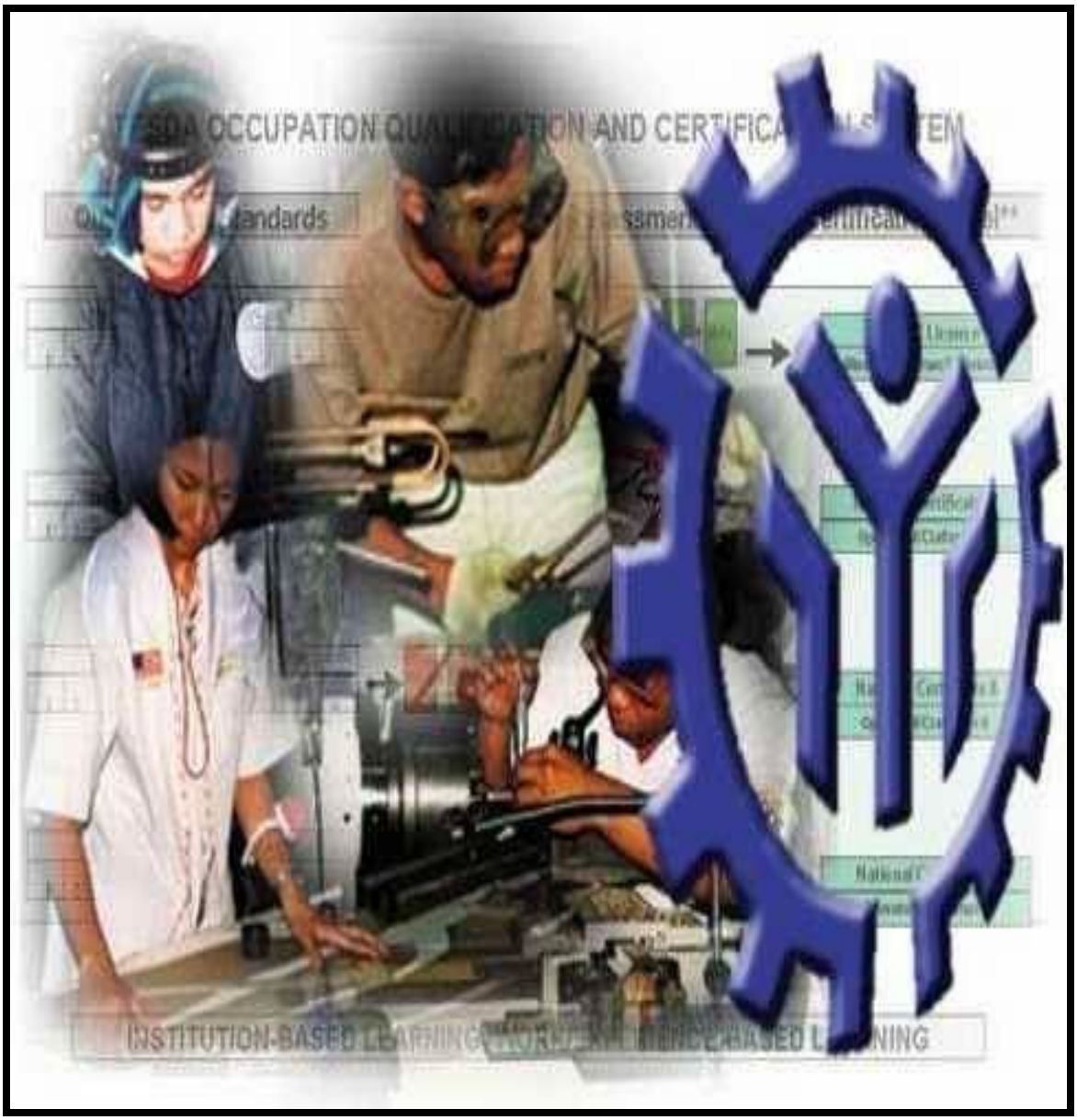
TRAINING REGULATIONS

PROCESS INSPECTION NC III



AUTOMOTIVE MANUFACTURING SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

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

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

The Training Regulations (TR) serves as basis for the:

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

Each TR has four sections:

Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.

Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.

Section 3 Training Standards - contains information and requirements in designing training program for certain Qualification. It includes curriculum design, training delivery; trainee entry requirements; tools equipment and materials; training facilities and trainer's qualification.

Section 4 National Assessment and Certification Arrangements - describe the policies governing assessment and certification procedure.

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PROCESS INSPECTION NC III

TRAINING REGULATIONS
FOR
PROCESS INSPECTION NC III

SECTION 1 PROCESS INSPECTION NC III QUALIFICATION

The PROCESS INSPECTION NC III Qualification consists of competencies that a person must achieve to apply quality systems, conduct product and or process capability studies and maintain and supervise the application of quality procedures. These units cover improving the quality system, and collecting and summarizing data to support the quality improvement process. The data would be used to produce statistical information such as averages and ranges, and charts such as tally, run or control charts.

The Units of Competency comprising this Qualification include the following:

CODE NO.	BASIC COMPETENCIES
500311109	Lead workplace communication
500311110	Lead small teams
500311111	Develop and practice negotiation skills
500311112	Solve problems related to work activities
500311113	Use mathematical concepts and techniques
500311114	Use relevant technologies

CODE NO.	COMMON COMPETENCIES
ALT742201	Read & interpret Engineering drawings
ALT311202	Perform Mensuration and Calculation
ALT723203	Read, Interpret and Apply Specifications and Manuals
ALT723204	Perform Shop Maintenance

CODE NO.	CORE COMPETENCIES
ALT315308	Apply quality systems
ALT315309	Conduct product and/or process capability studies
ALT315310	Maintain/supervise the application of quality procedures

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

- **Process Inspection Leader**

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in PROCESS INSPECTION NC III.

BASIC COMPETENCIES

UNIT OF COMPETENCY : **LEAD WORKPLACE COMMUNICATION**

UNIT CODE : **500311109**

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Communicate information about workplace processes	1.1 Appropriate ***communication method*** is selected 1.2 Multiple operations involving several topics areas are communicated accordingly 1.3 Questions are used to gain extra information 1.4 Correct sources of information are identified 1.5 Information is selected and organized correctly 1.6 Verbal and written reporting is undertaken when required 1.7 Communication skills are maintained in all situations
2. Lead workplace discussions	2.1 Response to workplace issues are sought 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 plan undertaken in the workplace are communicated
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 3.4 Communication problems and issues are raised as they arise

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	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

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 Made constructive contributions in workplace issues 1.3 Sought workplace issues effectively 1.4 Responded to workplace issues promptly 1.5 Presented information clearly and effectively written form 1.6 Used appropriate sources of information 1.7 Asked appropriate questions 1.8 Provided accurate information
2. Underpinning knowledge	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods
3. Underpinning skills	3.1 Organize information 3.2 Understand and convey intended meaning 3.3 Participate in variety of workplace discussions 3.4 Comply with organization requirements for the use of written and electronic communication methods
4. Resource implications	The following resources **MUST** be provided: 4.1 Variety of Information 4.2 Communication tools 4.3 Simulated workplace
5. Method of assessment	Competency may be assessed through: 5.1 Competency in this unit must be assessed through 5.2 Direct Observation 5.3 Interview
6. Context of assessment	6.1 Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : **LEAD SMALL TEAMS**

UNIT CODE : **500311110**

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Provide team leadership	1.1 ***Work requirements*** are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 ***Team members' queries and concerns*** are recognized, discussed and dealt with
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team members duties and area of responsibility 3.3 Performance expectations are discussed and disseminated to individual team members
4. Supervised team performance	4.1 ***Monitoring of performance*** takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2 Team members are provided with ***feedback***, positive support and advice on strategies to overcome any deficiencies 4.3 ***Performance issues*** which cannot be rectified or addressed within the team are referenced 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 in accordance with company procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's concerns	2.1 Roster/shift details
3. Monitor performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process
5. Performance issues	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. Underpinning knowledge	2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of Monitoring Performance 2.5 Client expectations 2.6 Team member's duties and responsibilities
3. Underpinning skills	3.1 Communication skills required for leading teams 3.2 Informal performance counseling skills 3.3 Team building skills 3.4 Negotiating skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2 Materials relevant to the proposed activity or task
5. Method of assessment	Competency may be assessed through: 5.1 Direct observations of work activities of the individual member in relation to the work activities of the group 5.2 Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal 5.3 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context of assessment	6.1 Competency assessment may occur in workplace or any appropriately simulated environment 6.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY: DEVELOP AND PRACTICE NEGOTIATION SKILLS

UNIT CODE : 500311111

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Plan negotiations	1.1 Information on ***preparing for negotiation*** is identified and included in the plan 1.2 Information on creating ***non verbal environments*** for positive negotiating is identified and included in the plan 1.3 Information on ***active listening*** is identified and included in the plan 1.4 Information on different ***questioning techniques*** is identified and included in the plan 1.5 Information is checked to ensure it is correct and up-to-date
2. Participate in negotiations	2.1 Criteria for successful outcome are agreed upon by all parties 2.2 Desired outcome of all parties are considered 2.3 Appropriate language is used throughout the negotiation A variety of questioning techniques are used 2.4 The issues and processes are documented and agreed upon by all parties 2.6 Possible solutions are discussed and their viability assessed 2.7 Areas for agreement are confirmed and recorded 2.8 Follow-up action is agreed upon by all parties

RANGE OF VARIABLES

VARIABLE	RANGE
1. Preparing for negotiation	1.1 Background information on other parties to the negotiation 1.2 Good understanding of topic to be negotiated 1.3 Clear understanding of desired outcome/s 1.4 Personal attributes 1.4.1 self awareness 1.4.2 self esteem 1.4.3 objectivity 1.4.4 empathy 1.4.5 respect for others 1.5 Interpersonal skills 1.5.1 listening/reflecting 1.5.2 non verbal communication 1.5.3 assertiveness 1.5.4 behavior labeling 1.5.5 testing understanding 1.5.6 seeking information 1.5.7 self disclosing 1.6 Analytic skills 1.6.1 observing differences between content and process 1.6.2 identifying bargaining information 1.6.3 applying strategies to manage process 1.6.4 applying steps in negotiating process 1.6.5 strategies to manage conflict 1.6.6 steps in negotiating process 1.6.7 options within organization and externally for resolving conflict
2. Non verbal environments	2.1 Friendly reception 2.2 Warm and welcoming room 2.3 Refreshments offered 2.4 Lead in conversation before negotiation begins
3. Active listening	3.1 Attentive 3.2 Don't interrupt 3.3 Good posture 3.4 Maintain eye contact 3.5 Reflective listening
4. Questioning techniques	4.1 Direct 4.2 Indirect 4.3 Open-ended

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome 1.2 Participated in negotiation with at least one person to achieve an agreed outcome
2. Underpinning knowledge and Attitude	2.1 Codes of practice and guidelines for the organization 2.2 Organizations policy and procedures for negotiations 2.3 Decision making and conflict resolution strategies procedures 2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation 2.5 Flexibility 2.6 Empathy
3. Underpinning skills	3.1 Interpersonal skills to develop rapport with other parties 3.2 Communication skills (verbal and listening) 3.3 Observation skills 3.4 Negotiation skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Room with facilities necessary for the negotiation process 4.2 Human resources (negotiators)
5. Method of assessment	Competency may be assessed through: 5.1 Observation/demonstration and questioning 5.2 Portfolio assessment 5.3 Oral and written questioning 5.4 Third party report
6. Context of assessment	6.1 Competency to be assessed in real work environment or in a simulated workplace setting.

UNIT OF COMPETENCY : SOLVE PROBLEMS RELATED TO WORK ACTIVITIES

UNIT CODE : 500311112

UNIT DESCRIPTOR : This unit of competencies 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 of problems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Identify the problem	1.1 Variances are identified from normal operating parameters; and product quality 1.2 Extent, cause and nature are of the problem are defined through observation, investigation and ***analytical techniques*** 1.3 ***Problems*** are clearly stated and specified
2. Determine fundamental causes of the problem	2.1 Possible causes 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
3. Determine corrective action	3.1 All possible options are considered for resolution of the problem 3.2 Strengths and weaknesses of 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
4. Provide recommendation/s to manager	4.1 Report on recommendations are prepared 4.2 Recommendations are presented to appropriate personnel. 4.3 Recommendations are followed-up, if required

RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	1.1 Brainstorming 1.2 Intuitions/Logic 1.3 Cause and effect diagrams 1.4 Pareto analysis 1.5 SWOT analysis 1.6 Gant chart, Pert CPM and graphs 1.7 Scattergrams
2. Problem	2.1 Non – routine process and quality problems 2.2 Equipment selection, availability and failure 2.3 Teamwork and work allocation problem 2.4 Safety and emergency situations and incidents
3. Action plans	3.1 Priority requirements 3.2 Measurable objectives 3.3 Resource requirements 3.4 Timelines 3.5 Co-ordination and feedback requirements 3.6 Safety requirements 3.7 Risk assessment 3.8 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified the problem 1.2 Determined the fundamental causes of the problem 1.3 Determined the correct / preventive action 1.4 Provided recommendation to manager These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Underpinning knowledge	2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard 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 2.2.1 Relevant equipment and operational processes 2.2.2 Enterprise goals, targets and measures 2.2.3 Enterprise quality, OHS and environmental requirement 2.2.4 Principles of decision making strategies and techniques 2.2.5 Enterprise information systems and data collation 2.2.6 Industry codes and standards
3. Underpinning skills	3.1 Using range of formal problem solving techniques 3.2 Identifying and clarifying the nature of the problem 3.3 Devising the best solution 3.4 Evaluating the solution 3.5 Implementation of a developed plan to rectify the problem

4. Resource implications	4.1 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.
5. Method of assessment	Competency may be assessed through: 5.1 Case studies on solving problems in the workplace 5.2 Observation 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.
6. Context of assessment	6.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY: **USE MATHEMATICAL CONCEPTS AND TECHNIQUES**

UNIT CODE : **500311113**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in the application of mathematical concepts and techniques.

ELEMENT	Performance Criteria ***Italicized terms*** are elaborated in the Range of Variables
1. Identify mathematical tools and techniques to solve problem	1.1 Problem areas are identified based on given condition 1.2 ***Mathematical techniques*** are selected based on the given problem
2. Apply mathematical procedure/solution	2.1 Mathematical techniques are applied based on the problem identified 2.2 Mathematical computations are performed to the level of accuracy required for the problem 2.3 Results of mathematical computation is determined and verified based on job requirements
3. Analyze results	3.1 Result of application is reviewed based on expected and required specifications and outcome 3.2 ***Appropriate action*** is applied in case of error

RANGE OF VARIABLES

VARIABLE	RANGE
1. Mathematical techniques	May include but are not limited to: 1.1 Four fundamental operations 1.2 Measurements 1.3 Use/Conversion of units of measurements 1.4 Use of standard formulas
2. Appropriate action	2.1 Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2 Report error to immediate superior for proper action

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems
2. Underpinning knowledge	2.1 Fundamental operation (addition, subtraction, division, multiplication) 2.2 Measurement system 2.3 Precision and accuracy 2.4 Basic measuring tools/devices
3. Underpinning skills	3.1 Applying mathematical computations 3.2 Using calculator 3.3 Using different measuring tools
4. Resource implications	The following resources **MUST** be provided: 4.1 Calculator 4.2 Basic measuring tools 4.3 Case Problems
5. Method of assessment	Competency may be assessed through: 5.1 Authenticated portfolio 5.2 Written Test 5.3 Interview/Oral Questioning 5.4 Demonstration
6. Context of assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY: USE RELEVANT TECHNOLOGIES

UNIT CODE : 500311114

UNIT DESCRIPTOR : This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Study/select appropriate technology	1.1 Usage of different ***technologies*** is determined based on job requirements 1.2 Appropriate technology is selected as per work specification
2. Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 ***Management concepts*** are observed and practiced as per established industry practices
3. Maintain/enhance ~~of~~ relevant technology	3.1 Maintenance of technology is applied in accordance with the ***industry standard operating procedure***, ***manufacturer's operating guidelines*** and ***occupational health and safety procedure*** to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement 3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for ***appropriate action***

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technology	May include but are not limited to: 1.1 Office technology 1.2 Industrial technology 1.3 System technology 1.4 Information technology 1.5 Training technology
2. Management concepts	May include but not limited to: 2.1 Real Time Management 2.2 KAIZEN or continuous improvement 2.3 5s 2.4 Total Quality Management 2.5 Other management/productivity tools
3. Industry standard operating procedure	3.1 Written guidelines relative to the usage of office technology/equipment 3.2 Verbal advise/instruction from the co-worker
4. Manufacturer's operating guidelines/ instructions	4.1 Written instruction/manuals of specific technology/ equipment 4.2 General instruction manual 4.3 Verbal advise from manufacturer relative to the operation of equipment
5. Occupational health and safety procedure	5.1 Relevant statutes on OHS 5.2 Company guidelines in using technology/equipment
6. Appropriate action	6.1 Implementing preventive maintenance schedule 6.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Studied and selected appropriate technology consistent with work requirements 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology
2. Underpinning knowledge	2.1 Awareness on technology and its function 2.2 Repair and maintenance procedure 2.3 Operating instructions 2.4 Applicable software 2.5 Communication techniques 2.6 Health and safety procedure 2.7 Company policy in relation to relevant technology 2.8 Different management concepts 2.9 Technology adaptability
3. Underpinning skills	3.1 Relevant technology application/implementation 3.2 Basic communication skills 3.3 Software applications skills 3.4 Basic troubleshooting skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Relevant technology 4.2 Interview and demonstration questionnaires 4.3 Assessment packages
5. Method of assessment	Competency must be assessed through: 5.1 Interview 5.2 Actual demonstration 5.3 Authenticated portfolio (related certificates of training/seminar)
6. Context of assessment	6.1 Competency may be assessed in actual workplace or simulated environment

COMMON COMPETENCIES
(AUTOMOTIVE MANUFACTURING-PARTS MANUFACTURING)

UNIT TITLE: **READ, INTERPRET AND APPLY ENGINEERING DRAWINGS**.

UNIT CODE: **ALT742201**

UNIT DESCRIPTOR: This unit deals with identifying, interpreting and applying specification from engineering blue prints or drawings that provides the measurements of the product and pattern that is to be produced.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify and access engineering drawings/ specification	1.1 Appropriate ***engineering drawings*** are identified and accessed as per job requirements. 1.2 Version and date of drawing is checked to ensure correct specification and procedure are identified.
2. Interpret drawings	2.1 Relevant dimensions and sections of the drawings/ specifications are located in relation to the work to be conducted 2.2 Information in the manual are interpreted in accordance to industry practices
3 Apply information in the drawings & specifications	3.1 Engineering drawing is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with the specifications in the drawings. 3.3 Dimensional ***data*** and shape are applied according to the given task
4. Store drawings	4.1 The drawings and specification are stored properly to ensure prevention of damage, ready access and updating of information when required in accordance with company requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Engineering drawings	Kinds of drawings: 1.1 Casting drawing 1.2 Machining drawing 1.3 Project plan 1.4 Technical drawing
2. Data	Data includes but not limited to 2.1 Material specifications 2.2 Process specifications 2.3 Special instructions 2.4 Machining locating points 2.5 Clamping points 2.6 Amount of draft 2.7 Surface finish

EVIDENCE GUIDE

1.Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified and accessed drawings/specification 1.2 Interpreted drawings 1.3 Applied information in drawings 1.4 Stored drawings
1. Underpinning knowledge and attitudes	2.1 Types of drawings used in automotive manufacturing industry 2.2 Identification of symbols used in the drawings 2.3 Identification of units of measurements 2.4 Unit conversion 2.5 Attention to details, Perseverance, Honesty
3. Underpinning skills	3.1 Reading and comprehension skills required to identify and interpret engineering drawings and specifications 3.2 Accessing information and data
4. Resource implications	The following resources **MUST** be provided: 4.1 All drawings/engineering specifications relative to automotive manufacturing 4.2 Job order, requisitions 4.3 Product sample
5 Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Interview
6 Context of assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment may be conducted in the workplace or a simulated environment.

UNIT OF COMPETENCY: **PERFORM MENSURATION AND CALCULATION**

UNIT CODE: **ALT311202**

UNIT DESCRIPTOR: This unit includes identifying, caring for, handling, using and maintaining measuring instruments.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Select measuring instruments	1.1 Object or component to be measured is identified 1.2 Correct specifications are obtained from relevant source 1.3 Appropriate ***measuring instrument*** is selected according to job requirements
2. Carry out measurements and calculation	2.1 Measuring tools are selected in line with job requirements 2.2 Accurate measurements are obtained to job 2.3 ***Calculation*** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x) and division (/). 2.4 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.5 Numerical computation is self-checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool.
3. Maintain measuring instruments	3.1 Measuring instruments are kept free from corrosion 3.2 Measuring instruments are not dropped to avoid damage 3.3 Measuring instruments are cleaned before and after using.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring instruments	Measuring instruments includes: 1.1 Multitester 1.2 Micrometer (In-out, depth) 1.3 Vernier caliper (Out, inside) 1.4 Dial Gauge with Mag. Std. 1.5 Straight Edge 1.6 Thickness gauge 1.7 Try square 1.8 Protractor 1.9 Height gauge 1.10 Steel rule 1.11 Shrink rule
2. Calculation	Kinds of part mensuration include: 2.1 Volume 2.2 Area 2.3 Displacement 2.4 Inside diameter 2.5 Circumference 2.6 Length 2.7 Thickness 2.8 Outside diameter 2.9 Taper 2.10 Out of roundness 2.11 Shrinkage allowance

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1 Selected measuring instruments 1.2 Carried-out measurements and calculations. 1.3 Maintained measuring instruments
2. Underpinning knowledge and attitudes	2.1 Types of Measuring instruments and its uses 2.2 Safe handling procedures in using measuring instruments 2.3 Four fundamental operation of mathematics 2.4 Formula for Volume, Area, Perimeter and other geometric figures
3. Underpinning skills	3.1 Caring and Handling measuring instruments 3.2 Calibrating and using measuring instruments 3.3 Performing calculation by Addition, Subtraction, Multiplication and Division 3.4 Visualizing objects and shapes 3.5 Interpreting formula for volume, area, perimeter and other geometric figures
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace location 4.2 Measuring instrument appropriate to servicing processes 4.3 Instructional materials relevant to the propose activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination 5.3 Interview 5.4 Demonstration with questioning
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.1 Assessment may be conducted in a workplace or simulated environment

UNIT TITLE: **READ, INTERPRET AND APPLY SPECIFICATION AND MANUALS**.

UNIT CODE: ALT723203

UNIT DESCRIPTOR: This unit deals with identifying, interpreting and applying service specification manuals, maintenance procedure manuals and periodic maintenance manual

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify and access manual/ specification	1.1 Appropriate ***manuals*** are identified and accessed as per job requirements. 1.2 Version and date of manual is checked to ensure correct specification and procedure are identified.
2. Interpret manuals	2.1 Relevant sections, chapters of manuals/specifications are located in relations to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance to industry practices
3 Apply information in manual	3.1 Manual is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer specification 3.3 Manual data is applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1 Manual or specification are stored appropriately to ensure prevention of damage, ready access and updating of information when required in accordance with company requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Manuals	Kinds of manuals: 1.1 Manufacturer's specification manual 1.2 Repair manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual

EVIDENCE GUIDE

1.Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified and accessed manual/specification 1.2 Interpreted manuals 1.3 Applied information in manuals 1.4 Stored manuals
2. Underpinning knowledge and attitudes	2.1 Types of manuals used in automotive industry 2.2 Identification of symbols used in the manuals 2.3 Identification of units of measurements 2.4 Unit conversion
3. Underpinning skills	3.1 Reading and comprehension skills required to identify and interpret automotive manuals and specifications 3.2. Accessing information and data
4 Resource Implications	The following resources must be provided: 4.1 All manuals/catalogues relative to Automotive 4.2 Job order, requisitions 4.3 Actual vehicle or simulator
5 Method of assessment	Competency must be assessed through: 5.1 Observation with questioning 5.2 Interview
6 Context of assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment may be conducted in the workplace or a simulated environment.

UNIT OF COMPETENCY : PERFORM SHOP MAINTENANCE

UNIT CODE : ALT723205

UNIT DESCRIPTOR : This unit deals with inspecting and cleaning of work area including tools, equipment and facilities. Storage and checking of tools/ equipment and disposal of used supplies/materials are also incorporated in this competency.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables
1. Inspect/clean tools and work area	1.1 Cleaning solvent used as per workshop/tools ***cleaning requirement***
	1.2 **W*ork area*** is checked and cleaned
	1.3 Wet surface/spot in work area is wiped and dried
2. Store/arrange tools and shop equipment	2.1 Tools/equipment are checked and stored in their respective shelves/location
	2.2 Corresponding labels are posted and visible
	2.3 Tools are safely secured and logged in the records
3. Dispose wastes/used lubricants	3.1 Containers for used lubricants are visibly labeled
	3.2 Wastes/used lubricants are disposed as per workshop SOP
4. Report damaged tools/equipment	4.1 Complete inventory of tools/equipment is maintained
	4.2 Damaged tools/equipment/facilities are identified and repair recommendation is given
	4.3 Reports prepared has no error/discrepancy

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work area	Work areas include: 1.1 Workshop areas for servicing/repairing light and/or heavy vehicle and/or plant transmissions and/or outdoor power equipment 1.2 Open workshop/garage and enclosed, ventilated office area 1.3 Other variables may include workshop with: • Mess hall • Wash room • Comfort room
2. Cleaning requirement	2.1 Cleaning solvent 2.2 Inventory of supplies, tools, equipment, facilities 2.3 List of mechanics/technicians 2.4 Rags 2.5 Broom 2.6 Mop 2.7 Pail 2.8 Used oil container 2.9 Oiler 2.10 Dust/waste bin
3. Manuals	3.1 Vehicle/plant manufacturer specifications 3.2 Company operating procedures 3.3 Industry/Workplace Codes of Practice 3.4 Product manufacturer specifications 3.5 Customer requirements 3.6 Industry Occupational Health and Safety
4. Company standard operating procedure	Wearing of Personal protective equipment include: 4.1 Gloves 4.2 Apron 4.3 Goggles 4.4 Safety shoes

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned workshop tools/facilities 1.2 Maintained equipment, tools and facilities 1.3 Disposed wastes and used lubricants/fluid as per required procedure
2. Underpinning knowledge and attitudes	2.1 5 S or TQM 2.2 Service procedures 2.3 Relevant technical information 2.4 Safe handling of equipment and tools 2.5 Vehicle safety requirements 2.6 Workshop policies 2.7 Personal safety procedures 2.8 Fire extinguishers and prevention 2.9 Storage/disposal of hazardous/flammable materials 2.10 Positive Work Values (Perseverance, Honesty, Patience, Attention to Details)
3. Underpinning skills	3.1 Handling/Storing of tools/equipment/supplies and material 3.2 Cleaning grease/lubricants 3.3 Disposing of wastes and fluid 3.4 Preparing inventory of s/m and tools and equipment 3.5 Monitoring of s/m and tools/equipment
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Written/Oral Questioning 5.2 Demonstration
6. Context of assessment	6.1 Competency must be assessed on the job or in a simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

CORE COMPETENCIES

UNIT OF COMPETENCY : **APPLY QUALITY SYSTEMS**

UNIT CODE : **ALT315308**

UNIT DESCRIPTOR : This unit covers working within a quality improvement system, either individually or in a team situation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Work within a quality system	1.1 Instructions and procedures are followed and duties are performed in accordance with requirements of ***quality improvement system.*** 1.2 Conformance to specifications is ensured. 1.3 Defects are detected and reported according to standard operating procedures. 1.4 Performance of operation or quality of product or service is monitored to ensure ***customer*** satisfaction.
2. Engage in quality improvement	2.1 Current performance is assessed. 2.2 Established performance measures are identified. 2.3 Specifications and standard operating procedures are identified. 2.4 Defects are detected and reported according to standard operating procedures. 2.5 Process improvement procedures are participated in. 2.6 The improvement of internal/external customer/supplier relationships is participated in. 2.7 Performance of operation or quality of product or service is monitored to ensure customer satisfaction.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Quality improvement system	A system comprising some or all of the following elements: 1.1 Quality assurance 1.2 Quality control 1.3 Quality inspection 1.4 Quality improvement 1.5 Total quality control
2. Customer	The next person or organization receiving the production or service

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1 Worked within a quality system which include planning to meet customers' requirements, checking procedures to ensure customer requirements are met; and inspecting and testing products and services
2. Underpinning knowledge and attitudes	2.1 Quality system terminology and concepts e.g. quality assurance – planning to meet customers' requirements 2.2 Quality control – checks and Quality inspection – inspecting and testing products and services 2.3 Total quality control 2.4 Commonly accepted meaning/s of the terms quality and quality system 2.5 Reasons for following the requirements of the quality improvement system 2.2 Strategies and approaches for working within a quality system 2.6 Procedures to be followed in undertaking the work 2.7 Specifications to which the individual's work is to comply 2.8 Reasons for ensuring work conforms to specification 2.9 Benefits of good quality: 2.10 Costs and consequences of poor quality 2.11 Procedures for reporting defects 2.12 Examples of common defects 2.13 Quality improvement procedures 2.14 Four steps of the quality cycle: plan, do, check, act 2.15 Reasons for following process improvement procedures 2.16 Examples of ways in which customer/supplier relationships can be improved 2.17 Benefits of good customer/supplier relationship 2.18 Hazards and control measures associated with applying quality procedures, including housekeeping 2.19 Safe work practices and procedures
3. Underpinning skills	3.1 Reading, interpreting and following information on written job sheets, instructions, standard operating procedures and drawings 3.2 Checking and clarifying task-related information 3.3 Entering information into workplace documents 3.4 Checking for conformance to specifications 3.5 Identifying duties of the individual within the quality improvement system 3.6 Identifying customers' requirements with respect to the operation or quality of the product or service 3.7 Reporting where appropriate, defects detected 3.8 Carrying out work in accordance with the process improvement procedures 3.9 Carrying out work in a manner consistent with the improvement of customer/supplier relationships 3.10 Performing numerical operations, geometry and calculations/ formulae within the scope of this unit

4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace area: Real or simulated 4.2 Access to all tools, equipment, materials and documentation required. 4.3 Any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Portfolio 5.3 Third party report
6. Context of assessment	6.1 Competency must be assessed on-the-job or in a simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience

UNIT OF COMPETENCY: **CONDUCT PRODUCT AND/OR PROCESS CAPABILITY STUDIES**

UNIT CODE : **ALT315309**

UNIT DESCRIPTOR : This unit covers conducting process capability studies, setting control limits and selecting sampling plans.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Conduct process capability studies	1.1 ***Procedure*** for conducting capability study is determined. 1.2 Instructions for personnel conducting trial run are prepared. 1.3 *Data* from trial run is analyzed and the ***process capability*** is calculated. 1.4 Possible number of ***product defects*** from a particular process is estimated. 1.5 Optimum target mean to suit process capability data is determined. 1.6 Reports listing of ***various options*** from process capability studies are prepared. 1.7 Design specifications based on an analysis of data are recommended.
2. Set control limits	2.1 Control limits for sample/subgroup average, range and standard deviation are calculated. 2.2 Warning limits for subgroup average, range and standard deviation are calculated. 2.3 Course of action resulting from out of control situation is determined and documented according to standard operating procedures.
3. Select sampling plans	3.1 ***Appropriate sampling plan*** to suit production schedule is selected and acceptable quality limits are determined, taking into account specified producer and consumer risks. 3.2 Sampling plan is documented including implementation strategy.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Procedure	1.1 Frequency of sample 1.2 sample size 1.3 Data From periodic samples drawn from a trial run of the process
2. Process capability	The natural tolerance of the process which may be calculated at 3 sigma/standard deviations
3. Product defects	From a consideration of 3 or 6 sigma standard deviations compared to specification requirements etc.
4. Various options	4.1 Adjustment of process to move average 4.2 Improvements to reduce process capability 4.3 Changes to reduce assignable causes
5. Appropriate sampling plan	Plans within the 5.1 Adopted quality system 5.2 Sample size 5.3 Frequency of sample

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate 1.1 Conducted process capability studies 1.2 Had set control limits 1.3 Selected sampling plans
2. Underpinning knowledge and attitudes	2.1 Process to be studied 2.2 Procedures for conducting process capability studies 2.3 Data used to calculate the process capability 2.4 Procedures for estimating the possible number of product defects 2.5 Options for improving the process and benefits of each 2.6 Procedures for determining the optimum target mean 2.7 Procedures for setting control limits 2.8 Numerical operations and calculations/formulae for process capability, control limits and other outcomes within the scope of this unit 2.9 Procedures for setting warning limits 2.10 Concept of 'out of control' situations 2.11 Action to be taken when an 'out of control' situation is detected 2.12 Procedures for documenting 'out of control' situations 2.13 Acceptable level of quality 2.14 A variety of sampling plans and their application 2.15 Sampling plan to be applied to a given situation 2.16 Reasons for selecting the chosen plan 2.17 Acceptable quality limits 2.18 Risks associated with identifying acceptable quality limits for the producer and customer 2.19 Procedures for documenting and implementing sampling plans 2.20 Hazards and control measures 2.21 Use and application of personal protective equipment 2.21 Safe work practices and procedures
3. Underpinning skills	3.1 Collecting and collating data 3.2 Analyzing data, identifying solutions and developing recommendations 3.3 Preparing reports listing the various options identified from the process capability study 3.4 Determining process design specifications from process capability data 3.5 Documenting sampling plan and implementation strategy
4. Resource Implications	The following resources **MUST** be provided: 4.1 Workplace area: Real or simulated 4.2 Access to all tools, equipment, materials and documentation required. 4.3 Any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials
5. Method of assessment	Competency **MUST** be assessed through: 5.1 Observation with questioning 5.2 Portfolio 5.3 Third party report

6. Context of assessment	6.1 Competency must be assessed on the job or in a simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience

UNIT OF COMPETENCY : **MAINTAIN / SUPERVISE THE APPLICATION OF QUALITY PROCEDURES**

UNIT CODE : **ALT315310**

UNIT DESCRIPTOR : This unit covers improving the quality system, and collecting and summarizing data to support the quality improvement process. The data would be used to produce statistical information such as averages and ranges, and charts such as tally, run or control charts.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Improve quality system	1.1 Specifications to meet ***customer needs*** (internal and external) are interpreted. 1.2 Leadership role as a supplier is undertaken to ensure quality within the supply chain.
2. Collect and summarize data	2.1 Data is recorded and interpreted accurately in accordance with standard operating procedures. 2.2 Data is used to produce relevant statistical information, for example, average and range or the production of charts such as tally, run or control charts.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Customer needs	1.1 Product 1.2 Service 1.3 Delivery and distribution 1.4 Quality 1.5 Quantity 1.6 Price 1.7 Communication and documentation

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate 1.1 Maintained/Supervised the application of quality procedures
2. Underpinning knowledge and attitudes	2.1 Specifications to be achieved in providing the service or producing the product 2.2 Team's supplier(s) and customer(s) 2.3 Possible effects of supplying products and/or services to customers that do not comply with specifications 2.4 Procedures to be followed in producing the product and/or supplying the service 2.5 Checks to be undertaken to ensure the product / service complies with specifications 2.6 Personnel responsible for the quality of the product / service provided 2.7 Actions to be taken when a non-conformance to specifications is detected and reasons for taking those actions 2.8 Procedures for recording data collected 2.9 Possible trends from the collected data 2.10 Actual trends indicated by given samples of data 2.11 Reasons for collecting data 2.12 Statistical information to be calculated 2.13 Use of statistics in interpreting production data 2.14 Functions of tally, run or control charts in representing production data 2.15 Trends indicated by the statistical information calculated and/or the charts produced 2.16 Action to be taken in response to any trends identified 2.17 Reasons for taking proposed action 2.18 Appropriate techniques, tools and equipment to measure machined components 2.19 Hazards and control measures within the scope of this unit 2.20 Use and application of personal protective equipment 2.21 Safe work practices and procedures
3. Underpinning skills	3.1 Obtaining and interpreting the specifications of the product or service to be provided 3.2 Communicating effectively with suppliers and customers 3.3 Recording data collected 3.4 Calculating relevant statistical information from collected data 3.5 Producing tally, run and control charts from collected data 3.6 Using leadership skills 3.7 Using analysis skills
4. Resource Implications	The following resources MUST be provided: 4.4 Workplace area: Real or simulated 4.5 Access to all tools, equipment, materials and documentation required. 4.6 Any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials

5. Method of assessment	Competency MUST be assessed through: 5.1 Observation with questioning 5.2 Portfolio 5.3 Third party report
6. Context of assessment	6.1 Competency must be assessed on-the-job or in a simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience

SECTION 3 TRAINING STANDARDS

These guidelines are set to provide the Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for PROCESS INSPECTION NC III.

3.1 CURRICULUM DESIGN

Course Title: **PROCESS INSPECTION** NC Level: **NC III**

Nominal Training Duration: **20 Hours** (Basic Competencies)
20 Hours (Common Competencies)
45 Hours (Core Competencies)

Course Description:

This course is designed to equip individual with competency to apply quality systems, conduct product and or process capability studies and maintain and supervise the application of quality procedures. These units cover improving the quality system, and collecting and summarizing data to support the quality improvement process.

Basic competencies such as: Lead workplace communication; Lead small teams; Develop and practice negotiation skills; Solve problems related to work activities; Use mathematical concepts and techniques and Use relevant technologies are included.

It also includes common competencies such as: Read, Interpret and Apply Engineering Drawings; Perform Mensuration and Calculation Read; Interpret and Apply Specifications and Manuals and; Perform Shop Maintenance

To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Lead workplace communication	1.1 Communicate information about workplace processes. 1.2 Lead workplace discussions. 1.3 Identify and communicate issues arising in the workplace	• Group discussion • Role Play • Brainstorming	• Observation • Interviews
2. Lead small teams	2.1 Provide team leadership. 2.2 Assign responsibilities among members. 2.3 Set performance expectation for team member 2.4 Supervise team performance	• Lecture • Demonstration • Case studies • Modular	• Written examination • Direct Observation
3. Develop and practice negotiation skills	3.1 Identify relevant information in planning negotiations 3.2 Participate in negotiations 3.3 Document areas for agreement	• Lecture • Role play • Practical exercises	• Written test • Demonstration

4. Solve workplace problem related to work activities	4.1 Explain the analytical techniques. 4.2 Identify the problem. 4.3 Determine the possible cause/s of the problem.	• Direct observation • Simulation/role playing • Case studies	• Written test • Practical/ performance test
5. Use mathematical concepts and techniques	5.1 Identify mathematical tools and techniques to solve problem 5.2 Apply mathematical procedures/solution 5.3 Analyze results	• Lecture • Self-paced instruction • Group discussion • Practical work approach • Research study	• Written test • Demonstration • Oral interview
6. Use relevant technologies	6.1 Identify appropriate technology 6.2 Apply relevant technology 6.3 Maintain/enhance relevant technology	• Lecture • Self-paced instruction Group discussion • Film showing	• Written test • Interview

COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Read, Interpret and Apply Engineering Drawings	1.1 Identify and access engineering drawings/ specification 1.2 Interpret drawings 1.3 Apply information in the drawings & specifications 1.4 Store drawings	• Lecture/ Demonstration • Dual training	• Direct observation • Interview
2. Perform Mensuration and Calculation	2.1 Select measuring instrument and carry out measurement and calculations. 2.2 Maintain measuring instruments	• Lecture • Demonstration • Practical exercises • Simulation	• Written test • Oral questioning • Direct observation
3. Read, Interpret and Apply Specifications and Manual	3.1 Identify/accessed manuals and interpret data and specification 3.2 Apply information accessed in manual 3.3 Store manual	• Lecture/ Demonstration • Dual training • Distance Learning	• Written/Oral questioning • Direct observation • Project method • Interview
4. Perform Shop Maintenance	4.1 Inspect/clean tools and work area 4.2 Store/arrange tools and shop equipment 4.3 Dispose wastes/used lubricants 4.4 Report damaged tools/equipment	• Lecture/ • Demonstration • Self-paced instruction • Dual training • Simulation	• Written test • Direct observation • Interview • Practical exercises • Demonstration

CORE COMPETENCY

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply quality systems	1.1 Work within a quality system. 1.2 Engage in quality improvement.	• Demonstration • Lecture • Discussion • Dual training	• Observation with questioning • Portfolio • Third party report
2. Conduct Product and/or process capability studies	2.1 Conduct process capability studies 2.2 Set control limits 2.3 Select sampling plans	• Demonstration • Lecture • Discussion • Dual training	• Observation with questioning • Portfolio • Third party report
3. Maintain / supervise the application of quality procedures	3.1 Improve quality system 3.2 Collect and summarize data	• Demonstration • Lecture • Discussion • Dual training	• Observation with questioning • Portfolio • Third party report

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are nationally accredited.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.
- Project-Based Instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

3.3 TRAINEE ENTRY REQUIREMENTS

This section specifies the qualifications of trainees and educational experience. Other requirements like health and physical requirements are also stated. Passing entry written examinations may also be indicated if necessary.

- Ability to communicate both orally and in writing;
- Physically and mentally fit; and
- Must possess the Process Inspection National Certificate (NC) II

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS PROCESS INSPECTION NC III

Recommended list of tools, equipment and materials for the training of 25 trainees for PROCESS INSPECTION NC III

TOOLS		EQUIPMENT		MATERIALS	
QTY		QTY		QTY	
10 units	Vernier caliper	1 units	Optical Pyrometer	6 pcs	Batteries (1.5v & 9 v)
25 units	Steel rule	1 unit	Contact or immersion Pyrometer	24 pcs	Thermocouple cups
10 units	Micrometer	2 units	Hardness Testers (portable)		
14 units	Sampling tools	2 units	Moisture testers	2 sets.	Heating elements
14 units	Magnifying glass	2 set	Sanding or grinding machine	4 belts or stones.	Sand paper (#120 to 400)
2 units	Ford cup #4	2 units	Sand rammer	2 kilos	White rag (De Hilo)
25 pcs.	Rubber glove	1 set	Desk top computer		
25 pcs.	Cotton glove	3 units	Printer		
25 pcs.	Nylon glove				
25 pcs.	Goggle				
25 pcs.	Gas mask				
25 pcs.	Safety shoe				
25 pcs.	Apron				

3.5 TRAINING FACILITIES
PROCESS INSPECTION NC III

Based on a class size of 25 students/trainees

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
• Building (permanent)	26.00 x 28.00	728.00	728.00
• Trainee Working Space	3.50 x 3.50 per student/trainee	12.25 per student	306.00
• Lecture Room	9.00 x 10.00	90.00	90.00
• Learning Resource Center	5.00 x 8.00	40.00	40.00
• Facilities/ Equipment/ Circulation Area**	-	-	349.00

***** Area requirement is equivalent to 30% of the total teaching/learning areas***

3.6 TRAINER'S QUALIFICATIONS FOR AUTOMOTIVE SECTOR MANUFACTURING SUB-SECTOR

PROCESS INSPECTION NC III
TRAINER QUALIFICATION (TQ II)

- Must be a holder of Process Inspection NC III
- Must have undergone training on Training Methodology II (TM II) [1]
- Must be computer literate
- Must be physically and mentally fit
- Must have at least 2 years job/industry experience[2]
- Must be a civil-service eligible or holder of appropriate professional license issued by the Professional Regulatory Commission (for government positions only)

[1] This shall be changed to ":Must be a holder of Trainer Qualification Level II (TQII) or equivalent" upon promulgation by the TESDA Board of the TQ/AQ training regulations

[2] Optional. Only when required by the hiring institution

Reference: TESDA Board Resolution No. 2004 03

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1 To attain the National Qualification of PROCESS INSPECTION NC III, the candidate must demonstrate competence in all the units listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.2 The qualification of PROCESS INSPECTION NC III may be attained through.

4.2.1 Demonstration of competence through project-type assessment covering all required units of competency of the qualification.

PERFORM PROCESS INSPECTION

- Apply Quality Systems
- Conduct Product and/or Process Capability Studies
- Maintain/Supervise the Application of Quality Procedures

4.3 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

4.4 The following are qualified to apply for assessment and certification:

4.4.1 Holder of Process Inspection NC II or equivalent qualification; or

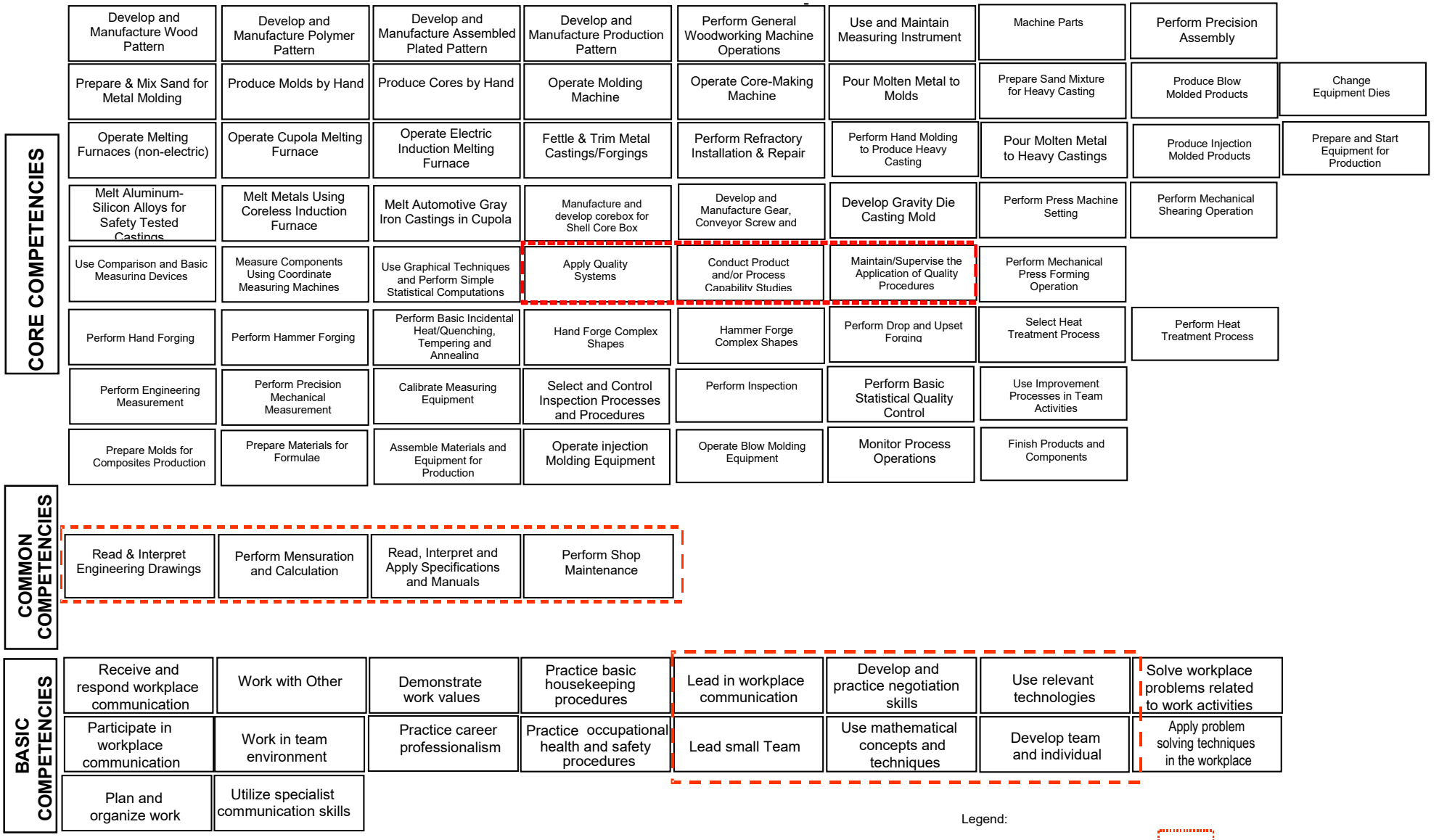
4.4.2 Graduates of formal, non-formal and informal including enterprise-based training programs.

4.4.3 Experienced workers (wage employed or self-employed)

4.5 The guidelines on assessment and certification are discussed in detail in the *Procedures Manual on Assessment* and *Certification* and *Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS).*

COMPETENCY MAP- AUTOMOTIVE SECTOR
MANUFACTURING SUB-SECTOR
(Parts Manufacturing)

ANNEX A



DEFINITION OF TERMS

1.	**Bore gauge**	**Bore gauge** is a measuring tool used for measuring the internal diameter of a cylindrical tube.
2.	**Data**	**Data** is the information collected about a product, service, process, person or machine.
3.	**Domain**	**Domain** is the set of possible values specified for a given mathematical function.
4.	**Flashing**	**Flashing** is a defect where resin flow out to the parting line of the mold and adheres to the part of the product, especially commonly seen in old mold.
5.	**Flowchart**	**Flowchart** is a pictorial summary of the flows and decisions that comprise a process. It is used for defining and documenting the process.
6.	**Gantt chart**	**Gantt chart** is a **scheduling chart** in which horizontal lines show the actual and projected amounts of time involved in completing a particular task or reaching specific levels of production it is is a bar chart that plots tasks and subtask against time.
7.	**Histogram**	**Histogram** is a statistical graph of frequency distribution in which vertical rectangles of different heights are proportionate to corresponding frequencies.
8.	**Ishikawa diagram**	**Ishikawa diagram** is a tool used to organize the possible causes of a problem, select the most probable cause, and verify the cause and effect relationship between the most probable cause and the problem under study.
9.	**Jetting**	**Jetting** or sometimes called flow marks is a defect that shows visible marks of movement as the materials enter the mold.
10.	**Mean**	**Mean** is a numerical representation of the arithmetic average it is the sum of the numerical values of the measurement divided by the number of items examined.
11.	**Median**	**Median** is the middle value when the data are arranged in ascending order. When there are an even number of observations, the median value is the arithmetic average of the middle two values.
12.	**Mode**	**Mode** of a distribution is the value that occurs most frequently, or the value corresponding to the highest point on a frequency polygon or histogram.
13.	**Pareto analysis**	**Pareto analysis** is the tool of analysis using the concept that focuses attention on the vital few against the trivial many.
14.	**Process**	**Process** is a collection of interacting components that transform inputs into outputs toward a common aim.
15.	**Short shot**	**Short shot** is a defect that occurs when the resin cools and solidifies before the material fills the mold completely.
16.	**Shrinkage**	**Shrinkage** is a defect that forms a cavity in a casting caused by insufficient amount of metal during solidification

17. The range — **The range** is the simplest measure of dispersion; for raw data from an enumerative or an analytic study, it is defined as the difference between the largest data point and the smallest.

18. Tolerance — **Tolerance** is the allowable variance from a nominal value established by design engineers that is deemed non harmful to the functioning of the product.

ACKNOWLEDGEMENT

The Technical Education and Skills Development Authority (TESDA) wishes to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies who rendered their time and expertise to the development and validation of this Training Regulation.

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