TRAINING REGULATIONS

ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION NC II

METALS AND ENGINEERING SECTOR

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

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

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

The Training Regulations (TR) serves as basis for:

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

Each TR has four sections:

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

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

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

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

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TRAINING REGULATIONS FOR

ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION NC II

SECTION 1 ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION NC II QUALIFICATION

The Electric Discharge Machine (EDM)-Sinking Operation NC II Qualification consists of competencies that a person must achieve to set-up EDM, electrode and workpiece, perform EDM-sinking operations and perform post EDM -sinking operations.

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
MEE722202	Interpret working drawings and sketches
MEE722203	Select/ cut workshop materials
MEE722204	Perform shop computations (Basic)
MEE722205	Measure workpiece (Basic)
MEE722206	Perform routine housekeeping
MEE722207	Perform shop computations (Intermediate)
MEE722208	Measure workpiece using angular measuring instruments
MEE722210	Measure workpiece using gages and surface texture comparator
MEE722211	Perform preventive and corrective maintenance

CODE NO.	CORE COMPETENCIES
MEE 821314	Set-up Electric Discharge Machine, electrode and workpiece
MEE 821315	Perform Electric Discharge Machine-sinking operations
MEE 821316	Perform post Electric Discharge Machine-sinking operations

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

- Electric Discharge Machine-Sinking Operator

SECTION 2 COMPETENCY STANDARDS

This section gives the details and contents of the units of competency required in **ELECTRIC DISCHARGE MACHINE(EDM)-SINKING OPERATION NC II.** These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 400311210

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

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely	1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette	1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace 1.7 Gathering and providing basic information in response to workplace requirements 1.8 Basic business writing skills 19 Interpersonal skills in the workplace 2.0 Active-listening skills

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

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using workplace communication equipment/systems 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1. Fax machine 2.2. Telephone 2.3. Notebook 2.4. Writing materials 2.5. Computer with Internet connection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration with oral questioning 3.2. ~~I~~nterview 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 i**n the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Managing properly one's emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace

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. Opportunities for improvement	May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices.
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.
5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

EVIDENCE GUIDE

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

UNIT OF COMPETENCY : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and 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
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	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

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	improvement.		evaluations 2.5 Stating organisational values, ethics and codes of conduct
3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics and codes of conduct	3.1 Describing data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Stating legislation, policy and procedures relating to the conduct of evaluations 3.4 Stating organisational values, ethics and codes of conduct practices

RANGE OF VARIABLES

VARIABLE	RANGE
1. Data analysis techniques	May include: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

EVIDENCE GUIDE

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

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

UNIT CODE : 400311216

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

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

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

ELEMENTS	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

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

ELEMENTS	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: 3.6.1 Quality-consciousness 3.6.2 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 procedure 2.3.2 manuals 2.4 Company quality policy
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Interview 3.2 Third-party report
4.Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY SAFETY PRACTICES

UNIT CODE : MEE722201

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify hazards	1.1 ***Hazards*** are identified correctly in accordance with OHS principles 1.2 Safety signs and symbols are identified and adhered to	1.1 Shop safety signs, symbols and alarms 1.2 Safety precautionary measures	1.1 Identifying hazard 1.2 Identifying safety sign and symbol
2. Use protective clothing and devices	2.1 Appropriate ***protective clothing and devices*** correctly selected and used in accordance with OHS requirements or industry/company policy	2.1 Shop safety signs, symbols and alarms 2.2 Safety precautionary measures 2.3 Housekeeping 2.4 Machine tools 2.5 First aid	2.1 Selecting appropriate protective clothing and devices
3. Perform safe handling of tools, equipment and materials	3.1 Safety procedures for pre-use check and operation of tools and equipment followed in accordance with industry/ company policies 3.2 Tools, equipment and materials handled safely in accordance with OHS requirements and industry/ company policies	3.1 Shop safety signs, symbols and alarms 3.2 Safety precautionary measures 3.3 Housekeeping 3.4 Machine tools 3.5 Engineering materials	3.1 Checking tools and equipment 3.2 Operating tools and equipment 3.3 Handling tools and equipment

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Perform first aid	4.1 Surroundings are checked for any possible risk or harm 4.2 Call for help someone if seriously injured. 4.3 First aid treatment of ***injuries*** are carried out according to recommended procedures	4.1 Shop safety signs, symbols and alarms 4.2 Safety precautionary measures 4.3 Housekeeping 4.4 Machine tools 4.5 First aid 4.6 Engineering materials	4.1 Determining first aid treatment according to recommended procedures 4.2 Performing first aid according to recommended procedures
5. Use fire extinguisher	5.1 Check for your own safety before starting to extinguish a fire. 5.2 Fire extinguisher is selected correctly according to the ***type of fire***. 5.3 Fire extinguisher are operated correctly according recommended procedures	5.1 Shop safety signs, symbols and alarms 5.2 Safety precautionary measures 5.3 Housekeeping 5.4 Machine tools 5.5 First aid 5.6 Engineering materials 5.7 Fire extinguishers	5.1 Selecting fire extinguisher according to the type of fire 5.2 Operating fire extinguisher according to the type of fire

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hazards	May include: 1.1 Cluttered tools and materials 1.2 Slippery floors (caused by oil, grease or any liquid) 1.3 Exposed electrical wires 1.4 Sharp edges 1.5 Machine without guards or with exposed moving parts 1.6 Uncollected chips or other wastes etc.
2. Protective clothing and devices	May include: 2.1 Safety glasses/goggles 2.2 Safety shoes 2.3 Overalls 2.4 Cap
3. Injuries	May include: 3.1 Burns/scalds 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. Type of fires	May include: 4.1 common combustibles (wood, cloth, paper, rubber and plastic) 4.2 Flammable liquids (gasoline, oil, solvents, paints, etc.) 4.3 Energized electrical equipment (wiring, fuse boxes, circuit breakers, appliances, etc. 4.4 Combustible metals (magnesium, sodium, etc.)

EVIDENCE GUIDE

1. Critical Aspects of competency	**Assessment requires evidence that the candidate:** 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 should 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 may be assessed through:** 3.1 Demonstration 3.2 Written or oral short answer questions 3.3 Practical exercises
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : INTERPRET WORKING DRAWINGS AND SKETCHES

UNIT CODE : MEE722202

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 Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret technical drawing	1.1 Components, assemblies or objects recognized as required. 1.2 Dimensions identified as appropriate. 1.3 Instructions identified and followed as required. 1.4 Material requirements identified as required. 1.5 Symbols recognized as appropriate in the ***drawing*****.** 1.6 ***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	1.1 Recognizing components, assemblies and objects. 1.2 Identifying dimension 1.3 Identifying instruction 1.4 Identifying material 1.5 Recognizing symbols in the drawing 1.6 Identifying tolerance, limits and fits
2. Prepare freehand sketch of parts	2.1 Sketch drawn correctly and appropriately. 2.2 Sketch depicted objects or part appropriately. 2.3 Dimensions indicated in sketch are clear and correct. 2.4 Instructions included in sketch are clear and correct. 2.5 Base line or datum points indicated as required.	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	2.1 Depicting sketch 2.2 Dimensioning sketch 2.3 Including instruction in the sketch 2.4 Indicating base line/ datum

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Interpret details from freehand sketch	3.1 Components, assemblies or objects recognized as required. 3.2 Dimensions identified as appropriate. 3.3 Instructions identified and followed as required. 3.4 Material requirements identified as required. 3.5 Symbols recognized as appropriate in the drawing.	3.1 Alphabet of lines 3.2 Projections 3.3 Drawing symbols 3.4 Dimensioning techniques 3.5 Tolerance, limits and fits 3.6 Engineering materials 3.7 Drawing tools and supplies	3.1 Recognizing components, assemblies and objects. 3.2 Identifying dimensions 3.3 Identifying instruction 3.4 Identifying material requirements 3.5 Recognizing symbols

RANGE OF VARIABLES

VARIABLE	RANGE
1. Drawing	1.1 Drawing technique may include 1.1.1 Perspective 1.1.2 Exploded view 1.1.3 Hidden view technique 1.2 Projections 1.2.1 First angle projections 1.2.2 Third angle projections
2. Tolerance	May include: 2.1 General tolerance 2.2 Angular tolerance 2.3 Geometric tolerance

EVIDENCE GUIDE

1. Critical aspect of competency	**Assessment requires evidence that the candidate:** 1.1 Interpreted technical drawing 1.2 Prepared sketches 1.3 Interpreted sketches
2. Resource implications	**The following resources should be provided:** 2.1 Drafting room/facilities and drafting instruments and supplies appropriate to the activity 2.2 Measuring tools 2.3 Drawings, sketches or blueprint 2.4 Specimen parts/components
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Written or oral short answer questions 3.3 Demonstration 3.4 Project/work sample 3.5 Portfolio
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : SELECT/ CUT WORKSHOP MATERIALS

UNIT CODE : MEE722203

UNIT DESCRIPTOR : This unit covers the skills and knowledge required to select and cut workshop materials.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine requirement	1.1 ***Plans/ drawings*** are interpreted to produce component to specification 1.2 Sequence of operation is determined to produce component to specification	1.1 Shop safety practices 1.1.1 Safe working habits 1.1.2 Safe handling of tools, equipment and materials 1.2 Blueprint reading 1.2.1 Standard drawing scales, symbols and abbreviations 1.2.2 Assembly and details of drawing 1.2.3 Dimensions 1.3 Measurement 1.3.1 Linear measuring tools	1.1 Interpreting plans and drawings 1.2 Determining sequence of operation
2. Select and measure materials	2.1 Materials are selected according to the requirement of the operation 2.2 Materials are measured to required level of accuracy using measuring tool 2.3 Measuring tools are used according to manufacturer's specification	2.1 Shop safety practices 2.1.1 Safe working habits 2.1.2 Safe handling of tools, equipment and materials 2.2 Blueprint reading 2.2.1 Standard drawing scales, symbols and abbreviations 2.2.2 Assembly and details of drawing	2.1 Selecting materials 2.2 Measuring materials 2.3 Using measuring tools

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.3 Dimensions 2.3.1 Measurement 2.3.2 Linear measuring tools 2.4 Materials and related science 2.4.1 Classification and mechanical properties of engineering materials	
3. Cut materials	3.1 Materials are cut according to plans/drawing instruction 3.2 ***Cutting tools/equipment*** are used based on manufacturers specification, appropriate techniques or the *safety procedure*	3.1 Shop safety practices 3.1.1 Safe working habits 3.1.2 Safe handling of tools, equipment and materials 3.2 Blueprint reading 3.2.1 Standard drawing scales, symbols and abbreviations 3.2.2 Assembly and details of drawing 3.2.3 Dimensions 3.3 Measurement 3.3.1 Linear measuring tools 3.4 Materials and related science 3.4.1 Classification and mechanical properties of engineering materials	3.1 Cutting of material 3.2 Using of cutting tools and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Plan/drawings	May include: 1.1 Dimensions 1.2 Tolerance
2. Materials	May include: 2.1 Ferrous 2.2 Non-ferrous
3. Measuring tools	May include: 3.1 Steel rule 3.2 Pull-push rule
4. Cutting tools/equipment	May include: 4.1 Hacksaw 4.2 Power hacksaw
5. Safety procedure	Safety involves the handling of: 5.1 Equipment 5.2 Tools 5.3 Materials

EVIDENCE GUIDE

1. Critical Aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Interpreted plans/drawings 1.2 Selected natural according to the requirement 1.3 Performed cutting operation 1.4 Cutting tools/equipment used safely
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities appropriate processes of an activity 2.2 Materials relevant to the proposal activity 2.3 Drawings/plans
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Oral short answer question 3.3 Practical exercises
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : PERFORM SHOP COMPUTATIONS (BASIC)

UNIT CODE : MEE722204

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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform four fundamental operations.	1.1 Simple calculations performed using *four **fundamental operations.*** 1.2 Simple calculations performed involving fractions and mixed numbers using four fundamental operations	1.1 English and metric system of measurement	1.1 Performing calculation using four fundamental operation
2. Perform basic calculations involving fractions and decimals	2.1 Simple calculations are performed involving fractions and decimals using the four fundamental operations. 2.2 Decimal are converted into fraction (and vice versa) accurately	2.1 English and metric system of measurement	2.1 Identifying die material requirements 2.2 Determining production volume 2.3 Identifying design parameters
3. Perform basic calculations involving percentages.	3.1 Simple calculations are performed to obtain percentages from information expressed in either fractional or decimal format	3.1 English and metric system of measurement	3.1 Performing calculation
4. Perform basic calculation involving ration and proportion	4.1 Simple calculations are performed involving ratios and proportion using whole numbers, fractions and decimal fractions.	4.1 English and metric system of measurement	4.1 Performing calculation
5. Perform calculations on algebraic expressions	5.1 Simple calculations are performed on ***algebraic expressions*** using the four fundamental operations. 5.2 Simple transposition of formulae is carried out to isolate the variable required, involving the four fundamental operations.	5.1 English and metric system of measurement	5.1 Performing calculation

RANGE OF VARIABLES

VARIABLE	RANGE
1. Four fundamental operations	May include: 1.1 Addition 1.2 Subtraction 1.3 Multiplication 1.4 Division
2. Algebraic expressions	Calculation using formula for determining: 2.1 tap drill size 2.2 feed 2.3 speed

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Using four fundamental operations 1.2 Involving fractions and mixed numbers 1.3 Involving fractions and decimals 1.4 Involving percentages 1.5 Involving ratio and proportion 1.6 On algebraic expressions 1.7 of simple formulae
2. Resource implications	**The following resources should 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 may 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 actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : MEASURE WORKPIECE (BASIC)

UNIT CODE : MEE722205

UNIT DESCRIPTOR : This unit covers the competencies required to measure workpieces using measuring instruments such as steel rules, Vernier calipers, micrometers, etc.….

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use measuring tools	1.1 ***Measuring tools*** are selected and used according to the level of accuracy required. 1.2 ***Measurements*** taken are accurate to the finest graduation of the selected measuring instrument. 1.3 Measuring technique used is correct and appropriate to the device used.	1.1 Types, purposes and accuracy of measuring instruments 1.2 Capability of measuring instruments 1.3 Part dimensions and tolerances 1.4 Techniques for measuring dimensions 1.5 Care and storage procedure of measuring tools	1.1 Selecting measuring tools 1.2 Obtaining accurate measurements 1.3 Determining measuring technique
2. Clean and store measuring tools	2.1 Cleaning of devices undertaken according to standard operating procedures. 2.2 Care of devices undertaken according to manufacturer's specifications. 2.3 Storage of devices undertaken according to standard operating procedures.	2.1 Types, purposes and accuracy of measuring instruments 2.2 Capability of measuring instruments 2.3 Part dimensions and tolerances 2.4 Techniques for measuring dimensions 2.5 Care and storage procedure of measuring tools	2.1 Determining proper care and storage of measuring tools.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring tools	May include 1.1 Steel tape 1.2 Steel rule 1.3 Straight edge 1.4 Combination square 1.5 Steel square 1.6 Divider or trammel 1.7 Caliper 1.8 Protractor 1.9 Vernier caliper 1.10 Micrometer
2. Measurements	May include: 2.1 Length 2.2 Diameter 2.3 Depth 2.4 Flatness 2.5 Straightness 2.6 Squareness

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Selected and used measuring instruments 1.2 Cleaned and stored measuring instruments
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities appropriate to the activity 2.2 Specimen component or part to the proposed activity
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Demonstration 3.3 Written or oral short answer questions 3.4 Portfolio
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : PERFORM ROUTINE HOUSEKEEPING

UNIT CODE : MEE722206

UNIT DESCRIPTOR : This unit covers the competencies required to maintain an organized and clean work area.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine requirement	1.1 Work area maintained in a safe, uncluttered and organized manner according to ***workshop policy*** 1.2 All tasks carried out safely, effectively and efficiently with minimum inconvenience according to workshop policy 1.3 Workshop policies and procedures for tidying work areas and placing items in designated areas applied	1.1 Shop safety practices 1.2 Machine shop equipment 1.3 Shop policies regulations 1.4 5-S 1.5 Shop cleaning equipment	1.1 Maintaining work area, safe uncluttered and organized 1.2 Carrying out all task safely, effectively and efficiently 1.3 Designating workshop policies and procedures for work area
2 Clean work area	2.1 Shop policies and procedures applied for cleaning ***work area*** 2.2 Wastes promptly removed and disposed of according to shop policies and environmental requirements 2.3 Spills, wastes and other potential hazards reported to appropriate personnel and removed according to shop policies and environmental requirements 2.4 Signage promptly displayed in regard to unsafe areas	2.1 Shop safety practices 2.2 Machine shop equipment 2.3 Shop policies regulations 2.4 5-S 2.5 Shop cleaning equipment	2.1 Applying shop policies and procedures 2.2 Disposing of waste according to shop policy and environmental requirements 2.3 Cleaning of tools and equipment

ELEMENT	PERFORMANC CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.5 Consumable materials maintained and stored correctly after use 2.6 ***Tools and equipment*** (including guards) cleaned and used in accordance with manufacturer's instructions		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Workshop policy	Shop policy and procedure in regard to: 1.1 Housekeeping practices 1.2 Maintenance and storage of cleaning equipment 1.3 Use and storage of cleaning chemicals
2. Work area	May include: 2.1 Work benches 2.2 Walkways and aisles 2.3 Fixtures and other working surfaces
3. Tools and Equipment	May include: 3.1 Drill Press 3.2 Pedestal Grinder 3.3 Surface plate 3.4 Layout and marking tools 3.5 Cutting tools (hacksaw, chisel, files) 3.6 Inspection and measuring tools (templates, vernier caliper, micrometer, straight edge, gages, etc…)

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Organized and cleaned work area according shop policies and environmental requirements.
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities appropriate to processes or activity 2.2 Materials and documentation relevant to the proposed activity 2.3 Shop policy and/or procedures manual on housekeeping, cleaning and occupational health and safety
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Demonstration or role play 3.3 Written or oral short answer questions 3.4 Identify colleagues/clients who can be approached for the collection of competency evidence, where appropriate
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : PERFORM SHOP COMPUTATIONS (INTERMEDIATE)

UNIT CODE : MEE722207

UNIT DESCRIPTOR : This unit covers the competencies required to perform calculation involving triangles and tapers.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform calculations involving triangles	1.1 Problems involving right triangles are performed using the ***trigonometric functions***. 1.2 Problems involving non-right triangles are performed using sine and cosine rules.	1.1 English and 1.2 Metric system of 1.3 Measurements 1.4 Geometrical 1.5 Shapes	1.1 Performing trigonometric function
2. Calculate taper	2.1 Convert the units of the conical taper so that all units are the same. 2.2 Visualize a cross section of the cone with the length being the height and the diameter being the base. 2.3 Taper of work calculated correctly using appropriate formula.	2.1 English and metric system of measurements 2.2 Geometrical shapes	2.1 Calculating taper of work

RANGE OF VARIABLES

VARIABLE	RANGE
1. Trigonometric functions	May include: 1.1 Sine 1.2 Cosine 1.3 Tangent 1.4 Cotangent 1.5 Secant 1.6 Cosecant

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Performed calculations involving right triangles, non-right triangles and involving tapers
2. Resource implications	**The following resources should 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 may 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 actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **MEASURE WORKPIECE USING ANGULAR MEASURING INSTRUMENTS**

UNIT CODE : **MEE722208**

UNIT DESCRIPTOR : This unit covers the competencies required to measure workpieces using angular measuring instruments.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use angular measuring tools	1.1 ***Angular measuring tools*** are selected and used according to the level of accuracy required. 1.2 ***Measurements*** taken are accurate to the finest graduation of the selected measuring instrument. 1.3 Measuring technique used is correct and appropriate to the device used.	1.1 Types, purposes and accuracy of angular measuring instruments 1.2 Capability of measuring tools 1.3 Techniques for measuring angles and tapers	1.1 Selecting angular measuring tools 1.2 Obtaining accurate measurements 1.3 Determining measuring techniques
2. Maintain angular measuring tools	2.1 Measuring tools are adjusted and maintained to the required accuracy utilizing manufacturer's or worksite procedures.	2.1 Types, purposes and accuracy of angular measuring instruments 2.2 Capability of measuring tools 2.3 Techniques for measuring angles and tapers	2.1 Maintaining and adjusting measuring tool accuracy
3. Clean and store measuring tools	3.1 Care and storage of devices undertaken to manufacturer's specifications or standard operating procedures.	3.1 Types, purposes and accuracy of angular measuring instruments 3.2 Capability of measuring tools 3.3 Techniques for measuring angles and tapers 3.4 Care and storage procedure of measuring tools	3.1 Storing and cleaning of measuring tools

RANGE OF VARIABLES

VARIABLE	RANGE
1. Angular measuring tools	May include: 1.1 Bevel protractor 1.2 Gage blocks 1.3 Sine bar
2. Measurements	May include: 2.1 Angle 2.2 Taper

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Selected and used angular measuring instruments 1.2 Maintained/adjusted instruments 1.3 Cleaned and stored measuring instruments
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities appropriate to the activity 2.2 Specimen component or part to the proposed activity
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Demonstration 3.3 Written or oral short answer questions 3.4 Portfolio
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **MEASURE WORKPIECE USING GAGES AND SURFACE TEXTURE COMPARATOR**

UNIT CODE : **MEE722210**

UNIT DESCRIPTOR : This unit covers the competencies required to measure workpieces using fixed and adjustable gages.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use fixed and adjustable gages	1.1 Appropriate ***gages*** are selected and used to undertake the required comparison or measurement using standard operating procedures. 1.2 Consistent and accurate ***measurements*** obtained conforms to drawing specification 1.3 Measuring technique used is correct and appropriate to the device used.	1.1 Types and application of fixed and adjustable gages 1.2 Gage limits and accuracy 1.3 Techniques for measuring components	1.1 Selecting appropriate gages and measuring instrument 1.2 Obtaining accurate measurements 1.3 Determining measuring techniques
2. Perform surface texture measurements	2.1 Surface texture are measured according worksite procedures. 2.2 Measurements taken are within the level of accuracy required.	2.1 Types and application of fixed and adjustable gages 2.2 Gage limits and accuracy 2.3 Techniques for measuring components	2.1 Identifying die material requirements 2.2 Determining production volume 2.3 Identifying design parameters
3. Clean and store measuring tools	3.1 Care and storage of devices undertaken to manufacturer's specifications or standard operating procedures.	3.1 Care and storage procedure of measuring tools	3.1 Cleaning and storing measuring tools

RANGE OF VARIABLES

VARIABLE	RANGE
1. Gages	May include: 1.1 Gage blocks 1.2 Telescoping gages 1.3 Center gages 1.4 Thread gages 1.5 Dial bore gages 1.6 Height gages 1.7 Radius gages 1.8 Go-no-go gages 1.9 Depth gages
2. Measurements	May include: 2.1 Linear dimensions 2.2 Diameters 2.3 Depths 2.4 Fits 2.5 Tapers 2.6 Threads 2.7 Radius 2.8 Squareness 2.9 Surface texture

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Selected and used fixed and adjustable gages 1.2 Performed surface texture measurements 1.3 Cleaned and stored measuring instruments
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities appropriate to the activity 2.2 Specimen component or part to the proposed activity 2.3 Drawing
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Demonstration 3.3 Written or oral short answer questions 3.4 Portfolio
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **PERFORM PREVENTIVE AND CORRECTIVE MAINTENANCE**

UNIT CODE : **MEE722211**

UNIT DESCRIPTOR : This unit covers the knowledge and skills required in performing preventive and corrective maintenance such as inspection and repair of hand tools, cleaning and lubrication of machine parts and changing drive pulley and belts.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform inspection of machine	1.1 Machine ***inspected*** according to worksite procedures. 1.2 Status/Report recorded on proforma or reported orally according to worksite procedure.	1.1 Proper cleaning and oiling 1.2 Parts and function of machine tools 1.3 Cutting oil, coolant or compound 1.4 Pulleys and belts 1.5 Location of main switches of the machine 1.6 Checklist of safe working conditions	1.1 Inspecting machine 1.2 Recording status report
2. Perform surface texture measurements	2.1 ***Machines*** lubricated as per manufacturer's recommendation using ***tools and materials*** 2.2 Fluids and lubricants replaced and/or topped up according to prescribed schedule.	2.1 Proper cleaning and oiling 2.2 Kinds of oil 2.3 Parts and function of machine tools 2.4 Cutting oil, coolant or compound 2.5 Location of main switches of the machine	2.1 Lubricating machine 2.2 Replacing fluid and lubricants
3. Perform minor machine repair and adjustments	3.1 Minor machine repairs performed according to manufacturer's instruction or worksite procedures. 3.2 Machine moving parts adjusted to manufacturer's specifications.	3.1 Proper cleaning and oiling 3.2 Kinds of oil 3.3 Parts and function of machine tools 3.4 Cutting oil, coolant or compound 3.5 Pulleys and belts 3.6 Location of main	3.1 Performing minor machine repair 3.2 Adjusting machine moving parts

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.7 switches of the machine 3.8 Handling and storage of tools Checklist of safe working conditions	
4. Maintain hand tools	4.1 Tool cutting ground to recommended specifications 4.2 Hand tools lubricated and stored according to prescribed procedure	4.1 Proper cleaning and oiling 4.2 Kinds of oil 4.3 Handling and storage of tools 4.4 Procedures in cleaning and disposal of waste materials	4.1 Recommending cutting tool 4.2 Lubricating hand tools

RANGE OF VARIABLES

VARIABLE	RANGE
1. Inspected	Inspected machine parts include: 1.1 V-belt 1.2 Bearing 1.3 Gears 1.4 Clutch 1.5 Drive pulley
2. Machines	May include: 2.1 Lathe machine 2.2 Milling machine 2.3 Grinding machine
3. Tools and materials	May include: 3.1 Lubricants 3.2 Oil can 3.3 Grease gun 3.4 Oil 3.5 Coolant or compound

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Performed inspection of machine 1.2 Performed cleaning and lubricating of machine 1.3 Performed minor machine repairs and adjustments
2. Resource Implications	**The following resources should 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 may be assessed through:** 3.1 Direct observation of activities 3.2 Oral or written questioning
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

CORE COMPETENCIES

UNIT OF COMPETENCY : **SET-UP ELECTRIC DISCHARGE MACHINE (EDM), ELECTRODE AND WORKPIECE**

UNIT CODE : **MEE821314**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to set-up electric discharge machine (sinking), electrode and workpiece.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare EDM-Sinking	1.1 ***EDM sinking type*** and capacity is selected according to job requirement 1.2 Oil, grease and ***dielectric fluid*** is checked according to manufacturer's specification. 1.3 Electrical settings and parameters are set according to manufacturer's specification. 1.4 ***Work holding and clamping devices*** are mounted according to standard operating procedures. 1.5 Operate dielectric fluid pump and set working pressure according to manufacturer's specification 1.6 Safety procedures are applied following OSHS	1.1 Procedures in setting up EDM 1.2 Types and capacity of EDM 1.3 Types of oil, grease and dielectric fluids 1.4 Setting and checking of parameters according to reference table 1.5 Types of work holding and clamping device 1.6 OSH Rule No. 1080 – Personal Protective Equipment & Devices 1.7 OSH Rule No. 1150 – Materials Handling & Storage 1.8 Air pollution 1.9 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	1.1 Communication skills 1.2 Selecting EDM 1.3 Setting up of EDM parameters 1.4 Selecting work holding devices 1.5 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Prepare electrode	2.1 ***Electrode*** is selected according to job requirement 2.2 Electrode is mounted on EDM platen and holder according to manufacturer's specification. 2.3 Electrode is aligned perpendicularly to the magnetic table according to standard operating procedures. 2.4 Safety procedures are applied following OSHS	2.1 Types of electrode 2.2 Spark gap allowance of electrode 2.3 Electrode fabrication 2.4 Metrology 2.5 Procedure in mounting electrode 2.6 Types of electrode holding and clamping device 2.7 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	2.1 Selecting electrode 2.2 Mounting of electrode 2.3 Applying safety procedures
3. Prepare workpiece	3.1 Clamping device is selected based on ***workpiece*** material 3.2 Workpiece is mounted on clamping device according to standard industry procedures 3.3 Workpiece is centered to required level of accuracy using ***tools and instruments*** in accordance with workplace procedures. *3.4 Zero reference point of X, Y. Z axes is set according to standard operating procedures.* 3.5 Front wall of tank is clamped to enclose and seal working tank according to industry standard procedures. 3.6 Safety procedures are applied following OSHS .	3.1 Procedures in mounting workpiece 3.2 Types of workpiece 3.3 Types of workpiece holding and clamping device 3.4 Procedures in enclosing tank 3.5 OSH Rule No. 1080 – Personal Protective Equipment & Devices 3.6 OSH Rule No. 1150 – Materials Handling & Storage 3.7 Air pollution 3.8 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	3.1 Mounting of workpiece 3.2 Centering of workpiece 3.3 Selecting clamping device 3.4 Setting of zero reference point 3.5 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. EDM sinking type	May include: According to capacity 1.1 30 amperes capacity 1.2 50 amperes capacity According to circuit 1.3 Pulse type 1.4 Relaxation type
2. Dielectric fluid	May include: 2.1 Petroleum base 2.2 Full synthetic 2.3 Vegetable based
3. Work holding and clamping devices	May include: 3.1 Magnetic table 3.2 Precision vise 3.3 Punch former 3.4 Sine magnetic table 3.5 Angular/ parallel bars 3.6 3R system or equivalent 3.7 Drill chuck
4. Electrode	May include: 4.1 Copper 4.2 Copper tungsten alloys 4.3 Silver tungsten alloys / Silver tungsten Carbide alloys 4.4 Graphite 4.5 Steel 4.6 Brass 4.7 Aluminum alloys 4.8 Zinc base die casting alloys 4.9 Tellerium copper alloys
5. Workpiece	May include: 5.1 Aluminum 5.2 Carbide 5.3 Steel 5.4 Copper 5.5 Brass 5.6 Stainless steel

6. Tools and Instruments	May include: 6.1 Combination wrench 6.2 Allen wrench 6.3 Adjustable wrench 6.4 Dial gage indicator 6.5 Vernier caliper 6.6 Micrometer 6.7 Depth gage 6.8 Pin gage 6.9 Gauge block

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Set-up EDM-Sinking 1.2 Set-up electrode 1.3 Set-up workpiece 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation
2. Resource implications	**The following resources should be provided:** 2.1 Tools, equipment and facilities 2.2 Consumable materials
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation 3.2 Demonstration with Oral Questioning
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **PERFORM ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION**

UNIT CODE : **MEE821315**

UNIT DESCRIPTOR : This unit involves the knowledge, skills and attitudes required in performing electric discharge machine (sinking) operations.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Operate EDM - Sinking	1.1 Dry run is conducted and adjustments are made if required according to EDM operating manual Workpiece is pressure flushed /submerged with dielectric fluid according to EDM operating manual 1.2 EDM is operated to meet dimensions, tolerances, limits ,fits and ***surface texture*** according to job requirements 1.3 ***EDM accessories*** are used according to job requirements 1.4 Worn out electrode is replaced according to job requirements 1.5 Safety procedures are applied following OSHS	1.1 Procedures in operating EDM 1.2 Kinds of EDM accessories 1.3 Procedures in setting parameters 1.4 Kinds of tolerances, limits, fits and surface Texture 1.5 Procedures in replacing worn out electrode 1.6 Metrology 1.7 OSH Rule No. 1080 – Personal Protective Equipment & Devices 1.8 OSH Rule No. 1150 – Materials Handling & Storage 1.9 Air pollution 1.10 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	1.1 Operating EDM 1.2 Using EDM accessories 1.3 Replacing worn out electrode 1.4 Identifying surface finish 1.5 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Monitor performance of machine and electrode	2.1 Machine and electrode performance is monitored and adjusted with the aid of **power *control unit*** based on the accepted industry standards 2.2 Dielectric fluid level is maintained according to machine operating manual 2.3 Flushing pressure is progressively increased based on job requirements 2.4 Depth of cut is thoroughly maintained according to standard work procedures 2.5 Safety procedures are applied following OSHS	2.1 Procedures in monitoring and adjusting EDM parameters 2.2 Procedures in maintaining level of dielectric fluid 2.3 Procedures in monitoring flushing pressure 2.4 Procedures in maintaining depth of cut 2.5 Procedure of comparing surface finish 2.6 OSH Rule No. 1080 – Personal Protective Equipment & Devices 2.7 OSH Rule No. 1150 – Materials Handling & Storage 2.8 Air pollution 2.9 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	2.1 Monitoring EDM performance 2.2 Maintaining dielectric fluid level 2.3 Monitoring flushing pressure 2.4 Maintaining depth of cut 2.5 Comparing surface finish to surface comparator 2.6 Applying safety procedures
3. Visual inspection of workpiece and electrode	3.1 Working table is emptied of ***dielectric fluid*** according to operating manual 3.2 Surface of workpiece is cleaned according to job requirement 3.3 Surface texture of workpiece is visually inspected while on its holder according to job requirements 3.4 Electrode is inspected for wear according to job requirements 3.5 Safety procedures are applied following OSHS	3.1 Procedures in emptying working table from dielectric fluid 3.2 Procedures in cleaning workpiece 3.3 Procedures in visual inspection of workpiece surface finish 3.4 OSH Rule No. 1080 – Personal Protective Equipment & Devices 3.5 OSH Rule No. 1150 – Materials Handling & Storage 3.6 Air pollution 3.7 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	3.1 Emptying of dielectric fluid 3.2 .Cleaning of workpiece 3.3 Visual inspection of workpiece and electrode 3.4 Comparing surface finish to surface comparator 3.5 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Surface texture	May include: Values 1.1. nr.12 = 0.40 Ra(um) 1.2. nr.15 = 0.56 Ra(um) 1.3. nr.18 = 0.80 Ra(um) 1.4 nr.21= 1.12 Ra(um) 1.5.nr.24 = 1.60 Ra(um) 1.6.nr.27 = 2.24 Ra(um) 1.7. nr.30 = 3.15 Ra(um) 1.8. nr.33 = 4.50 Ra(um) 1.9. nr.36 = 6.30 Ra(um) 1.10. nr.39 = 9.00 Ra(um) 1.11. nr.42 = 12.5 Ra(um) 1.12. nr.45 = 18.0 Ra(um)
2. EDM accessories	May include: 2.1 Electrode platen and holder 2.2 Flush nozzles 2.3 Dither / Audio sensors 2.4 Sensor with fire extinguisher
3.Power Control unit	May include: Knob, toggle, switches and buttons for: 3.1 Gap 3.2 Feed rate 3.3 Vibration Control System (VCS) or Arc Sensor 3.4 Pulse 3.5 Frequency 3.6 Suppress Control 3.7 Timer 3.8 Dielectric fluid height meter 3.9 Dielectric fluid pressure gauge
4. Dielectric fluid	May include: 4.1 Petroleum based 4.2 Full synthetic 4.3 Vegetable based

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Operated electric discharge machine-sinking 1.2 Monitored performance of machine and electrode 1.3 Visually inspected workpiece and electrode 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation
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 Written Examination 3.2 Direct observation 3.3 Demonstration with Oral Questioning
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **PERFORM POST-ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION**

UNIT CODE : **MEE821316**

UNIT DESCRIPTOR : This unit involves the knowledge, skills and attitudes to perform post-electric discharge machine-sinking operations.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct post-EDM-Sinking operation	1.1 EDM flushing is shut off or gate valve is opened in accordance to operation manual 1.2 EDM tank front wall is opened according to the operating manual 1.3 Workpiece is removed from ***work holding and clamping devices*** according to job requirement 1.4 ***Workpiece*** is cleaned and dried according to job requirement 1.5 Safety procedures are applied following OSHS	1.1 Procedures in opening of tank front wall 1.2 Procedures in removing workpiece 1.3 Procedures in cleaning workpiece 1.4 OSH Rule No. 1080 – Personal Protective Equipment & Devices 1.5 OSH Rule No. 1150 – Materials Handling & Storage 1.6 Air pollution 1.7 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	1.1 Removing workpiece 1.2 Cleaning workpiece 1.3 Applying safety procedures
2. Final check of workpiece	2.1 Workpiece is checked and measured using ***measuring tools*** following standard operating procedures 2.2 Inspected workpiece is applied with anti-corrosion agents 2.3 Inspected workpiece and accomplishment report are submitted to immediate supervisor following workplace	2.1 Procedures in checking and measuring workpiece 2.2 Application of anti-corrosion agents 2.3 Submission of inspected workpiece and accomplishment report 2.4 OSH Rule No.	2.1 Checking and measuring workpiece 2.2 Applying anti-corrosion agents 2.3 Submitting workpiece and accomplish ment report 2.4 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	procedures 2.4 Safety procedures are applied following OSHS	1080 – Personal Protective Equipment & Devices 2.5 OSH Rule No. 1150 – Materials Handling & Storage 2.6 Air pollution 2.7 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	
3 EDM-Sinking shutdown and housekeeping	3.1 Electrical, pneumatic and hydraulic switches are turned off according to manufacturers' operating manual 3.2 Tools are maintained and stored based on established procedures 3.3 Defective tools are tagged and reported according to workplace procedures 3.4 Good housekeeping is performed following 5S 3.5 Wastes are disposed according to waste management procedures and environmental regulations 3.6 Safety procedures are applied following OSHS	3.1 Procedure of shutting down EDM 3.2 Maintaining and storing of tools 3.3 Tagging of defective tools 3.4 5S and good housekeeping 3.5 Waste management 3.6 Environmental laws related to post EDM (sinking) activities 3.7 OSH Rule No. 1080 – Personal Protective Equipment & Devices 3.8 OSH Rule No. 1150 – Materials Handling & Storage 3.9 Air pollution 3.10 Quality control OSH Rule No. 1080 – Personal Protective Equipment & Devices	3.1 Shutting down EDM 3.2 Maintaining and storing tools 3.3 Performing good housekeeping 3.4 Managing wastes 3.5 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work holding and clamping devices	May include: 1.1 Magnetic table 1.2 Precision vise 1.3 Punch former 1.4 Sine magnetic table 1.5 Angular/ parallel bars 1.6 3R system or equivalent 1.7 Drill chuck
2.Workpiece	May include: 2.1 Aluminum 2.2 Carbide 2.3 Steel 2.4 Copper 2.5 Brass 2.6 Stainless Steel
3. Measuring tools	May include: 3.1 Dial indicator 3.2 Vernier caliper 3.3 Micrometer 3.4 Surface gauge comparator 3.5 Height gage 3.6 Gauge Block 3.7 Pin gauge 3.8 Depth gauge

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conducted post-electric discharge machine-sinking operation 1.2 Conducted final check of workpiece 1.3 Performed machine shutdown and housekeeping 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation
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 Direct observation 3.2 Demonstration with Oral Questioning
4. Context for assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

SECTION 3 TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **ELECTRIC DISCHARGE MACHINE (EDM)-SINKING OPERATION NC II.**

They include information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification.

3.1 CURRICULUM DESIGN

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

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

Course Title: EDM OPERATION (SINKING) NC II

Nominal Training Duration:	**37**	**Hours**	**Basic Competencies**
	104	**Hours**	**Common Competencies**
	160	**Hours**	**Core Competencies**
Total	**301**	**Hours**	

Course Description:

This course is designed to enhance the knowledge, skill and attitudes of ELECTRIC DISCHARGE MACHINE(EDM)-SINKING OPERATION NC II in accordance with industry standards. This covers competencies that a person must achieve in performing set-up of EDM, electrode and workpiece, perform operation procedures, and post-EDM operations.

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

BASIC COMPETENCIES
(37 HOURS)

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

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

	1.2. Perform duties following workplace instructions	• Read:
		  ○ Written notices and instructions
		  ○ Workplace interactions and procedures
		• Read instructions on work related forms/documents
		• Perform workplace duties scenario following workplace instructions
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written examination
				• Observation
					2 Hours

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

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

2. Work in a team environment	2.1 Describe team role and scope	• Discussion on team roles and scope
		• Participate in the discussion:
		  ○ Definition of Team
		  ○ Difference between team and group
		  ○ Objectives and goals of team
		• Locate needed information from the different sources of information
			• Lecture/ Discussion
			• Group Work
			• Individual Work
			• Role Play
				• Role Play
				• Case Study
				• Written Test
					1 Hour

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

	2.2 Identify one's role and responsibility within team	• Role play:
		  ○ individual role and responsibility
		• Role Play
		  ○ Understanding Individual differences
		• Discussion on gender sensitivity
			• Role Play
			• Lecture/ Discussion
				• Role Play
				• Written Test
					1 Hour

	2.3 Work as a team member	• Participate in group planning activities • Role play: Communication protocols • Participate in the discussion of standard work procedures and practices	• Group work • Role Play • Lecture/ Discussion	• Role Play • Written Test	1 Hour
3. Solve/address general routine problems	3.1 Identify routine problems	• Review of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Analyze routine/procedural problems	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
	3.2 Look for solutions to routine problems	• Review of the current industry hardware and software products and services • Identify correctly the industry maintenance, service and helpdesk practices, processes and procedures • Make use of the industry standard diagnostic tools • Share best practices in determining basic malfunctions and resolutions to general problems in the workplace • Formulate possible solutions to problems and document procedures for reporting	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.3 Recommend solutions to problems	• Discuss standard operating procedures and documentation processes	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
4. Develop Career and Life Decisions	4.1 Manage one's emotion	• Demonstrate self-management strategies that assist in regulating behavior and achieving personal and learning goals • Explain enablers and barriers in achieving personal and career goals • Identify techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc. • Manage properly one's emotions and recognize situations that cannot be changed and accept them and remain professional • Recall instances that demonstrate self-discipline, working independently and showing initiative to achieve personal and career goals • Share experiences that show confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace	• Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour
	4.2 Develop reflective practice	• Enumerate strategies to improve one's attitude in the workplace • Explain Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation, Analysis, Conclusion, and Action plan) • Use basic SWOT analysis as self-assessment strategy • Develop reflective practice through	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • 5 Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		realization of limitations, likes/ dislikes; through showing of self-confidence • Demonstrate self-acceptance and being able to accept challenges			
	4.3 Boost self-confidence and develop self-regulation	• Describe the components of self-regulation based on Self-Regulation Theory (SRT) • Explain personality development concepts • Cite self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts) • Perform effective communication skills – reading, writing, conversing skills • Show affective skills – flexibility, adaptability, etc. • Determine strengths and weaknesses	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Case problems involving workplace diversity issues	1 Hour
5. Contribute to workplace innovation	5.1 Identify opportunities to do things better	• Identify different roles of individuals in contributing to doing things better in the workplace • Appreciate positive impacts and challenges in innovation • Show mastery of the different types of changes and levels of participation in the workplace • Discuss 7 habits of highly effective people	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and	1 Hour

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

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Communicate ideas through small group discussions and meetings • Demonstrate basic skills in data analysis		evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	
6. Present relevant information	6.1 Gather data/ information	• Lecture and discussion on: o Organisational protocols o Confidentiality and accuracy o Business mathematics and statistics o Legislation, policy and procedures relating to the conduct of evaluations • Reviewing data/ information	• Group discussion • Lecture • Demonstration • Role Play	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.2 Assess gathered data/ information	• Lecture and discussion on: o Data analysis techniques/ procedures o Organisational values, ethics and codes of conduct o Trends and anomalies • Computing business mathematics and statistics • Application of data analysis techniques	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours
	6.3 Record and present information	• Lecture and discussion on: o Reporting requirements to a range of audiences o Recommendations for possible improvements • Analysis and comparison of interim and final reports' outcomes • Reporting of data findings	• Group discussion • Lecture • Demonstration • Role Play • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	3 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
7. Practice Occupational Safety And Health Policies And Procedures	7.1 Identify OSH compliance requirements	• Discussion regarding: - Hierarchy of Controls - Hazard Prevention and Controls - Work Standards and Procedures - Personal Protective Equipment	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	7.2 Prepare OSH requirements for compliance	• Identification of required safety materials, tools and equipment • Handling of safety control resources	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour
	7.3 Perform tasks in accordance with relevant OSH policies and procedures	• Discussion of General OSH Standards and Principles • Performing industry related work activities in accordance with OSH Standards	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / • Questioning	2 Hours
8. Exercise Efficient and Effective Sustainable Practices in the Workplace	8.1 Identify the efficiency and effectiveness of resource utilization	- Discussion on the process how Environmental Policies coherence is achieved • Discussion on Necessary Skills in response to changing environmental policies needs - Waste Skills - Energy Skills - Water Skills - Building Skills - Transport Skills - Material Skills	• Lecture • Group Discussion • Simulation • Demonstration	• Written Exam • Demonstration • Observation • Interviews / • Questioning	1 Hour

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

COMMON COMPETENCIES
(104 HOURS)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Apply safety practices	1.1 Identify hazards	• Identified hazards in accordance with safety standards • Identified safety signs and symbols in the workplace	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	8 Hrs
	1.2 Use protective clothing and devices	• Determine appropriate protective clothing and devices in accordance with safety standards. • Select appropriate protective clothing and devices in accordance with safety standards	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	
	1.3 Perform safe handling of tools, equipment and materials	• explain the safety procedure of tools and equipment • Describe safety handling of tools, equipment and materials.	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	
	1.4 Perform first aid	• Determine possible injuries in the work place. • Describe recommended first aid treatment according to injury	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	
	1.5 Use fire extinguisher	• Select fire extinguisher according to type of fire.	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	
2. Interpret working drawings and sketches	2.1 Interpret technical drawing	• Determine components, assemblies according to drawing. • Explain critical dimension, tolerances, and instruction	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	16 Hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		according to drawing.			
	2.2 Prepare freehand sketch of parts	• Describe the sketch drawing of a part • Determine critical dimension, datum points on the sketch • Explain the instruction in the sketch	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	2.3 Interpret details from freehand sketch	• Determine components, assemblies on the sketch • Determine critical dimension, datum points on the sketch • Determine material requirements on the sketch • Explain standard symbols in the sketch	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
3. Select/cut workshop materials	3.1 Determine requirement	• Explain plans and drawing interpretation according to specification. • Know and obtain the sequence of operation according to specification	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	3.2 Select and measure materials	• Determine materials according to requirements of operation • Determine measuring tools to be used according to specification	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	3.3 Cut materials	• Know how to cut material according to specification • Explain the cutting tool and equipment used according to plans and drawings	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
4. Perform shop computations (Basic)	4.1 Perform four fundamental operations	• Explain simple calculation performed using four fundamentals operations	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	22 Hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	4.2 Perform basic calculations involving fractions and decimals	• Explain simple calculation performed involving fraction and decimal using four fundamentals operations • Know how to convert decimal to fraction and vice versa	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	4.3 Perform basic calculations involving percentages	• Know and obtain percentages from information using simple calculation	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	4.4 Perform basic calculation involving ration and proportion	• Describe simple calculation involving ratios and proportion using whole numbers, fractions and decimal fraction	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	4.5 Perform calculations on algebraic expressions	• Explain simple calculations on algebraic expressions using the four fundamental operations	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
5. Measure workpiece (basic)	5.1 Select and use measuring tools	• Determine Measuring tools to be used according to the level of accuracy required • Determine appropriate measuring technique	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	5.2 Clean and store measuring tools	• Explain Care and storage of devices according to manufacturer's specifications	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
6. Perform routine housekeeping	6.1 Organize work area	• Determine workshop policy to work area	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	6.2 Clean work area	• Describe work shop policies and procedure in specific work area • Describe signage's displayed in the work area • Know how to clean and used tools and equipment according to manufacturer's specification	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
7. Perform shop computations (Intermediate)	7.1 Perform calculations involving triangles	• Know how to calculate problems involving right triangle using trigonometric function. • Know how to calculate problems involving non-right triangle using sine and cosine rules. •	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	10 Hrs
	7.2 Calculate taper	• Know how to calculate taper using appropriate formula	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
8. Measure workpiece using angular measuring instruments	8.1 Select and use angular measuring tools	• Determine angular measuring tools according to level of accuracy • Determine measuring techniques to the device.	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	8.2 Maintain angular measuring tools	• Know how to adjust and maintained the measuring tools to the required accuracy according to workplace procedures	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	8.3 Clean and store measuring tools	• Explain Care and storage according to standard operating procedures	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
9. Measure workpiece using gages and surface texture comparator	9.1 Select and use fixed and adjustable gages	• Determine Appropriate gages required • Know and obtained accurate measurement according to drawing specification • Determine measuring technique of the device	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	9.2 Perform surface texture measurements	• Determine surface texture according to worksite procedure • Obtain measurements according to level of accuracy	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	9.3 Clean and store measuring tools	• Explain Care and storage according to standard operating procedures	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
10. Perform preventive and corrective maintenance	10.1 Perform inspection of machine	• Know how to inspect machines according to worksite procedure • Prepare statue reports according to worksite procedure	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	8 Hrs
	10.2 Perform cleaning and lubricating of machine	• Know how to lubricate machines using appropriate tools • Know when to lubricate machines according prescribe schedule	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	10.3 Perform minor machine repair and adjustments	• Know how to perform minor machine repair according to worksite procedure • Know how to adjust machine moving parts according to manufacturer's specification	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	10.4 Maintain hand tools	• Know how to grind cutting tools according to recommended specification	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	10.5 Shut down computer	• Know how to properly shut down computer and peripheral devices	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	

CORE COMPETENCIES
(160 HOURS)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Set-up EDM -Sinking, electrode and workpiece	1.1 Prepare EDM-Sinking	• Select EDM type and capacity • Identify and explain types of oil, grease and dielectric fluids • Explain electrical settings and parameters • Identify work holding devices • Operate dielectric fluid pump and set working pressure	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	24 Hours
	1.2 Prepare electrode	• Identify and explain types of electrode • Select and explain mounting of electrode • Perform aligning of electrode	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	8 Hours
	1.3 Prepare workpiece	• Identify and explain types of clamping device • Explain and perform mounting and centering of workpiece • Explain and perform setting of zero reference point • Enclose working tank	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	8 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	• Assessment Methods	Nominal Duration
2. Perform EDM - sinking operation	2.1 Operate EDM - Sinking	• Perform and explain submerging of workpiece • Conduct dry run and explain adjustments made • Operate EDM(sinking) and explain tolerances, limits, fits and surface texture of workpiece required • Explain importance of replacing worn out electrode • Explain types of EDM accessories	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	80 hours
	2.2 Monitor performance of machine and electrode	• Enumerate power control unit knobs and switches • Explain importance of maintaining level of dielectric fluid • Explain importance of progressively increasing flushing pressure • Explain importance of maintaining depth of cut	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	
	2.3 Visual inspection of of workpiece and electrode	• Perform the draining of dielectric fluid of working table • Explain cleanliness of workpiece • Perform visual inspection of workpiece and electrode	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	• Assessment Methods	Nominal Duration
3. Perform post-EDM-sinking operation	3.1 Conduct post-EDM – sinking operation	• Perform procedures of opening tank • Perform procedures of workpiece removal • Perform and explain cleaning and drying of workpiece thoroughly	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	40 hours
	3.2 Final check of workpiece	• Explain kinds of precision measuring tools • Perform and explain procedures of using measuring tools • Explain importance of anti-corrosion agents application • Explain process of accomplishing report • Explain process of submitting workpiece and accomplishment report	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	
	3.1 EDM shutdown and housekeeping	• Perform EDM shutdown • Explain proper maintenance and storing of tools • Explain importance of tagging and reporting of defective tools • Explain and perform 5s • Explain and perform proper disposal of waste	• Lecture • Practical / Demonstration	• Written examination • Demonstration with oral questioning	

3.2 TRAINING DELIVERY

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

    a. Course design is based on competency standards set by the industry or recognized industry sector; (Learning system is driven by competencies written to industry standards)

    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;

    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;

    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.

    f. Training program allows for recognition of prior learning (RPL) or current competencies;

    g. Training completion is based on satisfactory performance of all specified competencies.

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

    ### 2.1 Institution-Based:

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

    - Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.
    - The classroom-based or in-center instruction uses of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

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

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

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

3.3 TRAINEE ENTRY REQUIREMENTS

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

- Holder of any Certificate of Competency in Machining NC I or 1-year industry experience in machining
- Must have completed the 10-year basic education or an Alternative Learning System (ALS) Certificate of Completion with grade 10 equivalent holder
- Can communicate orally or in writing
- Can perform basic mathematical computation

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

List of tools, equipment and materials for the training of a maximum of 20 trainees for Electric Discharge Machine (EDM)- Sinking Operation NC II are as follows:

EQUIPMENT			
QTY	**Description**	**QTY**	**Description**
2 units	Electric Discharge Machine with complete standard accessories, 30 Amp., pulse type	1 unit	Overhead/LCD Projector
1 unit	Power Hack saw, 230 watts/ 220 volts, single phase	1 set	Table with drawer and chair
2 units	Exhaust fan, 12 x 12 inches, 220 volts		

SUPPLIES AND MATERIALS					
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
1 pc. 20 pcs. 1 pc. 1 pc. 1 pc. 1 pc.	Graphite Electrode 100 x50 x50mm Copper Electrode 100 x50 x50mm Steel Electrode 100 x50 x50mm Carbide Electrode 100 x50 x50mm Aluminum Electrode 100 x50 x50mm Tungsten Electrode 100 x50 x50mm	20 pcs. 5 pcs. 5 pcs.	Mild Steel (MS) Plate 100mm x 100mm x 6mm Aluminum Plate 100mm x 100mm x 6mm Stainless Steel plate 100mm x 100 x 6mm	400 liters	Petroleum based (dielectric fluid)
1 set	First aid kit	5 pcs.	Paint brush 50mm width	5 kgs.	Rags

TRAINING MATERIALS			
QTY	**Description**	**QTY**	**Description**
	Manual		Brochures
	Reference books		

TOOLS					
QTY	**Description**	**QTY**	**Description**	**QTY**	**DESCRIPTION**
1 set	Combination wrench, Size 6mm to 21mm	1 set	Needle file 6”	1 set	Spanner (for 3R clamping devise)
		1 pc.	Rubber mallet 250g		
1 set	Allen wrench, Size 4mm to 12mm	1 pc.	Adjustable wrench, 150mm		
5 pcs.	Flat File, 2nd cut, 150 mm	1 pc.	Ball peen hammer, 500 grams		

MEASURING INSTRUMENTS					
QTY	**Description**				
2 pcs.	Vernier caliper (Digital) 150mm	2 pcs.	Micrometer (Digital), 0- 25 mm	1 pc.	Dial indicator with magnetic stand, lever-type, 0.01 least count
1 pc.	Precision Bevel protractor 200mm	1 set	Gauge block, Steel, 0.0005 mm – 100mm	1 pc.	Vernier height gage with dial indicator , 300mm
2 pcs.	Depth gage micrometer, 0- 25 mm	1 set	Steel Pin block, 0.1 mm – 10 mm	1 pc.	Surface gauge comparator, 0 .40-18.0 Ra(um)
1 pc.	Height Gage, 300mm	1 pc.	Granite surface plate 500mm x 500mm x 100mm		

3.5 TRAINING FACILITIES

The EDM workshop must be of concrete structure for 20 trainees. The space requirements for the teaching/learning and circulation areas are as follows:

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
• Building (Permanent)	10.0m X 7.0m	70 sqm	70 sqm
• EDM (Sinking) workshop	4 .0m X 3.0m	12 sqm	
• Quality Control room	3 .0m X 2.5m	7.5 sqm	
• Learning Resource Center	5 .0m X 5.0m	25 sqm	
• Tool Room and Storage	4 .0m X 3.0m	12 sqm	
• Dressing / Washroom	3 .0m X 2.5m	7.5 sqm	

NOTE : Training center may enter into a memorandum of understanding (MOU) with an institution/company with appropriate equipment and facilities.

3.6 TRAINERS' QUALIFICATION

- Holder of National TVET Trainer Certificate Level I (NTTC Level I) in Electric Discharge Machine (EDM)-Sinking Operation NC II
- Must have at least 3 years job/industry experience in Machining

3.7 INSTITUTIONAL ASSESSMENT

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

SECTION 4 ASSESSSMENT AND CERTIFICATION ARRANGEMENT

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

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

4.4 NATIONAL ASSESSMENTAND CERTIFICATION ARRANGEMENTS

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

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

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

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

a. entry requirements for candidates
b. evidence gathering methods
c. qualification requirements of competency assessors
d. specific assessment and certification arrangements as identified by industry

4.1.5 The following are qualified to apply for **assessment and certification**:

a. Graduating students/trainees of NTR programs or graduates of formal, non-formal and informal institutions including enterprise-based training programs related to Electric Discharge Machine (EDM)-Sinking Operation NC II

b. Industry workers (employed, self-employed or owners/proprietors).

4.2 COMPETENCY ASSESSMENT REQUISITE

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

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

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

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

ANNEX A

COMPETENCY MAP
METALS AND ENGINEERING SECTOR
MOLD MAKING NC III

BASIC COMPETENCIES	Lead workplace communication	Lead small teams	Apply critical thinking and problem-solving techniques in the workplace	Work in a diverse environment	Propose methods of applying learning and innovation in the organization	Use information systematically	Evaluate occupational safety and health work practices	Evaluate environmental work practices	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)
	Receive and respond to workplace communication	Work with others	Solve/address routine problems	Enhance self-management skills	Support Innovation	Access and maintain information	Follow occupational safety and health policies and procedures	Apply environmental work standards	Adopt entrepreneurial mindset in the workplace
	Participate in workplace communication	**Work in Team Environment**	**Solve/address general workplace problems**	**Develop career and life decisions**	**Contribute to workplace innovation**	**Present relevant information**	**Practice occupational safety and health policies and procedures**	**Exercise efficient and effective sustainable practices in the workplace**	**Practice entrepreneurial skills in the workplace**

Utilize specialize specialized communication skill	Develop and lead teams	Perform higher order thinking processes and apply techniques in the workplace	Contribute to the practice of social justice in the workplace	Manage innovative work instructions	Manage evaluate usage of information	Lead in improvement of Occupational Safety and Health Program, Policies and Procedures	Lead towards improvement of environmental work programs, policies and procedures	Sustain entrepreneurial skills
Manage and sustain effective communication strategies	Manage and sustain high performing teams	Evaluate higher order thinking skills and adjust problem solving techniques	Advocate strategic thinking for global citizenship	Incorporate innovation into work procedures	Develop systems in managing, and maintaining information	Manage Implementation of OSH programs in the workplace	Manage implementation of environmental program in the workplace	Develop and sustain a high-performing enterprise

COMMON COMPETENCIES

Apply safety practices	**Interpret working drawings and sketches**	**Select/ cut workshop materials**	**Perform shop computations (Basic)**
Measure workpiece (Basic)	**Perform routine housekeeping**	**Perform shop computations (Intermediate)**	**Measure workpiece using angular measuring instruments**
Perform shop computations (Advanced)	**Measure workpiece using gages and surface texture comparator**	**Perform preventive and corrective maintenance**	Operate a personal computer
Select and cut workshop materials	Prepare cost estimates	Apply Safety Practices	Interpret Drawings and Sketches
Perform Industry Calculations	Contribute to Quality System	Use Hand Tools	Prepare Weld Materials
Setup Welding Equipment	Fit up Weld Materials	Repair Welds	Perform shop computations (Intermediate)
Measure workpiece (Intermediate)	Perform preventive and corrective Maintenance		

CORE COMPETENCIES

Create drawing using CAD software	Apply CAD/CAM program	Write basic CNC lathe machine program	Set-up CNC lathe machine, workpiece and cutting tools
Perform basic CNC lathe machine operations	Write advanced CNC lathe machine program	Set-up multiple-axis CNC lathe machine, workpiece and cutting tools	Perform advanced CNC lathe machine operations
Write basic CNC milling machine program	Set-up CNC milling machine, workpiece and cutting tools	Perform basic CNC milling machine operations	Write advanced CNC milling machine program
Set-up multiple-axis CNC milling machine, workpiece and cutting tools	Perform advanced CNC milling machine operations	Weld Carbon Steel Plates Using FCAW	Weld Carbon Steel Pipes Using FCAW
Weld Alloy Steel Plates Using FCAW	Weld Alloy Steel Pipes Using FCAW	Perform Gas Welding in Carbon Steel Plates and Tubes	Perform Gas Welding in Alloy Steel Plates and Tubes
Weld Carbon Steel Plates Using GMAW	Weld Carbon Steel Pipes Using GMAW	Weld Alloy Steel Plates Using GMAW	Weld Alloy Steel Pipes Using GMAW
Weld Carbon Steel Plates Using GTAW	Weld Carbon Steel Pipes Using GTAW	Weld Alloy Steel Plates Using GTAW	Weld Alloy Steel Pipes Using GTAW
Perform bench work (Basic)	Turn workpiece	Mill workpiece	Grind workpiece
Shape workpiece	Repair workpiece	Perform bench work (Basic)	Perform bench work (Complex)
Turn workpiece (Basic)	Turn workpiece (Intermediate)	Mill workpiece (Basic)	Mill workpiece (Intermediate)

Grind workpiece (Basic)	Grind workpiece (Complex)	Turn workpiece (Advanced)	Mill workpiece (Advanced)
Prepare basic engineering drafting	Perform basic engineering detail drafting	Perform Preventive Maintenance	Perform Planned and Unplanned (Emergency) Maintenance
Fabricate Simple Items	Install Machinery	Perform press machine setting	Perform mechanical press operation
Weld Plates Using SAW	Weld Pipes Using SAW	Weld Carbon Steel Plates Using SMAW	Weld Carbon Steel Plates and Pipes Using SMAW
Weld Alloy Steel Plates Using SMAW	Weld Alloy Steel Pipes Using SMAW	Machine Die Components	Fit and Assemble Dies
Test and Try Die	Machine mold components	Implement surface finishing	Fit and assemble mold
Rectify mold flaws	**Set-up Electric Discharge Machine, electrode and workpiece**	**Perform Electric Discharge Machine-sinking operations**	**Perform post Electric Discharge Machine-sinking operations**

GOLASSARY OF TERMS

1. Electric discharge machine (EDM) operation	is the operation of removing metal thru electric discharge of short duration and high current density between the tool and workpiece
2. Electrode	a formed cutting tool usually made of electrically conductive material usually carbon (graphite)
3. Dielectric fluid	mostly of light lubricating oil of low viscosity and a non-conductor of electricity, able to rapidly ionize(vaporize) and deionize metal by removing it by flushing
4. Flushing	process of removing eroded particles from the spark gap thru the rapid passage of dielectric fluid on a pipe or nozzle or thru electrode
5. Surface texture	Is the surface finish on workpiece resulting from the spark duration, ie. Longer spark duration, rougher surface finish
6. Wear	refers to the tool or electrode's microscopic particles being carried on every spark, ie. More spark, more wear
7. Spark gap	The distance between the face and sides of the workpiece and the electrode during machining operation
8. Duty cycle	Is the measure of efficiency from the relationship between the on-time to the off-time of machine operation
9. Relaxation type circuit	Depends upon the capacitor and resistance to provide the spark discharge. It gives higher electrode wear rate and lower metal removal
10. Pulse type circuit	A valve or transistorized circuit to switch power into the working gap under accurate control, enabling precise amounts of energy to be measured in each spark discharge
11. Dither/Audio	Attachments designed to give visual or audible signal if proximity of electrode and workpiece is less than the spark gap
12. Gap Monitor Meter	It indicates deviation of spark gap; arching will cause a voltage increase and poor ionization of fluid will decrease the voltage
13.Servo head	It controls the advancement of the electrode into the workpiece. Correct spark gap is maintained when voltages at the working gap and the reference on the servo head are balance

TRAINING REGULATIONS (TR)

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