COMPETENCY STANDARDS

PRODUCTION OPERATION (SAW WAFERS) LEVEL III

MANUFACTURING SECTOR

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

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MANUFACTURING SECTOR
PRODUCTION OPERATOR (SAW WAFERS) LEVEL III

COMPETENCY STANDARDS FOR
PRODUCTION OPERATION (SAW WAFERS) LEVEL III

The **PRODUCTION OPERATION (SAW WAFERS) LEVEL III** consists of competencies that a person must achieve in checking apparel requirements, safety, and housekeeping, checking data in the process traveler card vs actual materials, evaluating set-up and buy-off wafer sawing, performing wafer sawing and cleaning, performing sawn wafer quality inspection.

The Units of Competency comprising this Qualification include the following:

UNIT CODE	BASIC COMPETENCIES
400311319	Lead workplace communication
400311320	Lead small teams
400311321	Apply critical thinking and problem solving techniques in the workplace
400311322	Work in a diverse environment
400311323	Propose methods of applying learning and innovation in the organization
400311324	Use information systematically
400311325	Evaluate occupational safety and health work practices
400311326	Evaluate environmental work practices
400311327	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)
UNIT CODE	**COMMON COMPETENCIES**
ELC311205	Use Hand Tools
ELC311204	Apply Quality Standards
ELC311203	Perform Computer Operations
UNIT CODE	**CORE COMPETENCIES**
CS-ELC821306	Check Apparel Requirements, Safety, and Housekeeping
CS-ELC821307	Check Data in the Process Traveler Card vs Actual Materials
CS-ELC821308	Evaluate Set-Up and Buy-Off Wafer Sawing
CS-ELC821309	Perform Wafer Sawing and Cleaning
CS-ELC821310	Perform Sawn Wafer Quality Inspection

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

- Production Operator (Saw Dicing/Sawing)

SECTION 2 COMPETENCY STANDARDS

This section details the contents of the basic, common and core units of competency required in **PRODUCTION OPERATION (SAW WAFERS) LEVEL III.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : 400311319

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the effective dissemination and discussion of ideas, information, and issues in the workplace. This includes preparation of written communication materials.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Communicate information about workplace processes	1.1 Relevant ***communication method*** is selected based on workplace procedures 1.2 Multiple operations involving several topics/areas are communicated following enterprise requirements 1.3 Questioning is applied to gain extra information 1.4 Relevant sources of information are identified in accordance with workplace/ client requirements 1.5 Information is selected and organized following enterprise procedures 1.6 Verbal and written reporting is	1.1. Organization requirements for written and electronic communication methods 1.2. Effective verbal communication methods 1.3. Business writing 1.4. Workplace etiquette	1.1 Organizing information 1.2 Conveying intended meaning 1.3 Participating in a variety of workplace discussions 1.4 Complying with organization requirements for the use of written and electronic communication methods 1.5 Effective business writing 1.6 Effective clarifying and probing skills 1.7 Effective questioning techniques (clarifying and probing)

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	undertaken when required 1.7 Communication and negotiation skills are applied and maintained in all relevant situations		
2. Lead workplace discussions	2.1 Response to workplace issues are sought following enterprise procedures 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to ***workplace discussions*** on such issues as production, quality and safety 2.4 Goals/ objectives and action plans undertaken in the workplace are communicated promptly	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods 2.3 Workplace etiquette	2.1 Organizing information 2.2 Conveying intended meaning 2.3 Participating in variety of workplace discussions 2.4 Complying with organization requirements for the use of written and electronic communication methods 2.5 Effective clarifying and probing skills
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel	3.1 Organization requirements for written and electronic communication methods 3.2 Effective verbal communication methods 3.3 Workplace etiquette 3.4 Communication problems and issues 3.5 Barriers in communication	3.1 Organizing information 3.2 Conveying intended meaning 3.3 Participating in a variety of workplace discussions 3.4 Complying with organization requirements for the use of written and electronic communication methods 3.5 Effective clarifying and probing skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.4 Communication problems and issues are raised as they arise 3.5 Identify barriers in communication to be addressed appropriately		3.6 Identifying issues 3.7 Negotiation and communication skills

RANGE OF VARIABLE

VARIABLE	RANGE
1. Methods of communication	May include: 1.1 Non-verbal gestures 1.2 Verbal 1.3 Face-to-face 1.4 Two-way radio 1.5 Speaking to groups 1.6 Using telephone 1.7 Written 1.8 Internet
2. Workplace discussions	May include: 2.1 Coordination meetings 2.2 Toolbox discussion 2.3 Peer-to-peer discussion

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Dealt with a range of communication/information at one time 1.2 Demonstrated leadership skills in workplace communication 1.3 Made constructive contributions in workplace issues 1.4 Sought workplace issues effectively 1.5 Responded to workplace issues promptly 1.6 Presented information clearly and effectively written form 1.7 Used appropriate sources of information 1.8 Asked appropriate questions 1.9 Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1 Variety of Information 2.2 Communication tools 2.3 Simulated workplace

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Case problem 3.2 Third-party report 3.3 Portfolio 3.4 Interview 3.5 Demonstration/Role-playing
4. Context of Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL ITEMS

UNIT CODE : 400311320

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting, maintaining and monitoring team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1 ***Work requirements*** are identified and presented to team members based on company policies and procedures 1.2 Reasons for instructions and requirements are communicated to team members based on company policies and procedures 1.3 ***Team members' and leaders' concerns*** are recognized, discussed and dealt with based on company practices	1.1 Facilitation of Team work 1.2 Company policies and procedures relating to work performance 1.3 Performance standards and expectations 1.4 Monitoring individual's and team's performance vis a vis client's and group's expectations	1.1 Communication skills required for leading teams 1.2 Group facilitation skills 1.3 Negotiating skills 1.4 Setting performance expectation
2. Assign responsibilities	2.1 Responsibilities are allocated having regard to the skills, knowledge and aptitude required to undertake task based on company policies 2.2 Duties are allocated having regard to individual	2.1 Work plan and procedures 2.2 Work requirements and targets 2.3 Individual and group expectations and assignments 2.4 Ways to improve group leadership and membership	2.1 Communication skills 2.2 Management Skills Negotiating skills 2.3 Evaluation skills 2.4 Identifying team member's strengths and rooms for improvement

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	preference, domestic and personal considerations, whenever possible		
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs 3.2 Performance expectations are based on individual team member's knowledge, skills and aptitude 3.3 Performance expectations are discussed and disseminated to individual team members	3.1 One's roles and responsibilities in the team 3.2 Feedback giving and receiving 3.3 Performance expectation	3.1 Communication skills 3.2 Accurate empathy 3.3 Congruence 3.4 Unconditional positive regard 3.5 Handling of Feedback
4. Supervise team performance	4.1 ***Performance is monitored*** based on defined performance criteria and/or assignment instruction 4.2 Team members are provided with ***feedback***, positive support and advice on strategies to overcome any deficiencies based on company practices 4.3 ***Performance issues*** which cannot be rectified or addressed	4.1 Performance coaching 4.2 Performance management 4.3 Performance issues	4.1 Communication skills required for leading teams 4.2 Coaching skill

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	within the team are referred to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed on accordance with company procedures		

RANGE OF VARIABLE

VARIABLE	RANGE
1. Work requirements	May include: 1.1 Client profile 1.2 Assignment instructions
2. Team member's concerns	May include: 2.1 Roster/shift details
3. Monitor performance	May include: 3.1 Formal process 3.2 Informal process
4. Feedback	May include: 4.1 Formal process 4.2 Informal process
5. Performance issues	May include: 5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2 Assessed and monitored team and individual performance against set criteria 1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
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 task
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Written examination 3.2 Oral Questioning

	3.3 Portfolio
4. Context of Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace environment

UNIT OF COMPETENCY : **APPLY CRITICAL THINKING AND PROBLEM-SOLVING TECHNIQUES IN THE WORKPLACE**

UNIT CODE : **400311321**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause/s of specific problems in the workplace.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Examine specific workplace challenges	1.1 Variances are examined from normal operating ***parameters;*** and product quality. 1.2 Extent, cause and nature of the specific problem are defined through observation, investigation and ***analytical techniques.*** 1.3 ***Problems*** are clearly stated and specified.	1.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations. 1.2 Competence to include the ability to apply and explain, enough for the identification of fundamental causes of specific workplace challenges. 1.3 Relevant equipment and operational processes. 1.4 Enterprise goals, targets and measures. 1.5 Enterprise quality OHS and environmental requirement. 1.6 Enterprise information systems and data collation	1.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 1.2 Identifying extent and causes of specific challenges in the workplace.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		1.7 Industry codes and standards	
2. Analyze the causes of specific workplace challenges	2.1 Possible causes of specific problems are identified based on experience and the use of problem solving tools **/** analytical techniques. 2.2 Possible cause statements are developed based on findings. 2.3 Fundamental causes are identified per results of investigation conducted.	2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations. 2.2 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 2.3 Relevant equipment and operational processes. 2.4 Enterprise goals, targets and measures. 2.5 Enterprise quality 2.6 OSH and environmental requirement. 2.7 Enterprise information systems and data collation. 2.8 Industry codes and standards.	2.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 2.2 Identifying extent and causes of specific challenges in the workplace. 2.3 Providing clear-cut findings on the nature of each identified workplace challenges.
3 Formulate resolutions to specific workplace challenges	3.1 All possible options are considered for resolution of the problem. 3.2 Strengths and weaknesses of	3.5 Competence includes a thorough knowledge and understanding of the process,	3.1 Using range of analytical techniques (e.g., planning, attention, simultaneous

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	possible options are considered. 3.3 Corrective actions are determined to resolve the problem and possible future causes. 3.4 ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	normal operating parameters, and product quality to recognize nonstandard situations. 3.6 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 3.7 Relevant equipment and operational processes. 3.8 Enterprise goals, targets and measures. 3.9 Enterprise quality OSH and environmental requirement. 3.10 Enterprise information systems and data collation. 3.11 Industry codes and standards.	and successive processing of information) in examining specific challenges in the workplace. 3.2 Identifying extent and causes of specific challenges in the workplace. 3.3 Providing clear-cut findings on the nature of each identified workplace challenges. 3.4 Devising, communicating, implementing and evaluating strategies and techniques in addressing specific workplace challenges.
4 Implement action plans and communicate results	4.1 Action plans are implemented and evaluated. 4.2 Results of plan implementation and recommendations are prepared. 4.3 Recommendations are presented to appropriate personnel. 4.4 Recommendations are followed-up, if required.	4.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize nonstandard situations. 4.2 Competence to include the ability to apply and	4.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 4.2 Identifying extent and

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 4.3 Relevant equipment and operational processes. 4.4 Enterprise goals, targets and measures. 4.5 Enterprise quality OSH and environmental requirement. 4.6 Enterprise information systems and data collation. 4.7 Industry codes and standards.	causes of specific challenges in the workplace. 4.3 Providing clear-cut findings on the nature of each identified workplace challenges. 4.4 Devising, communicating, implementing and evaluating strategies and techniques in addressing specific workplace challenges.

RANGE OF VARIABLE

VARIABLE	RANGE
1. Parameters	May include: 1.1 Processes 1.2 Procedures 1.3 Systems
2. Analytical techniques	May include: 2.1 Brainstorming 2.2 Intuitions/Logic 2.3 Cause and effect diagrams 2.4 Pareto analysis 2.5 SWOT analysis 2.6 Gant chart, Pert CPM and graphs 2.7 Scattergrams
3. Problem	May include: 3.1 Routine, non – routine and complex workplace and quality problems 3.2 Equipment selection, availability and failure 3.3 Teamwork and work allocation problem 3.4 Safety and emergency situations and incidents 3.5 Risk assessment and management
4. Action plans	May include: 4.1 Priority requirements 4.2 Measurable objectives 4.3 Resource requirements 4.4 Timelines 4.5 Co-ordination and feedback requirements 4.6 Safety requirements 4.7 Risk assessment 4.8 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Examined specific workplace challenges 1.2 Analyzed the causes of specific workplace challenges 1.3 Formulated resolutions to specific workplace challenges 1.4 Implemented action plans and communicated results on specific workplace challenges
2. Resource Implications	2.1 Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Case Formulation 3.3 Life Narrative Inquiry 3.4 Standardized Test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
4. Context of Assessment	In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : WORK IN A DIVERSE ENVIRONMENT

UNIT CODE : 400311322

UNIT DESCRIPTOR : This unit covers the outcomes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities and other differences.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	1.1 Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. 1.2 Differences are responded to in a sensitive and considerate manner 1.3 ***Diversity*** is accommodated using appropriate verbal and nonverbal communication.	1.1 Understanding cultural diversity in the workplace 1.2 Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other nonChristians, nonCatholics, tribes/ethnic groups, foreigners) 1.3 Different methods of verbal and nonverbal communication in a multicultural setting	1.1 Applying cross-cultural communication skills (i.e. different business customs, beliefs, communication strategies) 1.2 Showing affective skills – establishing rapport and empathy, understanding, etc. 1.3 Demonstrating openness and flexibility in communication 1.4 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices
2. Work effectively in an environment that acknowledges and values cultural diversity	2.1 Knowledge, skills and experiences of others are recognized and documented in	2.1 Value of diversity in the economy and society in terms of Workforce development	2.1 Demonstrating cross-cultural communication skills and active listening

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	relation to team objectives. 2.2 Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other team members and clients to enhance work outcomes. 2.3 Relations with customers and clients are maintained to show that diversity is valued by the business.	2.2 Importance of inclusiveness in a diverse environment 2.3 Shared vision and understanding of and commitment to team, departmental, and organizational goals and objectives 2.4 Strategies for customer service excellence	2.2 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices 2.3 Demonstrating collaboration skills 2.4 Exhibiting customer service excellence
3. Identify common issues in a multicultural and diverse environment	3.1 ***Diversity-related conflicts*** within the workplace are effectively addressed and resolved. 3.2 Discriminatory behaviors towards customers / stakeholders are minimized and addressed accordingly. 3.3 Change management policies are in place within the organization.	3.1 Value, and leverage of cultural diversity 3.2 Inclusivity and conflict resolution 3.3 Workplace harassment 3.4 Change management and ways to overcome resistance to change 3.5 Advanced strategies for customer service excellence	3.1 Addressing diversity-related conflicts in the workplace 3.2 Eliminating discriminatory behavior towards customers and coworkers 3.3 Utilizing change management policies in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in: 1.1 Religion 1.2 Ethnicity, race or nationality 1.3 Culture 1.4 Gender, age or personality 1.5 Educational background
2. Diversity – related conflicts	May include conflicts that result from: 2.1 Discriminatory behaviors 2.2 Differences of cultural practices 2.3 Differences of belief and value systems 2.4 Gender-based violence 2.5 Workplace bullying 2.6 Corporate jealousy 2.7 Language barriers 2.8 Individuals being differently-abled persons 2.9 Ageism (negative attitude and behavior towards old people)

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate**: 1.1 Adjusted language and behavior as required by interactions with diversity 1.2 Identified and respected individual differences in colleagues, clients and customers 1.3 Applied relevant regulations, standards and codes of practice
2. Resource Implications	**The following resources should be provided:** 2.1 Access to workplace and resources 2.2 Manuals and policies on Workplace Diversity
3. Methods of Assessment	**Competency in this unit may be assessed through**: 3.1 Demonstration or simulation with oral questioning 3.2 Group discussions and interactive activities 3.3 Case studies/problems involving workplace diversity issues 3.4 Third-party report 3.5 Written examination 3.6 Role Plays
4. Context for Assessment	Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : PROPOSE METHODS OF APPLYING LEARNING AND INNOVATION IN THE ORGANIZATION

UNIT CODE : 400311323

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess general obstacles in the application of learning and innovation in the organization and to propose practical methods of such in addressing organizational challenges.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess work procedures, processes and systems in terms of innovative practices	1.1. ***Reasons*** for innovation are incorporated to work procedures. 1.2. ***Models of innovation*** are researched. 1.3. ***Gaps or barriers to*** innovation in one's work area are analyzed. 1.4. Staff who can support and foster innovation in the work procedure are identified.	1.1 Seven habits of highly effective people. 1.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 1.3 Five minds of the future concepts (Gardner, 2007). 1.4 Adaptation concepts in neuroscience (Merzenich, 2013). 1.5 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	1.1 Demonstrating collaboration and networking skills. 1.2 Applying basic research and evaluation skills 1.3 Generating insights on how to improve organizational procedures, processes and systems through innovation.
2. Generate practical action plans for improving work procedures, processes	2.1 Ideas for innovative work procedure to foster innovation using individual and group techniques are conceptualized 2.2 Range of ideas with other team members and	2.1 Seven habits of highly effective people. 2.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004)	2.1 Assessing readiness for change on simple work procedures, processes and systems. 2.2 Generating insights on how to improve organizational procedures,

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	colleagues are evaluated and discussed 2.3 Work procedures and processes subject to change are selected based on ***workplace requirements*** (feasible and innovative). 2.4 Practical action plans are proposed to facilitate simple changes in the work procedures, processes and systems. 2.5 ***Critical inquiry*** is applied and used to facilitate discourse on adjustments in the simple work procedures, processes and systems.	2.3 Five minds of the future concepts (Gardner, 2007). 2.4 Adaptation concepts in neuroscience (Merzenich, 2013). 2.5 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	processes and systems through innovation. 2.3 Facilitating action plans on how to apply innovative procedures in the organization.
3 Evaluate the effectiveness of the proposed action plans	3.1 Work structure is analyzed to identify the impact of the new work procedures 3.2 Co-workers/key personnel is consulted to know who will be involved with or affected by the work procedure 3.3 Work instruction operational plan of the new work procedure is developed and evaluated.	2.1 Five minds of the future concepts (Gardner, 2007). 2.2 Adaptation concepts in neuroscience (Merzenich, 2013). 2.3 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	3.1 Generating insights on how to improve organizational procedures, processes and systems through innovation. 3.2 Facilitating action plans on how to apply innovative procedures in the organization. 3.3 Communicating results of the evaluation of the proposed and implemented changes in the

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.4 Feedback and suggestion are recorded. 3.5 Operational plan is updated. 3.6 Results and impact on the developed work instructions are reviewed 3.7 Results of the new work procedure are evaluated 3.8 Adjustments are recommended based on results gathered		workplace procedures and systems. 3.4 Developing action plans for continuous improvement on the basic systems, processes and procedures in the organization.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	May include: 1.1 Strengths and weaknesses of the current systems, processes and procedures. 2.10 1.2 Opportunities and threats of the current systems, processes and procedures.
2. Models of Innvotation	May include: 2.1 Seven habits of highly effective people. 2.2 Five minds of the future concepts (Gardner, 2007). 2.11 2.3 Neuroplasticity and adaptation strategies.
3. Gaps or barriers	May include: 3.1 Machine 3.2 Manpower 3.3 Methods 3.4 Money
4. Critical Inquiry	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Established the reasons why innovative systems are required 1.2 Established the goals of a new innovative system 1.3 Analyzed current organizational systems to identify gaps and barriers to innovation. 1.4 Assessed work procedures, processes and systems in terms of innovative practices. 1.5 Generate practical action plans for improving work procedures, and processes. 1.6 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.7 Evaluated the effectiveness of the proposed action plans.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : USE INFORMATION SYSTEMATICALLY

UNIT CODE : 400311324

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information systems, apply information technology (IT) systems and edit, format & check information.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information	1.1. ***Information*** are collated and organized into a suitable form for reference and use 1.2. Stored information are classified so that it can be quickly identified and retrieved when needed 1.3. Guidance are advised and offered to people who need to find and use information	1.1. Application in collating information 1.2. Procedures for inputting, maintaining and archiving information 1.3. Guidance to people who need to find and use information 1.4. Organize information 1.5. classify stored information for identification and retrieval 1.6. Operate the technical information system by using agreed procedures	1.1. Collating information 1.2. Operating appropriate and valid procedures for inputting, maintaining and archiving information 1.3. Advising and offering guidance to people who need to find and use information 1.4. Organizing information into a suitable form for reference and use 1.5. Classifying stored information for identification and retrieval 1.6. Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	2.1. ***Technical information*** system is operated using	2.1. Attributes and limitations of available software tools	2.1. Identifying attributes and limitations of

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	agreed procedures 2.2. Appropriate and valid procedures are operated for inputting, maintaining and archiving information 2.3. ***Software required*** are utilized to execute the project activities 2.4. Information and data obtained are handled, edited, formatted and checked from a range of internal and external ***sources*** 2.5. Information are extracted, entered, and processed to produce the outputs required by ***customers*** 2.6. Own skills and understanding are shared to help others 2.7. Specified ***security measures*** are implemented to protect the confidentiality and integrity of project data held in IT systems	2.2. Procedures and work instructions for the use of IT 2.3. Operational requirements for IT systems 2.4. Sources and flow paths of data 2.5. Security systems and measures that can be used 2.6. Extract data and format reports 2.7. Methods of entering and processing information 2.8. WWW enabled applications	available software tools 2.2. Using procedures and work instructions for the use of IT 2.3. Describing operational requirements for IT systems 2.4. Identifying sources and flow paths of data 2.5. Determining security systems and measures that can be used 2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications
3. Edit, format and check information	3.1 Basic editing techniques are used	3.1 Basic file handling techniques 3.2 Techniques in checking documents	3.1 Using basic file handling techniques is used for the software

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.2 Accuracy of documents are checked 3.3 Editing and formatting tools and techniques are used for more complex documents 3.4 Proof reading techniques is used to check that documents look professional	3.3 Techniques in editing and formatting 3.4 Proof reading techniques	3.2 Using different techniques in checking documents 3.3 Applying editing and formatting techniques 3.4 Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1. Property 1.2. Organizational 1.3. Technical reference
2. Technical information	May include: 2.1. paper based 2.2. electronic
3. Software	May include: 3.1. spreadsheets 3.2. databases 3.3. word processing 3.4. presentation
4. Sources	May include: 4.1. other IT systems 4.2. manually created 4.3. within own organization 4.4. outside own organization 4.5. geographically remote
5. Customers	May include: 5.1. colleagues 5.2. company and project management 5.3. clients
6. Security measures	May include: 6.1. access rights to input; 6.2. passwords; 6.3. access rights to outputs; 6.4. data consistency and back-up; 6.5. recovery plans

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Used technical information systems and information technology 1.2. Applied information technology (IT) systems 1.3. Edited, formatted and checked information
2. Resource Implications	**The following resources should be provided:** 2.1. Computers 2.2. Software and IT system
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1. Direct Observation 3.2. Oral interview and written test

4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES

UNIT CODE : 400311325

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to interpret-Occupational Safety and Health practices, set OSH work targets, and evaluate effectiveness of Occupational Safety and Health work instructions

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret Occupational Safety and Health practices	1.1 ***OSH work practices issues*** are identified relevant to work requirements 1.2 OSH work standards and procedures are determined based on applicability to nature of work 1.3 Gaps in work practices are identified related to relevant OSH work standards	1.1. OSH work practices issues 1.2. OSH work standards 1.3. General OSH principles and legislations 1.4. Company/ workplace policies/ guidelines 1.5. Standards and safety requirements of work process and procedures	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Set OSH work targets	2.1 Relevant work information is gathered necessary to determine OSH work targets 2.2 ***OSH Indicators*** based on gathered information are agreed upon to measure effectiveness of workplace OSH policies and procedures	2.1 OSH work targets 2.2 OSH Indicators 2.3 OSH work instructions 2.4 Safety and health requirements of tasks 2.5 Workplace guidelines on providing feedback on OSH and security concerns 2.6 OSH regulations Hazard control procedures 2.7 OSH trainings relevant to work	2.1 Communication skills 2.2 Collaborating skills 2.3 Critical thinking skills 2.4 Observation skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3 Agreed OSH indicators are endorsed for approval from appropriate personnel 2.4 ***OSH work instructions*** are received in accordance with workplace policies and procedures*		
3. Evaluate effectiveness of Occupational Safety and Health work instructions	3.1 OSH Practices are observed based on workplace standards 3.2 Observed OSH practices are measured against approved ***OSH metrics*** 3.3 Findings regarding effectiveness are assessed and gaps identified are implemented based on 3.4 OSH work standards	3.1 OSH Practices 3.2 OSH metrics 3.3 OSH Evaluation Techniques 3.4 OSH work standards	3.1 Critical thinking skills 3.2 Evaluating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Work Practices Issues	May include: 1.1 Workers' experience/observance on presence of work hazards 1.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break-time, constant overtime, scheduling of tasks) 1.3 Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/ guidelines
2. OSH Indicators	May include: 2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/symptoms 2.3 Common complaints of workers' related to OSH 2.4 High absenteeism for work-related reasons
3. OSH Work Instructions	May include: 3.1 Preventive and control measures**,** and targets 3.2 Eliminate the hazard (i.e., get rid of the dangerous machine 3.3 Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.4 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.5 Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signages, rotation/shifting work schedule) 3.6 Use engineering controls to reduce the risk (i.e. use safety guards to machine) 3.7 Use personal protective equipment 3.8 Safety, Health and Work Environment Evaluation 3.9 Periodic and/or special medical examinations of workers
4. OSH metrics	May include: 4.1 Statistics on incidence of accidence and injuries 4.2 Morbidity (Type and Number of Sickness) 4.3 Mortality (Cause and Number of Deaths) 4.4 Accident Rate

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identify OSH work practices issues relevant to work requirements 1.2. Identify gaps in work practices related to relevant OSH work standards 1.3. Agree upon OSH Indicators based on gathered information to measure effectiveness of workplace OSH policies and procedures 1.4. Receive OSH work instructions in accordance with workplace policies and procedures 1.5. Compare Observed OSH practices with against approved OSH work instructions 1.6. Assess findings regarding effectiveness based on OSH work standards
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials, tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES**

UNIT CODE : **400311326**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude to interpret environmental Issues, establish targets to evaluate environmental practices and evaluate effectiveness of environmental practices

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret environmental practices, policies and procedures	1.1 ***Environmental work practices*** issues are identified relevant to work requirements 1.2 Environmental Standards and Procedures nature of work are determined based on Applicability to nature of work 1.3 Gaps in work practices related to Environmental Standards and Procedures are identified	1.1 Environmental Issues 1.2 Environmental Work Procedures 1.3 Environmental Laws 1.4 Environmental Hazardous and Non-Hazardous Materials 1.5 Environmental required license, registration or certification	1.1. Analyzing Environmental Issues and Concerns 1.2. Critical thinking 1.3. Problem Solving 1.4. Observation Skills
2. Establish targets to evaluate environmental practices	2.1 Relevant information is gathered necessary to determine environmental work targets 2.2 ***Environmental Indicators*** based on gathered information are set to measure environmental work targets 2.3 Indicators are verified with	2.1 Environmental indicators 2.2 Relevant Environment Personnel or expert 2.3 Relevant Environmental 2.4 Trainings and Seminars	2.1 Investigative Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	appropriate personnel		
3. Evaluate effectiveness of environmental practices	3.1 Work environmental practices are recorded based on workplace standards 3.2 Recorded work environmental practices are compared against planned indicators 3.3 Findings regarding effectiveness are assessed and gaps identified are implemented based on environment work standards and procedures 3.4 Results of environmental assessment are conveyed to appropriate personnel	3.1 Environmental Practices 3.2 Environmental Standards and Procedures	3.1 Documentation and Record 3.2 Keeping Skills 3.3 Critical thinking 3.4 Problem Solving 3.5 Observation Skills

RANGE OF VARIABLES

VARIABLE	R A N G E
1. Environmental Practices Issues	May include: 1.1 Water Quality 1.2 National and Local Government Issues 1.3 Safety 1.4 Endangered Species 1.5 Noise 1.6 Air Quality 1.7 Historic 1.8 Waste 1.9 Cultural
2. Environmental Indicators	May include: 2.1 Noise level 2.2 Lighting (Lumens) 2.3 Air Quality - Toxicity 2.4 Thermal Comfort 2.5 Vibration 2.6 Radiation 2.7 Quantity of the Resources 2.8 Volume

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identified environmental issues relevant to work requirements 1.2. Identified gaps in work practices related to Environmental Standards and Procedures 1.3. Gathered relevant information necessary to determine environmental work targets 1.4. Set environmental indicators based on gathered information to measure environmental work targets 1.5. Recorded work environmental practices are recorded based on workplace standards 1.6. Conveyed results of environmental assessment to appropriate personnel
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 : FACILITATE ENTREPRENEURIAL SKILLS FOR MICRO-SMALL-MEDIUM ENTERPRISES (MSMEs)

UNIT CODE : 400311327

UNIT DESCRIPTOR : This unit covers the outcomes required to build, operate and grow a micro/small-scale enterprise.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop and maintain micro-small medium enterprise (MSMEs) skills in the organization	1.1 Appropriate ***business strategies*** are determined and set for the enterprise based on current and emerging business environment. 1.2 ***Business operations*** are monitored and controlled following established procedures. 1.3 Quality assurance measures are implemented consistently. 1.4 Good relations are maintained with staff/workers. 1.5 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.	1.1 Business models and strategies 1.2 Types and categories of businesses 1.3 Business operation 1.4 Basic Bookkeeping 1.5 Business internal controls 1.6 Basic quality control and assurance concepts 1.7 Government and regulatory processes	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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Establish and maintain client-base/ market	2.1 Good customer relations are maintained 2.2 New customers and markets are identified, explored and reached out to. 2.3 Promotions / Incentives are offered to loyal customers 2.4 Additional products and services are evaluated and tried where feasible. 2.5 ***Promotional / advertising initiatives*** are carried out where necessary and feasible.	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. Apply budgeting and financial management skills	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.	3.1 Cash flow management 3.2 Basic financial management 3.3 Basic financial accounting 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. Business strategies	May include: 1.1. Developing/Maintaining niche market 1.2. Use of organic/healthy ingredients 1.3. Environment-friendly and sustainable practices 1.4. Offering both affordable and high-quality products and services 1.5. Promotion and marketing strategies (e. g., online marketing)
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
4. Promotional/ Advertising initiatives	May include: 4.1 Use of tarpaulins, brochures, and/or flyers 4.2 Sales, discounts and easy payment terms 4.3 Use of social media/Internet 4.4 "Service with a smile" 4.5 Extra attention to regular customers

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated basic entrepreneurial skills 1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3 Demonstrated ability to manage/operate a micro/small-scale business
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, materials and supplies needed to demonstrate the required tasks 2.3 References and manuals
3. Methods of Assessment	**Competency in this unit may be assessed through :** 3.1 Written examination 3.2 Demonstration/observation with oral questioning 3.3 Portfolio assessment with interview 3.4 Case problems

4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT TITLE : USE HAND TOOLS

UNIT CODE : ELC311205

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

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for tasks to be undertaken	1.1. Tasks to be undertaken are properly identified 1.2. Appropriate ***hand tools*** are identified and selected according to the task requirements	• Planning and preparing task/activity • Electronics hand tools and their uses • Function, operation and common faults in electronics hand tools	• Preparing required tasks • Communication skills • Using hand tools properly
2. Prepare hand tools	2.1. Appropriate hand tools are checked for proper operation and safety 2.2. Unsafe or faulty tools are identified and marked for repair according to standard company procedure	• Checking and safety requirements in handling tools • Standard procedures in checking, identification and marking of safe or unsafe/ faulty tools	• Identifying and checking hand tools • Marking of safe or unsafe/ faulty hand tools
3. Use appropriate hand tools and test equipment	3.1 Tools are used according to tasks undertaken 3.2 All safety procedures in using tools are observed at all times and appropriate ***personal protective equipment*** (PPE) are used	• Safety requirements in using electronics hand tools and test equipment • Electronics hand tools for adjusting, dismantling, assembling, finishing, and cutting. • Processes, Operations, Systems	• Reading skills required to interpret work instruction and numerical skills • Using PPE properly • Problem solving in emergency situation

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.3 Malfunctions, unplanned or unusual events are reported to the supervisor	○ Proper usage and care of hand tools ○ Types and uses of test equipment • Common faults in the use of hand tools	
4. Maintain hand tools	4.1 Tools are not dropped to avoid damage 4.2 Routine ***maintenance*** of tools undertaken according to standard operational procedures, principles and techniques 4.3 Tools are stored safely in appropriate locations in accordance with manufacturer's specifications or standard operating procedures	• Safety requirements in maintenance of hand tools • Processes, Operations, Systems ○ Maintenance of tools ○ Storage of hand tools	• Checking and cleaning hand tools Storing hand tools properly

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hand tools	Hand tools for adjusting, dismantling, assembling, finishing, and cutting. Tool set includes the following but not limited to: screw drivers, pliers, punches, wrenches, files
2. Personal Protective Equipment (PPE)	2.1. Gloves 2.2. Protective eyewear 2.3. Apron/overall
3. Maintenance	3.1. Cleaning 3.2. Lubricating 3.3. Tightening 3.4. Simple tool repairs 3.5. Hand sharpening 3.6. Adjustment using correct procedures

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Demonstrated safe working practices at all times 1.2. Communicated information about processes, events or tasks being undertaken to ensure a safe and efficient working environment 1.3. Planned tasks in all situations and reviewed task requirements as appropriate 1.4. Performed all tasks to specification 1.5. Maintained and stored tools in appropriate location
2. Method of assessment	Competency in this unit must be assessed through: 2.1. Observation 2.2. Oral questioning
3. Resource Implication	Tools may include the following but not limited to: 3.1 screw drivers 3.2 pliers 3.3 punches 3.4 wrenches, files
4. Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

UNIT TITLE : APPLY QUALITY STANDARDS

UNIT CODE : ELC311204

UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess quality of received materials or components	1.1. Work instructions are obtained and work is carried out in accordance with standard operating procedures 1.2. Received ***materials or component parts*** are checked against workplace standards and specifications 1.3. Faulty material or components related to work are identified and isolated 1.4. ***Faults*** and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures 1.5. Faulty materials or components are replaced in accordance with workplace procedures	• Relevant production processes, materials and products • Characteristics of materials, software and hardware used in production processes • Quality checking procedures • Quality Workplace procedures • Identification of faulty materials related to work	• Reading skills required to interpret work instruction • Critical thinking Interpreting work instructions

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Assess own work	2.1. ***Documentation*** relative to quality within the company is identified and used 2.2. Completed work is checked against workplace standards relevant to the task undertaken 2.3. Faulty pieces are identified and isolated 2.4. Information on the quality and other indicators of production performance is recorded in accordance with workplace procedures In cases of deviations from specified ***quality standards***, causes are documented and reported in accordance with the workplace' standards operating procedures	• Safety and environmental aspects of production processes • Fault identification and reporting • Workplace procedure in documenting completed work Workplace Quality Indicators	• Carry out work in accordance with OHS policies and procedures
3. Engage in quality improvement	3.1 Process improvement procedures are participated in relation to workplace assignment 3.2 Work is carried out in accordance with process improvement procedures 3.3 Performance of operation or	• Quality improvement processes • Company customers defined	• Solution providing and decision-making • Practice company process improvement procedure

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	quality of product or service to ensure ***customer*** satisfaction is monitored		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials/components	1.1. Materials may include but not limited to: 1.1.1. wires 1.1.2. cables, soldering lead 1.1.3. electrical tape 1.2. Components may include but not limited to: 1.2.1. ICs 1.2.2. Diodes
2. Faults	Faults may include but not limited to: 2.1. Components/materials not according to specification 2.2. Components/materials contain manufacturing defects 2.3. Components/materials do not conform with government regulation i.e., PEC, environmental code 2.4. Components/materials have safety defect
3. Documentation	3.1. Organization work procedures 3.2. Manufacturer's instruction manual 3.3. Customer requirements 3.4. Forms
4. Quality standards	4.1. Quality standards may relate but not limited to the following: 4.1.1. materials 4.1.2. component parts 4.1.3. final product 4.1.4. production processes
5. Customer	5.1. Co-worker 5.2. Supplier 5.3. Client 5.4. Organization receiving the product or service

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment must show that the candidate: 1.1. Carried out work in accordance with the company's standard operating procedures 1.2. Performed task according to specifications 1.3. Reported defects detected in accordance with standard operating procedures 1.4. Carried out work in accordance with the process improvement procedures
2. Method of assessment	2.1. The assessor may select two (2) of the following assessment methods to objectively assess the candidate: 2.1.1. Observation 2.1.2. Questioning 2.1.3. Practical demonstration
3. Resource implication	Materials and component parts and equipment to be use in a real or simulated electronic production situation
4. Context of Assessment	Assessment may be conducted in the workplace or in a simulated environment.

UNIT TITLE : **PERFORM COMPUTER OPERATIONS**

UNIT CODE : **ELC311203**

UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for task to be undertaken	1.1. Requirements of task are determined in accordance with the required output. 1.2. Appropriate ***hardware*** and ***software*** are selected according to task assigned and required outcome. 1.3. Task is planned to ensure that ***OH & S guidelines*** *and* procedures are followed. 1.4. Client -specific guidelines and procedures are followed. 1.5. Required data security guidelines are applied in accordance with existing procedures.	• Main types of computers and basic features of different operating systems • Main parts of a computer • Information on hardware and software Data security guidelines	• Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. • Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. Interpreting user manuals and security guidelines
2. Input data into computer	2.1 Data are entered into the computer using appropriate program/application in accordance with company procedures 2.2 Accuracy of information is checked and information is	• Basic ergonomics of keyboard and computer user • Storage devices and basic categories of memory • Relevant types of software	• Technology skills to use equipment safely including keyboard skills. • Entering data

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	saved in accordance with standard operating procedures 2.3 Inputted data are stored in ***storage media*** according to requirements 2.4 Work is performed within ***ergonomic guidelines***		
3. Access information using computer	3.1 Correct program/ application is selected based on job requirements 3.2 Program/application containing the information required is accessed according to company procedures 3.3 ***Desktop icons*** are correctly selected, opened and closed for navigation purposes 3.4 Keyboard techniques are carried out in line with OH & S requirements for safe use of keyboards	• General security, privacy legislation and copyright • Productivity Application • Business Application	• Accessing information • Searching and browsing files and data
4. Produce/ output data using computer system	4.1 Entered data are processed using appropriate software commands 4.2 Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures 4.3 Files, data are transferred between	• Computer application in printing, scanning and sending facsimile • Types and function of computer peripheral devices	• Computer data processing • Printing of data • Transferring files and data

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures		
5. Maintain computer equipment and systems	5.1 Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented 5.2 Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures 5.3 Basic file maintenance procedures are implemented in line with the standard operating procedures	• Computer equipment/system basic maintenance procedures • Viruses • OH & S principles and responsibilities • Calculating computer capacity • System Software • Basic file maintenance procedures	• Removing computer viruses from infected machines • Making backup files

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hardware and peripheral devices	1.1. Personal computers 1.2. Networked systems 1.3. Communication equipment 1.4. Printers 1.5. Scanners 1.6. Keyboard 1.7. Mouse 1.8. Voice/Data logger
2. Software	Software includes the following but not limited to: 2.1. Word processing packages 2.2. Data base packages 2.3. Internet 2.4. Spreadsheets 2.5. Client Specific Software
3. OH & S guidelines	3.1. OHS guidelines 3.2. Enterprise procedures
4. Storage media	Storage media include the following but not limited to: 4.1. USBs 4.2. CDs 4.3. External disk drives 4.4. hard disk drives, local and remote 4.5. optical drives 4.6. cloud storage
5. Ergonomic guidelines	5.1. Types of equipment used 5.2. Appropriate furniture 5.3. Seating posture 5.4. Lifting posture 5.5. Visual display unit screen brightness
6. Desktop icons	Icons include the following but not limited to: 6.1. directories/folders 6.2. files 6.3. network devices 6.4. recycle bin 6.5. program icons
7. Maintenance	7.1. Creating and managing more space in the hard disk and other peripherals 7.2. Reviewing programs 7.3. Deleting unwanted files 7.4. Backing up files 7.5. Checking hard drive for errors 7.6. Using up to date anti-virus programs 7.7. Cleaning dust from internal and external surfaces

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Identified and explain the functions of both hardware and software used, their general features and capabilities 1.3. Produced accurate and complete data in accordance with the requirements 1.4. Used appropriate devices and procedures to transfer files/data accurately 1.5. Maintained computer system in line with the standard operating procedures
2. Method of assessment	2.1. The assessor may select two of the following assessment methods to objectively assess the candidate: 2.1.1. Observation with oral questioning 2.1.2. Practical demonstration
3. Resource implication	3.1. Computer hardware with peripherals 3.2. Appropriate software
4. Context of Assessment	Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT OF COMPETENCY : CHECK APPAREL REQUIREMENTS, SAFETY, AND HOUSEKEEPING

UNIT CODE : CS-ELC821306

UNIT DESCRIPTOR : This unit covers the skills, knowledge, and attitudes to perform visual and functional checking of equipment and good housekeeping during production.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check visual and functional condition of forms	1.1. ***Electrostatic Discharge (ESD) uniforms*** are checked based on process requirements. 1.2. ESD compliance is checked based on process requirements.	**SCIENCE** 1.1 Use and importance of ESD uniform and compliance **COMMUNICATION** 1.2 Checklist 1.3 Documentation **ENVIRONMENT** 1.4 Occupational Safety and Health Standards (OHSAS)	1.1 Checking of visual and functional conditions of uniforms 1.2 Keen to details 1.3 Communication skills 1.4 Complying ESD requirements
2. Practice good housekeeping	2.1 Good housekeeping is conducted every start and end of the shift. 2.2 Wastes are segregated following solid waste management system. 2.3 6S is applied following good housekeeping practices. 2.4 Record keeping is performed following process requirements.	**COMMUNICATION** 2.1 Record keeping **ENVIRONMENT** 2.2 Waste segregation 2.3 6S	2.1 Identifying the certification processes including the documentation, inspection, and auditing. 2.2 Identifying the requirements for Halal certification.

RANGE OF VARIABLES

VARIABLE	RANGE
1. ESD uniforms	**May include:** 1.1 Bunny suit 1.2 Head cap 1.3 Booties 1.4 Facemask 1.5 ESD shoes

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Checked visual and functional condition of uniforms 1.2 Practiced good housekeeping
2. Resource Implications	**The following resources should be provided**: 2.1 Manpower 2.2 Spare parts 2.3 Instruction manual 2.4 Recording sheet 2.5 ESD protective materials 2.6 Facilities
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written Test 3.2 Demonstration with oral questioning 3.3 Interview
4. Context of Assessment	4.1 Competency may be assessed in the actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **CHECK DATA IN THE PROCESS TRAVELER VS ACTUAL MATERIALS**

UNIT CODE : **CS-ELC821307**

UNIT DESCRIPTOR : This unit covers the skills, knowledge, and attitudes required to prepare process traveler and materials by reviewing details and quantity as well as reporting and recording of materials.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check process traveler card and materials	1.1 ***Details*** in the process traveler are checked versus actual materials in accordance with process requirements. 1.2 ***Reporting*** is done following reporting requirements.	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 Relative temperature and Humidity **MATHEMATICS** 1.3 Basic Arithmetic **COMMUNICATION** 1.4 Materials Request Form 1.5 Work Instruction 1.6 Process Traveler 1.7 Assembly drawing 1.8 Log sheet **ENVIRONMENT RELATED LAWS AND ORDINANCES** 1.9 Occupational Safety and Health Standards (OHSAS)	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Keen to details 1.4 Reporting skills
2. Record details	2.1 6S is applied following good housekeeping 2.2 Record keeping is performed following recording requirements.	**SCIENCE** 2.1 Electrostatic Discharge (ESD) 2.2 Relative temperature and Humidity **MATHEMATICS** 2.3 Basic Arithmetic **COMMUNICATION** 2.4 Materials Request Form 2.5 Work Instruction 2.6 Process Traveler 2.7 Assembly drawing	2.1 Basic communication skills 2.2 Basic computation skills 2.3 Keen to details 2.4 Reporting skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.8 Log sheet **ENVIRONMENT RELATED LAWS AND ORDINANCES** 2.9 Occupational Safety and Health Standards (OHSAS)	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Details	**May include:** 1.1 Customer 1.2 Package type 1.3 Traveler number 1.4 Part number/Device number 1.5 Lot number 1.6 Run number 1.7 Quantity 1.8 Special Instruction
2. Reporting	**May include:** 2.1 Availability of materials and machine 2.2 Quantity and quality of materials 2.3 Any disparity between lot traveler information versus actual materials

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Checked process traveler and materials 1.2 Recorded details
2. Resource Implications	**The following resources should be provided**: 2.1 Manpower 2.2 Raw materials 2.3 Instruction manual 2.4 Recording sheet 2.5 Facilities
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written Test 3.2 Demonstration with oral questioning 3.3 Interview
4. Context of Assessment	4.4 Competency may be assessed in the actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : EVALUATE SET-UP AND BUY-OFF WAFER SAWING

UNIT CODE : CS-ELC821308

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes required to prepare for wafer sawing which includes determining raw materials, and checking machine parameters and program recipes.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check machine parameters	1.1 Wearing of ***ESD control materials*** are applied following Electrostatic Discharge (ESD) requirements. 1.2 Machine parameters are checked based on control plan requirements. 1.3 Machine program, recipe is checked according to appropriate assembly diagram. 1.4 Surfactant is checked based on the content level seen in the container in accordance with OHSAS.	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 Relative temperature and Humidity **TECHNOLOGY** 1.3 Parameters **MATHEMATICS** 1.4 Basic Arithmetic **COMMUNICATION** 1.5 Material Request Form 1.6 Work Instruction 1.7 Process Traveler 1.8 Assembly drawing 1.9 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 1.10 ESD control materials 1.11 Occupational Safety and Health Standards (OHSAS)	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Application of ESD control materials ~~1.4 Performing cleanroom dust particle count~~ ~~1.5 Determining raw materials~~ ~~1.6 Withdrawing raw materials~~ 1.7 Checking functionality of wafer machines. 1.8 Reporting Skills 1.9 Documentation Skills 1.10 Keen to details
2. Perform set-up wafer run	2.1 Correct set-up wafer is withdrawn in accordance to traveler card requirements. 2.2 Set-up wafer is loaded and run in	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 Relative temperature and Humidity	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Application of

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	accordance to process requirements.	**TECHNOLOGY** 1.3 Parameters **MATHEMATICS** 1.4 Basic Arithmetic **COMMUNICATION** 1.5 Material Request Form 1.6 Work Instruction 1.7 Process Traveler 1.8 Assembly drawing 1.9 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 1.10 ESD control materials 1.11 Occupational Safety and Health Standards (OHSAS)	ESD control materials 1.4 Checking functionality of wafer machines. 1.5 Reporting Skills 1.6 Documentation Skills 1.7 Keen to details
3. Check record details	3.1 Set-up run results is checked in accordance with the quality requirements. 3.2 Set-up run results is recorded in accordance with recording requirements. 3.3 Wafer saw machine is endorsed to production.	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 Relative temperature and Humidity **TECHNOLOGY** 1.3 Parameters **MATHEMATICS** 1.4 Basic Arithmetic **COMMUNICATION** 1.5 Material Request Form 1.6 Work Instruction 1.7 Process Traveler 1.8 Assembly drawing 1.9 Log sheet	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Application of ESD control materials 1.4 Checking functionality of wafer machines. 1.5 Reporting Skills 1.6 Documentation Skills 1.7 Keen to details

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		ENVIRONMENTAL RELATED LAWS AND ORDINANCE 1.10 ESD control materials 1.11 Occupational Safety and Health Standards (OHSAS)	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Electrostatic Discharge (ESD) control materials	May include: 1.1 Bunny suit with booties, facemask 1.2 ESD Shoes 1.3 Foot strap 1.4 Wrist strap 1.5 Gloves 1.6 Finger cots
2. Machine parameters	May include: 2.1 Cut mode 2.2 Blade height 2.3 Feed speed 2.4 Y-index 2.5 Sensor sensitivity 2.6 Air pressure
3. Appearance of withdrawn materials	May include: 3.1 Visual appearance 3.2 Material Expiration

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Checked machine parameters 1.2 Performed set-up wafer run 1.3 Checked record details
2. Resource Implications	**The following resources should be provided**: 2.1 Manpower 2.2 Raw materials 2.3 Inspection equipment 2.4 Instruction manual 2.5 Recording sheet 2.6 ESD control materials 2.7 Machine 2.8 Facilities
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written test 3.2 Demonstration with oral questioning 3.3 Interview
4. Context of Assessment	4.1 Competency may be assessed in the actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM WAFER SAWING AND CLEANING

UNIT CODE : CS-ELC821309

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to apply best practice in preparation for wafer sawing and cleaning, ensures efficiency, quality, safety, and compliance with industry practices.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare for sawing process	1.1 ***Lot details*** are checked prior processing in accordance with process requirements. 1.2 Lot is loaded to the machine in accordance to process requirements.	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 Relative temperature and Humidity **TECHNOLOGY** 1.3 Parameters **MATHEMATICS** 1.4 Basic Arithmetic **COMMUNICATION** 1.5 Material Request Form 1.6 Work Instruction 1.7 Process Traveler 1.8 Assembly drawing 1.9 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 1.10 ESD control materials 1.11 Occupational Safety and Health Standards (OHSAS)	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Application of ESD control materials 1.4 Checking functionality of wafer machines. 1.5 Reporting Skills 1.6 Documentation Skills 1.7 Keen to details
2. Saw wafer	2.1 Wafer saw production run is initiated. 2.2 ***Machine parameters*** are monitored based on process requirements. 2.3 Wafer cleaning is performed in	**SCIENCE** 2.1 Electrostatic Discharge (ESD) 2.2 Relative temperature and Humidity **TECHNOLOGY** 2.3 Parameters	2.1 Basic communication skills 2.2 Basic computation skills 2.3 Application of ESD control materials 2.4 Checking

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	accordance with process requirements. 2.4 Monitoring results are recorded in accordance with recording requirements.	**MATHEMATICS** 2.4 Basic Arithmetic **COMMUNICATION** 2.5 Material Request Form 2.6 Work Instruction 2.7 Process Traveler 2.8 Assembly drawing 2.9 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 2.10 ESD control materials 2.11 Occupational Safety and Health Standards (OHSAS)	functionality of wafer machines. 2.5 Reporting Skills 2.6 Documentation Skills 2.7 Keen to details
3 Conduct post-sawing activities	3.1 Wastes are segregated following solid waste management system. 3.2 6S is applied following good housekeeping practices. 3.3 Record keeping is performed following recording requirements. 3.4 Reporting is conducted in accordance with process requirements.	**SCIENCE** 3.1 Electrostatic Discharge (ESD) 3.2 Relative temperature and Humidity **TECHNOLOGY** 3.3 Parameters **MATHEMATICS** 3.4 Basic Arithmetic **COMMUNICATION** 3.5 Material Request Form 3.6 Work Instruction 3.7 Process Traveler 3.8 Assembly drawing 3.9 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 3.10 ESD control materials 3.11 Occupational Safety and Health Standards (OHSAS) 3.12 6S	3.1 Basic communication skills 3.2 Basic computation skills 3.3 Application of ESD control materials 3.4 Checking functionality of wafer machines. 3.5 Reporting Skills 3.6 Documentation Skills 3.7 Keen to details

RANGE OF VARIABLES

VARIABLE	RANGE
1. Lot details	May include: 2.1 Customer 2.2 Package type 2.3 Traveler number 2.4 Part number/Device number 2.5 Lot number 2.6 Run number 2.7 Quantity 2.8 Special Instruction
2. Machine parameters	May include: 3.1 Cut mode 3.2 Blade height 3.3 Feed Speed 3.4 Y-index/Die size 3.5 Sensor sensitivity 3.6 Air pressure 3.7 DI Water resistivity

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared for sawing process 1.2 Sawn wafer 1.3. Conduct post-sawing activities
2. Resource Implications	**The following resources should be provided**: 2.1 Manpower 2.2 Raw materials 2.3 Inspection equipment 2.4 Recording sheet 2.5 ESD control materials 2.6 Machines 2.7 Facilities
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written test 3.2 Demonstration with oral questioning 3.3 Interview
4. Context of Assessment	4.1 Competency may be assessed in the actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM SAWN WAFER QUALITY INSPECTION

UNIT CODE : CS-ELC821310

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes required to conduct wafer and sawn wafer visual quality inspection through the use of low and high power microscope.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare for wafer quality inspection	1.1 Wearing of ***ESD control materials*** are applied following Electrostatic Discharge (ESD) requirements. 1.2 Cleanroom dust particle count requirement is performed following process requirements.	**SCIENCE** 1.1 Electrostatic Discharge (ESD) 1.2 ISO 14644-1 (Cleanroom Standards) **TECHNOLOGY** 1.3 Low and high power microscope **MATHEMATICS** 1.4 Basic Arithmetic **COMMUNICATION** 1.5 Work Instruction 1.6 Process Traveler 1.7 Assembly drawing 1.8 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 1.9 ESD control materials 1.10 Occupational Safety and Health Standards (OHSAS)	1.1 Basic communication skills 1.2 Basic computation skills 1.3 Application of ESD control materials 1.4 Cleanroom dust particle count practices 1.5 Preparing wafer for inspection 1.6 Determining wafer for inspection 1.7 Reporting Skills 1.8 Documentation Skills
2. Perform sawn wafer quality inspection	2.1***Details*** are checked following ***Process Traveler***. 2.2Sawn wafers are checked based on Process Traveler	**SCIENCE** 2.1 Electrostatic Discharge (ESD) 2.2 Relative temperature and Humidity	2.1 Performing sawn wafers visual inspection 2.2 Checking sawn wafer quality 2.3 Checking records

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3 Required microscope and magnification settings are used in accordance with process requirements. 2.4 Quality of sawn wafers is checked according to wafer visual criteria. 2.5 Sawn wafers are placed in N2 cabinet following process requirements. 2.6 Record keeping is done following process requirements.	**TECHNOLOGY** 2.3 Low and high power microscope **MATHEMATICS** 2.4 Basic Arithmetic **COMMUNICATION** 2.5 Work Instruction 2.6 Process Traveler 2.7 Assembly drawing 2.8 Log sheet **ENVIRONMENTAL RELATED LAWS AND ORDINANCE** 2.9 ESD control materials 2.10 Occupational Safety and Health Standards (OHSAS)	2.4 Checking appearance of withdrawn materials 2.5 Checking functionality of wafer inspection equipment 2.6 sampling skills 2.7 microscope settings skills
3. Record inspection result	3.1 Quantity of good and reject are checked in accordance with traveller's card. 3.2 Out- of -control action plan is executed according to (OCAP) 3.3 Material Review Board (MRB) decision is executed as appropriate. 3.4 Final result is recorded in accordance with recording requirements.	**MATHEMATICS** 3.1 Basic Arithmetic **COMMUNICATION** 3.2 Basic Communication 3.3 Out- of -control action plan (OCAP) 3.4 Material Review Board (MRB) **ENVIRONMENT RELATED LAWS AND ORDINANCES** 3.5 6S	3.1 Basic communication skills 3.2 Keen to details 3.3 Out-of-control action plan (OCAP) interpretation 3.4 Material Review Board (MRB) interpretation

RANGE OF VARIABLES

RANGE	VARIABLE
1. ESD control materials	May include: 1.1 Bunny suit with booties, facemask 1.2 ESD Shoes 1.3 Foot strap 1.4 Wrist strap 1.5 Gloves 1.6 Finger cots
2. Details	May include: 2.1 Process Traveler 2.2 Assembly diagram (AD) 2.3 Sticker 2.4 Control plan 2.5 Internal visual criteria
3. Visual inspection of sawn wafer	May include: 3.1 Scratches 3.2 Impact marks 3.3 Chipped out 3.4 Absence of foreign materials
4. Process Traveler	May include: 4.1 Lot information 4.2 Process step 4.3 Process requirements per steps 4.4 Special Instructions

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Prepared for wafer quality inspection 1.2 Perform sawn wafer quality inspection 1.3 Recorded inspection result
2. Resource implications	The following resources should be provided: 2.1 Manpower 2.2 Raw materials 2.3 Inspection equipment 2.4 Instruction manual 2.5 Recording sheet 2.6 ESD control materials 2.7 Facilities
3. Methods of assessment	Competency in this unit must be assessed through 3.1 Written test 3.2 Demonstration with oral questioning 3.3 Interview
4. Context for assessment	4.1 Competency may be assessed in the actual workplace or simulation environment in TESDA accredited institutions.

GLOSSARY OF TERMS

1.	**6S**	A systematic approach to workplace organization and standardization, comprising six components that aim to optimize efficiency and safety in the workplace. (Sort, Set in order, shine, standardize, sustain and safety)
2.	**Assembly Drawing**	it is a technical illustration used in manufacturing to show how various components of a products fit together.
3.	**Blade**	It is a critical component in many cutting tools and machinery, designed to slice through materials by applying a sharp edge or teeth. Blades come in various forms and are used in a wide range of applications
4.	**Checklist**	It is a written or digital list of items, tasks, or criteria that need to be verified, completed, or reviewed. It serves as a tool to ensure that all necessary steps or elements are addressed and nothing is overlooked.
5.	**Cleanroom Dust Particle Count**	it is a critical measurement that indicates the level of cleanliness in the environment
6.	**Deionized water**	also known as (DI water) is water that has had its ions removed through a deionization process. This process is designed to remove mineral salts and other charged particles, making the water highly purified
7.	**ESD**	any material that has properties designed to either dissipate static electricity or prevent the build up of static charges
8.	**ESD Uniforms**	It is a uniform to protect sensitive electronic components from damage caused by static electricity.
9.	**Final Result**	It refers to the end outcome of a process, project, or series of activities.
10.	**Good Housekeeping**	It refers to the practice of maintaining clean, organized and safe work environment. It involves managing anf organizing the workplace to ensure efficiency, safety and cleanliness
11.	**Internal Visual Criteria**	a set of standards or guidelines used to evaluate the visual aspects of a product or component during quality control or inspection processes.
12.	**ISO 14644-1 (Cleanroom Standards)**	It is an international standard that defines the classification of air cleanliness in cleanrooms and controlled environments. It is part of the ISO 14644 series, which focuses on cleanroom standards and the control of contamination in such environments. The standard is crucial for ensuring that cleanrooms meet specific cleanliness levels required for various industries, including semiconductor manufacturing,
13.	**Logsheet**	It is a structured document used to record data, activities, or events systematically over time. It helps track and monitor various aspects of operations, performance, or processes. Logsheets are commonly used in a range of industries and settings, including manufacturing, project management, maintenance, and research.
14.	**Lot Details**	It refer to specific information about batch and group of the product.
15.	**Machine Parameters**	It is the specific settings or configuration that determine how a machine operates.
16.	**Machine program recipe**	It refers to a set of instructions or parameters used to control and optimize the operation of a machine or manufacturing process. It typically includes detailed specifications required to produce a product or perform a task with consistent quality and efficiency.

17. **Material Request Form**	It is a document used to formally request materials or supplies needed for a project, production process, or other operational needs. It serves as a way to ensure that the necessary materials are ordered and provided in a timely manner, maintaining smooth operations and avoiding disruptions.
18. **Material Review Board**	It is is a team or committee responsible for evaluating and making decisions regarding non-conforming materials or products within a manufacturing or production environment. The MRB plays a critical role in quality control by assessing issues related to material quality, defects, or deviations from specifications and determining the appropriate course of action.
19. **N2 Cabinet**	it is a nitrogen cabinet or a storage enclosure that is filled or purged with nitrogen gas to create a controled environment with low humidity and oxygen levels. It is to protect sensitive materiaks and components from moisture, oxidation and other forms of contamination.
20. **Occupatioal Safety and Health Standards (OSHS)**	It refers to the field dedicated to the safety, health and welfare of people engaged in work or employment. It involves the practices, regulations, and policies designed to prevent workplace accidents, injuries and illness ensuring a safe and healthy working environment.
21. **Out of Control Action Plan**	It is a structured approach designed to address and manage situations where a process or system deviates from established control limits or standards. This plan is crucial for maintaining quality, ensuring operational stability, and preventing defects or failures in various industries.
22. **PPE**	If refers to Personal Protective Equipment and a specialized gear and clothing designed to protect individuals from various hazards and risks encountered in their work or daily activities.
23. **Raw Materials**	are the basic substances or components used in manufacturing processes to produce finished goods or products.
24. **Relative Temperature and Humidity**	It is used for various setting to maintain comfort, equipment functionality and product quality .
25. **Sampling**	It is a fundamental process used in various fields to obtain a representative subset from a larger population or dataset. The aim is to draw conclusions about the entire population based on this smaller, manageable sample
26. **Sawing Process**	It is a mechanical operation used to cut materials into specific shapes and sizes using a saw.
27. **Sawn Wafer**	A thin, circular slice of silicon cut from a larger silicon boule. These wafers serve as the base material for fabricating semiconductor devices.
28. **Surfactant**	It is a substance that lowers the surface tension of a liquid, allowing it to spread more easily or interact with other substances. Surfactants are used in a variety of applications, including cleaning, emulsifying, foaming, and dispersing.
29. **Temperature**	It is a maeasure of the thermal energy or heat of an object or environment.
30. **Process Traveler**	a document or form used in manufacturing and production to track progress of a product or component through various stages of production

31. **Visual Appearance**	It refers to the way something looks or appears to the eye. It encompasses various aspects of an object's physcial characteristics.
32. **Visual Inspection of Sawn Wafer**	It is is a critical step in semiconductor manufacturing to ensure that the wafers, once diced into individual chips or dies, meet quality and defect criteria. This inspection process helps identify any issues that could impact the performance or reliability of the final semiconductor devices.
33. **Wafer**	It is a thin, flat disk of semiconductor material used as a base for fabricating integrated circuits (ICs) and other electronic devices. The wafer serves as the substrate on which microelectronic devices are built through various processes.
34. **Wafer Alignment**	It is a critical process in semiconductor manufacturing, particularly during photolithography, wafer bonding, and various other fabrication steps. Proper alignment ensures that patterns and structures are correctly placed on the wafer, leading to high-quality, functional semiconductor devices
35. **Wafer Sawing**	It is a critical process in semiconductor manufacturing used to slice a wafer into individual semiconductor chips or dies. This process is essential for creating discrete components from a large, single wafer that has been processed to include multiple integrated circuits or devices.
36. **Waste Segregation**	It is a process of sorting and separating different types of waste materials to facilitate their appropriate disposal or recycling.
37. **Water Resistivity**	It is a measure of how strongly water resists the flow of electrical current. It is the inverse of electrical conductivity, which measures how well water can conduct electricity.
38. **Work Instruction**	It provides clear, step by step directions to ensure consistency, quality, and safety in the execution of work.

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