Co-funded by the European Union

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Norwegian Embassy
Islamabad

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

TRAINER GUIDE

National Vocational Certificate Level 4

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 4

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-4 in Automotive Parts Production Machine Operator	**Total Course Duration:** 780 hours
Course Overview:	
The purpose of the “Automotive Parts Production Machine Operator” level-4 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-4 in automotive industry. The qualification address a variety of skill required for parts production operation of automotive parts manufacturing industry like plastic, rubber, moulding & extrusion, hot forging, casting, and gear cutting beside generic skills of contribute to work related Health and Safety (WHS) initiatives, comply with workplace policy and procedures, perform advanced communication, develop advance computer application Skills, manage human resource services and Develop entrepreneurial skills, 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 Title and Aim	Learning Units	Duration
Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives **Aim:** The Aim of this module is to describe the skills and knowledge required to manage the identification, review, development, implementation and evaluation of effective participation and consultation processes as an integral part of managing work health and safety (WHS).	**LU1:** Contribute to initiate work-related health and safety measures. **LU2:** Contribute to establish work-related health and safety measures. **LU3:** Contribute to ensure legal requirements of WHS measures. **LU4:** Contribute to review WHS measures. **LU5:** Evaluate the organization's WHS system.	30 Hours

Module Title and Aim	Learning Units	Duration
Module 2: Comply with 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:** Respect work timeframes. **LU2:** Manage to convene meeting. **LU3:** Decision making at workplace. **LU4:** Set and meet own work priorities at instant. **LU5:** Develop and maintain professional competence. **LU6:** Follow and implement work safety requirements.	30 Hours

Module Title and Aim	Learning Units	Duration
Module 3 Perform Advanced Communication **Aim:** The Aim of this module is to describe the performance outcomes, skills and knowledge required to develop communication skills used professionally. It covers plan and organise work and conduct trainings at workplace, along with demonstrating professional skills independently.	**LU1:** Demonstrate professional skills. **LU2:** Plan and Organize work. **LU3:** Provide trainings at workplace.	30 Hours

Module Title and Aim	Learning Units	Duration
Module 4: Develop Advance Computer Application Skills **Aim:** The Aim of this module is to provides an overview of Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards, i.e. Data Entry, Power Point Presentation and managing data base and graphics for Design It applies to individuals employed in a range of work environments who need to be able to present a set range of data in a simple and direct form.	**LU1:** Manage Information System to complete a task. **LU2:** Prepare Presentation using computers**.** **LU3:** Use Microsoft Access to manage database. **LU4:** Develop graphics for Design.	40 Hours

Module Title and Aim	Learning Units	Duration
Module 5: Manage Human Resource Services **Aim:** The Aim of this module is to describe the skills and knowledge required to plan, manage and evaluate delivery of human resource services, integrating business ethics. It applies to individuals with responsibility for coordinating a range of human resource services across an organization. They may have staff reporting to them.	**LU1:** Determine strategies for delivery of human resource services. **LU2:** Manage the delivery of human resource services. **LU3:** Evaluate human resource service delivery. **LU4:** Manage integration of business ethics in human resource practices.	20 Hours

Module Title and Aim	Learning Units	Duration
Module 6: Develop Entrepreneurial Skills **Aim:** The Aim of this module is to identify the competencies required to develop entrepreneurial skills, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.	**LU1:** Develop a business plan. **LU2:** Collect information regarding funding sources. **LU3:** Develop a marketing plan. **LU4:** Develop basic business communication skills.	30 Hours

Module Title and Aim	Learning Units	Duration
Module 7: Conduct moulding and extrusion operations **Aim:** The aim of this module is to cover the specific skills and knowledge related to the plastic and rubber parts manufacturing operation on moulding and extrusion machines, material handling, inspection techniques and maintenance of machines and workplace.	**LU1:** Prepare for moulding and extrusion. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare moulds (Injection, Compression, blow, rubber injection,PU). **LU4:** Prepare Die. **LU5:** Operate injection molding machine. **LU6:** Operate rubber compression mounding machine. **LU7:** Operate blow moulding machine. **LU8:** Operate rubber injection moulding machine. **LU9:** Operate Polyurethane moulding mchine. **LU10:** Operate extrusion machine. **LU11:** Inspect the final product. **LU12:** Perform workplace cleaning and maintenance.	290 Hours
Module 8: Perform hot forging operations **Aim:** This aim of this module is to cover the specific skills and knowledge related to the process of hot forging parts manufacturing operation on hot forging and press forging machines, material handling, inspection techniques and maintain of machines and workplace.	**LU1:** Prepare for hot press forging. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare mould/die. **LU4:** Operate machine. **LU5:** Inspect final product. **LU6:** Perform workplace cleaning and maintenance.	100 Hours

Module Title and Aim	Learning Units	Duration
Module 9: Perform metal die casting operations **Aim:** The aim of this module is to cover the specific skills and knowledge related to prepare a machine for die casting process, material handling, formulation/ construction, defects & remedies and maintains machine and workplace.	**LU1:** Prepare for die casting. **LU2:** Conduct pre-operational checks on machine. **LU3:** Prepare casting mould. **LU4:** Operate machine. **LU5:** Inspect final product. **LU6:** Perform workplace cleaning and maintenance.	100 Hours
Module 10: Perform gear cutting operations **Aim:** The aim of this module is to cover the specific skills and knowledge related to perform gear hobbing process, material handling, inspection techniques and maintain the machine and workplace.	**LU1:** Prepare for gear cutting. **LU2:** Conduct pre-operational checks on hobbing machine. **LU3:** select tools. **LU4:** Operate machine. **LU5:** Inspect final product. **LU6:** Perform workplace cleaning and maintenance.	110 Hours

FORMAT FOR LESSON PLAN			
Module 7: Conduct moulding and extrusion operations			
Learning Unit 1: Prepare for moulding and extrusion			
Methods	Key Notes The tools, material and techniques used for preparing workplace for moulding and extrusion.	Media	Time
	Introduction		
	This session will introduce learners to the tools, techniques and material used for preparing workplace for moulding and extrusion, using presentation, demonstration, question and answer, and practical skills development.		
	Main Body		
	• Interpreting of drawing or process sheet. • Understanding of material preparation as per drawing or process sheet. • Understanding about types of material (Plastic, Rubber, PU, Extrusion) • Understanding about how to select the tools and equipment. • Understanding about how to set machine as per job specification.		
	Conclusion		
	To conclude the session, review the tools, techniques and material used for preparing workplace for moulding and extrusion. 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 4

Version 1 - October, 2019

Trainer's Guidelines

Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Contribute to initiate work-related health and safety measures		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Contribute to establish work-related health and safety measures		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU3. Contribute to ensure legal requirements of WHS measures		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU4. Contribute to review WHS measures		Class Room Workshop.	Learner guide Handouts Presentation Videos

Module 1: Contribute to Work Related Health and Safety (WHS) Initiatives			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU5. **Evaluate the organization's WHS system**		Class Room Workshop.	Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-2

TRAINER GUIDE

National Vocational Certificate Level 4

Version 1 - October, 2019

Module 2**: Comply with Workplace Policy and Procedures**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. **Respect work timeframes**		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. **Manage to convene meeting**		Class Room Workshop.	Learner guide Handouts Videos
LU3. **Decision making at workplace**		Class Room Workshop.	Learner guide Handouts Videos
LU4. Set and meet own work priorities at instant	.	Class Room Workshop.	Learner guide Handouts Presentation Videos

Module 2**: Comply with Workplace Policy and Procedures**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU5. **Develop and maintain professional competence**		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU6. **Follow and implement work safety requirements**		Class Room Workshop.	Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-3

TRAINER GUIDE

National Vocational Certificate Level 4

Version 1 - October, 2019

Module 3: Perform Advanced Communication			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Demonstrate professional skills		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Plan and Organize work	.	Class Room Workshop.	Learner guide Handouts Presentation
LU3. Provide trainings at workplace		Class Room Workshop.	Learner guide Handouts Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-4
TRAINER GUIDE
National Vocational Certificate Level 4

Version 1 - October, 2019

Module 4: Develop Advance Computer Application Skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Manage Information System to complete a task		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Prepare Presentation using computers		Class Room Workshop. Visit garment industries Stitching room	Learner guide Videos for related knowledge on multimedia Handouts
LU3. Use Microsoft Access to manage database		Workshop. Classroom	Learner Guide Videos for related knowledge on multimedia Handouts
LU4. Develop graphics for Design		Class Room Workshop.	Learner guide Handouts Presentation Videos

Module 4: Develop Advance Computer Application Skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-5

TRAINER GUIDE

National Vocational Certificate Level 4

Version 1 - October, 2019

Module 5: Manage Human Resource Services			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Determine strategies for delivery of human resource services		Class Room Workshop.	Learner guide Handouts Presentation
LU2. Manage the delivery of human resource services		Class Room Workshop. Visit garment industries Stitching room	Learner guide Videos for related knowledge on multimedia Handouts
LU3. Evaluate human resource service delivery		Class Room Workshop.	Learner guide Handouts Presentation
LU4. **Manage integration of business ethics in**		Class Room	Learner guide Handouts

Module 5: Manage Human Resource Services			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
human resource practices		Workshop.	Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-6
TRAINER GUIDE
National Vocational Certificate Level 4

Version 1 - October, 2019

Module 6: Develop entrepreneurial skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Develop a business plan		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU2. Collect information regarding funding sources		Class Room Workshop. Visit garment industries Stitching room	Learner guide Videos for related knowledge on multimedia Handouts
LU3. Develop a marketing plan		Class Room Workshop.	Learner guide Handouts Presentation Videos
LU4. Develop basic business communication skills		Class Room	Learner guide Handouts

Module 6: Develop entrepreneurial skills			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
		Workshop.	Presentation Videos

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-7

TRAINER GUIDE

National Vocational Certificate Level 4

Version 1 - October, 2019

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for moulding and extrusion	Begin this session with an illustrative presentation about the preparation of workstation for performing moulding and extrusion : Include examples of: Interpreting of drawing or process sheet. Understanding of material preparation as per drawing or process sheet. Understanding about types of material (Plastic, Rubber, PU, Extrusion) Understanding about how to select the tools and equipment. Understanding about 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 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
LU3. Prepare moulds	Invite an experienced moulding and extrusion operator from industry to deliver a presentation to trainees about prepare moulds. Ask the invited	Class Room	Learner guide

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
(Injection, Compression, blow, rubber injection,PU)	operator to address the following key points: Explain of types of Moulds(Injection, Compression, blow, rubber injection, PU) Understanding of 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.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. **Prepare die**	Invite an experienced moulding and extrusion operator from industry to deliver a presentation to trainees about prepare die. Ask the invited operator to address the following key points: Explain of types of dies Understanding of how to lift die. Method of die clamping. Understanding of die alignment. Importance and method of parameters setting. Knowledge and Understanding of trial of die to verify the operation. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU5. Operate injection moulding machine	Invite an experienced moulding and extrusion operator from industry to deliver a Presentation to trainees about performs injection moulding machine operation independently to complete the job according to quality and safety parameters within time. Ask the invited supervisor to	Workshop. Classroom Visit of relevant	Learner guide Videos and Presentation for related knowledge

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	address the following key points: Understanding of machine selection. Understanding and importance of parameters setting. Understanding of injection moulding operation. Knowledge of monitoring operation. Understanding about quality of plastic parts. Knowledge and Understanding of different parts of machine. Knowledge and Understanding of fits and limits system. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating injection moulding machine in a controlled environment Prepare either: • A flip chart • A PowerPoint slide • A handout Showing the key topics about operating injection moulding 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	industry	on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	main points they have recorded for their key topic for operating injection moulding 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. Trainees need to practice their skills in using equipment and methods independently to perform thread rolling job, in a real or realistic environment.		
LU6. **Operate rubber compression mounding machine**	Presentation to trainees about performs rubber compression moulding machine 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 machine selection. Understanding and importance of parameters setting. Understanding of rubber compression moulding operation. Knowledge of monitoring operation. Understanding about quality of rubber compression moulding parts. Knowledge and Understanding of different parts of machine. Knowledge and Understanding of fits and limits system. Demonstrate the equipments to learners to support their understanding.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Enable learners to practice using the appropriate tools and equipment for operating rubber compression mounding machine in a controlled environment. Learners need to devise 10 quiz questions with answers based on operating rubber compression mounding machine. They must make sure their questions cover key topics for operating rubber compression mounding 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 rubber compression mounding 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 thread rolling job, in a real or realistic environment.		

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU7. **Operate blow moulding machine**	Presentation to trainees about performs blow moulding machine 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. Understanding and importance of parameters setting. Understanding of blow moulding operation. Knowledge of monitoring operation. Understanding about quality of blow moulding parts. Knowledge and Understanding of different parts of machine. Knowledge and Understanding of fits and limits system. Demonstrate the equipments to learners to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating blow moulding machine in a controlled environment Prepare either: • A flip chart • A PowerPoint slide • A handout Showing key topics for operating blow moulding 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 blow moulding machine. Discuss these main points briefly with the whole group. Learners should make additional notes to record	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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 thread rolling job, in a real or realistic environment.		
LU8. **Operate rubber injection moulding machine**	Presentation to trainees about performs rubber injection moulding machine 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. Understanding and importance of parameters setting. Understanding about degassing on mould. Understanding of rubber injection moulding operation. Knowledge of monitoring operation. Understanding about quality of rubber injection moulding parts. Knowledge and Understanding of different parts of machine. Knowledge and Understanding of fits and limits system. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating rubber injection moulding machine in a controlled environment Prepare either:	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	• A flip chart • A PowerPoint slide • A handout Showing the key topics about operating rubber injection moulding 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 rubber injection moulding 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. Trainees need to practice their skills in using equipment and methods independently to perform thread rolling job, in a real or realistic environment.		
LU9. **Operate**	Presentation to trainees about performs polyurethane moulding machine operation independently to complete the job according to quality and	Workshop.	Learner guide Videos and

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
Polyurethane moulding mchine	safety parameters within time. Ask the invited supervisor to address the following key points: Understanding of machine selection. Understanding and importance of parameters setting. Understanding about material mixing. Understanding of polyurethane moulding operation. Knowledge of monitoring operation. Understanding about quality of PU moulding parts. Knowledge and Understanding of different parts of machine. Understanding about behavior on environment on process. Demonstrate the equipments to learners to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating polyurethane moulding mchine in a controlled environment. Learners need to devise 10 quiz questions with answers based on operating polyurethane moulding mchine. They must make sure their questions cover key topics for operating polyurethane moulding mchine. 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 polyurethane moulding mchine. 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	Classroom Visit of relevant industry	Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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 thread rolling job, in a real or realistic environment		
LU10. **Operate extrusion machine**	Presentation to trainees about performs extrusion machine 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. Understanding and importance of parameters setting. Understanding of extrusion moulding operation. Knowledge of monitoring operation. Understanding about quality of extrusion moulding parts. Knowledge and Understanding of different parts of machine. Knowledge of explaining about fits, limits and Hole and Shaft system. Demonstrate the equipments to learners to support their understanding. Enable learners to practice using the appropriate tools and equipment for operating extrusion machine in a controlled environment	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Prepare either: • A flip chart • A PowerPoint slide • A handout Showing key topics for operating extrusion 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 extrusion 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. Trainees need to practice their skills in using equipment and methods independently to perform thread rolling job, in a real or realistic environment		
LU11. 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,	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 7: 0716001046 Conduct moulding and extrusion operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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.		
LU12. 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, 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-8
TRAINER GUIDE
National Vocational Certificate Level 4

Version 1 - October, 2019

Module 8: 0716001048 Perform hot forging operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for hot press forging	Begin this session with an illustrative presentation about the preparation of workstation for performing hot forging operation. Include examples of: Interpreting of drawing or process sheet. Understanding how to arrange material as per drawing or process sheet. Knowledge and Understanding of types of material 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. Understanding of manual operation of machine. 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 8: 0716001048 Perform hot forging operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU3. Prepare mould/die	Invite an experienced vacuum forming operator from industry to deliver a presentation to trainees about prepare hot forging mould/die. 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.	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate machine	Invite an experienced hot forging operator from industry to deliver a presentation to trainees about hot forging 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 about induction heater Knowledge of monitoring of operation. Understanding about quality of forging parts. Understanding about Mult/Blank and their Calculation. Demonstrate the equipments to learner to support their understanding. Enable learners to practice using the appropriate	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 8: 0716001048 Perform hot forging operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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 all the flipcharts and use these to create a handout to distribute to all learners.		

Module 8: 0716001048 Perform hot forging operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Knowledge and Understanding of different parts of hot forging machine. 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 to keep tools and equipment at	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia Handouts

Module 8: 0716001048 Perform hot forging operations			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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.		

AUTOMOTIVE PARTS PRODUCTION MACHINE OPERATOR

Module-9
TRAINER GUIDE
National Vocational Certificate Level 4

Version 1 - October, 2019

Module 9: 0716001048 Perform metal die casting operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for die casting	Begin this session with an illustrative presentation about the preparation of workstation for performing metal die casting operation. Include examples of: Interpreting drawing or process sheets. Understanding about types of material. 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 plunger Check cooling lines Check air pressure Check and maintain machine lubricant, temperature, pressures and coolant. Ask learners to work in small groups. Each small group should	Class Room Workshop. Visit related industry	Learner guide Videos for related knowledge on multimedia Handouts

Module 9: 0716001048 Perform metal die casting operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	consider two of the above points and illustrate the importance of each point with specific examples.		
LU3. Prepare casting mould	Invite an experienced metal die casting operator from industry to deliver a presentation to trainees about casting mould. Ask the invited operator to address the following key points: Understanding how to lift mould. Understanding of mould alignment. Method of mould clamping. Importance and method of parameters setting. Understanding about hydraulic and water connection. 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.	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate machine	Invite an experienced metal die casting operator from industry to deliver a presentation to trainees about perform metal die casting 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 about temperature and melting point of material. Explain types of casting. Understanding of machine selection.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 9: 0716001048 Perform metal die casting operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Knowledge ad understanding of main components of casting machine. Understanding and importance of parameters setting. Understanding about furnace. Knowledge of monitoring operation. Demonstrate the equipments to learners 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		

Module 9: 0716001048 Perform metal die casting operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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 metal die casting 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	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 9: 0716001048 Perform metal die casting operation			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	of product inspection and uses of measuring equipments in final inspection.		
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 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-10
TRAINER GUIDE
National Vocational Certificate Level 4

Version 1 - October, 2019

Module 10: 0716001049 **Perform gear cutting operation**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for gear cutting	Begin this session with an illustrative presentation about the preparation of workstation for performing gear cutting: Include examples of: Interpreting of drawing or process sheet. Understanding about types of material 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 hobbing 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 operation of machine. 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 10: 0716001049 **Perform gear cutting operation**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
LU3. Select tools	Invite an experienced gear cutting operator from industry to deliver a presentation to trainees about select gear cutting tools. Ask the invited operator to address the following key points: Understanding of selection of cutting tools. Understanding of selection of clamping devices. Understanding of selection of measuring tools Understanding about calculation and formulas. After the presentation, invite trainees to pose questions to the invited operator that will clarify their understanding.	Class Room Workshop.	Learner guide Videos and Presentation for related knowledge on multimedia Handouts
LU4. Operate machine	Invite an experienced gear cutting operator from industry to deliver a presentation to trainees about perform gear cutting 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. Understanding of tool clamping. Understanding of work piece clamping. Understanding and importance of parameters setting. Understanding about types of gears. Understanding of gear cutting operation.	Workshop. Classroom Visit of relevant industry	Learner guide Videos and Presentation for related knowledge on multimedia Handouts

Module 10: 0716001049 **Perform gear cutting operation**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	Understanding of work piece alignment. Knowledge of monitoring operation. Knowledge and Understanding of different parts of gear cutting machine. Demonstrate the equipments to learners 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 key topics for operating 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 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		

Module 10: 0716001049 **Perform gear cutting operation**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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 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	Workshop. Visit of relevant industry	Learner guide Videos of related knowledge on multimedia

Module 10: 0716001049 **Perform gear cutting operation**			
Learning Unit	**Suggested Teaching / Learning Activities**	**Delivery Context**	**Media**
	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.		Handouts

Test Yourself (Short & Multiple Choice Questions)

Module-7

Question	Candidate's answer
1. Enlist three important steps of mould setting in the machine?	1. Lift the mould with the help of lifting equipment and place on machine bed. 2. Centralized the mould. 3. Clamp the mould with bed.
2. What is the most common reason of damage of die / Mould during operation?	Loose clamping is the most common reason of damage of die / Mould during operation
3. Enlist three main reasons defects of productive parts?	1. Shortage of material. 2. Improper setting of pressure and degassing 3. Overheated the mould.
4. What is the main reason of short moulding during moulding operation?	Injection pressure or material melting temperature is not appropriate.
5. Which chemicals are used in polyurethane product?	1. Polyols (Part-A) 2. Isocyanates (Part-B)

Question	Candidate's answer
6. Define curing time in PU process?	It is the time taken for chemical reaction when part A (Polyols) and Part B (Isocyanates) are injected in the mold
7. Select the blow moulding product in given list. a) Cup **b) Pet Bottle** c) Spoon d) Bumper	**b) Pet Bottle**
8. Which of the following is the main part of Injection mould ? **a) Core, Cavity** b) Crank c) Piston d) Cam	**a) Core, Cavity**
9. In injection moulding process Injector is used to; a) Ejection of material b) Ejection of mould **c) Ejection of part.** d) Ejection of waste material	**c) Ejection of part**

Question	Candidate's answer
10. Which defect is produce by improper degassing? **a) Pinhole, air bubble, air cut** b) Part color, location, and thickness. c) Part hole, position, and surface d) All on the above	**a) Pinhole, air bubble, air cut.**

Module-8

Question	Candidate's answer
11. Enlist the types of presses used in hot forging?	1. Pneumatic Press 2. Hydraulic Press 3. Mechanical Press
12. What is the Carbon steel deformation temperature?	1100 C^o to 1200 C^o
13. Enlist the three hot forging operations?	1. Up sitter 2. Blocker 3. Finisher

Question	Candidate's answer
14. Write any three advantages of hot forging?	1. Increase the part strength. 2. Heavy parts can be formed easily. 3. Maintain the required dimension easily.
15. Enlist the common PPE's used in Hot Forging?	1. Helmet 2. Goggle 3. Leather Gloves 4. Safety Apron 5. Ear Plugs
16. Select which one is forging defect in below list. a. Soaking b. Gas marks **c. Non filling** d. Pin hole	c) **Non filling**
17. Which is the right method for pre heating of mould in below list? **a) Gas Burner** b) Kerosene burner c) Ceramic heater d) Stove	**a) Gas burner**

Question	Candidate's answer
18. Select main operation name during forging in below list. a) Creeper **b) Blocker** c) Holder d) Finder	**b) Blocker**
19. Can deep draw performed on forging press? a. True **b. False**	**b) False**
20. ISO stands for? **a) International Standard Organization** b) International System Organization c) Industry System Organization	**a) International Standard Organization**

Module-9

Question	Candidate's answer
21. Enlist any three metal die casting defects?	1. Porosity 2. Blister 3. Crakes

Question	Candidate's answer
22. Write any three advantages of metal die casting process.	1. High seed production 2. Dimensional accuracy 3. Complex shape
23. Write the three types of casting process.	1. Sand casting 2. Pressure die casting 3. Investment casting
24. What is the function of plunger?	It is a part of machine that helps in feeding the material in the mold.
25. Write any four components of casting die.	1. Core 2. Cavity 3. Ejector plate 4. Locating pins
26. Select the right molten temperature of aluminum in below list. **a) 660 degree Celsius** b) 1260 degree Celsius c) 1600 degree Celsius d) 250 degree Celsius	**a) 660 degree Celsius**

Question	Candidate's answer
27. Which material in below list is not used in die casting process? a) Aluminum **b) Plastic** c) Lead d) Zinc	**b) Plastic**
28. HPDC stands for? **a) High Pressure Die Casting** b) High pouring die casting c) High pouring define cost d) Not in above	**a) High Pressure Die Casting**
29. Is zinc melting temperature is 320 degree Celsius. a) True **b) False**	**b) False**
30. Can we use hot chamber machine for the material melt upto 400 degree Celsius. **a) True** b) False	**a). True**

Module-10

Question	Candidate's answer
31. Enlist the three types of gears	1. Helical Gear 2. Bevel gear 3. Worm gear
32. What is the difference between the spur gear and helical gear?	The teeth of spur gear are straight. The teeth of helical gear are inclined.
33. Write any three advantages of gear hobbing?	1. High rate of production 2. Teeth profile are accurate 3. Low tooling cost
34. What is cutting feed formula?	Cutting Feed= N x Fz x Z N=Spindle Speed Fz= Feed per Tooth Z= Number of flutes
35. Write the cutting speed formula?	Cutting speed = (π X Dia X Height) / 100

Question	Candidate's answer
36. What is the bilateral tolerance? a) Total tolerance is in one direction **b) Total tolerance is in both direction** c) May or not may be in one direction d) Tolerance provided all over the component body	**b) Total tolerance is in both direction**
37. Which gear has higher torque ability? a. Spur gear b. Rack gear **c. Helical gear** d. Worm gear	**c) Helical Gear**
38. For higher rate of gear production, we use milling machine. a. True **b. False**	b**) False**
39. M-series high speed steel tool has more efficient that T-series high special steel tool? **a. True** b. False	**a) True**
40. Spur Gear has straight teeth? **a. True** b. False	**a) True**

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