TRAINING REGULATIONS

DIE DESIGNING NC IV

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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DIE DESIGNING NC IV

SECTION 1 DIE DESIGNING NC IV

The **DIE DESIGNING NC IV** qualification consists of competencies that the designer must achieve to enable them to perform tasks such as reviewing tools and design, determining the methods to assemble, testing and debugging complete tools whether single hit or progressive.

This qualification is packaged from the competency map of the Metals and engineering sector as shown in Annex A.

The units of competency comprising this qualification include the following:

CODE NO.	BASIC COMPETENCIES
500311401	Utilized specialized communication skills
500311402	Develop and lead teams
500311403	Perform higher-order thinking processes and apply techniques in the workplace
500311404	Contribute to the practice of social justice in the workplace
500311405	Manage innovative work instructions
500311406	Manage and evaluate usage of information
500311407	Lead in improvement of Occupational Safety and Health (OSH) programs, policies and procedures
500311408	Lead towards improvement of environment work programs, policies and procedures
500311409	Sustain entrepreneurial skills

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
ICT311201	Operate a personal computer

CODE NO.	CORE COMPETENCIES
MEE722321	Determine die design parameters
MEE722322	Perform CAD operation
MEE722323	Simulate and verify die design
MEE722324	Modify and finalize die design
MEE722325	Create fabrication drawing

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

- Die Designer

SECTION 2 COMPETENCY STANDARDS

This section gives the details and contents of the units of competency required in **DIE DESIGNING NC IV**. These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY : UTILIZE SPECIALIZED COMMUNICATION SKILLS

UNIT CODE : 500311401

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use specialized communication skills to meet specific needs of internal and internal clients, conduct interviews, facilitate discussion with groups, and contribute to the development of communication strategies.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Meet common and specific communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met 1.2 Different approaches are used to meet communication needs of clients and colleagues 1.3 Conflict is addressed promptly in a manner which does not compromise the organization	1.1 Communication processes 1.2 Dynamics of groups and different styles of group leadership 1.3 Communication skills relevant to client groups 1.4 Flexibility in communication	1.1 Full range of communication techniques including: 1.1.1 Effective communication process 1.1.2 Active listening 1.1.3 Giving/ receiving feedback 1.1.4 Interpretation of information 1.1.5 Role boundaries setting 1.1.6 Negotiation 1.1.7 Establishing empathy 1.1.8 Conduct seminars 1.1.9 Public speaking 1.2 Communication skills required to fulfill job roles as specified by the organization

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Contribute to the development of communication strategies	2.1 ***Strategies*** for internal and external dissemination of information are developed, promoted, implemented and reviewed as required 2.2 Channels of communication are established and reviewed regularly 2.3 Coaching in effective communication is provided 2.4 Work related network and relationship are maintained 2.5 Negotiation and conflict resolution strategies are used where required 2.6 Communication with clients and colleagues is performed appropriate to individual needs and organizational objectives	2.1 Communication process 2.2 Dynamics of groups and different styles of group leadership 2.3 Openness and flexibility in communication 2.4 Communication skills relevant to client groups	2.1 Full range of communication techniques including: 2.1.1 Effective communication process 2.1.2 Active listening 2.1.3 Giving/ receiving Feedback 2.1.4 Interpretation of information 2.1.5 Role boundaries setting 2.1.6 Negotiation 2.1.7 Establishing empathy 2.1.8 Openness and flexibility in communication 2.2 Communication skills required to fulfill job roles as specified by the organization
3. Deliver a technical presentation	3.1 Presentation is delivered clearly, sequential and delivered within allotted time 3.2 Utilize appropriate media to enhance presentation 3.3 Differences in views/opinions are respected 3.4 Questions during fora are responded in a manner consistent with organizational standard	3.1 Communication process 3.2 Dynamics of groups and different styles of group leadership 3.3 Openness and flexibility in communication 3.4 Communication skills relevant to client groups	3.1 Full range of communication techniques including: 3.1.1 Effective communication process 3.1.2 Active listening 3.1.3 Giving/receiving feedback 3.1.4 Interpretation of information 3.1.5 Role boundaries setting 3.1.6 Negotiation 3.1.7 Establishing empathy 3.1.8 Openness and

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
			flexibility in communication 3.1.9 Communication skills required to fulfill job roles as specified by the organization
4. Represent the organization	4.1 When participating in internal or external forums, presentation is relevant, appropriately researched and presented in a manner to promote the organization 4.2 Presentation is clear and sequential and delivered within a predetermined time 4.3 Utilize appropriate media to enhance presentation 4.4 Differences in views are respected 4.5 Written communication is consistent with organizational standards 4.6 Inquiries are responded in a manner consistent with organizational standard 4.7 Consolidate ideas and suggestions 4.8 Generalize and summarize all ideas and suggestions	4.1 Communication process 4.2 Dynamics of groups and different styles of group leadership 4.3 Openness and flexibility in communication 4.4 Communication skills relevant to client groups	4.1 Full range of communication techniques including: 4.1.1 Effective communication process 4.1.2 Active listening 4.1.3 Giving/ receiving feedback 4.1.4 Interpretation of information 4.1.5 Role boundaries setting 4.1.6 Negotiation 4.1.7 Establishing empathy 4.1.8 Openness and flexibility in communication 4.2 Communication skills required to fulfill job roles as specified by the organization

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Facilitate group discussion	5.1 Mechanisms which enhance ***effective group interaction*** is defined and implemented 5.2 Strategies which encourage all group members to participate are used routinely 5.3 Objectives and agenda for meetings and discussions are routinely set and followed 5.4 Relevant information is provided to group to facilitate outcomes 5.5 Evaluation of group communication strategies is undertaken to promote participation of all parties 5.6 Specific communication needs of individuals are identified and addressed	5.1 Communication process 5.2 Dynamics of groups and different styles of group leadership 5.3 Openness and flexibility in communication 5.4 Communication skills relevant to client groups	5.1 Full range of communication techniques including: 5.1.1 Effective communication process 5.1.2 Active listening 5.1.3 Giving/receiving feedback 5.1.4 Interpretation of information 5.1.5 Role boundaries setting 5.1.6 Negotiation 5.1.7 Establishing empathy 5.1.8 Openness and flexibility in communication 5.2 Communication skills required to fulfill job roles as specified by the organization
6. Conduct interview	6.1 A range of appropriate communication strategies are employed in ***interview situations*** 6.2 Records of interviews are made and maintained in accordance with organizational procedures 6.3 Effective questioning, listening and nonverbal communication techniques are used to ensure that required message is communicated	6.1 Communication process 6.2 Dynamics of groups and different styles of group leadership 6.3 Effective questioning techniques 6.4 Communication skills relevant to client groups	6.1 Full range of communication techniques including: 6.1.1 Effective communication process 6.1.2 Active listening 6.1.3 Giving/ receiving feedback 6.1.4 Interpretation of information 6.1.5 Role boundaries setting 6.1.6 Negotiation 6.1.7 Establishing empathy 6.2 Effective clarifying and probing techniques (questioning skills) 6.3 Communication skills required to fulfill job roles as specified by the organization

RANGE OF VARIABLES

VARIABLE	RANGE
1. Strategies	May include: 1.1 Recognizing own limitations 1.2 Referral to specialists 1.3 Utilizing techniques and aids 1.4 Providing written drafts 1.5 Verbal and non verbal communication
2. Effective group interaction	May include: 2.1 Identifying and evaluating what is occurring within an interaction in a non judgmental way 2.2 Using active listening 2.3 Making decision about appropriate words, behavior 2.4 Putting together response which is culturally appropriate 2.5 Expressing an individual perspective 2.6 Expressing own philosophy, ideology and background and exploring impact with relevance to communication 2.7 Openness and flexibility in communication
3. Types of Interview	May include: 3.1 Related to staff issues 3.2 Routine 3.3 Confidential 3.4 Evidential 3.5 Non disclosure 3.6 Disclosure
4. Interview situations	May include: 4.1 Establish rapport 4.2 Elicit facts and information 4.3 Facilitate resolution of issues 4.4 Develop action plans 4.5 Diffuse potentially difficult situation

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated effective communication skills with clients accessing service and work colleagues 1.2 Adopted relevant communication techniques and strategies to meet client particular needs and difficulties
2. Resource Implications	2.1 Access to appropriate workplace where assessment can take place
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Case Study 3.2 Interview 3.3 Portfolio 3.4 Written Test 3.5 Role Play
4. Context for Assessment	4.1 This unit should be assessed on the job through simulation

UNIT OF COMPETENCY : DEVELOP AND LEAD TEAMS

UNIT CODE : 500311402

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to determine individual and team development needs and facilitate the development of the workgroup.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Foster Individual growth	1.1 ***Learning and development needs*** of team members are systematically identified in line with ***organizational requirements*** 1.2 Development plan to meet individual needs is collaboratively developed and implemented 1.3 Individuals are encouraged to self - evaluate performance and identify areas for improvement 1.4 ***Feedback on performance*** of team members is collected from relevant sources and compared with established team learning process	1.1 Effective workplace communication, coaching and mentoring principles 1.2 Feedback principles and procedures 1.3 Working interdependently: strategies and techniques 1.4 Leadership Concepts: • Types of Decisions Teams Make • Team Responsibilities • Problems That Affect Teams • Building Strong Team Communication • Expressing Yourself on a Team • Team Problem Solving	1.1 Ability to read and understand a variety of texts, prepare general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management 1.2 Coaching and mentoring skills to provide support to colleagues 1.3 Communication skills including receiving feedback and reporting, maintaining effective relationships and conflict management 1.4 Ability to relate to people from a range of social, cultural, physical and mental backgrounds 1.5 Planning skills to organize required resources and equipment to meet learning needs 1.6 Reporting skills to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes 1.7 Facilitation skills to conduct small group training sessions

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Foster individual and team growth	2.1. Learning and development program goals and objectives are identified to match the specific knowledge and skills requirements of competency standards 2.2. ***Learning delivery methods*** are appropriate to the learning goals, the learning style of participants and availability of equipment and resources 2.3. Workplace learning opportunities and coaching/ mentoring assistance are provided to facilitate individual and team achievement of competencies 2.4. Resources and timelines required for learning activities are identified and approved in accordance with organizational requirements	2.1 Advanced coaching and mentoring techniques 2.2 Performance evaluation concepts 2.3 Training and development techniques	2.1 Instructional planning and delivery skills 2.2 Monitoring and evaluation skills 2.3 Mentoring and coaching skills

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Monitor and evaluate workplace learning	3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements 3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional support 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning 3.4 Records and reports of competency are maintained within organizational requirement	3.1 Types and levels of learning evaluation 3.2 Learning styles and strategies 3.3 Training and development approaches	3.1 Instructional planning and delivery skills 3.2 Monitoring and evaluation skills 3.3 Mentoring and coaching skills

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Develop team commitment and cooperation	4.1 Open communication processes to obtain and share information is used by team 4.2 Decisions are reached by the team in accordance with its agreed roles and responsibilities 4.3 Mutual concern and camaraderie are developed in the team 4.4 Career planning for each member are monitored	4.1 Career development for group members 4.2 Principles of team commitment and cooperation 4.3 Team dynamics and performance	4.1 Instructional planning and delivery skills 4.2 Monitoring and evaluation skills 4.3 Mentoring and coaching skills
5. Facilitate accomplishment of team goals	5.1 Team members actively participated in team activities and communication processes 5.2 Teams members developed individual and joint responsibility for their actions 5.3 Collaborative efforts are sustained to attain organizational goals	5.1 Group Development Process and Principles as applied in the workplace 5.2 Principles of organizational development 5.3 Collaboration principles and procedures	5.1 Instructional planning and delivery skills 5.2 Monitoring and evaluation skills 5.3 Mentoring and coaching skills 5.4 Organizational leadership

RANGE OF VARIABLES

VARIABLE	RANGE
1. Learning and development needs	May include: 1.1 Coaching, mentoring and/or supervision 1.2 Formal/informal learning program 1.3 Internal/external training provision 1.4 Work experience/exchange/opportunities 1.5 Personal study 1.6 Career planning/development 1.7 Performance appraisals 1.8 Workplace skills assessment 1.9 Recognition of prior learning 1.10 Job design and enrichment
2. Organizational requirements	May include: 2.1 Quality assurance and/or procedures manuals 2.2 Goals, objectives, plans, systems and processes 2.3 Legal and organizational policy/guidelines and requirements 2.4 Safety policies, procedures and programs 2.5 Confidentiality and security requirements 2.6 Business and performance plans 2.7 Ethical standards 2.8 Quality and continuous improvement processes and standards
3. Feedback on performance	May include: 3.1 Formal/informal performance appraisals 3.2 Obtaining feedback from supervisors and colleagues 3.3 Obtaining feedback from clients 3.4 Personal and reflective behavior strategies 3.5 Routine and organizational methods for monitoring service delivery
4. Learning delivery methods	May include: 4.1 On the job coaching or mentoring 4.2 Problem solving 4.3 Presentation/demonstration 4.4 Formal course participation 4.5 Work experience 4.6 Involvement in professional networks 4.7 Conference and seminar attendance 4.8 Induction

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identified and implemented learning opportunities for others 1.2. Gave and received feedback constructively 1.3. Facilitated participation of individuals in the work of the team 1.4. Negotiated learning plans to improve the effectiveness of learning 1.5. Prepared learning plans to match skill needs 1.6. Accessed and designated learning opportunities
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. Observation of work activities of the individual member in relation to the work activities of the group 3.2. Observation of simulation and or 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
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 tasks are being undertaken whether individually or in-group

UNIT OF COMPETENCY : PERFORM HIGHER-ORDER THINKING PROCESSES AND APPLY TECHNIQUES IN THE WORKPLACE

UNIT CODE : 500311403

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to use fundamental critical thinking skills in the workplace.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Evaluate effectiveness and efficiency of the workplace systems, processes and procedures.	1.1 **Effectiveness and efficiency** of workplace standards and procedures are examined. 1.2. Usage of inquiry and dialogue to communicate evaluation measures and results are implemented. 1.3 Evaluation reports are prepared and communicated to team members.	1.1 Systems, standards, procedures and protocols in the workplace. 1.2 Different methods of critical and appreciative inquiry and their relevance to different situations 1.3 Techniques to assist in forming the habit of asking questions and taking responsibility for answers. 1.4 Why questions are important and the benefits of asking good questions for individuals, businesses and communities (the importance of critical thinking).	1.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information). 1.2 Communicating to actively listen and to ask questions of others in a constructive way. 1.3 Using critical thinking pathway to formulate and ask relevant questions and come up with appropriate answers. 1.4 Performing assimilation and accommodation skills to interpret and distil key information of relevance to a given situation. 1.5 Assessing and measuring the extent of effectiveness and efficiency of the systems, processes and procedures in the workplace.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Foster the habit of critical inquiry and curiosity in the workplace.	2.1 Issues and situations are reflected on and wondered about. 2.2 Issues and problems in the workplace particularly in the policies, procedures and protocols are discussed and evaluated between and among teams. 2.3 Evaluation of efficiency and effectiveness of workplace policies, procedures and protocols are documented, communicated and agreed upon between and among teams. 2.4 Growth mindset and positive relationship and communication is applied in the context of **curiosity and critical inquiry** in the workplace.	2.1 Different methods of critical and appreciative inquiry and their relevance to different situations. 2.2 Techniques to assist in forming the habit of asking questions and taking responsibility for answers. 2.3 Why questions are important and the benefits of asking good questions for individuals, businesses and communities (the importance of critical thinking). 2.4 Growth mindset and positive communication and relationship strategies and techniques.	2.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information). 2.2 Communicating to actively listen and to ask questions of others in a constructive way. 2.3 Using critical thinking pathway to formulate and ask relevant questions and come up with appropriate answers. 2.4 Performing assimilation and accommodation skills to interpret and distil key information of relevance to a given situation. 2.5 Assessing and measuring the extent of effectiveness and efficiency of the systems, processes and procedures in the workplace. 2.6 Communicating insights on workplace effectiveness and efficiency.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Develop practical action plans for improving workplace conditions.	3.1 Evaluation of efficiency and effectiveness of workplace policies, procedures and protocols are documented, communicated to stakeholders. 3.2 **Practical action plans** in improving workplace conditions are formulated, presented and negotiated with stakeholders. 3.3 Proposed changes and directions are inquired, processed and negotiated between and among teams, and stakeholders as well of the organization. 3.4 Commitment to continuous improvement and change is highlighted. 3.5 Passion and dedication for changing and adapting to the demands of the 21st century workplace are considered.	3.1 Different methods of critical and appreciative inquiry and their relevance to different situations. 3.2 Techniques to assist in forming the habit of asking questions and taking responsibility for answers. 3.3 Why questions are important and the benefits of asking good questions for individuals, businesses and communities (the importance of critical thinking). 3.4 Growth mindset and positive communication and relationship strategies and techniques. 3.5 Creative negotiation skills. 3.6 Change management and continuous improvement concepts.	3.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information). 3.2 Communicating to actively listen and to ask questions of others in a constructive way. 3.3 Using critical thinking pathway to formulate and ask relevant questions and come up with appropriate answers. 3.4 Performing assimilation and accommodation skills to interpret and distil key information of relevance to a given situation. 3.5 Assessing and measuring the extent of effectiveness and efficiency of the systems, processes and procedures in the workplace. 3.6 Communicating practical insights on improving workplace conditions.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Effectiveness and efficiency	May include; 1.1 Developing a more efficient way of doing something 1.2 Developing a new idea 1.3 Developing and improving products and services 1.4 Enhancing skills and career opportunities 1.5 Enhancing the physical environment 1.6 Financial benefit 1.7 Greater personal satisfaction 1.8 Improving interpersonal relationships 1.9 Evaluating overall workplace conditions
2. Curiosity and critical inquiry	May include: 2.1 Accuracy 2.2 Breadth 2.3 Clarity 2.4 Depth 2.5 Emotion 2.6 Fairness 2.7 Logic 2.8 Meaning 2.9 Planning 2.10 Attention 2.11 Precision 2.12 Relevance 2.13 Significance 2.14 Social engagement 2.15 Society 2.16 Style 2.17 Growth mindset 2.18 Positive communication 2.19 Positive negotiation 2.20 Workplace conditions 2.21 Appreciative inquiry methods

VARIABLE	RANGE
3. Practical action plans	May include: 3.1 Insights on continuous improvement 3.2 Creative strategies and techniques for becoming better at work and real life 3.3 Career plans 3.4 Challenging workplace policies, procedures and protocols 3.5 Specifying plans for change and adapting to the demands of the contemporary workforce 3.6 Challenges in negotiating with stakeholders and teams 3.7 Change management, innovation and knowledge creation 3.8 Contractual agreements 3.9 Extreme time pressure or non-negotiable deadlines 3.10 Financial limitations 3.11 Procedures determined by laws or other regulations 3.12 Safety issues 3.13 When others are totally closed to new ideas 3.14 acknowledging shared responsibility 3.15 adopting a positive 'can do' attitude 3.16 following up on practical details 3.17 pro-actively seeking information 3.18 suggesting a new approach 3.19 talking to others about possible answers 3.20 constraints of the broader context and environment 3.21 overall goal - what needs to be achieved 3.22 personal hopes and expectations

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Evaluated the effectiveness and efficiency of workplace systems, processes and procedures. 1.2 Modelled the conscious process of critical inquiry to get new insights that s/he can get in formulating action plans on continuous improvement in the workplace and real-life 1.3 Practiced the habit of critical inquiry and curiosity in the workplace 1.4 Shown a thorough knowledge and understanding of how critical thinking impacts on individual lives, the broader community and work situations. 1.5 Developed practical action plans for improving workplace conditions.
2. Resource Implications	2.1. Interactions with specific challenges and situations to demonstrate the application of critical thinking (this would usually involve interactions with others).
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate 3.2 Evaluation of a candidate blog exploring different ideas and questions 3.3 Review of candidate response to scenarios that allow the candidate to apply critical thinking techniques to a life or work situation, and to demonstrate ability to portray curiosity and exploration of new concepts 3.4 Evaluation of candidate response to the challenge of adopting different perspectives on a situation, and ability to both develop and respond to questions from those perspectives 3.5 Observation of the candidate participating in a group problem-solving session 3.6 Oral or written questioning to assess knowledge of typical blockers to the critical thinking process. 3.7 Life Narrative Inquiry to reflect life stories that reflect how critical thinking and problem solving is applied in the lives.
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 : CONTRIBUTE TO THE PRACTICE OF SOCIAL JUSTICE IN THE WORKPLACE

UNIT CODE : 500311404

UNIT DESCRIPTOR : This unit covers ways and means to assume active roles in resolving local and global challenges and to become proactive contributors to a more peaceful and sustainable world.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Update self on local, national and global trends/ issues in the workplace	1.1 **Media** are regularly **scanned/ monitored** for trends and issues relevant to human rights, gender equality, promotion of culture of peace and non-violence, global citizenship and appreciation of cultural diversity. 1.2 Knowledge and understanding of **local, national and global issues** and their interconnectedness and interdependency are acquired. 1.3 Notable issues and trends are critically examined and discussed with peers, colleagues, or family members.	1.1 Local, national and global systems and structures 1.2 Issues affecting interaction and connectedness of communities at local, national and global levels 1.3 Underlying assumptions and power dynamics (politics, understanding political system, social structures, labor laws, labor relations, human right)	1.1 Monitoring trends and issues relevant to human rights, gender equality, culture of peace, global citizenship, and cultural diversity using different media platforms 1.2 Analyzing trends and issues relevant to human rights, gender equality, culture of peace, global citizenship, and cultural diversity 1.3 Engaging in discourse about the local, national and global issues

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Relate local and global trends to workplace context	2.1 Local events are reflected on for implications in one's own situation and in the external global environment. 2.2 Sense of belonging to a common humanity, sharing values and responsibilities are developed. 2.3 Attitudes of empathy, solidarity and respect for differences and diversity are strengthened.	2.1 Different levels of human identity according to Amber Mayer (2015) 2.2 Different communities people belong to and how these are connected 2.3 Difference and respect for cultural diversity	2.1 Recognizing differences and commonalities among people 2.2 Strengthening attitudes of empathy, solidarity and respect for diversity 2.3 Connecting local issues to global trends, and vice versa.
3. Engage and take actions on workplace issues and concerns	3.1 Effective and responsible actions at local, national and global levels are identified. 3.2 Motivation and willingness to take necessary actions are developed. 3.3 Attitude of "thinking globally and acting locally" is practiced.	3.1 Actions that can be taken individually and collectively 3.2 Ethically responsible behaviour 3.3 Importance and benefits of civic engagement 3.4 Strategies and techniques of "thinking globally and acting locally	3.1 Employing appropriate actions to address workplace issues involving national and global trends 3.2 Showing concern and willingness to take part in the development efforts to discuss workplace issues and concerns 3.3 Applying the attitude of "thinking globally and acting locally" in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Media	May include: 1.1 Print media 1.2 Broadcast media 1.3 Internet and social media
2. Scanning/Monitoring	May include: 2.1 Sourcing from key informants 2.2 Conversation with clients 2.3 Man-on-the-street conversation 2.4 Scanning print and broadcast media
3. Local, national and global issues	May include: 3.1 Poverty 3.2 Unemployment 3.3 Global warming 3.4 Safety, security, and well-being

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated ability and attitude to keep oneself updated of relevant issues/trends 1.2 Demonstrated ability to think and act based on one's principles and values 1.3 Demonstrated a holistic/global outlook on internal and external events in the workplace
2. Resource Implications	**The following resources should be provided:** 2.1 Access to workplace and resources 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 global and local 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 : MANAGE INNOVATIVE WORK INSTRUCTIONS

UNIT CODE : 500311405

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to sustain and develop a workplace environment in which improvement, innovation and learning are promoted and reinforced.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Review and analyze existing workplace practices	1.1 Current instructions and strategies to perform tasks in the workplace are reviewed 1.2 Climate for **innovation** at the organizational level is defined 1.3 Innovation drivers in the workplace are identified	1.1. Four drivers of innovation according to Gallup Management Journal (2007) 1.2. Contextual variables related to innovative practices in the organization 1.3. The nine dimensions of innovation climate (Isaksen & Isaksen, 2018) 1.4. Types of Innovation identified by Gopalakrishnan and Damanpour (1997)	1.1 Investigating the organizational needs in the innovation process 1.2 Defining current organizational innovative practices 1.3 Linking innovation to contextual variables in the organization

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Examine opportunities for continuous improvement and innovation of practices in the workplace	2.1. Effectiveness of innovative practices in the workplace is determined 2.2. **Innovative behaviors** of leaders or managers in the organization are assessed 2.3. Driving principles of innovation are discussed	2.1 Determinants of innovative behavior by Scott and Bruce (1992) 2.2 Four principles of innovation according to Gallup Management Journal (2007)	2.1 Evaluating organizational innovative practices 2.2 Gauging innovative behaviors of the leaders and managers in the organization 2.3 Deliberating opportunities and challenges in implementing innovation
3. Implement innovative ways in the conduct of usual workplace practices	3.1. Innovative behaviors in the workplace are performed 3.2. Innovative climate in the workplace is maintained 3.3. Adoption or modification of new ideas relevant to the organizational needs is achieved	3.1 Determinants of innovative behavior by Scott and Bruce (1992) 3.2 The nine dimensions of innovation climate (Isaksen & Isaksen, 2018) 3.3 Techniques in implementing innovative change in the workplace	3.1 Developing risk management techniques and control systems 3.2 Evaluating impact of changes and developing action plans 3.3 Demonstrating strategies and techniques in managing changes in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Innovation	May include: 1.1 Products versus processes 1.2 Radical versus incremental 1.3. Technical versus administrative
2. Innovative behaviors	May include: 2.1 Always generate creative ideas or new solutions 2.2 Exploring and secure funds or resources required for implementing new ideas 2.3 Establishing adequate plans and schedules for implementing new ideas 2.4 Contributing suggestions or approaches for others' creative ideas

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Analyzed and evaluated systems and performance in key areas of the organization and identify opportunities for improvement, seeking advice from experts as appropriate 1.2 Promoted the value of creativity, innovation and sustainability and recognize successes 1.3 Supported the testing and trialing of new ideas and undertake risk management and cost-benefit analysis for options 1.4 Planned for and implemented improvements using organization's processes for approvals, project management and change management 1.5 Facilitated effective contributions to and communications about continuous improvement and innovation 1.6 Captured insights, experiences and ideas for improvements and incorporate them into the organization's knowledge management systems and future planning.
2. Resource Implications	**The following resources should be provided:** 2.1 Impact evaluation materials (guide and form)
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Interview 3.2 Written Evaluation 3.3 Case analysis
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 : MANAGE AND EVALUATE USAGE OF INFORMATION

UNIT CODE : 500311406

UNIT DESCRIPTOR : This unit of competency covers the knowledge, skills and attitudes required to support

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Review information needs and sources	1.1. The ***information*** needs of individuals/teams are determined and the sources are identified. 1.2. Information held by the organisation is reviewed to determine suitability and accessibility. 1.3. Plans are prepared to obtain information that is not available or accessible within the organization.	1.1. Analysis and display techniques 1.2. Information evaluation issues 1.3. Information storage requirements and methods 1.4. Reporting procedures of the organisation	1.1. Analysing record information 1.2. Communicating effectively 1.3. Disseminating information 1.4. Presenting information
2. Collect and analyze information	2.1. ***Collection*** of information is interpreted timely and relevant to the needs of individuals/teams. 2.2. Information is collected in formal suitable for analysis, interpretation and dissemination. 2.3. Information is analyzed to identify relevant trends and developments in terms of the needs for which is acquired.	2.1. Information collection, collation 2.2. Analysis and display techniques 2.3. Information evaluation issues 2.4. Information storage requirements and methods 2.5. Reporting procedures of the organisation	2.1. Collecting and collating information 2.2. Analysing record information 2.3. Communicating effectively 2.4. Disseminating information 2.5. Presenting information
3. Use management information systems	3.1. ***Management information systems*** are used to store and retrieve data for decision making. 3.2. Technology available in the work area/ organisation is used to manage information. 3.3. Recommendations for improving the information system are submitted to designated persons/ groups.	3.1. Analysis and display techniques 3.2. Information collection, collation 3.3. Information evaluation issues 3.4. Information storage requirements and methods 3.5. Reporting procedures of the organisation	3.1. Analysing record information 3.2. Collecting and collating information 3.3. Communicating effectively 3.4. Disseminating information 3.5. Presenting information 3.6. Using management information systems to store and retrieve data

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Report and disseminate analyzed information	4.1. The results of information gathering, ***analysis*** and synthesis are reported within specified time frames and to the standard defined by the organisation. 4.2. The results of information gathering, analysis and synthesis are reported so they can be inputs to policy development and organisation decision making. 4.3. Information which is gathered is disseminated to appropriate personnel within the specified timeframe	4.1. Analysis and display techniques 4.2. Information collection, collation 4.3. Information evaluation issues 4.4. Information storage requirements and methods 4.5. Reporting procedures of the organisation	4.1. Analysing record information 4.2. Collecting and collating information 4.3. Communicating effectively 4.4. Disseminating information 4.5. Presenting information 4.6. Using management information systems to store and retrieve data

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1 Routine and complex reports and submissions 1.2 Briefing notes 1.3 Ministerial 1.4 Proposals 1.5 Project plans 1.6 Articles and promotional material
2. Collection techniques or methods	2.1 Collection techniques may include: 2.1.1 Research 2.1.2 Surveys 2.1.3 Literature search 2.1.4 Interviews 2.1.5 Data bases 2.1.6 Observation 2.2 Collection methods may include: 2.2.1 Indexing 2.2.2 linking 2.2.3 Sorting 2.2.4 Comparing 2.2.5 Categorizing 2.2.6 Integrating
3. Analysis	May include: 3.1. application of statistical methods 3.2. mathematical calculations 3.3. critical analysis 3.4. problem solving
4. Management information systems	May include: 4.1. Computers 4.2. Communication channels 4.3. Records management 4.4. Procedures 4.5. Manuals 4.6. Protocol 4.7. Legislation 4.8. Guidelines and awards 4.9. Organizational 4.10. Legal and policy materials

EVIDENCE GUIDE

1 Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Identified information needs and sources 1.2 Collected and analyzed information 1.3 Determined the correct / preventive action 1.4 Used management information systems 1.5 Record and support 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 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 : LEAD IN IMPROVEMENT OF OCCUPATIONAL SAFETY AND HEALTH (OSH) PROGRAMS, POLICIES AND PROCEDURES

UNIT CODE : 500311407

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess Occupational Safety and Health (OSH) practices and programs, recommend OSH program improvement initiatives, and implement recommended improvements on Occupational Safety and Health (OSH) Programs, Procedures and Policies

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess Occupational Safety and Health (OSH) practices and programs	1.1 ***OSH practices and programs*** are reviewed based on workplace policies and procedures 1.2 Appropriate personnel or ***OSH reference guides*** are consulted for proper guidance based on workplace policies and procedures 1.3 Current practices and programs are evaluated based on acceptable level of OSH work standards	1.1. OSH practices and programs workplace policies and procedures 1.2. OSH reference guides 1.3. OSH work standards	1.1. Critical thinking skills 1.2. Evaluating skills
2. Recommend OSH program improvement initiatives	2.1 OSH work improvement initiatives are identified that are relevant with the workplace scenario 2.2 OSH program improvement plans are organized based on workplace policies and procedures 2.3 OSH program improvement plans are presented based on workplace policies and procedures	2.1. OSH Programs 2.2. OSH work improvement initiatives	2.1. Presentation Skills 2.2. Communication skills 2.3. Collaborating skills 2.4. Critical thinking skills 2.5. Observation skills

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Implement recommended improvements on Occupational Safety and Health (OSH) Programs, Procedures and Policies	3.1 Approved improvements on OSH work improvement initiatives are communicated based on workplace policies and procedures 3.2 Concern personnel are guided in accordance with workplace policies and procedures 3.3 Implementation of the approved OSH initiatives are monitored in accordance with workplace policies and procedures 3.4 Implementation of approved OSH initiatives are evaluated based on workplace policies and procedures	3.1. Coaching Concepts 3.2. OSH work improvement initiatives 3.3. Supervisory Concepts	3.1. Monitoring Skills 3.2. Evaluation Skills 3.3. Auditing Skills 3.4. Coaching Skills 3.5. Supervisory Skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Practices and Programs	May include: 1.1 Planning, implementation and maintenance of manufacturing plants 1.2 Work-physiological, psychological, ergonomic and hygienic practices and programs 1.3 First aid within the workplace 1.4 Safety inspection practices
2. OSH Reference Guides	May include: 2.1 Occupational Safety and Health Standards Book 2.2 OSHA Safety Bulletins and Magazines 2.3 Equipment Safety Operating Instructions 2.4 Established National Safety Management Books 2.5 Credible OSH Web-sites 2.6 Safety Solution Guide Books and Handbooks
3. OSH Work Improvement Initiatives	May include: 3.1 Eliminate the hazard altogether (i.e., get rid of the dangerous machine) 3.2 Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.3 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.4 Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage) 3.5 Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users) 3.6 Use personal protective equipment (i.e., wear gloves and goggles when using the machine)

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Consult appropriate personnel or OSH reference guides for proper guidance based on workplace policies and procedures 1.2. Evaluate current practices and programs based on acceptable level of OSH work standards 1.3. Identify OSH work improvement initiatives that are relevant with the workplace scenario 1.4. Present OSH program improvement plans based on workplace policies and procedures 1.5. Communicate approved improvements on OSH work program initiatives based on workplace policies and procedures 1.6. Monitor implementation of the approved OSH initiatives in accordance with workplace policies and procedures 1.7. Evaluate implementation of approved OSH initiatives based on workplace policies and procedures
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace or assessment location 2.2 OSH personal records 2.3 PPE 2.4 Health records
3. Methods of Assessment	Competency may be assessed through: 3.1 Portfolio Assessment 3.2 Interview 3.3 Case Study/Situation 3.4 Observation/Demonstration and oral questioning
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **LEAD TOWARDS IMPROVEMENT OF ENVIRONMENTAL WORK PROGRAMS, POLICIES AND PROCEDURES**

UNIT CODE : **500311408**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in assessing environmental work practices and standards, recommending environmental work improvement initiatives and implementing recommended environmental improvements

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess environmental work practices and programs	1.1. ***Environmental practices and programs*** are reviewed based on workplace policies 1.2 Appropriate personnel or ***environmental reference guides*** are consulted for proper guidance based on workplace policies* 1.3 Current practices and programs are evaluated based on acceptable level of environmental work standards*	1.1 Environmental Practices 1.2 Environmental Reference Guides 1.3 Corrective Action and Follow-up 1.4 Relevant environmental experts 1.5 Re-Training Needs 1.6 Energy and Healthy Habits	1.1 Critical thinking 1.2 Problem solving 1.3 Observation Skills 1.4 Training Delivery Skills

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Recommend environmental program improvements initiatives	2.1 Environment practices opportunities are Identified that are relevant with the workplace scenario 2.2 Environmental program improvement plans are organized based on workplace policies and procedures* 2.3 Environmental program improvement plans are presented based on workplace policies and procedures*	2.1 Environmental Practices and Standards 2.2. Mitigation Requirements	2.1. Presentation Skills 2.2 Critical thinking 2.3. Problem Solving 2.4 Observation Skills 2.5 Training Delivery Skills 2.6 Cost-Benefit Analysis
3. Implement recommended improvements on environmental programs, policies and procedures	3.1. Approved improvements on ***environmental work program initiatives*** are promoted based on workplace policies and procedures 3.2 Implementation of the approved environmental initiatives are monitored in accordance with workplace policies and procedures 3.3. Implementation of approved environmental initiatives are evaluated based on workplace policies and procedures	3.1. Environmental Work Initiatives 3.2. Communication Strategies 3.3. Environmental inspection and Monitoring Techniques 3.4. Notification Requirements	3.1. Inspection Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills

RANGE OF VARIABLES

VARIABLE	R A N G E
1. Environmental Practices and Programs	May include: 1.1 Utilization of Energy, Water, Fuel 1.2 Segregation Practices 1.3 Waste Disposal and Reuse 1.4 Saving Resources 1.5 Waste Collection 1.6 Usage of Hazardous Materials 1.7 Chemical Application 1.8 Equipment Operation 1.9 Dewatering and Discharging 1.10 Surface Disturbance 1.11 Periodic Inspection 1.12 Resource Storage and Handling
2. Environmental Reference Guides	May include: 2.1 Air Emission and Ambient Air Quality Guidelines 2.2 Energy Conservation Guidelines 2.3 Wastewater and Ambient Water Quality Guidelines 2.4 Water Conservation Guidelines 2.5 Hazardous Materials Management 2.6 Waste Management 2.7 Noise 2.8 Contaminated Land 2.9 Cultural Conservation Guides
3. Environmental Work Program Initiatives	May include: 3.1 Low Energy Lighting 3.2 Water Reduction initiatives 3.3 Holding Employee Awareness event 3.4 Recycling Waste Materials 3.5 Unplugging power converters overnight 3.6 Tree-Planting 3.7 Wild-life conservation

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Consulted appropriate personnel or environmental reference guides for proper guidance based on workplace policies* 1.2. Evaluated current practices and standards based acceptable level of environmental work standards 1.3. Organized environmental standard improvement plans based on workplace policies and procedures 1.4. Presented environmental standard improvement plans based on workplace policies and procedures* 1.5. Promoted approved environmental work initiatives based on workplace policies and procedures 1.6. Evaluated the implementation of approved environmental improvements based on workplace policies and procedures
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace/Assessment location 2.2 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.3 Case studies/scenarios relating to environmental protection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written/ Oral Examination 3.2 Interview/Third Party Reports 3.3 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.4 Simulations and role-plays
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA center.

UNIT OF COMPETENCY : SUSTAIN ENTREPRENEURIAL SKILLS

UNIT CODE : 500311409

UNIT DESCRIPTOR : This unit covers the outcomes required to update and continue one's professional development along entrepreneurship, including applying such growth in skills toward expanding the enterprise and developing its work force.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Enhance one's business skills	1.1 **Entrepreneurial skills** development needs are identified and responded to promptly. 1.2 Market trends are monitored, anticipated and taken advantage of where feasible. 1.3 New technologies, products and processes are included/utilized where advantageous to the enterprise. 1.4 Constant dialog/linkages with other entrepreneurs/peers and stakeholders are maintained 1.5 Circulation and participation in business fora, meetings, conventions and exhibits are maintained.	1.1 Business models and strategies 1.2 Types and categories of businesses 1.3 Business internal controls 1.4 Market Trends 1.5 Relevant national and local legislation and regulations 1.6 Basic quality control and assurance concepts	1.1 Basic bookkeeping/ accounting skills 1.2 Communication skills 1.3 Building relations with customer and employees 1.4 Building competitive advantage of the enterprise 1.5 Networking and Linkaging skills

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Manage entrepreneurial practices	2.1 Ideas and comments for improvements are sought from workers and clients. 2.2 Staff/workers are encouraged and supported in their skills development and enhancement. 2.3 A culture of ***continuous improvement*** *is* fostered within the enterprise. 2.4 Innovations on the existing lines of products and services are encouraged	2.1 Public relations concepts 2.2 Basic product promotion strategies 2.3 Basic market and feasibility studies 2.4 Basic business ethics	2.1 Building customer relations 2.2 Individual marketing skills 2.3 Using basic advertising (posters/ tarpaulins, flyers, social media, etc.)
3. Expand markets and clientele	3.1 Enterprise is built up and sustained through judicious control of cash flows. 3.2 Profitability of enterprise is ensured though appropriate ***internal controls*****.** 3.3 Unnecessary or lower-priority expenses and purchases are avoided. 3.4 New markets and clients are identified based on current market trends	3.1 Basic cost-benefit analysis 3.2 Basic financial management 3.3 Basic financial accounting 3.4 Business internal controls	3.1 Setting business priorities and strategies 3.2 Interpreting basic financial statements 3.3 Preparing business plans

RANGE OF VARIABLES

VARIABLE	RANGE
1. Entrepreneurial skills	May include: 1.1. Financial management skills 1.2. People management skills 1.3. Operations management skills 1.4. Business acumen
2. Business operations	May include: 2.1 Purchasing 2.2 Accounting/Administrative work 2.3 Production/Operations/Sales
3. Internal controls	May include: 3.1 Accounting systems 3.2 Financial statements/reports 3.3 Cash management 3.4 Managing property, plant and equipment
4. Continuous improvement	May include: 4.1 Quality management systems (PDCA, ISO 9001,TQM, Six-Sigma, etc.) 4.2 Client feedback systems 4.3 Quality assurance/Quality control systems

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated enhancement of one's entrepreneurial skills through performance of business, supervisor evaluation, worker and client testimony
2. Resource Implications	The following resources should be provided: 2.1 Interview guide for entrepreneurs, enterprise workers and third parties 2.2 Materials and location relevant to the proposed activity and tasks
3. Methods of Assessment	**Competency in this unit may be assessed through :** 3.1 Written report 3.2 Written examination 3.3 Demonstration/observation with oral questioning 3.4 Portfolio assessment with interview 3.5 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	1.2 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 metric system of measurements 1.2 Geometrical 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.	2.2 Types, purposes and accuracy of angular measuring instruments 2.3 Capability of measuring tools 2.4 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 switches of the machine 3.7 Handling and storage of tools 3.8 Checklist of safe working conditions	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
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

UNIT OF COMPETENCY : OPERATE A PERSONAL COMPUTER

UNIT CODE : ICT311201

UNIT DESCRIPTOR : This unit defines the competency required to operate a personal computer by: starting the PC, logging in, using and working with files, folders and programs, saving work, and closing down the PC.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Start the computer	1.1 The ***peripheral devices*** are properly connected 1.2 Power is checked and the computer and peripheral devices are switched on 1.3 Proper logging in and logging off is successfully done 1.4 The operating system features and functions are accessed and 1.5 Navigated Hardware configuration and other system features are checked	1.1 Computer functions 1.2 Basic parts of a computer and various hardware components 1.3 Keyboard layout and functions	1.1 Connecting peripheral devices 1.2 Logging in and logging off properly
2. Arrange and customize desktop display/ Windows settings	2.1 The desktop screen or Windows elements are changed as needed 2.2 Desktop icons are added, renamed, moved, copied or deleted 2.3 The online help functions are accessed or used as needed 2.4 Desktop icons of application programs are selected, opened and closed 2.5 Properties of icons are displayed 2.6 Computer or desktop settings are saved and restored	2.1 Keyboard layout and functions 2.2 Computer functions 2.3 Basic parts of a computer and various hardware components 2.4 Storage devices and file concepts 2.5 Basic software operation and functionalities	2.1 Changing desktop screen or windows element 2.2 Adding, renaming, moving, copying and deleting desk top icon 2.3 Accessing online help function 2.4 Opening and closing desk top icons 2.5 Displaying properties of icons

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Work with files and folders (or directories	3.1 A file or folder is created, opened, moved, renamed or copied 3.2 Files are located, deleted and restored 3.3 Details and properties of files and folders are displayed or viewed 3.4 Various files are organized for easy lookup and use 3.5 Files and information are searched 3.6 Disks are checked, erased or formatted as necessary	3.1 Keyboard layout and functions 3.2 Computer functions 3.3 Basic parts of a computer and various hardware components 3.4 Storage devices and file concepts 3.5 Basic software operation and functionalities	3.1 Creating, opening, moving, renaming and copying a file and folder 3.2 Locating, deleting and restoring files 3.3 Displaying details and properties of files and folders 3.4 Organizing files 3.5 Searching file and information
4. Work with user application programs	4.1 Application programs are added, changed, removed or ran 4.2 User software or application program are installed, updated and upgraded 4.3 Information/data are moved between documents or files	4.1 Keyboard layout and functions 4.2 Computer functions 4.3 Basic parts of a computer and various hardware components 4.4 Storage devices and file concepts 4.5 Basic software operation and functionalities	4.1 Checking hardware configuration and other system featured 4.2 Installing, updating and upgrading user software or application program
5. Print information	5.1 Printer is added or installed and correct printer settings is ensured 5.2 Default printer is assigned accordingly 5.3 Information or document is printed on the installed printer 5.4 Progress of print jobs are viewed and deleted as required	5.1 Keyboard layout and functions 5.2 Computer functions 5.3 Basic parts of a computer and various hardware components 5.4 Storage devices and file concepts 5.5 Basic software operation and functionalities	5.1 Installing printer settings 5.2 Printing information or document

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
6. Shut down computer	6.1 All open application programs are closed 6.2 Computer and peripheral devices are properly shut down	6.1 Keyboard layout and functions 6.2 Computer functions 6.3 Basic parts of a computer and various hardware components 6.4 Storage devices and file concepts 6.5 Basic software operation and functionalities	6.1 Shutting down computer and peripheral devices

RANGE OF VARIABLES

VARIABLE	RANGE
1. Peripheral device	May include: 1.1 Mouse 1.2 Keyboard 1.3 Monitor or visual display unit 1.4 Printer 1.5 Scanner
2. Computer	May include: 2.1 Laptops/notebooks 2.2 Workstations 2.3 Servers 2.4 other personal computer devices
3. Application programs	May include: 3.1 User programs 3.2 Database programs 3.3 Word processors 3.4 Email programs 3.5 Internet browsers 3.6 System browsers 3.7 Spreadsheets
4. Operating system	May include: 4.1 Windows 4.2 NT 4.3 Mac OS 4.4 Linux 4.5 Solaris 4.6 Unix
5. System features	May include: 5.1 Memory size 5.2 Disk capacities 5.3 Video cards 5.4 Usbs 5.5 Modems 5.6 1394 and lan connectors 5.7 Sd and pc cards 5.8 Wireless and infrared connections.
6. Online help functions	May include: 6.1 An instruction manual, or a portion of the manual, integrated and accessible from within the program or software being used

VARIABLE	RANGE
7. Properties	May include: 7.1 File name 7.2 Type of file 7.3 File size 7.4 Date created and modified 7.5 Attributes (hidden, read-only).
8. Various files	May include: 8.1 Documents 8.2 Records 8.3 Pictures 8.4 Music 8.5 Video
9. Disks	May include: 9.1 Floppy disks 9.2 CDs 9.3 CD-RW (Compact discs-Read/Write) 9.4 DVD RW 9.5 zip disks 9.6 flash drives 9.7 memory sticks 9.8 hard drives
10. Printer settings	May include: 10.1 Page layout 10.2 Paper size 10.3 ink/cartridge type 10.4 Number of copies 10.5 Page orientation.

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Ability to utilize software, navigate the desktop, using system features to perform tasks and save results of work.
2. Resource Implications	**The following resources should be provided:** 2.1 A personal computer 2.2 A printer 2.3 Mouse and keyboard 2.4 Basic systems software
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation in a workplace or simulated environment 3.2 Third party reports 3.3 Exams and tests 3.4 Demonstration of required skills 3.5 Interviews
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 : DETERMINE DIE DESIGN PARAMETERS

UNIT CODE : MEE722321

UNIT DESCRIPTOR : This unit covers the skills and knowledge required to determine die design parameters in accordance with product specifications.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify product requirements	1.1 ***Product material*** is identified as required. 1.2 ***Die classification*** is determined based on production volume. 1.3 ***Production process*** is identified based on product requirements in all situations	1.1 Customer expectations 1.2 Types and properties of product material 1.3 Die classification 1.4 Types of production process 1.5 OSH Rule No. 1060 – Premises of Establishments 1.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	1.1 Identifying product material 1.2 Determining die classification 1.3 Identifying production process(es)
2. Identify die material parameters	2.1 ***Die material*** requirements are identified as required. 2.2 ***Production volume*** is determined based on product requirements. 2.3 ***Design parameters*** are identified based on product requirements.	2.1 Company Policy 2.2 Handbooks and catalogs 2.3 Types of material 2.4 Properties of material 2.5 Metrology 2.6 Calculation 2.7 Material selection 2.8 Standard parts identification 2.9 OSH Rule No. 1060 – Premises of Establishments 2.10 OSH Rule No. 1070 – Occupational Health & Environmental Control	2.1 Identifying die material requirements 2.2 Determining production volume 2.3 Identifying design parameters

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Determine equipment	3.1. Press ***machine type end capacity*** is determined based on die requirements. 3.2. Product volume is determined based on cycle time. 3.3. Die design is determined based on ***type of Machine***	3.1 Customer expectations 3.2 Manuals and catalogs 3.3 Principles of press working 3.4 Calculation 3.5 Types of machines 3.6 Parts and functions of equipment 3.7 OSH Rule No. 1060 – Premises of Establishments 3.8 OSH Rule No. 1070 – Occupational Health & Environmental Control 3.9 OSH Rule No. 1080 – Personal Protective Equipment & Devices 3.10 OSH Rule No. 1200 – Machine Guarding 3.11 Noise pollution 3.12 Air pollution	3.1 Determining press machine capacity 3.2 Determining product volume 3.3 Determining die design

RANGE OF VARIABLES

VARIABLE	RANGE
1. Product material	May include: 1.1 Metallic 1.2 Non-metallic
2. Die classification	May include: 2.1 Simple 2.2 Compound 2.3 Progressive 2.4 Combination 2.5 Compression
3. Production process	May include: 3.1 Rolling 3.2 Extrusion 3.3 Press working
4. Die material	May include: 4.1 Carbon steel 4.2 Alloyed steel 4.3 Cast steel 4.4 Cast iron 4.5 Carbide 4.6 High speed steel
5. Production volume	May include: 5.1 Short run 5.2 Medium run 5.3 Long run
6. Design parameters	May include: 6.1 Clearance 6.2 Dimension 6.3 Allowance 6.4 Surface finish 6.5 Hardness 6.6 Standard parts
7. Machine capacity	May include: 7.1 Tonnage 7.2 Shot height 7.3 Table size 7.4 Shank dimension
8. Type of Machine	May include: 8.1 Press machine 8.1.1 Mechanical 8.1.2 Hydraulic 8.1.3 Pneumatic 8.1.4 Combination 8.1.5 Knuckle 8.2 Rolling Machine 8.3 Extrusion machine

EVIDENCE GUIDE

1. Critical aspect of competency	**Assessment requires evidence that the candidate:** 1.1 Identified product requirements 1.2 Identified die material parameters 1.3 Determined equipment 1.4 Observed safety practices in accordance with OSH standards 1.5 Communicated effectively with others to ensure effective work operation
2. Resource implications	**The following resources should be provided:** 2.1 Sample product 2.2 Product drawing 2.3 Reference books 2.4 Instruction 2.5 Manuals
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/ 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 CAD OPERATION**

UNIT CODE : **MEE722322**

UNIT DESCRIPTOR : This unit covers the skills and knowledge required to create drawings with the use of Computer Aided Design (CAD) software.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine job requirements	1.1 ***Instructions and relevant materials*** are obtained as required. 1.2 Product samples and drawings are verified for design consistency. 1.3 Missing dimensions are determined using measuring instruments.	1.1 Work instructions 1.2 Sketches and drawings 1.3 Product sample 1.4 Metrology 1.5 Fundamental operation 1.6 Geometry 1.7 CAD Software	1.1 Obtaining instructions and relevant materials 1.2 Verifying product drawing dimensions based on actual product sample. 1.3 Determining missing dimensions on product drawing using measuring instruments.
2. Prepare the CAD environment	2.1 All relevant manuals, instructions and operating procedures for the CAD software are obtained in accordance with workplace procedures. 2.2 The CAD package is booted up in accordance with workplace procedures. 2.3 Screen display area is set to required ***CAD environment*** and **design toolbars** are set in accordance with instructions.	2.1 CAD Manuals 2.2 3D tutorial 2.3 Work instructions 2.4 CAD software 2.5 Workstation 2.6 OSH Rule No. 1060 – Premises of Establishments 2.7 OSH Rule No. 1070 – Occupational Health & Environmental Control	2.1 Obtaining relevant manuals, instructions and operating procedures for the CAD software 2.2 Booting up the CAD package 2.3 Setting the screen display area and design toolbars 2.4 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Create 3D CAD drawings	3.1. ***3D CAD drawings*** are created and guidance is sought as required. 3.2. Drawings are prepared in accordance with existing standard. 3.3. 3D CAD drawings are reviewed by ***concerned person*** in accordance with workplace procedures. 3.4. Reviewed 3D CAD drawings are modified, if necessary. duties and area of responsibility	3.1 CAD Manuals 3.2 3D tutorial 3.3 Work instructions 3.4 Verbal communication 3.5 Drafting 3.6 Fundamental operation 3.7 Geometry 3.8 Trigonometry 3.9 Conversion of units 3.10 CAD software 3.11 Workstation 3.12 OSH Rule No. 1060 – Premises of Establishments 3.13 OSH Rule No. 1070 – Occupational Health & Environmental Control	3.1 Creating 3D CAD drawings 3.2 Preparing drawings 3.3 Modifying reviewed 3D CAD drawings 3.4 Applying safety procedures
4. Save 3D CAD drawing	4.1 Drawing files are saved in the designated folder in accordance with standard operating procedures. 4.2 3D CAD drawings are verified if saved to the designated folder 4.3 Programs are closed in accordance with standard operating procedures 4.4 Computer is shut-down in accordance with standard operating procedures.	4.1 CAD Manuals 4.2 Work instructions 4.3 CAD software 4.4 Workstation 4.5 OSH Rule No. 1060 – Premises of Establishments 4.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	4.1 Saving drawing files 4.2 Closing and Shutting down of programs and computer 4.3 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Instructions and relevant materials	May include: 1.1 Instructions 1.2 Sample product 1.3 Drawings 1.4 Sketches 1.5 Concept
2. CAD environment	May include: 2.1 Modeling 2.2 Drafting
3. Design toolbars	May include: 3.1 Standard 3.2 Sketch 3.3 Feature 3.4 View 3.5 Selection bar 3.6 Utility 3.7 Modelling Tool 3.8 Edit 3.9 Surface
4. 3D CAD Drawings	May include: 4.1 Product drawing 4.2 Parts drawing 4.3 Assembly drawing
5. Concerned person	May include: 5.1 Design Supervisor 5.2 Designer 5.3 Production supervisor

EVIDENCE GUIDE

1. Critical aspect of competency	**Assessment requires evidence that the candidate:** 1.1 Determined job requirements 1.2 Prepared CAD environment 1.3 Created 3D CAD drawings 1.4 Observed safety practices in accordance with OSH standards 1.5 Communicated effectively with others to ensure effective work operation
2. Resource implications	**The following resources should be provided:** 2.1 Product sample 2.2 Product drawing 2.3 Reference books 2.4 Work instruction 2.5 Manuals 2.6 3D CAD software 2.7 Tutorials 2.8 Workstation
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/ 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 : SIMULATE AND VERIFY DIE DESIGN

UNIT CODE : MEE722323

UNIT DESCRIPTOR : This unit covers the skills and knowledge required for simulating and verifying die design with the use of simulation software.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine job requirements	1.1 ***Simulation requirements*** are identified as required. 1.2 3D CAD drawings for simulations are prepared. 1.3 3D CAD drawings are converted to appropriate extension file.	1.1 Work instructions 1.2 Verbal communication 1.3 Material characteristics 1.4 CAD simulation software 1.5 OSH Rule No. 1060 – Premises of Establishments 1.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	1.1 Identifying simulation requirements 1.2 Preparing 3D CAD drawing for simulations 1.3 Converting 3D CAD drawing to appropriate extension file
2. Prepare the CAD simulation environment	2.1 All relevant manuals, instructions and operating procedures for simulation are obtained in accordance with workplace procedures. 2.2 The CAD package is booted up in accordance with workplace procedures. 2.3 ***Simulation toolbars and environment*** are set in accordance with instructions.	2.1 CAD simulation manuals 2.2 CAD Simulation tutorial 2.3 Work instructions 2.4 CAD simulation software 2.5 Workstation 2.6 OSH Rule No. 1060 – Premises of Establishments 2.7 OSH Rule No. 1070 – Occupational Health & Environmental Control	2.1 Obtaining relevant manuals, instructions and operating procedures for simulation 2.2 Booting up the CAD package 2.3 Setting the simulation toolbars and environment 2.4 Applying safety procedures
3. Simulate and verify 3D CAD drawings	3.1. ***3D CAD drawings*** are simulated and verified in accordance with the existing standard and guidance is sought as required.	3.1 CAD simulation manuals 3.2 CAD simulation tutorial 3.3 Work instructions	3.1 Simulating and verifying 3D CAD drawings 3.2 Printing out simulation results 3.3 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.2. Simulated results are verified if saved to the designated folder. 3.3. Simulation results are reviewed by ***concerned person*** in accordance with company procedures. 3.4. Simulation results are printed out in accordance with standard operating procedures, if required.	3.4 Verbal communication 3.5 Meshing principles 3.6 Simulation analysis 3.7 CAD simulation software 3.8 Workstation 3.9 OSH Rule No. 1060 – Premises of Establishments 3.10 OSH Rule No. 1070 – Occupational Health & Environmental Control	
4. Save simulation results	4.1 Simulation results are saved in the designated folder in accordance with standard operating procedures. 4.2 Simulation results are verified if saved to the designated folder. 4.3 Programs are closed in accordance with standard operating procedures. 4.4 Computer is shut-down in accordance with standard operating procedures.	4.1 CAD simulation manuals 4.2 Work instructions 4.3 CAD simulation software 4.4 Workstation 4.5 OSH Rule No. 1060 – Premises of Establishments 4.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	4.1 Saving simulation results 4.2 Verifying simulation results 4.3 Closing and shutting down of programs and computer 4.4 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Simulation requirements	May include: 1.1 Blank size 1.2 Gravity 1.3 Thinning 1.4 Spring back 1.5 Wrinkles
2. Simulation toolbars	May include: 2.1 Collectors 2.2 Visualization 2.3 Display
3. Simulation Environment	May include: 3.1 Mesh 3.2 Analysis 3.3 Results
4. 3D CAD Drawings	May include: 4.1 Product drawing 4.2 Parts drawing 4.3 Assembly drawing
5. Concerned person	May include: 5.1 Design Supervisor 5.2 Designer 5.3 Production supervisor

EVIDENCE GUIDE

1. Critical aspect of competency	**Assessment requires evidence that the candidate:** 1.1 Determined job requirements 1.2 Prepared simulation CAD environment 1.3 Simulated and verified 3D CAD drawings 1.4 Saved simulation results 1.5 Observed safety practices in accordance with OSH standards 1.6 Communicated effectively with others to ensure effective work operation
2. Resource implications	**The following resources should be provided:** 2.1 Product drawing 2.2 Reference books 2.3 Work instruction 2.4 Manuals 2.5 3D CAD software 2.6 Tutorials 2.7 Workstation
3. Method of assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/ 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 : MODIFY AND FINALIZE DIE DESIGN

UNIT CODE : MEE722324

UNIT DESCRIPTOR : This unit covers the skills and knowledge required for modifying and finalizing drawings with the use of Computer Aided Design (CAD) software.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare the CAD environment	1.1 All relevant manuals, instructions and operating procedures for the CAD software are obtained in accordance with workplace procedures. 1.2 The CAD package is booted up in accordance with workplace procedures. 1.3 Screen display area is set to required ***CAD environment*** and **design toolbars** are set in accordance with instructions.	1.1 CAD Manuals 1.2 3D tutorial 1.3 Work instructions 1.4 CAD software 1.5 Workstation 1.6 OSH Rule No. 1060 – Premises of Establishments 1.7 OSH Rule No. 1070 – Occupational Health & Environmental Control	1.1 Obtaining all relevant manuals, instructions and operating procedures for the CAD software 1.2 Booting up the CAD package 1.3 Setting the screen display area and design toolbars 1.4 Applying safety procedures
2. Modify 3D CAD drawings	2.1 ***3D CAD drawings*** are modified based on simulation results. 2.2 Modified 3D CAD drawings are prepared in accordance with the existing standard. 2.3 Modified 3D CAD drawings are reviewed by ***concerned persons*** in accordance with workplace procedures.	2.1 CAD Manuals 2.2 3D tutorial 2.3 Work instructions 2.4 Verbal communication 2.5 Drafting 2.6 CAD software 2.7 Workstation 2.8 OSH Rule No. 1060 – Premises of Establishments 2.9 OSH Rule No. 1070 – Occupational Health & Environmental Control	2.1 Modifying 3D CAD drawings 2.2 Preparing modified CAD drawings 2.3 Applying safety procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Save modified 3D CAD drawings	3.1. Modified 3D CAD drawing files are saved in the designated folder in accordance with standard operating procedures. 3.2. Modified designs are verified if saved to the designated folder 3.3. Programs are closed in accordance with workplace procedures. 3.4. Computer is shut-down in accordance with workplace procedures.	3.1 CAD Manuals 3.2 Work instructions 3.3 CAD software 3.4 Workstation 3.5 OSH Rule No. 1060 – Premises of Establishments 3.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	3.1 Saving modified 3D CAD drawing files 3.2 Verifying simulation results 3.3 Closing and shutting down programs and computer 3.4 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. CAD environment	May include: 1.1 Modelling 1.2 Drafting
2. Design toolbars	May include: 2.1 Standard 2.2 Sketch 2.3 Feature 2.4 View 2.5 Selection bar 2.6 Utility 2.7 Modelling tool 2.8 Edit 2.9 Surface
3. 3D CAD drawings	May include: 3.1 Product drawing 3.2 Parts drawing 3.3 Assembly drawing
4. Concerned person	May include: 4.1 Design Supervisor 4.2 Designer 4.3 Production supervisor

EVIDENCE GUIDE

1. Critical aspect of competency	**1.1 Assessment requires evidence that the candidate:** 1.1.1 Prepared CAD environment 1.1.2 Modified 3D CAD drawings 1.1.3 Saved modified 3D CAD drawings 1.1.4 Observed safety practices in accordance with OSH standards 1.1.5 Communicated effectively with others to ensure effective work operation
2. Resource implications	**The following resources should be provided:** 2.1. Work instruction 2.2. Manuals 2.3. 3D CAD software 2.4. Tutorials 2.5. Workstation
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Written examination 3.2. Direct observation/ 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 : CREATE FABRICATION DRAWING

UNIT CODE : MEE722325

UNIT DESCRIPTOR : This unit covers the skills and knowledge required for preparing assembly and part drawings with the use of Computer Aided Design (CAD) software.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare assembly drawings	1.1 Screen display area is set to required ***CAD environment*** and **design toolbars** are set in accordance with instructions. 1.2 ***Assembly drawings*** are created in accordance with the existing standard, and guidance is sought as required. 1.3 Assembly drawings are reviewed by concerned persons in accordance with workplace procedures. 1.4 Reviewed assembly drawings are modified, if necessary. 1.5 Assembly drawing files are saved in designated folder in accordance with standard operating procedures.	1.1 Work instructions 1.2 Verbal communication 1.3 Drafting 1.4 CAD software 1.5 OSH Rule No. 1060 – Premises of Establishments 1.6 OSH Rule No. 1070 – Occupational Health & Environmental Control	1.1 Obtaining and understanding instructions and relevant materials 1.2 Obtaining all relevant manuals, instructions and operating procedures for the CAD software 1.3 Booting up the CAD package 1.4 Setting the screen display area and design toolbars 1.5 Creating assembly drawings 1.6 Preparing assembly drawings 1.7 Modifying reviewed assembly drawings 1.8 Saving assembly drawing files 1.9 Applying safety procedures
2. Prepare parts drawing	2.1 Screen display areas are set in required CAD environment in accordance with instructions. 2.2 ***Parts drawing*** are created in created in accordance with the existing standard, and guidance is sought as required.	2.1 Work instructions 2.2 Verbal communication 2.3 Drafting 2.4 CAD software 2.5 OSH Rule No. 1060 – Premises of Establishments 2.6 OSH Rule No. 1070 – Occupational Health &	2.1 Setting screen display areas 2.2 Creating parts drawing 2.3 Preparing parts drawing 2.4 Modifying reviewed part drawings 2.5 Saving part drawing files 2.6 Applying safety

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3 Parts drawing are reviewed by ***concerned persons*** in accordance with workplace procedures. 2.4 Reviewed part drawings are modified, if necessary. 2.5 Parts drawing files are saved in the designated folder in accordance with standard operating procedures.	Environmental Control	procedures
3. Print drawings	3.1. Assembly drawings are ***printed*** out in accordance with standard operating procedures. 3.2. Part drawings are printed out in accordance with standard operating procedures 3.3. Programs are closed in accordance with standard operating procedures. 3.4. Computer is shut-down in accordance with standard operating procedures.	3.1 Work instructions 3.2 CAD software 3.3 Workstation 3.4 Printer 3.5 Plotter 3.6 OSH Rule No. 1060 – Premises of Establishments 3.7 OSH Rule No. 1070 – Occupational Health & Environmental Control	3.1 Printing assembly and part drawings 3.2 Closing and shutting down programs and computer 3.3 Applying safety procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. CAD environment	May include: 1.1 Modeling 1.2 Drafting
2. Design toolbars	May include: 2.1 Standard 2.2 Selection bar 2.3 View 2.4 Utility 2.5 Table 2.6 Drawing 2.7 Dimension 2.8 Annotation 2.9 Symbol 2.10 Edit 2.11 Sketch 2.12 Lines and curve
3. Assembly drawing	May include: 3.1 Bill of materials 3.2 Isometric view 3.3 Orthographic view 3.4 Balloon 3.5 Dimension
4. Parts drawing	May include: 4.1 Orthographic view 4.2 Isometric view 4.3 Dimension 4.4 Label 4.5 Section 4.6 Tolerance 4.7 Allowance 4.8 Symbol 4.9 Surface finish 4.10 Material 4.11 Process 4.12 Quantity 4.13 Instruction
5. Concerned persons	May include: 5.1 Design supervisor 5.2 Designer 5.3 Production supervisor
6 Printed	May include: 6.1 Printer 6.2 Plotter

EVIDENCE GUIDE

1. Critical aspect of competency	**Assessment requires evidence that the candidate:** 1.1 Prepared assembly drawings 1.2 Prepared parts drawing 1.3 Printed drawings 1.4 Observed safety practices in accordance with OSH standards 1.5 Communicated effectively with others to ensure effective work operation
2. Resource Implications	**The following resources should be provided:** 2.1 Work instruction 2.2 Manuals 2.3 3D CAD software 2.4 Tutorials 2.5 Workstation
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/ 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 **DIE DESIGNING NC IV**.

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: DIE DESIGNING NC IV

Nominal Training Duration	**47**	**Hours**	**Basic Competencies**
	120	**Hours**	**Common Competencies**
	257	**Hours**	**Core Competencies**
Total -	**424**	**Hours**	

Course Description:

This course is designed to enhance the knowledge, skill and attitudes of DIE DESIGNING NC IV in accordance with industry standards. This covers competencies that a person must achieve in performing tasks such as determining die design parameters, performing CAD operation, simulation and verification of die design, modifying and finalizing of die design and creating fabrication drawing

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
(47 Hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
1. Utilize specialized communication skills	1.1 Meet common and specific communication needs of clients and colleagues	• Read ➢ Communication process ➢ Dynamics of groups and different styles of group leadership • Identify different approaches to meet the needs of clients and colleagues	• Lecture	• Written examination	1 Hour
	1.2. Contribute to the development of communication strategies	• Apply communication skills to fulfill job roles as specified by the organization • Apply communication techniques in communicating with clients and colleagues ➢ Active listening ➢ Feedback ➢ Interpretation ➢ Role boundaries setting ➢ Negotiation ➢ Establishing empathy • Describe strategies for internal and external dissemination of information	• Demonstration • Group discussion	• Observation • Oral evaluation	1 Hour
	1.3. Deliver a technical presentation	• Enhance the presentation using appropriate media • Deliver a clear and sequential presentation within given time	• Demonstration	• Observation	1 Hour
	1.4 Represent the organization	• Describe criteria for a good presentation • Prepare presentation material for internal or external forums to promote the organization	• Demonstration	• Observation	1 Hour
	1.5 Facilitate group discussion	• Gather relevant information • Apply values in facilitating differences in views	• Demonstration	• Observation	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
	1.6 Conduct interview	• Describe communication strategies employed in interview situations • Conduct interview • Apply organizations procedure in maintaining records of interviews • Use questioning, listening and nonverbal communication techniques to client groups	• Group discussion • Demonstration	• Oral evaluation • Observation	1 Hour
2. Develop and lead teams	2.1 Foster individual growth	• Discussion on Team Leadership and expectation from team leaders • Case study on learning and development needs of team members • Discussion on organizational requirements from team members • Role play on coaching and mentoring • Discussion on preparation of team members development plan • Role Play on providing feedback on performance	• Observation Lecture/ Discussion • Case Study • Role Play • Role Play • Case Study • Written Test	• Observation • Role Play • Case Study ▪ Written Test	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.2 Foster individual and team growth	• Discussion on learning and development program goal setting • Preparation of learning and development program goals • Discussion on learning delivery methods • Role play on the different learning delivery methods • Discussion on workplace learning opportunities • Role play on coaching and mentoring	• Lecture/ Discussion • Case Study • Role Play	• Observation • Role Play • Case Study • Written Test	2 Hours
	2.3 Monitor and evaluate workplace learning	• Discussion on the different levels of learning evaluation. • Discussion on the different methods used to evaluate learning • Develop reporting system for monitoring of performance attributed to learning programs • Gathering of information to evaluate individual performance attributed to learning programs • Case study on modification of learning plan based on performance	• Lecture/ Discussion • Case Study Role Play	• Observation • Role Play • Case Study • Written Test	2 Hours
	2.4 Develop team commitment and cooperation	• Discussion on team commitment and cooperation and its impact to attainment of goals • Play games on team commitment and cooperation • Discussion on team dynamics and its relation to team performance • Play games on team dynamics and performance • Development of career plans	• Lecture/ Discussion • Case Study • Role Play	• Observation • Role Play • Case Study • Written Test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.5 Facilitate accomplishment of team goals	• Perform team building activities towards improving communication among team members, goal setting and improving performance • Case studies involving collaborative activities to improve attainment of group goals	• Group Activity • Case Study	• Role Play • Case Study • Observation	1 Hour
3. Perform higher-order thinking processes and apply techniques in the workplace	3.1 Evaluate effectiveness and efficiency of the workplace systems, processes and procedures	• Examine current systems, standards, procedures and protocols in the workplace • Discuss different methods of critical and appreciative inquiry and their relevance to different situations • Form habit of asking questions and taking responsibility for answers • Appreciate importance of why questions for individuals, businesses and communities • Use range of analytical techniques • Examine different strategies and techniques in communicating results, applying critical thinking pathway, assessing effectiveness and efficiency of systems, processes and procedures	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
	3.2 Foster the habit of critical inquiry and curiosity in the workplace	• Discuss different methods of critical and appreciative inquiry and their relevance to different situations • Form habit of asking questions and taking responsibility for answers • Appreciate importance of why questions for individuals, businesses and communities • Use range of analytical techniques, growth mindset and positive communication strategies • Examine different strategies and techniques in communicating results, applying critical thinking pathway, assessing effectiveness and efficiency of systems, processes and procedures • Discuss insights on workplace effectiveness and efficiency	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
	3.3 Develop practical action plans for improving workplace conditions	• Use range of analytical techniques, growth mindset and positive communication strategies in developing action plans for efficiency and effectiveness • Examine different strategies and techniques in communicating results, applying critical thinking pathway, assessing effectiveness and efficiency of systems, processes and procedures • Discuss concepts creative negotiation skills, change management and improvement strategies	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test • Project-based learning	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
4. Contribute to the practice of social justice in the workplace	4.1 Update self on local, national and global trends/ issues in the workplace	• Explain the local, national and global systems and structures • Discuss issues affecting interaction and connectedness of communities at local, national and global levels • Explain underlying assumptions and power dynamics (politics, understanding political system, social structures, labor laws, labor relations, human right) • Monitor trends and issues relevant to human rights, gender equality, culture of peace, global citizenship, and cultural diversity using different media platforms • Analyze trends and issues relevant to human rights, gender equality, culture of peace, global citizenship, and cultural diversity • Engage in discourse about the local, national and global issues	• Interactive Lecture • Small Group Discussion • Brainstorming • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination (Essay) • Role Playing	1 Hour
	4.2 Relate local and global trends to workplace context	• Discuss the different levels of human identity according to Amber Mayer (2015) • Explain different communities people belong to and how these are connected • Recognize cultural differences and respect for cultural diversity • Recognize differences and commonalities among people • Demonstrate attitudes of empathy, solidarity and respect for diversity • Connect local issues to global trends, and vice versa.	• Interactive Lecture • Small Group Discussion • Brainstorming • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination (Essay)	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
	4.3 Engage and take actions on workplace issues and concerns	• Identify the actions that can be taken individually and collectively • Describe ethically responsible behaviour • Explain the importance and benefits of civic engagement • Employ appropriate actions to address workplace issues involving national and global trends • Show concern and willingness to take part in the development efforts to discuss workplace issues and concerns • Apply the attitude of "thinking globally and acting locally" in the workplace	• Interactive Lecture • Small Group Discussion • Brainstorming • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination (Essay) • Role Playing	1 Hour
5. Manage innovative work instructions	5.1 Review and analyze existing workplace practices	• Show mastery of basic management concepts according to Gallup, nine dimensions of innovative practices and climate; and different types of innovation • Contextualize innovation to different variables in the organization • Review current organizational practices where innovation is contextualized	• 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 Method	Nominal Duration
				virtues applied	
	5.2 Examine opportunities for continuous improvement and innovation of practices in the workplace	• Show mastery of the determinants of innovative behaviors and principles of innovation • Review current organizational practices where innovation is contextualized • Evaluate innovative practices in the organization • Assess innovative behaviors for promoting innovation and learning in the workplace	• 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 Implement innovative ways in the conduct of usual workplace practices	• Show mastery of the determinants of innovative behaviors, principles of innovation; and dimensions of innovation climate and strategies and techniques for implementing innovation in the workplace • Evaluate impact of innovative practices in the organization • Demonstrate skills in managing changes in the workplace	• 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	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
				performance. • Standardized assessment of character strengths and virtues applied	
6. Manage and evaluate usage of information	6.1 Review information needs and sources	• Lecture and discussion on: o Kinds of information o Information evaluation issues o Information storage requirements and methods • Analysing record information • Identification of information sources	• Lecture • Group Discussion • Hands on • Demonstration • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.2 Collect and analyze information	• Lecture and discussion on: o Information collection and collation o Relevant trends and developments • Collection of information • Analyzation of information	• Lecture • Group Discussion • Hands on • Demonstration • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.3 Use management information systems	• Lecture and discussion on: o Management information systems o Available technology in information management o Advance strategies for customer service excellence • Use of available technology in information management	• Lecture • Group Discussion • Hands on • Demonstration • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.4 Report and disseminate analyzed information	• Lecture and discussion on: o Reporting procedures of the organisation o Analysis and display techniques • Using management information systems to store and retrieve data	• Lecture • Group Discussion • Hands on • Demonstration • Practical exercises	• Oral evaluation • Written Test • Observation • Presentation	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
7. Lead in improvement of Occupational Safety and Health (OSH) programs, policies and procedures	7.1 Assess Occupational Safety and Health (OSH) practices and programs	• Case Study in evaluating current OSH programs effectiveness • Practice auditing the workplace	• Lecture • Group Discussion • Case Study • Group Project	• Written Exam • Demonstration • Observation • Interviews / Questioning Portfolio	2 Hours
	7.2 Recommend OSH program improvement initiatives	• Writing and Presenting Action Plans to improve OSH compliance in the workplace and/or increase effectiveness of OSH Programs	• Lecture • Group Discussion • Case Study • Group Project	• Written Exam • Demonstration • Observation • Interviews / Questioning Portfolio	4 Hours
	7.3 Implement recommended improvements on Occupational Safety and Health (OSH) Programs, Procedures and Policies	• Role play in increasing the OSH awareness • Measuring the impact of the new OHS program or initiative	• Lecture • Group Discussion • Case Study • Group Project	• Written Exam • Demonstration • Observation • Interviews / Questioning Portfolio	2 Hours
8. Lead towards improvement of environmental work programs, policies and procedures	8.1 Assess environmental work practices and programs	• Discussion of Green structural change and retraining needs - What is green structural change and where is it happening - Workforce restructuring and adjustment - Employment effects of Environment - Sectors most affected by green restructuring - Retraining and skills upgrading - Effective and equitable restructuring: Good practices and programs by public and private sector actors	• Lecture • Group Discussion • Demonstration • Case Study • Reporting	• Written Exam • Demonstration • Observation • Interviews / Questioning • Third Party Reports	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Perform Impact Assessment • Discussions of Gender Implications			
	8.2 Recommend environmental program improvement initiatives	• Practicing Leadership skills: The biggest challenge in transition to a low-carbon economy or environment friendly activities • Practicing Basic Business planning • Opportunities Management - Identification of low-carbon and Resource scarcity risks • Perform Cost–benefit Analysis	• Lecture • Group Discussion • Demonstration • Case Study • Reporting	• Written Exam • Demonstration • Observation • Interviews / Questioning • Third Party Reports	1 Hour
	8.3 Implement recommended improvements on environmental programs, policies and procedures	• Practicing Environmental Awareness Raising (Communication/ Implementation campaigns) • Teaching and training personnel - necessary skills and methods to impart environmental knowledge, to create awareness and to react flexibly to ever-changing labor market needs.	• Lecture • Group Discussion • Demonstration • Case Study • Reporting	• Written Exam • Demonstration • Observation • Interviews / Questioning • Third Party Reports	1 Hour
9. Sustain entrepreneurial skills	9.1 Enhance one's business skills	• Discussion on entrepreneurial skills • Identifying market trends • Case studies on new technologies, products and processes • Practice gathering information on new trends	• Lecture/ Discussion • Case study • Group work	• Written Report • Case problem	2 Hours
	9.2 Manage entrepreneurial practices	• Discussion on continuous improvement • Presentation of plans for continuous improvement • Evaluation of new products and services	• Lecture discussion • Group work	• Written Report • Case problem	1 Hour
	9.3 Expand markets and clientele	• Prepare business plan and proposal	• Lecture discussion • Group work	• Portfolio	1 Hour

COMMON COMPETENCIES
(120 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 Hours
	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 according to drawing.	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	16 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	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	8 Hours
	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	
	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 Hours

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 Hours
	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 Hours
	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 Hours
	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 Hours
	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 Hours
	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 Hours
	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	
11. Operate a personal computer	11.1 Start the computer	• Obtained properly connected peripheral devices • Know how to proper logging in and logging off • Know how to check system features and hardware configuration	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	16 hours
	11.2 Arrange and customize desktop display/ Windows settings	• Know how to add, rename, move, copy and delete desktop icon • Know how to access online help • Know how to select and desktop icons of application program	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	11.3 Work with files and folders (or directories	• Know how to create, open, move, rename and copy a file or folder • Know how to organize various files • Know how to search files and information	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	11.4 Work with user application programs	• Know how to add, change remove and ran application program • Know how to install, update and upgrade software and application	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	11.5 Print information	• Know how to install printer program and ensure correct printer setting	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	
	11.6 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
(257 Hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Determine die design parameters	1.1 Identify product requirements	• Examine the product drawing including product sample and ascertain the material and production volume requirement • Know how to identify appropriate die classification and production process • Determine design parameters using product and production data	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	4 hrs
	1.2 Identify die material parameters	• Explain how to select appropriate die material based on selected production process • Describe the properties of different die materials • Determine die design parameters using die material and production volume data	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	4 hrs
	1.3 Determine appropriate equipment	• Explain how to select appropriate machine capacity • Describe the parts and functions of various types of machine	• Lecture-Discussion • Demonstration • Interaction • Video presentation • Practical Exercises	• Written Examination • Observation • Oral Questioning	3 hrs
2. Perform CAD operation	2.1 Determine job requirements	• Know and obtain the required information to perform CAD operation	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	4 hrs
	2.2 Prepare the CAD environment	• Explain the features of the CAD software package • Set the CAD software package to required environment	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Observation • Oral Questioning	40 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	2.3 Create 3D CAD drawings	• Know and explain the steps in preparing and modifying 3D CAD drawings • Perform step-by-step process to create 3D CAD drawings	• Lecture-Discussion • Practical exercise • Interaction • Demonstration • Tutorial	• Observation • Oral Questioning • Demonstration • Evaluation	80 hrs
	2.4 Save 3D CAD drawing	• Save drawing files in accordance with standard operating procedures • Close CAD program and shutdown computer	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Observation • Oral Questioning	8 hrs
3. Simulate and verify die design	3.1 Determine job requirements	• Identify and describe possible product material flaws	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Oral Questioning	4 hrs
	3.2 Prepare the CAD environment	• Explain the simulation features of the CAD package • Set the CAD software to required simulation toolbars and environment	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Observation • Oral Questioning	16 hrs
	3.3 Simulate and verify 3D CAD drawings	• Know and explain the steps in simulating and verifying 3D CAD drawings • Perform step-by-step process to simulate and verify 3D CAD drawings	• Lecture-Discussion • Practical exercise • Interaction • Demonstration • Tutorial	• Observation • Oral Questioning • Demonstration • Evaluation	24 hrs
	3.4 Save simulation results	• Save simulation results in accordance with standard operating procedures • Close CAD program and shutdown computer	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Observation • Oral Questioning	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
4. Modify and finalize die design	4.1 Prepare the CAD environment	• Set the CAD software package to required environment	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Written Examination • Observation • Oral Questioning	2 hrs
	4.2 Modify 3D CAD drawings	• Know and explain the steps in modifying and finalizing 3D CAD drawings • Perform step-by-step process to modify and finalize 3D CAD drawings	• Lecture-Discussion • Practical exercise • Interaction • Demonstration • Tutorial	• Observation • Oral Questioning • Demonstration • Evaluation	4 hrs
	4.3 Save modified 3D CAD drawings	• Save modified 3D CAD drawings in accordance with standard operating procedures • Close CAD program and shutdown computer	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Observation • Oral Questioning	2 hrs
5. Create fabrication drawing	5.1 Prepare assembly drawings	• Know and explain the steps in preparing and modifying assembly drawings • Perform step-by-step process to create assembly drawings • Save assembly drawing files in accordance with standard operating procedures	• Lecture-Discussion • Practical exercise • Interaction • Demonstration • Tutorial	• Observation • Oral Questioning • Demonstration • Evaluation	16 hrs
	5.2 Prepare parts drawing	• Know and explain the steps in preparing and modifying parts drawings • Perform step-by-step process to create parts drawings • Save parts drawings files in accordance with standard operating procedures	• Lecture-Discussion • Practical exercise • Interaction • Demonstration • Tutorial	• Observation • Oral Questioning • Demonstration • Evaluation	40 hrs
	5.3 Print drawings	• Print assembly and parts drawings in accordance with standard operating procedures • Close CAD program and shutdown computer	• Lecture-Discussion • Practical exercise • Interaction • Demonstration	• Observation • Oral Questioning	2 hrs

3.1 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).

3.2 TRAINEE ENTRY REQUIREMENTS

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

- Technology Graduate or have completed basic engineering course
- Computer literate with CAD background
- Industrial experience in die making with CNC background
- Can communicate both orally and in writing
- Can perform mathematical computation (including the application of strength of materials)

3.3 LIST OF TOOLS, EQUIPMENT AND MATERIALS

List of tools, equipment and materials for the training of a maximum of 10 trainees for DIE DESIGN NC IV are as follows:

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
10 unit	3D CAD software license	10 unit	Workstation (As per minimum requirement of design and manufacturing software)	2 rim	Bond paper (A4 & A3 size)
10 unit	CAD Simulation software license	1 unit	Printer (A4/A3 size)	5 units	Printer ink (black/ colored)
10 unit	Caliper (300mm)	1 unit	Copier machines (A3/A4 size)	1 lot	Toner
10 unit	Micrometer	1 unit	Plotter (Optional)	1 lot	Whit board markers & Eraser
10 unit	Scientific Calculator	1 unit	Digital light projector	10 pcs	Mechanical Pencil
10 pcs.	Steel Rule	1 lot	Audio system	10 pcs.	Eraser
10 unit	Chairs				
10 unit	Table				
5 unit	Locker cabinet				
1 lot	presentation materials				
1 unit	White board				
1 lot	References				

3.4 TRAINING FACILITIES

Based on class intake of 10 students/trainees.

TEACHING/LEARNING AREAS	SIZE IN METERS	AREA IN SQ. METERS	QTY	TOTAL AREA IN SQ. METERS
Lecture Area	5 x 8	40	1	40
Laboratory Area	5 x 8	40	1	40
Tool Room / Storage Area	4 x 5	20	1	20
Wash, Toilet & Locker Room	1 x 2	2	1	2
Total Area				102

Note:

Training center may enter into a Memorandum of Understanding (MOU) with an institution/company with appropriate equipment and facilities.

3.5 TRAINERS QUALIFICATION FOR DIE DESIGNING NC IV

- Holder of National TVET Trainer Certificate Level I (NTTC Level I) in DIE DESIGNING NC IV
- At least technology graduate related to Mechanical Engineering
- Must be computer literate
- Must have at least 3 years experience in Die Designing with working knowledge in CNC programming and machining or at least 5 years teaching experience and 240 hours relevant training in Die Designing and Fabrication
- Must have at least 2 years experience in designing using CAD software.

3.6 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 a full qualification or employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

2.1 NATIONAL ASSESSMENT AND 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 Die Designing NC IV

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
DIE DESIGNING NC IV

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	**Determine die design parameters**	**Perform CAD operation**	**Simulate and verify die design**
Modify and finalize die design	**Create fabrication drawing**		

GLOSSARY OF TERMS

1.	Assembly Drawing	Are used to show the position and functional relationship of parts in an assembly.
2.	CAD (computer-aided design)	Refers to the software used to create precision drawings or technical illustrations and can be used to create two-dimensional (2-D) drawings or three-dimensional (3-D) models.
3.	Compound Die	A die in which two cutting operations are accomplished in one press stroke. The most common type of compound die blanks and pierces a part.
4.	Combination Die	A die in which a cutting operation and a noncutting operation on a part are accomplished in one stroke of the press. The most common type of combination die blanks and draws a part.
5.	Dimensions	Refers to the collective process of modeling, defining and describing geometric sizes and feature relationships, and providing all of the required technical information necessary to produce and inspect the part.
6.	Die	Refers to any various tools or devices for imparting a desired shape, form, or finish to a material.
7.	Extrusion Die	A die in which a punch forces metal to plastically flow through a die orifice so that the metal assumes the contour and cross-sectional area of the orifice.
8.	Machine	Refers to an equipment used for the manufacturing of formed products.
9.	Material	Refers to the substance or substances of which the product is made of composed.
10.	Part Drawing	Detail drawing completely described a single parts with multiple orthographic projections.
11.	Process	Refers to a continuous action or operation taking place in a definite manner.
12.	Product	Refers to the outcome produced during forming process.
13.	shut height	The distance from the finished top face of the upper shoe to the finished bottom face of the lower shoe, immediately after the die operation and with the work in the die.

14.	Simulation	Refers to the representation of the behavior or characteristics of the product through the use of software.
15.	Specification	Refers to a detailed description or assessment of requirements.
16.	Tolerance	Refers to the range of permissible size
17.	Toolbars	Refers to horizontal row or vertical column of selectable buttons displayed on a computer screen, allowing the user to select a variety of functions.

TRAINING REGULATIONS (TR)
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