity 2.7 Adherence to work requirements	2.1 Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in lay-out of mold area 2.4 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Laminate composite materials to form hull and structure	3.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 3.2 Hull and structure are prepared and dry-laid in line with job requirement. 3.3 Composite materials are prepared and applied according to manufacturer's instructions or recommendation. 3.4 Hull and structure are arranged and fixed to the designed pattern. 3.5 Special cut wood is installed in accordance with drawings and specifications. 3.6 Gaps of mold are maintained according to job specifications. 3.7 Wood trim, nosing, expansion joint and threshold are placed according to job requirement. 3.8 Mold surface and gaps are cleaned and sealed according to work standards and specifications. 3.9 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 3.10 Required output is completed as specified by the immediate supervisor based on work schedule.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Green Building Concept relative to Construction (3R, 5S) 3.3 Applied mathematics 3.4 Work drawing and instructions 3.5 Manufacturer's product specifications and instructions 3.6 Compliance with quality requirements 3.7 Sequence of lamination mold 3.8 Factors affecting productivity 3.9 Productivity work measurements 3.10 Ways of improving productivity 3.11 Adherence to work requirements	3.1Communication skills 3.2 Applying productive methods of cutting and laying of mold 3.3 Observing safe use of tools Handling of materials 3.4 Applying productive methods and techniques in installing of woods on plain and curved surfaces and other application 3.5 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Cure mixed composite materials	4.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 4.2 Cure mixed composite materials are checked in line with job requirements. 4.3 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 4.4 Required output is completed as specified by the immediate supervisor based on work schedule.	4.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 4.2 Applied Mathematics 4.3 Green Building 4.4 Concept relative to Construction (3R, 5S) 4.5 Work drawing and instructions 4.6 Procedures in curing composite materials 4.7 Factors affecting productivity 4.8 Productivity work measurements 4.9 Ways of improving productivity 4.10 Adherence to work requirements	4.1 Communication skills 4.2 Applying mensuration 4.3 Applying productive methods and techniques in curing 4.4 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Perform housekeeping	5.1 Occupational health, safety and environmental plans are complied. 5.2 Waste materials are reported following Occupational health and safety/ environmental management plans. 5.3Unused and excess materials are returned to warehouse following company standard and operating procedures. 5.4 Equipment and tools are returned to warehouse after work completion. 5.5 Environmental and safety reports are prepared and submitted following management plans.	5.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 5.2 Green Building Concept relative to Construction (3R, 5S) 5.3 Applied mathematics 5.4 Compliance with quality requirements 5.5 Waste management 5.6 Types of wood cutters 5.7 Cutting methods and techniques 5.8 Factors affecting productivity 5.9 Productivity work measurements 5.10 Ways of improving productivity 5.11 Adherence to work requirements	5.1Communication skills 5.2 Applying productive cutting methods and techniques 5.3 Application and operation of tools 5.4 Handling of materials 5.5 Applying productive methods and techniques in cutting woods 5.6 Implementing 3R and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2. Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3. Work plan	May include: 3.1 Work instructions 3.2 Specifications 3.3 Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1 Quality of materials 4.2 Quality of mold surface 4.3 Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1 Protective clothing and equipment 5.2 Use of tools 5.3 Handling of materials 5.4 Hazardous materials 5.5 Working platforms
6. Materials	May include: 6.1 Composite materials 6.2 Rags 6.3 Gelcoat 6.4 Wax 6.5 Woven roving
7. Tools & Equipment	May include: 7.1 Measuring cup 7.2 Paint rollers 7.3 Paint brush 7.4 Pail (1 gal.) Equipment 7.5 Blower

8. Surface treatment method	May include: 8.1 Need to be smooth 8.2 Must properly waxed 8.3 Can be pre painted

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Inspected mold to be applied with composite materials 1.2 Obtained accurate application of composite materials conforming to given guidelines 1.3 Used correct hand tools for applying composite materials 1.4 Mixed and applied composite materials as per manufacturer's instruction 1.5 Observed safety measures applicable to worksite operation 1.6 Communicated effectively with others to ensure effective work operation 1.7 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided: 2.1 Tools, equipment and facilities 2.2 Consumable materials 2.3 Charts and tables
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with Oral Questioning 3.2 Written Test
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY: UNPLUG MOLD FROM HULL AND STRUCTURE

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes for unplugging mold from hull and structure of boat.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)***is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** ***Work plan*** is produced in accordance with work instruction Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.3 Materials, ***tools*** and ***equipment*** are identified in accordance with job requirements 1.4***Unplugging/detaching method*** is selected and used as per work requirements 1.5 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications 1.3 Manufacturer's product specifications and instructions 1.4 Pattern development 1.5 Adherence to work requirements 1.6 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.7 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1Communication skills 1.2 Estimating of materials and tools 1.3 Handling of materials 1.4 Making pattern 1.5 Mixing and applying of surface treatment methods
2. Prepare lifting equipment	2.1 Personal protective equipment (PPE)is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Chain blocks are checked in line with job	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry	2.1Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in lay-

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	requirements. 2.3 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.4 Required output is completed as specified by the immediate supervisor based on work schedule.	Applied Mathematics 2.2 Green Building Concept relative to Construction (3R, 5S) 2.3 Ways of improving productivity 2.4 Adherence to work requirements	out of mold area 2.4 Implementing 3R and 5S
3. Unplug mold and structure	3.1 Personal protective equipment (PPE)is used in accordance with Rule 1080 of Occupational Safety and Health Standards 3.2 Mold is checked in line with job requirements. 3.3 Mold is unplugged and laid-out in line with work instruction. 3.4 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 3.5 Required output is completed as specified by the immediate supervisor based on work schedule.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Applied Mathematics 3.3 Green Building Concept relative to Construction (3R, 5S) 3.4 Factors affecting productivity 3.5 Productivity work measurements 3.6 Ways of improving productivity 3.7 Adherence to work requirements	3.1Communication skills 3.2 Applying mensuration 3.3 Applying productive methods and techniques in lay-out of mold area 3.4 Implementing 3R and 5S
4.Inspect result of unplugging	4.1Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 4.2Mold are checked for damage and repair if necessary. 4.3 Mold are erected to the desired level and/ or alignment before unplugging	4.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 4.2 Green Building Concept relative to Construction	4.1 Communication skills 4.2 Applying productive methods of cutting and laying of mold 4.3 Observing safe use of tools 4.4 Handling of materials 4.5 Applying productive

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	4.4 Mold are arranged and fixed to the designed position 4.5 Wood trim, nosing, expansion joint and threshold are placed according to job requirement to avoid tilting. 4.6 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 4.7 Required output is completed as specified by the immediate supervisor based on work schedule.	(3R, 5S) 4.3 Applied mathematics 4.4 Manufacturer's product specifications and instructions Compliance with quality requirements Sequence of forming mold 4.5 Factors affecting productivity 4.6 Productivity work measurements 4.7 Ways of improving productivity 4.8 Adherence to work requirements	methods and techniques in installing of woods on plain and curved surfaces and other application 4.6 Implementing 3R and 5S
5. Perform housekeeping	5.1 Occupational health, safety and environmental plans are complied. 5.2 Waste materials are reported following Occupational health and safety/ environmental management plans. 5.3 Unused and excess materials are returned to warehouse following company standard and operating procedures. 5.4 Equipment and tools are returned to warehouse after work completion. 5.5 Environmental and safety reports are prepared and submitted following management plans.	5.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry Equipment and tools specification 5.2 DENR standards and regulatory requirements 5.3 Waste segregation 5.4 Material description Adherence to work requirement	5.1 Communication skills 5.2 Applying productive cutting methods and techniques 5.3 Application and operation of tools 5.4 Handling of materials 5.5 Applying productive methods and techniques in cutting woods 5.6 Implementing 3R and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2. Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3. Work plan	May include: 3.1 Work instructions 3.2 Specifications 3.3 Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1 Quality of materials 4.2 Quality of mold surface 4.3 Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1 Protective clothing and equipment 5.2 Use of tools 5.3 Handling of materials 5.4 Hazardous materials 5.5 Working platforms
6. Tools	May include: 6.1 Rubber mallet 6.2 Chisel 6.3 Wooden /Plastic wedge
7. Equipment	May include: 7.1 Chain block and sling 7.2 A-Frame
8. Unplugging/ Detaching Method	May include: 8.1 Chain Block 8.2 Rubber Mallet 8.3 Plastic Wedge

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Secured and interpreted work instruction in line with job requirements 1.2 Unplugged safely mold and structure using lifting assembly 1.3 Conducted inspection and regular testing prior to use 1.4 Selected tools and lifting assembly appropriate to the job 1.5 Observed safety measures applicable to worksite operation 1.6 Communicated effectively with others to ensure effective work operation 1.7 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided: 2.1 Tools, equipment and facilities appropriate to the process or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with Oral Questioning 3.2 Written Test
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY: APPLY PAINT IN HULL AND STRUCTURE

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to paint and retouch hull and structure of boat

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)***is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** 1.3 ***Work plan*** is produced in accordance with work instruction 1.4 Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5 ***Materials, tools and equipment*** are identified in accordance with job requirements 1.6 ***Surface treatment method*** is selected and used as per work requirements 1.7 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications 1.3 Manufacturer's product specifications and instructions 1.4 Pattern development 1.5 Adherence to work requirements 1.6 Surface treatment methods 1.7 DOH and IATF Guidelines in social distancing (IATF Res No.38) 1.8 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1 Communication skills 1.2 Estimating of materials and tools 1.3 Handling of materials 1.4 Making pattern 1.5 Mixing and applying of surface treatment methods

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Paint and retouch hull and structure	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Surface area of hull and structure is quality checked in line with job requirements. 2.3 Hull and structure are painted and retouched in line with work instruction and preservation. 2.4 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.5 Required output is completed as specified by the immediate supervisor based on work schedule.	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry Applied Mathematics 2.2 Green Building Concept relative to Construction (3R, 5S) 2.3 Procedures in paint and retouch of hull and structure. 2.4 Ways of improving productivity 2.5 Adherence to work requirements	2.1 Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in painting and retouching of hull and structure 2.4 Implementing 3R and 5S
3. Perform housekeeping	3.1 Occupational health, safety and environmental plans are complied. 3.2 Waste materials are reported following Occupational health and safety/ environmental management plans. 3.3 Unused and excess materials are returned to warehouse following company standard and operating procedures.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Equipment and tools specification 3.3 DENR standards and regulatory requirements 3.4 Waste segregation 3.5 Material description	3.1 Following occupational health and safety/environmental management plans 3.2 Performing housekeeping

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.4 Equipment and tools are returned to warehouse after work completion. 3.5 Environmental and safety reports are prepared and submitted following management plans.	3.6 Adherence to work requirements	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2.Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3.Work plan	May include: 3.1 Work instructions 3.2 Specifications 3.3 Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1 Quality of materials 4.2 Quality of mold surface 4.3 Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1 Protective clothing and equipment 5.2 Use of tools 5.3 Handling of materials 5.4 Hazardous materials 5.5 Working platforms
6. Materials	May include: 6.1 Paint 6.2 Paint thinner 6.3 Rags 6.4 Polish

7. Tools and equipment	May include: Tools: 7.1 Paint rollers 7.2 Paint brush 7.3 Sanding tools Equipment: 7.4 Paint sprayer set 7.5 Air Compressor 7.6 Buffer
8. Surface treatment method	May include: 8.1 Need to be smooth 8.2 Must properly waxed 8.3 Can be pre painted

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 Quality checked surface area of hull and structure in line with job requirements. 1.2 Painted and retouched hull and structure in line with work instruction. 1.3 Observed safety measures applicable to worksite operation 1.4 Communicated effectively with others to ensure effective work operation 1.5 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided 2.1 Tools, equipment and facilities appropriate to the process or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written Test
4. Context for assessment	4.1 Competency may be assessed in the workplace or in simulated workplace environment or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : INSTALL NAVIGATIONAL AND COMMUNICATION EQUIPMENT, PROPULSION AND ELECTRICAL WIRINGS

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to install navigational and communication equipment, propulsion and electrical wirings.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** 1.3 ***Work plan*** is produced in accordance with work instruction 1.4Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5***Materials, tools*** and equipment are identified in accordance with job requirements 1.7 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications Manufacturer's product specifications and instructions 1.3 Pattern development 1.4 Adherence to work requirements 1.5 Area and equipment preparation methods 1.7 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.8 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1Communication skills 1.2 Preparing all needed materials and tools 1.3 Handling of materials 1.4 Making pattern of installation

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2 Set-up navigational and communication equipment and electrical wirings	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Area is checked for cabling of wires in line with job requirements. 2.3 Navigational and communication equipment are laid out with work instruction. 2.4 Cables for lighting and battery are prepared and laid out in line with job requirement. 2.5 Cables for navigational and communication equipment are prepared and laid out as per plan. 2.6 Batteries are installed according to manufacturer's instructions or recommendation. on work schedule. 2.7 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.8 Required output is completed as specified by the immediate supervisor based on work schedule.	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.2 Applied Mathematics 2.3 Green Building Concept relative to Construction (3R, 5S) 2.4 Work drawing and instructions 2.5 Basic Electricity 2.6 Procedures in setting up navigational and communication equipment 2.6 Factors affecting productivity 2.7 Productivity work measurements 2.8 Ways of improving productivity 2.9 Adherence to work requirements	2.1Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in setting up navigational and communication equipment and electrical wirings 2.4 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Check all inter-connection of propulsion and machinery	3.1 Personal protective equipment (PPE**)**is used in accordance with Rule 1080 of Occupational Safety and Health Standards 3.2 All connections of navigational equipment with the battery are checked according to standard operating procedures 3.3 Main engines throttle connection to the bridge are checked according to standard operating procedures 3.4 Structural integrity is checked between hull and steel 3.5 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 3.6 Required output is completed as specified by the immediate supervisor based on work schedule.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Applied Mathematics 3.3 Green Building Concept relative to Construction (3R, 5S) 3.4 Basic Electricity 3.5 Factors affecting productivity 3.6 Productivity work measurements 3.7 Ways of improving productivity 3.8 Adherence to work requirements	3.1Communication skills 3.2 Applying mensuration 3.3 Applying productive methods and techniques in checking inter-connection of propulsion and machinery 3.4 Implementing 3R and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2. Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3. Work plan	May include: 1.1 Work instructions 1.2 Specifications 1.3 Work lay-out (work sequence lay-out and materials location lay-out)
2 Quality requirements	May include: 2.1 Quality of materials 2.2 Quality of mold surface 2.3 Quality of specified finish (pattern, color, texture)
3 Occupational Safety and Health Standards	May include: 3.1 Protective clothing and equipment 3.2 Use of tools 3.3 Handling of materials 3.4 Hazardous materials 3.5 Working platforms
4 Materials	May include: 4.1 Nails 4.2 Sanding tools 4.3 Electrical tape 4.4 Electrical wire 4.5 Insulator
5 Tools	May include: 5.1 Cutting tools 5.2 Multi-Tester 5.3 Cutter 5.4 Pliers 5.5 Screw driver 5.6 Wrench

	5.7 Adjustable Wrench 5.8 Hand drill

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 Install safely navigational and communication equipment per work instruction 1.2Prepared and laid out engine, cables and battery for lighting according to manufacturer's instruction 1.3 Prepared and laid out cables for navigational and communication equipment as per plan. 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation 1.6 Complied with attitudinal work requirements
2 Resource implications	The following resources should be provided 2.1 Tools, equipment and facilities appropriate to the process or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written Test
4 Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY: CONDUCT TRIAL AND COMMISSIONING

UNIT CODE : MTMXXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform trial and commissioning for the navigational equipment and propulsion for boat

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 ***Personal protective equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.2 Work instruction is secured and interpreted in line with ***job requirements*** 1.3 ***Work plan*** is produced in accordance with work instruction 1.4 Safety and ***quality requirements*** are identified in line with ***Occupational Safety and Health Standards (OSHS)*** and company standard operating procedures 1.5 Required output is completed as specified by the immediate supervisor based on work schedule	1.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Materials, tools and equipment identifications and classifications Manufacturer's product specifications and instructions 1.3 Pattern development 1.4 Adherence to work requirements 1.5 DOH & IATF Guidelines in social distancing (IATF Res No.38) 1.6 Gender Equality as per Phil Constitution 1987 Sec 14, Art 2	1.1Communication skills 1.2 Estimating of materials and tools 1.3 Handling of materials
2 Test Navigational Equipment	2.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.2 Area is checked for cabling of wires in line with job requirements. 2.3 Navigational equipment	2.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.2 Applied Mathematics 2.3 Green Building	2.1Communication skills 2.2 Applying mensuration 2.3 Applying productive methods and techniques in lay-out of mold area 2.4 Implementing

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	are laid out with work instruction. 2.4 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42) 2.5 Navigational Equipment is tested as per Maker's Manual 2.6 Required output is completed as specified by the immediate supervisor based on work schedule.	Concept relative to Construction (3R, 5S) 2.4 Trial sequence and instructions are as planned. 2.5 Check of navigational equipment as per manufacturer's standard. 2.6 Test to be done as per instruction manual.	3R and 5S
3 Check Engine	3.1 Personal protective equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 3.2 Installed engine is checked and tested in line with manufacturer's specification and parameters 3.3 Inter-connection of hull and engine bed is checked as per manufacturer's specification 3.4 Work area is cleaned according to safety and environmental regulations (e.g. 1152 Section 6, 8 & 42) 3.5 Required output is completed as specified by the immediate supervisor based on work schedule.	3.1 DOLE Department Order No. 13 series 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Applied Mathematics 3.3 Green Building Concept relative to Construction (3R, 5S) 3.4Work drawing and instructions are as planned. 3.6 Check of engine as per manufacturer's standard. 3.6 Test to be done as per instruction manual.	3.1Communication skills 3.2 Applying mensuration 3.3 Applying productive methods and techniques in lay-out of mold area 3.4 Implementing 3R and 5S

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal Protective Equipment (PPE)	May include: 1.1 Hard hat 1.2 Safety shoes/ rubber boots 1.3 Proper uniform/clothing 1.4 Gloves (cotton) 1.5 Dust mask 1.6 Safety goggles
2. Job requirements	May include: 2.1 Approved working drawings 2.2 Work instructions 2.3 Specifications 2.4 Setting out procedures 2.5 Application procedures 2.6 Workplace operations and procedures
3. Work plan	May include: 3.1 Work instructions 3.2 Specifications 3.3 Work lay-out (work sequence lay-out and materials location lay-out)
4. Quality requirements	May include: 4.1 Quality of materials 4.2 Quality of mold surface 4.3 Quality of specified finish (pattern, color, texture)
5. Occupational Safety and Health Standards	May include: 5.1 Protective clothing and equipment 5.2 Use of tools 5.3 Handling of materials 5.4 Hazardous materials 5.5 Working platforms

EVIDENCE GUIDE

1. Critical aspects of evidence	Assessment requires evidence that the candidate: 1.1 Tested engine and navigational equipment as per maker's manual 1.2 Checked and tested installed engine in line with manufacturer's specification and parameters 1.3 Checked Inter-connection of hull and engine bed as per manufacturer's specification 1.2Observed safety measures applicable to worksite operation 1.4 Communicated effectively with others to ensure effective work operation 1.4 Complied with attitudinal work requirements
2 Resource implications	The following resources should be provided 2.1 Tools, equipment and facilities appropriate to the process or activity 2.2 Materials relevant to the proposed activity
3. Method of assessment	Competency in this unit must be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written Test
4 Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3. TRAINEE ENTRY REQUIREMENTS AND TRAINER'S QUALIFICATION AND LIST OF TOOLS, MATERIALS AND EQUIPMENT

3.1 TRAINEE ENTRY REQUIREMENTS

Trainees or students who wish to enter this training should possess the following requirements:

- Must possess good communication skills
- Can perform basic mathematical computations
- Can understand basic English in interpreting procedures in every equipment Manual

3.2 TRAINERS' QUALIFICATION

- Must be a holder of Trainer's Methodology Certificate (TMC) **OR** must have Trainer's Certificate **OR** must be a practicing trainer for one (1) year within the last two (2) years

- Must have at least (1) year industry experience on boat building within the last two (2) years

3.3 LIST OF TOOLS, MATERIALS AND EQUIPMENT

Recommended list of tools, equipment, and materials for the training of 25 trainees for BOAT BUILDING (Composite Materials) Level II are as follows.

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

Qty.	Tools	Qty.	Equipment	Qty.	Materials
2 pcs.	Measuring cup	2 units	Chain Block (2 tons)	30 liters	Resin
12 pcs.	Straight edge	4 units	Sling	1 roll	Fiber mat 300
30 pcs.	C-clamps	2 units	Paint Sprayer	1 liter	Hardener Fiber mat 450
25 pcs.	Paint rollers	2 units	Air Compressor	1 pc.	Plywood 3/4
25 pcs.	Paint brush	2 units	Buffer	1 liter	Adhesive
2 pcs.	Pail (1 gal.)	5 units	Sander	2 kgs.	Nails

4 pcs.	Cutting tools (scissor)	5 units	Hand drill	1 kg.	Screws
4 pcs.	Adjustable wrench	1 unit	Chain Block (5 Tons)	10 pcs.	Sand paper 300
10 pcs.	Screw driver (Flat)	1 unit	Blower	8 pcs. .	Sanding Disc
10 pcs.	Screw driver (Star)	1 unit	Welding Machine	1 kg.	Rags
8 pcs.	Carpenter hammer	1 unit	Oxy acetylene cutting outfit	1 liter	Paint
4 sets	Drill bit	5 units	Jigsaw	2 gallons	Paint thinner
5 pcs.	Rubber mallet	1 set	A-Frame	2 rolls	Electrical tape
8 pcs.	Chisel			10 meters	Electrical wire
10 pcs.	Wooden/plastic Wedge 4”			10 meters	Insulator
4 pcs.	Multi-tester			8 pcs.	Cutting Disc
4 pcs.	Cutter			1 liter	Polish
4 pcs.	Pliers			1 roll	Woven roving 600
4 pcs.	Wrench			6 liters	Gel coat
8 pcs.	Tape measure			500 grams	Wax
5 pcs.	Sanding tools			10 pcs.	Sand paper 100

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TECHNICAL AND INDUSTRY EXPERTS PANEL

CAPT. LAMBERTO G. TORRES
(President – Seaman Job Study Center, Inc.)
Retired Ship's Master/Present Operation Division Head
Naess Shipping Philippines
Leon Guinto, Malate Manila

CAPT. REYNALDO VALEROS, JR.
(Project Director – Seaman Job Study Center Inc.)
Independent Marine Vetting Inspector
Blk19 Lot10 Balimbing St. Meadowood Executive Village, Bacoor Cavite

CAPT. LOUELL SAMACO
(Training Director – Seaman Job Study Center, Inc.)
Ship's Master and Independent Boat Builder
SeaJet Boat Builder
Pinamalayan, Mindoro

MR. YURY VINOGRANOV
(Consultant – Seaman Job Study Center Inc.)
Independent Boat Builder/Consultant
Panglao, Bohol

PERLITO EVELYNO M. AQUIATAN
TESDA Assessor/Trainer
SPED Teacher DepEd
Sariaya, Quezon

The PARTICIPANTS in the National Validation of this Competency Standards

ENGR. MICAH ARSENO
President – GAM Engineering
Boat Building Company – Registered with MARINA
La Consolacion, Cebu

GEELO ORCULLO
Naval Architect
GAM Engineering
La Consolacion, Cebu

JULIUS BADAJOS
Ship/Boat Building Foreman
GAM Engineering

ANACLETO PERALES
LeadMan, Composite FRP Expert
GAM Engineering

TEODORO DUCDUCAN
Class A - Boat Builder (MARINA Registered)
Eastern Samar

CAPT. NESTOR VARGAS
Fleet Manager – Michaelmar Shipping
(Experienced in Ship and Boat Superintendent)
A. Zobel cor Arellano Makati

CAPT. LEO MIRANDE
(Ship and Boat Building Superintendent)
Opeations Manager
IINO Maritime Shipping
Ermita Manila

CAPT. LEUEL OSENA
Great Star Softwares
(Developer of Trim and Stability Softwares for Ship and Boat)

Maritime Industry Authority (MARINA)

- **MS. NANETTE Z. VILLAMOR-DINOPOL**
  Deputy Administrator for Operations
  MARINA

- **MR. RAMON C. HERNANDEZ**
  Director, Shipyard Regulation Service
  MARINA

- **Qualifications and Standards Office (QSO)**
  - **MS. IMELDA B. TAGANAS - Executive Director**

- **Competency Standards and Development Division**
  - **MA. ISABEL G. GAMUROT**
  - **EVANGELINE A. COSEP**
  - **HOWARD MARK N. PLETE**