Co-funded by the European Union

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Norwegian Embassy
Islamabad

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

NAVTTC

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Published by
National Vocational and Technical Training Commission
Government of Pakistan

Headquarter
Plot 38, Kirthar Road, Sector H-9/4, Islamabad, Pakistan
www.navttc.org

Responsible
Director General Skills Standard and Curricula, National Vocational and Technical Training Commission
National Deputy Head, TVET Sector Support Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Layout & design
SAP Communications

Photo Credits
TVET Sector Support Programme

This document has been produced with the technical assistance of the TVET Sector Support Programme, which is funded by the European Union, the Federal Republic of Germany and the Royal Norwegian Embassy and has been commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with the National Vocational and Technical Training Commission (NAVTTC) as well as provincial Technical Education and Vocational Training Authorities (TEVTAs), Punjab Vocational Training Council (PVTC), Qualification Awarding Bodies (QABs)s and private sector organizations.

Document Version
October, 2019
Islamabad, Pakistan

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

Introduction

Competence-based training helps to bridge the gap between what is taught in training and what tasks will be performed on the job. Training trainees to perform actual job functions helps to ensure that future front-line workers have the skills, knowledge and abilities required to perform their jobs properly, safely and effectively. In addition to competence-based training, assessment based on the performance of actual work competencies helps to ensure that:

- Trainees are performing their work tasks as safely as possible
- Performance gaps are recognized prior to serious incidents
- Training can be implemented to improve competence.

There are significant benefits to competence-based training:

1. **Cost effectiveness**

   Since training activities and assessments in a competence-based approach are goal-oriented, trainers focus on clearly defined areas of skills, knowledge and understanding that their own industry has defined in the competence standards. At the same time, trainees are more motivated to learn when they realize the benefits of improved performance.

2. **Efficiency**

   The transfer gap between the training environment and working on the job is reduced substantially in a competence-based approach. This is because training and assessment are relevant to what needs to be done on the job. As a result, it takes less time for trainees to become competent in the required areas. This, in turn, contributes to improved efficiency where training and assessment are concerned.

3. **Increased productivity**

   When trainees become competent in the competence standards that their own industry has defined, when they know what the performance expectations are and receive recognition for their abilities through successful assessments, they are likely to be more motivated and experience higher job satisfaction. The result is improved productivity for organizations. The communication and constructive feedback between future employers and employees will improve as a result of a competence-based approach, which can also increase productivity.

4. **Reduced risk**

   Using a competence-based approach to training, development, and assessment, employers are able to create project teams of people with complementary skills. A trainee's record of the skills, knowledge and understanding relating to the competence standards they have achieved can be used by a future employer to identify and provide further relevant training and assessment for new skills areas. Competence standards can shape employee development and promotional paths within an organization and give employees the opportunity to learn more competencies beyond their roles. It can also provide organizations with greater ability to scale and flex as needed, thereby reducing the risk they face.

5. **Increased customer satisfaction**

   Employees who have been trained and assessed using a competence-based approach are, by the definition of the relevant competence standards, able to perform the required tasks associated with a job. The knock-on effect is that, in service-related industries, they are able to provide high service levels, thereby increasing customer satisfaction. In production or manufacturing industries, they are able to work closely to industry standards in a more effective and efficient way.

Lesson plans

This manual provides a series of lesson plans that will guide delivery of each module for the *Automotive Parts Production Machine Operator* qualification. It is important for trainers to be flexible and be ready to adapt lesson plans to suit the context of the subject and the needs of their trainees.

Good teachers acknowledge that CBT means each and every trainee in the class learns at a different speed. The good teacher is prepared to throw aside the day's lesson plan and do something different (and unplanned) for the class even if it means 'writing' a lesson plan for each trainee to match their learning pace for that day or week.

Learning by doing is different from learning theory and then applying it. To learn to do something, trainees need someone looking over their shoulder saying 'it's not quite like that, it's like this', 'you do it like this because …', or even 'tell me why you chose to do it like this?'.

In this way, trainees learn that theoretical knowledge is meaningless if it is not seen in the context of what they are doing. In other words, if a trainee doesn't know why they do something, they will not do it competently (skills underpinned by knowledge = competent performer).

This is how an Automotive Parts Production Machine Operator acquires a practical grasp of the standards expected. It's not by learning it in theory, but because those standards are acquired through correction by people who show what the standards are, and correct the trainee where they do not meet those standards, and where they repeat it correction until they have internalized those standards.

Demonstration of skill

Demonstration or modeling a skill is a powerful tool, which is used, in vocational training. The instructions for trainers for demonstration are as under:

a) Read the procedure mentioned in the Trainer Guide for the relevant Learning Unit before demonstration.
b) Arrange all tools, equipment and consumable material, which are required for demonstration of a skill.
c) Practice the skill before demonstration to trainees, if possible.
d) Introduce the skill to trainees clearly at the commencement of demonstration.
e) Explain how the skill relates to the skill(s) already acquired and describe the expected results or show the objects to trainees.
f) Carry out demonstration in a way that can be seen by all trainees.
g) Use the same tools and materials that the learner will be using
h) Go through EACH of the steps involved in performing the skill
i) Go SLOWLY - describe each step as it is completed.
j) Encourage the learners to move around and watch what you are doing from a number of different angles.
k) Identify critical or complex steps, or steps that involve safety precautions to be followed.
l) Explain theoretical knowledge where applicable and ask questions to trainees to test their understanding.
m) Try to involve the learners: Ask them questions about why they think the process may work that way.
n) Repeat critical steps in demonstration, if required.
o) Summarize the demonstration by asking questions to trainee.

Overview of the program

Course: NVQ Certificate Level-3 in Automotive Parts Production Machine Operator	**Total Course Duration:** 750 hours
Course Overview:	
The purpose of the "Automotive Parts Production Machine Operator" level-3 course is to engage youth of this country with high demand training of automotive parts manufacturing sector that provides them relevant skill, knowledge and understanding to start their career as "*Automotive Parts Production Machine Operator*" level-3 in automotive industry. The qualification address a variety of skills required for parts production operation of automotive parts manufacturing industry like pressing /stamping, welding, threading and vacuum forming manufacturing and periodic maintenance beside competencies of generic like work health and safety practices, work place policies and procedures, communication skills at workplace, computer application skills and manage personal finance with the aim to meet the skilled manpower requirement of the automotive parts manufacturing industry across the country and globe.	

Module Title and Aim	Learning Units	Duration
Module 1: Apply Work Health and Safety Practices (WHS). **Aim:** The Aim of this module is to describe the skills to work with safety and participate in hazard assessment activities, follow emergency procedures and participate OHS practices in process.	**LU1:** Implement safe work practices at work place. **LU2:** Participate in hazard assessment activities at work place. **LU3:** Follow emergency procedures at workplace. **LU4:** Participate in OHS consultative processes.	30 Hours

Module Title and Aim	Learning Units	Duration
Module 2: Identify and Implement Workplace Policy and Procedures. **Aim:** The Aim of this module is to describe the skills and knowledge required to develop and implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.	**LU1:** Identify workplace policy & procedures. **LU2:** Implement workplace policy & procedures. **LU3:** Communicate workplace policy & procedures. **LU4:** Review the implementation of workplace policy & procedures.	20 Hours

Module Title and Aim	Learning Units	Duration
Module 3: Communicate at Workplace **Aim:** The Aim of this module is to describe the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.	**LU1:** Communicate within the organization. **LU2:** Communicate outside the organization. **LU3:** Communicate effectively in workgroup. **LU4:** Communicate in writing**.**	30 Hours

Module Title and Aim	Learning Units	Duration
Module 4: Perform Computer Application Skills **Aim:** The Aim of this module is to describe the skills and knowledge required to use spreadsheet applications, prepare in page documents, develops familiarity with Word, Excel, Access, PowerPoint, email, and computer graphics basics. It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets, Microsoft office and computer graphics in under direct supervision or with limited responsibility.	**LU1:** Prepare In-page documents as per required information. **LU2:** Prepare Spreadsheets as per required information. **LU3:** Use MS Office as per required information. **LU4:** Perform computer graphics in basic applications. **LU5:** Create Email account for communications.	40 Hours

Module Title and Aim	Learning Units	Duration
Module 5: Manage Personal Finances **Aim:** The Aim of this module is to describe the outcomes required to develop, implement and monitor a personal budget in order to plan regular savings and manage debt effectively.	**LU1:** Develop a personal budget. **LU2:** Develop long term personal budget. **LU3:** Identify ways to maximize future finances.	30 Hours
Module 6: Perform welding **Aim:** The aim of this module is to cover the specific skills and knowledge related to Spot-, Seam-, MIG and TIG-welding operations in automotive parts manufacturing industries, material handling and maintains machine and workplace.	**LU1:** Prepare for welding. **LU2:** Prepare welding equipments and accessories. **LU3:** Perform spot welding operations. **LU4:** Perform seam welding operations. **LU5:** Perform MIG/TIG welding operations. **LU6:** Inspect final work. **LU7**: Perform work place cleaning and maintenance.	160 Hours

Module Title and Aim	Learning Units	Duration
Module 7: Apply thread rolling operations **Aim:** The aim of this module is to cover the specific skills and knowledge related to perform for thread rolling operation, material handling, formulation/construction, defects & remedies and maintains machine and workplace.	**LU1:** Prepare for thread rolling. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare thread rolling die. **LU4:** Operate machine. **LU5:** Inspect final product. **LU6:** Perform workplace cleaning and maintenance.	100 Hours

Module Title and Aim	Learning Units	Duration
Module 8: Perform vacuum forming operations **Aim:** The aim of this module is to cover the specific skills and knowledge related to perform vacuum forming operation, material handling, formulation/construction, defects & remedies and maintains machine and workplace.	**LU1:** Prepare for Vacuum forming. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare vacuum mould. **LU4:** Operate machine. **LU5:** Inspect final product. **LU6:** Perform workplace cleaning and maintenance.	100 Hours
Module 9: Perform pressing operation **Aim:** The aim of this module is to cover the specific skills and knowledge related to perform Pressing/stamping operations, material handling, inspection techniques and maintain hydraulic, pneumatic and mechanical press machines and work place.	**LU1:** Prepare for pressing. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare die. **LU4:** Operate mechanical press machine. **LU5:** Operate hydraulic press machine. **LU6:** Operate pneumatic press machine. **LU7:** Inspect final product. **LU8:** Perform workplace cleaning and maintenance.	150 Hours

Module Title and Aim	Learning Units	Duration
Module 10: Perform periodic operator maintenance **Aim:** The aim of this module is to cover the specific skills and knowledge related to work on periodic maintenance, making the workplace free from hazards and capable to report and record the maintenance activity performed on the machine and workplace.	**LU1:** Prepare for maintenance. **LU2:** Isolate and shut down equipment and machine. **LU3:** Inspect equipment and machine. **LU4:** Conduct preventive maintenance. **LU5:** Report faults. **LU6:** Record maintenance.	90 Hours

FORMAT FOR LESSON PLAN			
Module 6: Perform Welding			
Learning Unit 1: Prepare for welding			
Methods	Key Notes The tools, material and techniques used for preparing workstation for welding.	Media	Time
	Introduction		
	This session will introduce learners to the tools, techniques and material used for preparing workstation for welding, using presentation, demonstration, question and answer, and practical skills development.		
	Main Body		
	• Importance of PPEs. (I.e. Protection sheet/ goggles, hand gloves, safety shoes, apron, ear plug/ muffler). • Explaining types of materials to be used in welding. • Explaining the functions and purpose of welding accessories/ components. [i.e. torch body (or handle), two separate gas tubes (through the handle connected to the hoses), separate control valves, mixer chamber, flame tube, welding tip]		
	Conclusion		
	To conclude the session, review the tools, techniques and material used for preparing workstation for welding. Give learners the opportunity to ask questions.		
	<u>Assessment</u> Question and answer, discussion groups with feedback, observation of practice skills development		
		Total time:	15 Hrs

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-1
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Trainer's Guidelines

Module 1: Apply Work Health and Safety Practices (WHS)			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Implement safe work practices at work place		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Participate in hazard assessment activities at work place		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU3. Follow emergency procedures at workplace		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU4. Participate in OHS consultative processes			

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-2

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

Module 2: **Identify and Implement Workplace Policy and Procedures**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. **Identify workplace policy & procedures**		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. **Implement workplace policy & procedures**		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU3. **Communicate workplace policy & procedures**		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU4. Review the implementation of workplace policy &	.	Class Room	Learner guide Handouts

Module 2: **Identify and Implement Workplace Policy and Procedures**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
procedures		Workshop.	Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-3

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

Module 3: Communicate at Workplace			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Communicate within the organization		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Communicate outside the organization	.	Class Room Workshop.	Learner guide Handouts Presentation Videos
LU3. Communicate effectively in workgroup		Class Room Workshop.	Learner guide Handouts Presentation Videos

Module 3: Communicate at Workplace			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU4. Communicate in writing		Class Room Workshop.	Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-4

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

Module 4: Perform Computer Application Skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare In-page documents as per required information		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Perform Prepare Spreadsheets as per required information		Class Room Workshop.	Learner guide Videos for related knowledge on multimedia Handouts
LU3. Use MS Office as per required information		Workshop. Classroom	Learner guide Handouts Presentation Videos
LU4. Perform computer graphics in basic applications			Learner guide Handouts Presentation Videos

Module 4: Perform Computer Application Skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU5. Create Email account for communications			Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-5

TRAINER GUIDE

National Vocational Certificate Level 3

Version 1 - October, 2019

Module 5: Manage Personal Finances			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Develop a personal budget		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Develop long term personal budget		Class Room Workshop.	Learner guide Videos for related knowledge on multimedia Handouts
LU3. Identify ways to maximize future finances		Workshop. Classroom	Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-6
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for welding	Begin this session with an illustrative presentation about the preparation of workstation for performing welding. Include examples of: Importance of PPEs. (I.e. Protection sheet/ goggles, hand gloves, safety shoes, apron, ear plug/ muffler). Explaining types of materials to be used in welding. Explaining the functions and purpose of welding accessories/ components. [i.e. torch body (or handle), two separate gas tubes (through the handle connected to the hoses), separate control valves, mixer chamber, flame tube, welding tip] Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each issue with specific examples.	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU2. Prepare welding equipments and accessories	Invite an experienced welding operator from industry to deliver a presentation to trainees about prepare welding equipments and accessories. Ask the invited operator to address the following key points: Explaining types of electrodes and its importance (i.e. Consumable Electrodes- Non-Consumable Electrodes). Calculation of electrical current with respect to sheet thickness. Setting of gas pressure as per provided material with respect to sheet thickness and its specification or parameters. Explaining about types of welding machines (Spot Welders, Brazing/MIG Welders, Stud Welders etc.**)** After the presentation, invite trainees to pose questions to the	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	invited operator that will clarify their understanding..		
LU3. Perform spot welding operations	Invite an experienced spot welding operator from industry to deliver a presentation to trainees about perform spot welding operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Interpreting drawing and welding symbols. Explaining electrode tip calculation for spot welding with the help of general formula. Explaining the relation between holding time with the technique of job and electrode space maintaining and current calculation for spot welding. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for performing spot welding operations in a controlled environment Prepare either: • A flip chart • A PowerPoint slide • A handout Showing the key topics about performing spot welding operations. Go through all the key topics briefly and then allocate **one key topic** to each group. Learners need to work in their small groups discussing the key topic that has been allocated to their group. Each group should use a sheet of flip chart paper to record **three main points** from	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	their discussions that relate to **their key topic**. After the discussion, begin the feedback session. Ask one group to come to the front of the class with their flipchart. Put up the flipchart where it can be easily seen by other learners. Ask the group to share the main points they have recorded for their key topic for performing spot welding operations. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. Then ask the next group to share their flipchart showing the main points they have recorded for the next key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Photograph or scan all the flipcharts and use these to create a handout to distribute to all learners. Trainees need to practice their skills in using equipment and methods independently to perform spot welding job, in a real or realistic environment.		
LU4. Perform seam welding operations	Invite an experienced seam welding operator from industry to deliver a presentation to trainees about perform seam welding operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Interpreting drawing and welding symbols. Explaining roller electrode with adjustment of RPM and pressure for seam welding. Explaining the relation between holding time with the technique of job and electrode space maintaining and current calculation	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	for seam welding. Demonstrate the equipments to learners to support their understanding. Enable learners to practice using the appropriate tools and equipment for performing seam welding operations in a controlled environment. Learners need to devise 10 quiz questions with answers based on performing seam welding operations. They must make sure their questions cover key topics for performing seam welding operations. Issue each learner with 10 blank cards. Each learner should number the cards and write their name on one side with a question about performing seam welding operations. On the reverse of the card, they should write an appropriate answer to their question. For the quiz, arrange learners in two equal teams. Ask one learner to keep score using a suitable score-card. Player 1 for Team A asks one of their questions to Player 1 of Team B, who needs to answer the question. Discuss the answer with the group and ask the group to determine if the answer is correct. Player 1 of Team A then confirms the answer they had devised. (You need to correct answers if the learner's answer was not wholly correct.) The scorekeeper records 1 mark for a correct answer under the appropriate team's score column. Play then passes to Player 1 of Team B, who asks their question to Player 1 of Team A, and so on. Total the scores at the end of the quiz to see which team won. After the quiz, collect learners' question/answer cards and check that answers provided were correct. Return any incorrect		

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	answers to learners and ask them to change their answer to the correct one. Trainees need to practice their skills in using equipment and methods independently to perform seam welding job, in a real or realistic environment.		
LU5. Perform MIG/TIG welding operations	Invite an experienced MIG/TIG welding operator from industry to deliver a presentation to trainees about perform MIG/TIG welding operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Interpreting drawing and welding symbols. Explaining about types of gases to be used in TIG/MIG welding.(i.e. Argon, CO_2). Understanding of electrode selection as per the job requirement. Explaining the relation between holding time with the technique of job and electrode space maintaining and current calculation for MIG/TIG welding. Demonstrate the equipments to learners to support their understanding. Enable learners to practice using the appropriate tools and equipment for performing MIG/TIG welding operations in a controlled environment Prepare either: • A flip chart • A PowerPoint slide • A handout Showing key topics for Performing MIG/TIG welding operations. Learners need to work in small groups discussing the key topics.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Each group should make notes from their discussions that identify **three main points** that related to **each key topic**. After the discussion, begin the feedback session. Ask one group to share the main points they have recorded for the first key topic for Performing MIG/TIG welding operations. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified. Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Trainees need to practice their skills in using equipment and methods independently to perform MIG/TIG welding job, in a real or realistic environment.		
LU6. Inspect final work	Begin this session with an illustrated presentation on inspection methods. Ensure that the presentation addresses the following points: Explaining welding inspection procedures in accordance with drawing and job. Uses of measurement equipments. (i.e. Vernier caliper, micro meter, sheet gauge, measuring tape, Checking fixture etc.) Knowledge and understanding of welding symbols. Preparation of inspection report. Ask the learner group to work in pairs to discuss the key points of product inspection and uses of measuring equipments in final inspection.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 6: 0716001041 Perform welding			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU7. Perform work place cleaning and maintenance	Trainees need to practice their skills in independently for cleaning the machine, tools and job floor after job completed in a realistic environment. These includes: Understanding of maintaining all check sheets and work instructions of the machine. Understanding of maintaining the tools and equipment. Knowledge and Understanding to keep tools and equipment at their appropriate place. Knowledge and Understanding about lubricants and lubrication. Knowledge and Understanding how to perform cleaning of machine, mould/die and floor. Knowledge and Understanding how to apply anti-rust spray/cleaning agent. Understanding about handling waste/excess material. Following the discussion, arrange trainees into small groups. Each group should produce a leaflet to encourage and support to perform workplace cleaning and maintenance with working efficiently and effectively.	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia Handouts

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-7
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 7: 0716001042 Apply thread rolling operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for thread rolling	Begin this session with an illustrative presentation about the preparation of workstation for performing thread rolling: Include examples of: Interpreting of drawing or process sheet. Understanding about types of material (i.e. Alloy Steel, Stainless Steel, Carbon Steel, Aluminum, Titanium, Copper Beryllium Copper, Brass etc.) Understanding about how to select the tools and equipment. Understanding how to set machine as per job specification. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.	Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Conduct pre-operational checks on machine	Lead a brainstorm to pre-operational checks on machine. List the brainstorm points on a flipchart. These includes : Inspect electrical connections. Check mechanical fitting and joints. Check operation of emergency switches. Check and maintain machine lubricant, temperature, pressures and coolant. Understanding of types of thread roller (i.e. In feed rolling (plunge, thru feed rolling). Understanding of operation of machine. Understanding of tool setting. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.	Class Room Workshop. Visit related industry	Learner guide Videos for related knowledge on multimedia Handouts

Module 7: 0716001042 Apply thread rolling operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU3. Prepare thread rolling die	Invite an experienced thread rolling operator from industry to deliver a presentation to trainees about prepare thread rolling die. Ask the invited operator to address the following key points: Understanding of how to lift roller. Method of roller clamping. Understanding of roller alignment. Importance and method of parameters setting. Knowledge and Understanding of trial of roller to verify the operation. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.	Workshop. Classroom	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate machine	Invite an experienced thread rolling operator from industry to deliver a presentation to trainees about perform thread rolling operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Knowledge and Understanding of speed and feed. Understanding thread rolling defects. Understanding of machine selection. Understanding and importance of parameters setting. Understanding of thread rolling operation. Knowledge of monitoring operation. Knowledge and Understanding of different parts of machine.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001042 Apply thread rolling operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Knowledge and Understanding of types of threads. Knowledge and Understanding of fits and limits system. Knowledge and Understanding of thread standards. Understanding of threading techniques. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating machine in a controlled environment. Prepare either: • A flip chart • A PowerPoint slide • A handout Showing the key topics about operating machine. Go through all the key topics briefly and then allocate **one key topic** to each group. Learners need to work in their small groups discussing the key topic that has been allocated to their group. Each group should use a sheet of flip chart paper to record **three main points** from their discussions that relate to **their key topic**. After the discussion, begin the feedback session. Ask one group to come to the front of the class with their flipchart. Put up the flipchart where it can be easily seen by other learners. Ask the group to share the main points they have recorded for their key topic for operating machine. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. Then ask the next group to share their flipchart showing the main points they have recorded for the next key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Photograph or scan		

Module 7: 0716001042 Apply thread rolling operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	all the flipcharts and use these to create a handout to distribute to all learners. Trainees need to practice their skills in using equipment and methods independently to perform thread rolling job, in a real or realistic environment.		
LU5. Inspect final product	Begin this session with an illustrated presentation on inspection methods. Ensure that the presentation addresses the following points: Explaining inspection procedures in accordance with drawing and job. Understanding of visual inspection. Understanding how to Check final product dimensionally. Uses of measurement equipments. (i.e. Vernier caliper, micro meter, gauges, measuring tape, Checking fixture etc.) Preparation of inspection report. Ask the learner group to work in pairs to discuss the key points of product inspection and uses of measuring equipments in final inspection.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU6. Perform workplace cleaning and maintenance	Trainees need to practice their skills in independently for cleaning the machine, tools and job floor after job completed in a realistic environment. These includes: Understanding of maintaining all check sheets and work instructions of the machine. Understanding of maintaining the tools and equipment. Knowledge and Understanding to keep tools and equipment at their appropriate place. Knowledge and Understanding about lubricants and lubrication. Knowledge and Understanding how to perform cleaning of machine,	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia Handouts

Module 7: 0716001042 Apply thread rolling operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	mould/die and floor. Knowledge and Understanding how to apply anti-rust spray/cleaning agent. Understanding about handling waste/excess material. Following the discussion, arrange trainees into small groups. Each group should produce a leaflet to encourage and support to perform workplace cleaning and maintenance with working efficiently and effectively.		

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-8
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 8: 0716001043 Perform vacuum forming operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for vacuum forming	Begin this session with an illustrative presentation about the preparation of workstation for performing vacuum forming operation. Include examples of: Interpreting of drawing or process sheet. Understanding how to arrange material as per drawing or process sheet. Knowledge and Understanding types of material (i.e. ABS, PP, PS, PC, AS etc.) Understanding about how to select tools and equipment. Understanding how to set machine as per job specification. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.	Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Conduct pre-operational checks on machine	Lead a brainstorm to pre-operational checks on machine. List the brainstorm points on a flipchart. These includes : Inspect electrical connections Check mechanical fitting and joints. Check operation of emergency switches. Check and maintain machine lubricant, temperature, pressures and coolant. Knowledge and Understanding of pneumatic system, connections and fittings. Knowledge and Understanding of Vacuum pump.	Class Room Workshop. Visit related industry	Learner guide Videos for related knowledge on multimedia Handouts

Module 8: 0716001043 Perform vacuum forming operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Understanding of operation of machine. Understanding how to check heaters Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.		
LU3. Prepare vacuum mould	Invite an experienced vacuum forming operator from industry to deliver a presentation to trainees about prepare vacuum forming equipments and accessories. Ask the invited operator to address the following key points: Understanding how to lift Mould. Method of mould clamping. Understanding of mould alignment. Importance and method of parameters setting. Knowledge and Understanding of trial of mould to verify the operation. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.	Workshop. Classroom	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate machine	Invite an experienced vacuum forming operator from industry to deliver a presentation to trainees about perform vacuum forming operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Understanding selection of machine as per job. Understanding and importance of parameters setting. Understanding of vacuum forming operation. Knowledge of monitoring of operation.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 8: 0716001043 Perform vacuum forming operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Understanding about quality of vacuum moulding parts. Knowledge and Understanding of different parts of moulding machine. Knowledge and Understanding of fits, limits, Hole and Shaft system. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating machine in a controlled environment. Learners need to devise 10 quiz questions with answers based on operating machine. They must make sure their questions cover key topics for operating machine. Issue each learner with 10 blank cards. Each learner should number the cards and write their name on one side with a question about operating machine. On the reverse of the card, they should write an appropriate answer to their question. For the quiz, arrange learners in two equal teams. Ask one learner to keep score using a suitable score-card. Player 1 for Team A asks one of their questions to Player 1 of Team B, who needs to answer the question. Discuss the answer with the group and ask the group to determine if the answer is correct. Player 1 of Team A then confirms the answer they had devised. (You need to correct answers if the learner's answer was not wholly correct.) The scorekeeper records 1 mark for a correct answer under the appropriate team's score column. Play then passes to Player 1 of Team B, who asks their question to Player 1 of Team A, and so on.		

Module 8: 0716001043 Perform vacuum forming operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Total the scores at the end of the quiz to see which team won. After the quiz, collect learners' question/answer cards and check that answers provided were correct. Return any incorrect answers to learners and ask them to change their answer to the correct one. Trainees need to practice their skills in using equipment and methods independently to perform vacuum forming job, in a real or realistic environment.		
LU5. Inspect final product	Begin this session with an illustrated presentation on inspection methods. Ensure that the presentation addresses the following points: Explaining inspection procedures in accordance with drawing and job. Understanding of visual inspection. Understanding how to Check final product dimensionally. Uses of measurement equipments. (i.e. Vernier caliper, micro meter, gauges, measuring tape, Checking fixture etc.) Preparation of inspection report. Ask the learner group to work in pairs to discuss the key points of product inspection and uses of measuring equipments in final inspection.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

LU6. Perform workplace cleaning and maintenance	Trainees need to practice their skills in independently for cleaning the machine, tools and job floor after job completed in a realistic environment. These includes: Understanding of maintaining all check sheets and work instructions of the machine. Understanding of maintaining the tools and equipment. Knowledge and Understanding how to maintain compressor lines. Knowledge and Understanding of heaters. Knowledge and Understanding to keep tools and equipment at appropriate place. Knowledge and Understanding about lubricants and lubrication. Knowledge and Understanding how to Perform cleaning of machine, mould/die and floor. Knowledge and Understanding how to Apply anti-rust spray/cleaning agent Understanding about handling waste/excess material. Following the discussion, arrange trainees into small groups. Each group should produce a leaflet to encourage and support to perform workplace cleaning and maintenance with working efficiently and effectively.	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia Handouts

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-9
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for pressing	Begin this session with an illustrative presentation about the preparation of workstation for performing press operation. Include examples of: Interpreting drawing or process sheets Understanding about types of material Knowledge to define uses and application of stamping machine with tools. Understanding how to set machine as per job specification. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.	Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Conduct pre-operational checks on machine	Lead a brainstorm to pre-operational checks on machine. List the brainstorm points on a flipchart. These includes : Knowledge and understanding of Inspection procedures for braking system (Mechanical, Hydraulic & Pneumatic) with its main components. Inspect electrical connections. Check mechanical fitting and joints. Check operation of emergency switches. Understanding cylinder leakages. Understanding to inspect brake lines, hose pipes and loose	Class Room Workshop. Visit related industry	Learner guide Videos for related knowledge on multimedia Handouts

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	fittings. Check and maintain machine lubricant, temperature, pressures and coolant. Understanding of pneumatic system, connections and fittings. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.		
LU3. Prepare die	Invite an experienced pressing operator from industry to deliver a presentation to trainees about pressing, equipments and accessories. Ask the invited operator to address the following key points: Understanding how to lift die. Understanding of die alignment. Method of die clamping. Importance and method of parameters setting. Knowledge and Understanding of trial of di to verify the operation. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.	Workshop. Classroom	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate mechanical press machine	Invite an experienced Mechanical pressing operator from industry to deliver a presentation to trainees about perform mechanical pressing operation independently to complete the job according to quality and safety parameters within time. Ask	Workshop. Classroom Visit of relevant	Learner guide Videos and Presentation for related knowledge on

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	the invited supervisor to address the following key points: Understanding of machine selection. Knowledge and understanding of main components of mechanical press machine. Understanding and importance of parameters setting. Understanding function of each component. Knowledge of monitoring operation. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating mechanical press machine in a controlled environment. Prepare either: • A flip chart • A PowerPoint slide • A handout Showing key topics for operating mechanical press machine. Learners need to work in small groups discussing the key topics. Each group should make notes from their discussions that identify **three main points** that related to **each key topic**. After the discussion, begin the feedback session. Ask one group to share the main points they have recorded for the first key topic for operating mechanical press machine. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not	industry	multimedia Handouts

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	identified. Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Trainees need to practice their skills in using equipment and methods independently to perform mechanical pressing job, in a real or realistic environment.		
LU5. Operate hydraulic press machine	Invite an experienced Hydraulic pressing operator from industry to deliver a presentation to trainees about perform Hydraulic pressing operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Understanding of machine selection. Knowledge and understanding of main components of hydraulic press machine. Understanding and importance of parameters setting. Understanding function of each component. Knowledge of monitoring operation. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating hydraulic press machine in a controlled environment	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Prepare either: • A flip chart • A PowerPoint slide • A handout Showing the key topics about operating hydraulic press machine. Go through all the key topics briefly and then allocate **one key topic** to each group. Learners need to work in their small groups discussing the key topic that has been allocated to their group. Each group should use a sheet of flip chart paper to record **three main points** from their discussions that relate to **their key topic**. After the discussion, begin the feedback session. Ask one group to come to the front of the class with their flipchart. Put up the flipchart where it can be easily seen by other learners. Ask the group to share the main points they have recorded for their key topic for operating hydraulic press machine. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. Then ask the next group to share their flipchart showing the main points they have recorded for the next key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Photograph or scan all the flipcharts and use these to create a handout to		

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	distribute to all learners. Trainees need to practice their skills in using equipment and methods independently to perform hydraulic pressing job, in a real or realistic environment.		
LU6. Operate pneumatic press machine	Invite an experienced Pneumatic pressing operator from industry to deliver a presentation to trainees about perform Pneumatic pressing operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Understanding of machine selection. Knowledge and understanding of main components of pneumatic press machine. Understanding and importance of parameters setting. Understanding function of each component. Knowledge of monitoring operation. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating pneumatic press machine in a controlled environment. Learners need to devise 10 quiz questions with answers based on operating pneumatic press machine. They must make sure their questions cover key topics for operating pneumatic press machine. Issue each learner with 10 blank cards. Each learner should	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	number the cards and write their name on one side with a question about operating pneumatic press machine. On the reverse of the card, they should write an appropriate answer to their question. For the quiz, arrange learners in two equal teams. Ask one learner to keep score using a suitable score-card. Player 1 for Team A asks one of their questions to Player 1 of Team B, who needs to answer the question. Discuss the answer with the group and ask the group to determine if the answer is correct. Player 1 of Team A then confirms the answer they had devised. (You need to correct answers if the learner's answer was not wholly correct.) The scorekeeper records 1 mark for a correct answer under the appropriate team's score column. Play then passes to Player 1 of Team B, who asks their question to Player 1 of Team A, and so on. Total the scores at the end of the quiz to see which team won. After the quiz, collect learners' question/answer cards and check that answers provided were correct. Return any incorrect answers to learners and ask them to change their answer to the correct one. Trainees need to practice their skills in using equipment and methods independently to perform pneumatic pressing job, in a real or realistic environment.		
LU7. Inspect final	Begin this session with an illustrated presentation on inspection methods. Ensure that the presentation addresses the following	Workshop.	Learner guide

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
product	points: Explaining inspection procedures in accordance with drawing and job. Understanding of visual inspection. Understanding how to Check final product dimensionally. Uses of measurement equipments. (i.e. Vernier caliper, micro meter, gauges, measuring tape, Checking fixture etc.) Preparation of inspection report. Ask the learner group to work in pairs to discuss the key points of product inspection and uses of measuring equipments in final inspection.	Classroom Visit of relevant industry	Videos and Presentation for related knowledge on multimedia Handouts
LU8. Perform workplace cleaning and maintenance	Trainees need to practice their skills in independently for cleaning the machine, tools and job floor after job completed in a realistic environment. These includes: Understanding of maintaining all check sheets and work instructions of the machine. Understanding of maintaining the tools and equipment. Knowledge and Understanding to keep tools and equipment at appropriate place. Knowledge and Understanding about lubricants and lubrication. Knowledge and Understanding how to perform cleaning of machine, mould/die and floor. Knowledge and Understanding how to apply anti-rust spray/cleaning agent.	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia Handouts

Module 9: 0716001044 Perform pressing operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Understanding about handling waste/excess material. Following the discussion, arrange trainees into small groups. Each group should produce a leaflet to encourage and support to perform workplace cleaning and maintenance with working efficiently and effectively.		

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-10
TRAINER GUIDE
National Vocational Certificate Level 3

Version 1 - October, 2019

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for maintenance	Deliver an illustrated presentation on prepare for maintenance requirements. Ensure that the presentation focuses on the following: Understanding the types and importance of machine oil grades, and oil filter defined as per standard. Ensure that Compatibility of seal is decided upon the particular operating medium or restraints due to pressure, fluid type, temperature Understanding and ensure that properly fastening of hydraulic pipe, tube and hose clamp in a place as per standard define. Understanding and ensure that inner and outer size of bearing would specify (i.e. ball bearing, roll bearing, tapper or plane bearing etc.) Understanding and ensure that coupling and fitting for pneumatic hose size as per gauge requirement and standard define. Understanding and ensure that switches, relays, sensor and Circuit breaker use as per voltage and current define by manufacturer. Understanding how to obtain cleaning agents WD-40, degreaser, rough cotton etc. Understanding how to actively repair machine with the help of appropriate tools and equipment.	Class Room Workshop.	Learner guide Handouts Presentation Videos

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Understanding and ensure red and white color use to mark the floor in front of electrical panels and hazardous areas. Ask learners to work in small groups. Each small group should consider two of the above points and illustrate the importance of each point with specific examples.		
LU2. Isolate and shut down equipment and machine	Deliveries an illustrative about presentation on isolates and shut down equipment and machine for carrying maintenance. Ensure that the presentation focuses on the following: Understanding and Identify the faulty part and components and do work within the 5S standard procedure. Identify and remove hazards at workplace. Changing of machine oil and oil filter that would be specified by its manufacturer. Changing hydraulic pipe, tube and hose clamp as per define standard. Changing of Pneumatic hose and coupler. Changing of the fuses, relays, circuit breaker. Understanding of floor paint marking near machine with different color. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for isolating and shut down equipment and	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	machine in a controlled environment. Prepare either: • A flip chart • A PowerPoint slide • A handout …showing key topics for isolating and shut down equipment and machine. Learners need to work in small groups discussing the key topics. Each group should make notes from their discussions that identify **three main points** that related to **each key topic**. After the discussion, begin the feedback session. Ask one group to share the main points they have recorded for the first key topic for isolating and shut down equipment and machine. Discuss these main points briefly with the whole group. Learners should make additional notes to record additional points their group had not identified. Then ask the next group to share the main points they have recorded for the second key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.		

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU3. Inspect equipment and machine	Invite an experienced maintenance supervisor from relevant industry to deliver a presentation to trainees about inspection of equipment and machine for identify and remove faults for maintenance and complete the target according to quality and safety parameters within time. Ask the invited supervisor to address the following key points: Operate machine and confirm all its function working properly. Ensure about no leakages of oil in hydraulic machine. Ensure about no air leakage in pneumatic system. Ensure about supply voltage of all electronics components would be working correctly. Ensure that no one would move on floor marking paint until its dry. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for inspecting equipment and machine in a controlled environment. Prepare either: • A flip chart • A PowerPoint slide • A handout Showing the key topics about inspecting equipment and machine. Go through all the key topics briefly and then allocate **one key topic** to each group.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Learners need to work in their small groups discussing the key topic that has been allocated to their group. Each group should use a sheet of flip chart paper to record **three main points** from their discussions that relate to **their key topic**. After the discussion, begin the feedback session. Ask one group to come to the front of the class with their flipchart. Put up the flipchart where it can be easily seen by other learners. Ask the group to share the main points they have recorded for their key topic for inspecting equipment and machine. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. Then ask the next group to share their flipchart showing the main points they have recorded for the next key topic. Repeat the discussion process. Continue until you have covered all the key topics. End the group discussion activity with a summary. Photograph or scan all the flipcharts and use these to create a handout to distribute to all learners. Arrange learners in different pairs. Ask each pair to devise 5 questions with correct answers about inspection of equipment and machine. Hold a quiz for the group using the questions devised by each pair		
LU4. Conduct preventive maintenance	Invite an experienced maintenance supervisor from relevant industry to deliver a presentation to trainees about preventive maintenance to complete the target according to quality and	Workshop. Classroom	Learner guide Videos and

Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	safety parameters within time. Ask the invited supervisor to address the following key points: Knowledge and understanding how to obtain information from preventive maintenance chart of working equipment regularly in order to minimize disaster. Understanding of small hazards and reduce by following working define standard. Following the presentation, arrange a question and answer session	Visit of relevant industry	Presentation for related knowledge on multimedia Handouts
LU5. Report faults	Lead a discussion about the faults and report it. Ensure the discussion focuses on the following points: Detail description of work that is going to performed for work order. Knowledge of service and maintenance section for advance action. Knowledge of further examination in order to perform maintenance. Ask the learner group to work in pairs to discuss the key points of record and report faults.	Workshop. Classroom	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU6. Record Maintenance	After the practical sessions are complete, lead a session that ask learners to prepare maintenance record and complete report. These includes Knowledge and understanding how to keep your record organize for help in future.	Workshop. Classroom	Learner guide Videos and Presentation for related knowledge on

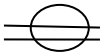
Module 10: 0716001045 **Perform periodic operator maintenance**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Knowledge and understanding how to maintaining record for consumable items and spare parts Knowledge and understanding how to keep maintaining complete maintenance expenses records. Trainees need to practice their skills to record maintenance independently in a real or realistic environment.		multimedia Handouts

Test Yourself (Short & Multiple Choice Questions)

Module-6

Question	Candidate's answer
1. Explain Arc Welding Principle?	Arc welding is a welding process, in which heat is generated by an electric arc struck between an electrode and the work piece.
2. Which gas is used in TIG welding?	Argon gas is used for TIG welding.
3. Enlist any three advantages and disadvantages of TIG Welding?	Advantage of TIG welding 1. None use of Flux 2. Surface finish is good 3. Less ampere are used Disadvantage of TIG welding 1. Difficult to operate 2. Expensive 3. Slow speed process
4. Name of the welding in which electrode are not consumed?	In Spot and Seam welding electrode are not consumed.

Question	Candidate's answer
5. Enlist any three methods of welding inspection?	Following are three methods of welding inspection. 1. Appearance Test 2. Dimension Test 3. Destructive Test
6. Enlist any three types of joint in arc welding?	1. Tee Joint 2. Lap Joint 3. Butt Joint
7. Which tip material used in TIG Welding? **a. Tungsten** b. Copper c. Aluminum	**a. Tungsten**
8. Which gas is used in MIG welding? a. Helium b. Argon c. **CO_2**	**c. CO_2**

Question	Candidate's answer
9. How much gap between object and electrode maintain in arc welding? **a. 1.5 mm to 3 mm** b. 1.5 cm to 3 cm c. 4 mm to 8 mm d. 4 cm to 8 cm	a. **1.5 mm to 3 mm**
10. Identify the welding symbols? a)  b) 	A) Symbol a) denotes for Spot/projection welding B) Symbol b) denotes for Seam Welding

Module-7

Question	Candidate's answer
11. Define two standards of thread types?	1. British Standard 2. Metric Standard (ISO)
12. What are the measuring methods of pitch thread?	1. Root to Root 2. Crest to Crest

Question	Candidate's answer
13. Enlist any three advantages of thread rolling?	1. Mass production 2. Smooth Surface 3. Size Consistency
14. Enlist the any three techniques of thread cutting?	1. Through split die 2. Through lathe machine 3. Through thread rolling machine
15. What is the abbreviation of ISO & BSI	1. International Standard Organization 2. British Standard International
16. What is the major Diameter of M10 thread? a) Diameter 9 mm b) Diameter 9.2 mm **c) Diameter 10mm** d) Diameter 11 mm	**c) Diameter 10mm**
17. What is the angle of acme thread? **a) 29^o** b) 39^o c) 49^o d) 59^o	**a) 29^o**

Question	Candidate's answer
18. AISI 1040 material is used for high tensile bolt? **a) True** b) False	**a) True**
19. What is the least count of analog vernier Caliper? **a) 0.05** b) 0.07 c) 0.09	**a) 0.05 mm**

Module-8

Question	Candidate's answer
20. Enlist any three vacuum forming process defects?	1. Sharp Corner 2. Socking 3. Short Molding
21. Enlist any five material used in vacuums forming?	1. ABS 2. Acrylic 3. Poly Carbonate 4. Poly styrene 5. Polypropylene

Question	Candidate's answer
22. Enlist the advantages of vacuum performing machine?	1. Low Cost 2. Flexible 3. Low Tooling Cost 4. Low mold maintenance 5. Proto Typing
23. Define vacuum forming operation?	The vacuum forming operation is define, a sheet of plastic is heated to form by stretch and forced against the mould by a vacuum.
24. Which is the common manufacturing method of vacuum mould?	Aluminum casting is a common manufacturing method of vacuum mould.
25. Which of following is correct deformation temperature of poly carbonate? a) 400 C^{o} b) 425 C^{o} **c) 450 C^{o}** d) 480 C^{o}	**c) 450 C^{o}**
26. Can wood material is used as a part material in vacuum forming process? a. True **b. False**	**b) False**

Question	Candidate's answer
27. Abbreviation of ABS? a) Acetylene butadiene styrene **b) Acrylonitrile butadiene styrene** c) Acrylonitrile butadiene surface	**b) Acrylonitrile butadiene styrene**
28. What is the abbreviation of PPE's?	PPE is stand for Personal Protective Equipments
29. Vacuum forming mould has single half / side? **a. True** b. False	**a) True**

Module-9

Question	Candidate's answer
30. Enlist the types of press machine?	1. Hydraulic Press Machine 2. Pneumatic Press Machine 3. Mechanical Press Machine

Question	Candidate's answer
31. Enlist any five pre- operational checks?	1. Check all electrical connections, mechanical fitting and joint. 2. Inspect brake lines, hose pipes and fittings for dents, leaks, rust, crack and loose fittings. 3. Ensure working of two hand operational button. 4. Check brake fluid, hydraulic fluid. 5. Check all limit switches.
32. Name any 05 types of stamping dies in press machine?	1. Blanking 2. Notching 3. Trimming 4. Flanging 5. Drawing
33. Define the shut height of press machine?	The shut height of press machine is the distance between of top and bottom plates.
34. Define the use of checking fixture production operation.	Checking fixture is used as process inspection tool for the quick verification part fitment and dimensional verification.
35. Enlist any three names of the defects that found on part during press operation.	1. Burs on sheet/part 2. Wrinkle 3. Cracks

Question	Candidate's answer
36. Forming dies are used in blanking and piercing operation. a. True **b. False**	**b) False**
37. Shackle is the basic accessory is used during Loading/ Unloading die on press machine. **a. True** b. False	**a) True**
38. The operation of flanging die is…. a) Cut the piece **b) Bend the edges** c) Draw d) Blanking	**b) Bend the edges**
39. What is the purpose of double push button in the press machine?	The purpose of double push button is the safety of operator and minimize the injury during the press operation.

Module-10

Question	Candidate's answer
40. What are the three basic benefits of periodic maintenance?	1. Minimize hazards 2. Smooth production 3. Minimum short fall

Question	Candidate's answer
41. Which are the basic routine maintenance of machines?	1. Cleaning 2. Lubricating 3. Greasing
42. Define the KIAZEN?	The term KAIZEN refers for the Continues improvement in work.
43. Enlist the any three types of maintenance?	1. Periodic maintenance 2. Shut down maintenance 3. Break down maintenance
44. What are the difference b/w periodic and break down maintenance?	1. Periodic maintenance is performed on as per schedule. 2. Break Down maintenance is performed on getting faults.
45. Name the three maintenance activity that is not included in periodic maintenance?	1. Oil Seale leakage 2. Bearing noise 3. Damage machine parts

Question	Candidate's answer
46. Select the right tool to open the flange. a. Hammer b. Chisel **c. Spanner** d. Torque wrench	**c) Spanner**
47. Grease is used as lubricant in machine? **a. True** b. False	**a) True**
48. The Faulty accessories (Fuse, Sensor, Relays, and Switch) are recommended to repair and refit again? a. True **b. False**	**b) False**
49. Select the right abbreviation of OHSA? **a) Occupational Health and safety Administration.** b) Occupational Health and safety Association c) Occupational Hazard and safety Administration. d) Occupational Health and safety Addition.	**a) Occupational Health and safety Administration**.

National Vocational and Technical Training Commission (NAVTTC)

Plot 38, Kirthar Road, Sector H-9/4, Islamabad, Pakistan
+92 51 9044 322
+92 51 9044 322
info@navttc.org
www.navttc.org