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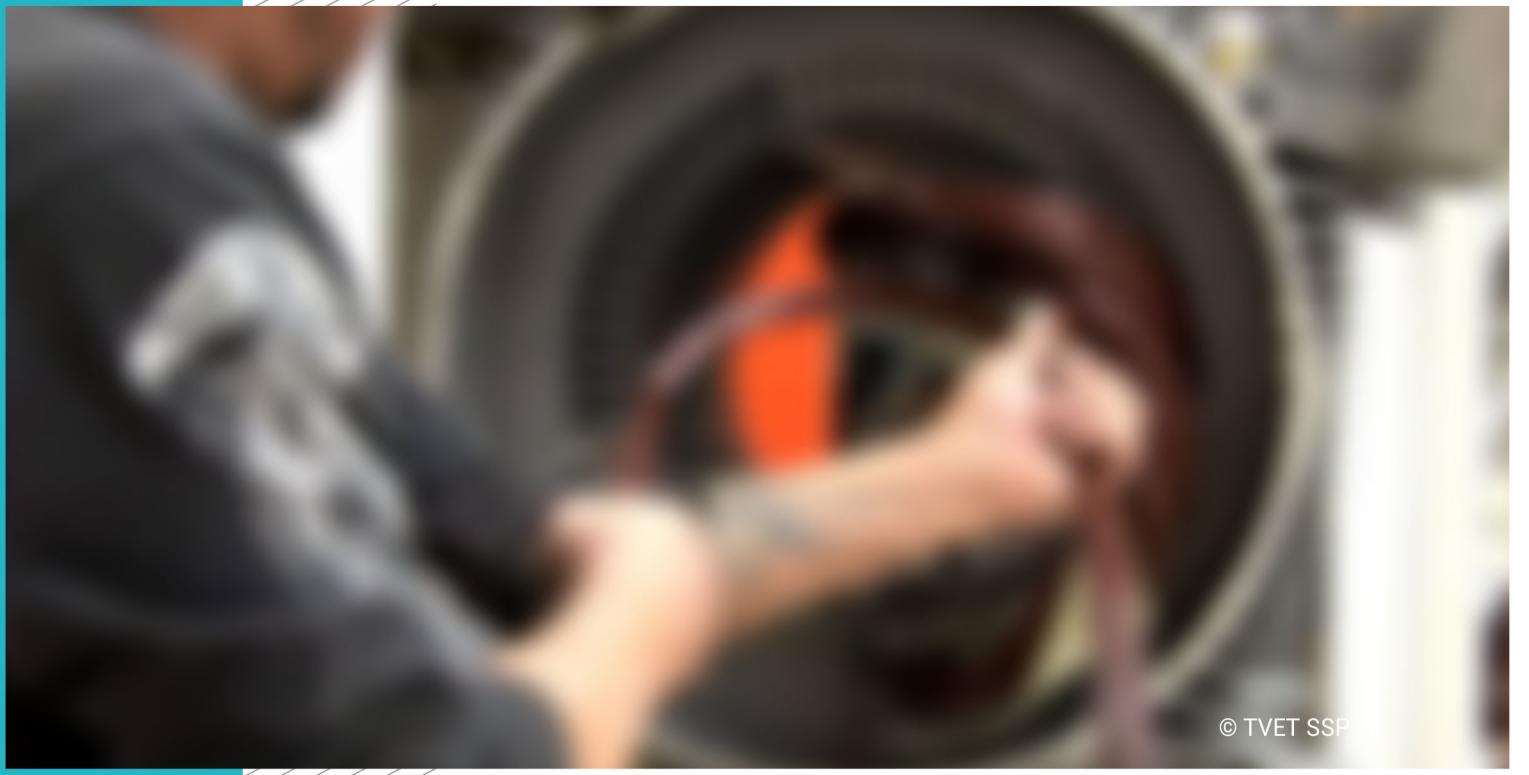
Norwegian Embassy
Islamabad

ELECTRICAL MACHINE WINDING TECHNICIAN



TRAINER GUIDE

National Vocational Certificate Level 2

Version 1 - September, 2018

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
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Islamabad, Pakistan

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Contents

Introduction

In traditional approach there was a gap between the curricula and the market needs. While 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 **Electrical Machine Winding Technician** *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. A simple lesson plan format is given below for your guidance .the Trainer will make it for very learning unit.

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 **Electrical Machine Winding Technician** *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 trainees.

Involvement in the process (actively seeing) is important at this stage. When you work on getting involved, getting people to participate, you make them a part of what is happening. Questions for clarification or explanation are important throughout the demonstration. It is up to the learners to ask questions about things they do not understand, but it is also important for trainers to seek out and elicit questions from learners. A trainer may need to do repeated demonstrations of difficult or complex skills.

Remember that the learner will learn a lot from your demonstration - and not just the demonstration itself. Learners will learn about how to perform the skills, but they will also learn from watching demonstrations how trainers treat the tools or materials and how they follow safety procedures.

After the demonstration, it is important to again seek out questions - be sure all questions are answered. The trainer should ask the learner if they are ready to try the skill. If not, there may be a need for recycling the demonstration (or part of it), and clarifying some of the information.

Overview of the program

Course: NVQ Certificate Level 2 **Electrical Machine Winding Technician**	**Total Course Duration:** 50 Credit hours
Course Overview:	
The purpose of the training (level 1-4) in **Electrical Machine Winding Technician**" is to provide skilled manpower to improve the existing capacity of Electrical sector. This training will provide the requisite skills, knowledge and ability to the trainees to rewind Electrical Machines (Motor & Transformer) and Repair/replace its allied parts It will enable the participants to meet the challenges in the field as "**Electrical Machine Winding Technician**" in the industry. Furthermore, it would improve the skill level of the technician and will prepare such a competitive skilled workforce who will be globally acceptable.	

Module	**Learning Unit**	**Duration**
Module A: Perform on-site Inspection/testing of machine **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required to Perform on-site Inspection/testing of machine like checking data plate, terminal/terminals plate of machine and conduct of Megger test and transformer oil test.	**LU1.** Take feedback from the operator **LU2.** Check Physical status/condition of Machine **LU3.** Check data plate of machine for specifications **LU4.** Conduct Megger test of the Machine **LU5.** Carry out Transformer's oil test **LU6.** Perform Transformer Turn Ratio Test **LU7.** Check Terminals/Terminal plate of Machine	110

Module	Learning Unit	Duration
Module B: Ensure Electrical isolation of Machine **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required to Isolate Machine from Electrical Supply, perform tagging of machine , communicate with machine operator and de energizing of machine .	**LU1.** Prepare for Work to ensure Electrical Isolation of Machine **LU2.** Wear PPE's **LU3.** Isolate Machine from Electrical Supply **LU4.** Perform Tagging of Machine **LU5.** Document the Electrical Isolation of Machine **LU6.** Communicate with machine operator and other personnel **LU7.** De-Energize Machine	110
Module C: Carry out Mechanical De- Installation of Machine **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required for isolation of machine from Pneumatic/hydraulic supply, Fuel Supply, Gear Box, Pulley, perform de-coupling and de installation of Machine from the foundation.	**LU1.** Prepare for work to Carry out Mechanical De-Installation of Machine **LU2.** Isolate Machine from Pneumatic/hydraulic Supply **LU3.** Isolate Machine from Fuel Supply **LU4.** Isolate Machine from Gear Box **LU5.** Isolate Machine from Pulley **LU6.** Perform De-Coupling of Machine **LU7.** De- Install Machine from Foundation	110

Module	Learning Unit	Duration
Module D: Maintain Tools/ Equipment and Machinery **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required to perform preventive and corrective maintenance of Tools/equipment used for the trade of Electrical Machine Winding Technician.	**LU1. Prepare for work to maintain tools / equipment and machinery** **LU2.** Maintain Tools and equipment **LU3.** Perform Preventive maintenance of tools and equipment **LU4.** Perform Corrective maintenance of tools and equipment **LU5.** Ensure Electrical/Thermal Insulation of tools and equipment **LU6.** Calibrate measuring instruments **LU7.** Maintain Winding Machines **LU8.** Manage Inventory of tools/equipment and Machinery	50

Module	Learning Unit	Duration
Module E: Comply Personal Health and Safety Guidelines **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required to identify personal hazards at work place , application of PPE's and compliance of health and safety guidelines.	**LU1. Identify Personal Hazards at Workplace** **LU2. Apply Personal Protective and Safety Equipment (PPE)** **LU3. Comply Occupational Safety and Health (OSH)** **LU4. Dispose of hazardous Waste/materials from the designated area.**	30 hours
Module F: Communicate the Workplace Policy and Procedure **Aims:** The aim of this module is to develop basic knowledge, skills and understanding to communicate the work place policies and procedures.	**LU1. Identify workplace communication procedures** **LU2. Communicate at workplace** **LU3. Draft Written Information** **LU4. Review Documents**	20hours

Module	Learning Unit	Duration
Module G: Perform Basic Communication (Specific) **Aim:** The aim of this module is to develop basic knowledge, skills and understanding that how to communicate in a team, follow organizational SOP and develop generic communication skills at the work place.	**LU1. Communicate in a team to achieve intended outcomes** **LU2. Follow Supervisor's instructions as per organizational SOPs** **LU3. Develop Generic communication skills at workplace**	30 hours
Module H: Perform Basic Computer Ap plication (Specific) **Aim:** The aim of this module is to develop basic knowledge, skills and understanding required how to perform basic computer application like creation of word document and use of internet for browsing.	**LU1. Create Word Documents** **LU2. Use internet for Browsing**	40

Lesson Plan Template - EXAMPLE

Module			
Learning unit			
Learning outcome			
Methods	**Key Notes**	**Media**	**Time**
Introduction			
Introduce the topic and its daily applications to motivate the learner to attain his/her full consideration towards the topic. Recall the previous lesson and then connect with new topic.			
Main Body			
Present the new information .divide the topic into small section like define, describe To make learning as well as delivering easy .demonstrate the skill relevant to the learning unit.			
Conclusion			
Summarize the complete lesson to memorize the learners the key notes.			
ASSESSMENT			
How this lesson will be assessed? Feedback from students and for students.			
Total time			

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Module-C

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SAMPLE FOR LESSON PLAN

Module C:Carry out Mechanical De- Installation of Machine

- **Learning Unit 6> Perform De-Coupling of Machine**

Learning Outcomes>Trainee will be able to:

- **Identify the required tools/equipment and PPE's**
- **Wear the required PPE's**
- **Locate the parts of machine to be De-coupled**
- **Perform marking on parts to be De-coupled for realignment/readjustment**
- **Perform De-coupling of the machine**
- **Record De-coupling of the machine**
- **Perform Tagging on De-coupled parts of the machine**

Methods .:Presentation/Lecture(Theory),Demonstration(practical**)** **Key Notes** **Perform De-Coupling of the Machine** **Media:** Multimedia presentation Time: 03 hrs.

Introduction Time: 30 Minute

Introduce the topic and its daily applications to motivate the learner by videos/quotes/or through brain storming and then connect the topic with previous one to establish connection with previous lesson/unit and new one to attain his/her full consideration towards the topic.

Objectives. After completing the Learning unit you will be able that how to **Perform De-Coupling of Machine**

Main Body Time: 2:00 hrs.

- Explain why do we use PPE, s
- Discuss why do we locate parts of the Machine to be de coupled.
- Explain the importance of marking on parts of machine to be De-coupled
- Why it is important to Record De-coupling of the machine
- Describe importance of Tagging on the decoupled parts of Machine.
- **Group Activity:** What will happen if we don't perform marking on the parts of machine to be De-coupled
- **Group Discussion**

Conclusion Time: 15 Minute.

Summarize the topic and discussion so that to memorize the Learners the key notes.

Assessment Time :15 Minute

Questions Answering Session

Total time:03 hrs

Trainer's guidelines

Module A: 0713001126 Perform on-Site Inspection / testing of Machine			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Take feedback from the operator	**Description/Demonstration:** ○ State the procedure of Taking feedback from the operator . ○ Perform demonstration of the following to: • Perform site visit • Collect information from the machine operator regarding the fault • Record the data • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU2. Check Physical status/condition of Machine	**Description/Demonstration:** ○ Describe the procedure to be adopted for Checking Physical /condition of Machine. ○ Perform demonstration of the following to: • Perform physical checking of machine by: ○ Seeing ○ Touching ○ Smelling • Analyse for loose fitting • Analyse for open / loose / burnt connections • Analyse for true connections as per circuit diagram • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. Discuss these main points briefly with	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU3. Check data plate of machine for specifications.	**Description/Demonstration:** ○ Give a brief description on the importance of Checking data plate of machine for specifications. ○ Perform demonstration of the following to: • Locate the Data/Name Plate of Machine • Read data of Machine • Record data of Machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners.	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	• **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU4. Conduct Megger test of the Machine	**Description/Demonstration:** ○ State functions of the Meggar and the techniques of using Meggar for the conduct of test. . ○ Perform demonstration of the following to: • Identify the required tools and equipment for conduct of Megger Test • Collect the required tools and equipment • Disconnect the Supply Cables • Perform testing with Megger ○ Ground/Earth Fault ○ Short Circuit ○ Open Circuit • Record test result • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. Each group should use a sheet of flip chart paper to record **three main points** from their discussions that relate to **their key topic**	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	After the discussion, begin the feedback session. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU5. Carry out Transformer's oil test	**Description/Demonstration:** ○ Give a brief description on the importance of Carrying out Transformer's oil test. ○ Perform demonstration of the following to: • Identify the required tools and equipment • Collect the required tools and equipment • Disconnect the Supply Cables • Take Oil Sample for test • Perform oil testing • High Voltage/Breakdown Test • Moisture Test • Flash Point Test • Record test results • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. Discuss these main points briefly with	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU6. Perform Transformer Turn Ratio Test	**Description/Demonstration:** ○ Describe procedure for conduct of Turn Ratio Test of Transformer. ○ Perform demonstration of the following to: • Identify the required tools and equipment • Collect the required tools • Disconnect the Supply Cables • Perform TTR Test • Compare TTR test result with the specifications as per Data Plate • Record test result • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	additional points their group had not identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU7. Check Terminals/Terminal plate of Machine	**Description/Demonstration:** ○ Explain how Terminals/Terminal plates of Machine are checked. ○ Perform demonstration of the following to: • Inspect the Terminal Plate of Machine • Check the physical condition of nut bolts • Check space/gap between the terminals • Check the condition of linking strips for connection • Check the space condition for rusting/car boning between terminals • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. Discuss these main points briefly with the whole group. Learners should make additional notes **on the flip chart** to record	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	additional points their group had not identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

Module B: 0713001128 Ensure Electrical Isolation of Machine			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	• **Media** • Lecture • Multi Media presentation
LU1. Prepare for Work to ensure Electrical Isolation of Machine	**Description/Demonstration:** ○ Give a brief description on the importance of Preparation for work to Carry out Electrical Isolation of Machine ○ Perform demonstration of the following to: • Identify the required PPE's • Collect the required PPE's	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	• Identify the required tools and equipment • Collect the required tools and equipment • Ensure functional condition of PPE's/Tools and equipment • Prepare the required tags for isolation • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU2. Wear PPE's	**Description/Demonstration:** o Explain why do we use PPE's and why their functional condition is necessary to be maintained. o Perform demonstration of the following to: • Wear PPE's as per job requirement • Clean the PPE's after use • Perform proper storing of the PPE's after use. • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

LU3. Isolate Machine from Electrical Supply	**Description/Demonstration:** ○ Explain the procedure for isolation of Machine from Electrical supply. ○ Perform demonstration of the following to: • Identify the machine for isolation • Collect the required tools for isolation	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	• Identify the supply Sources/points to be isolated • Identify the supply disconnecting devices • Take on board the concerned department for electrical isolation • Switch off the supply sources • Perform electrical isolation of machine. • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU4. Perform Tagging of Machine	**Description/Demonstration:** ○ Explain the importance of Tagging on Machine. ○ Perform demonstration of the following to: • Collect required tagging • Perform tagging of faulty Machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

LU5. Document the Electrical Isolation of Machine	**Description/Demonstration:** Give a brief description on the procedure and importance of Documenting the Electrical Isolation of Machine o Perform demonstration of the following to: • Enlist the tagged Machines • Document nature of the faults • Record the electrical isolation of machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

LU6. Communicate with machine operator and other personnel	**Description/Demonstration:** ○ Give a brief description on the importance of Communicating with machine operator and other personnel. ○ Perform demonstration of the following to: • Identify nature of fault of machine • Diagnose the causes of fault • Communicate nature of fault of machine to operation department • Prepare memo/(MWR) Maintenance Work Request for maintenance of machines • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

LU7. De-energies machine	**Description/Demonstration:** ○ Define de energizing of machine and its procedure. ○ Perform demonstration of the following to: • Identify the required tools and equipment for De-energize the machine • Collect the required tools and equipment for De-energize the machine • Identify the part of the machine to be De-energize • Perform de-energizing of machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

Module C: 0713001127 Carry out Mechanical De-Installation of Machine			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Prepare for work to Carry out Mechanical De-Installation of Machine	**Description/Demonstration:** Give a brief description on the importance of Preparation for work to Carry out Mechanical De-Installation of Machine o Perform demonstration of the following to: ● Identify the required PPE's ● Collect the required PPE's ● Identify the required tools and equipment ● Collect the required tools and equipment ● Ensure functional condition of PPE's/Tools and equipment ● Ensure safe working conditions ➢ Clear Passage ➢ Cleanliness ➢ Adequate light ➢ Ventilation **Activity:** Divide the Trainees into small groups	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available Handouts Regarding to personal protective Equipment.

	and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU2. Isolate Machine from Pneumatic/hydraulic Supply	**Description / Demonstration:** ○ Give a presentation on how the isolation of machine from Pneumatic/hydraulic Supply is carried out ○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Locate the main valve of Pneumatic/hydraulic supply to the machine • Shut off the main valve of Pneumatic/hydraulic supply to the machine • Identify parts to be isolated from pneumatic/hydraulic supply • Perform isolation of all the pneumatic/hydraulic supplies to the machine • Perform dead plugging of all the pneumatic/hydraulic supplies • Maintain Record of pneumatic/hydraulic supplies isolation • Perform Tagging of the isolated pneumatic/hydraulic supplies	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	Activity: Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU3. Isolate Machine from Fuel Supply	**Description/Demonstration:** ○ Give a presentation on how the isolation of machine from Fuel Supply is carried out ○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Locate the main valve of fuel supply to the machine • Close the main valve of fuel supply to the machine • Identify parts to be isolated from fuel supplies • Perform isolation of all the fuel supplies to the machine • Perform dead plugging of all the fuel supplies • Maintain Record of fuel supplies isolation • Perform Tagging of the isolated fuel supplies • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. Each group should use a sheet	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU4. Isolate Machine from Gear Box	**Description/Demonstration:** ○ Give a presentation on how the isolation of machine from Gear Box is carried out ○ .	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Locate the gear box of the machine • Perform marking on driver, driven and foundation for proper alignment and placement of parts • Perform isolation of Gear Box • Record isolation of Gear Box • Perform Tagging on Gear Box and driven end • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU5. Isolate Machine from Pulley	**Description/Demonstration:** ○ Give a presentation on how the isolation of machine from Pulley is carried out ○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Locate the pulley of the machine • Perform isolation of pulley • Record isolation of pulley • Perform Tagging on pulley and its allied parts • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. Discuss these main	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	points briefly with the whole group. Learners should make additional notes **on the flip chart** to record additional points their group had not identified. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU6. Perform De-Coupling of Machine	**Description/Demonstration:** ○ Define De coupling and enlist the steps to be taken for decoupling of Machine. ○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Locate the parts of the machine to be De-coupled • Perform marking on parts to be De-coupled for realignment/readjustment • Perform De-coupling of the machine • Record De-coupling of the machine • Perform Tagging on De-coupled parts of the machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	feedback session. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU7. De- Install Machine from Foundation	**Description/Demonstration:** ○ Explain the procedure for De-Installation of Machine from Foundation. ○ Perform demonstration of the following to: • Wear the required PPE's • Identify the required tools and equipment • Identify machine to be de-installed from foundation • Perform de-installation of machine from foundation • Record de-installation of machine • Perform tagging on the de-installed machine • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation • Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

ELECTRICAL MACHINE WINDING TECHNICIAN

Module-D

TRAINER GUIDE

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Module D: 0713001125 Maintain Tools/ Equipment and Machinery			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context** Classroom/ lab	• **Media** • Lecture • Multi Media presentation
LU1. Prepare for work to maintain tools / equipment and machinery	**Description/Demonstration:** ○ Give a brief description on the importance of Prepare for work to maintain tools / equipment and machinery. ○ Perform demonstration of the following to: • Prepare list of the PPE'S required for maintaining tools/equipment and machinery • Identify the required PPE'S • Use the required PPE'S • Ensure working / functional condition of PPE'S • Prepare list of the tools / equipment required for winding technician • Identify the tools/equipment required for winding technician • Collect the tools/equipment required for winding technician	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	• **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU2. Maintain Tools and equipment	**Description/Demonstration** Give a brief description on the importance of Maintain Tools and equipment o Perform demonstration of the following to: • Display list of the tools / equipment required for winding technician • Match the available tools / equipment with the displayed list • Prepare list of missing tools and equipment • Arrange the missing tools and equipment	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation
LU3. Perform Preventive maintenance of tools and equipment	**Description/Demonstration:** o Give a brief description on the importance of Performing Preventive maintenance of tools and equipment. o Perform demonstration of the following to: • Check physical condition of tools and equipment • Perform cleaning of tools and equipment • Perform lubrication of tools and equipment • Ensure proper storage of tools and equipment	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment. • Tools/equipment

	• **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

LU4. Perform Corrective maintenance of tools and equipment	**Description/Demonstration:** ○ Give a brief description on the importance of Performing corrective maintenance of tools and equipment. ○ Perform demonstration of the following to: • Check working/functional condition of tools and equipment • Perform Corrective maintenance of tools and equipment regarding: ➢ Sharpening ➢ Adjustment ➢ Balancing ➢ Tightness ➢ Jamming ➢ Breakage ➢ Calibration • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU5. Ensure Electrical/Thermal Insulation of tools and equipment	**Description/Demonstration:** ○ Deliver a presentation on the Electrical/Thermal Insulation of tools and equipment. ○ Perform demonstration of the following to: • Check Electrical Insulation of tools and equipment • Maintain electrical	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment • Tools/equipment

	insulation of tools and equipment • Check Thermal Insulation of tools and equipment • Maintain Thermal insulation of tools and equipment • Ensure proper storage of tools and equipment • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners.		

	• **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU6. Calibrate measuring instruments	**Description/Demonstration:** Define Calibration of measuring instruments and its importance. o Perform demonstration of the following to: • Check calibration of measuring instruments • Set calibration of measuring instruments • Compare calibration with the standard/Pre-calibrated instrument • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the	Classroom/ lab with Multi media	

	front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU7. Maintain Winding Machines	**Description/Demonstration:** Give a brief description on the importance of Maintaining Winding Machines ○ Perform demonstration of the following to: • Check physical condition of winding machines • Perform cleaning of winding	Classroom/ lab with Multi media	• **Media** • Lecture • Multi Media presentation

	machines • Perform lubrication of winding machines • Check calibration of turns counter of winding machines • Set calibration of turns counter of winding machines • Replace turns counter of winding machines • Ensure safe covering/storing of winding machines • **Activity:** Divide the Trainees into small groups and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		
LU8. Manage Inventory of tools/equipment and Machinery	**Description/Demonstration:** ○ Give a presentation on Managing Inventory of tools/equipment and Machinery . ○ Perform demonstration of the following to: • Collect relevant inventory forms/stock register • Record receiving of tools, equipment and machinery in inventory forms/stock register • Maintain record of tools and equipment in stock register • **Activity:** Divide the Trainees into small groups	Classroom/ lab with Multi media	• Learner guide • All PPE ready available • Handouts Regarding to personal protective Equipment.

	and allocate at least **one key topic** to each group for discussion on the topic. 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. Facilitate all the groups one by one to come to the front of class with their flipcharts, display their flipcharts visible to all the learners and ask them to share their main points they have recorded for their key points. 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. End the group discussion activity with a summary. Photograph or scan of all the flipcharts and use these charts to create a handout for distribution amongst all the learners. • **Assessment:** Observe the students and give feedback to Improve their Knowledge and skill. Learners must be able to practice and develop their knowledge and skills relating to Work safely. Ensure that learners have the opportunity to ask questions to support their understanding.		

ELECTRICAL MACHINE WINDING TECHNICIAN

Module-E

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Module E: Comply with Personal Health and Safety Guidelines			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Identify Personal Hazards at Workplace	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU2. Apply Personal Protective and Safety Equipment (PPE)	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU3. Comply Occupational Safety and Health (OSH)	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	

LU4. Dispose of hazardous Waste/materials from the designated area.	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	

ELECTRICAL MACHINE WINDING TECHNICIAN

Module-F

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Module F: Communicate the Workplace Policy and Procedure			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Identify workplace communication procedures	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU2. Communicate at workplace	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU3. Draft Written Information	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	

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Module-G

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LU4. Review the Documents	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	

Module G: Perform Basic Communication (Specific)			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Communicate in a team to achieve intended outcomes	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU2. Follow Supervisor's instructions as per organizational SOPs	**Description/Demonstration:** **:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	

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Module-H

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LU3. Develop Generic communication skills at workplace	**Description/Demonstration:** **Activity:** **Assessment**	Classroom/ lab with Multi media	

Module H: Perform Basic Computer Application (Specific)			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1. Create Word Documents	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab with Multi media	
LU2. Use internet for Browsing	**Description/Demonstration:** **Activity:** **Assessment:**	Classroom/ lab	

Frequently Asked Questions

1. What is Competency Based Training (CBT) and how is it different from currently offered trainings in institutes?	Competency-based training (CBT) is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training. Compared to conventional programs, the competency based training is not primarily content based; it rather focuses on the competence requirement of the envisaged job role. The whole qualification refers to certain industry standard criterion and is modularized in nature rather than being course oriented.
2. What is the passing criterion for CBT certificate?	You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
3. What are the entry requirements for this course?	The entry requirement for this course is level-1 qualification in Electrical Machine Winding Technician.
4. How can I progress in my educational career after attaining this certificate?	You shall be eligible take admission in a level-3 course Electrical Machine Winding Technician.
5. If I have the experience and skills mentioned in the competency standards, do I still need to attend the course to attain this certificate?	You can opt to take part in the Recognition of Prior Learning (RPL) program by contacting the relevant training institute and getting assessed by providing the required evidences.
6. What is the entry requirement for Recognition of Prior Learning program (RPL)?	There is no general entry requirement. The institute shall assess you, identify your competence gaps and offer you courses to cover the gaps; after which you can take up the final assessment.
7. Is there any age restriction for entry in this course or Recognition of Prior Learning program (RPL)?	There are no age restrictions to enter this course or take up the Recognition of Prior Learning program
8. What is the duration of this course?	The duration of the course work is 50 Credit hrs(500 Contact Hrs) .

9. What are the class timings?	The classes are normally offered for 5 days a week (08:00 A.M to 01:00 PM) These may vary according to the practices of certain institutes
10. What is equivalence of this certificate with other qualifications?	As per the national vocational qualifications framework, this is a level-2 certificate in Electrical Machine Winding Technician.
11. What is the importance of this certificate in National and International job market?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTC). These standards are also recognized worldwide as all the standards are coded using international methodology and are accessible to the employers worldwide through NAVTTC website.
12. Which jobs can I get after attaining this certificate? Are there job for this certificate in public sector as well?	You shall be able to take up jobs in Electrical Machine Winding Technician industries/workshops or you can start your own business in the field of Electrical Machine Winding.
13. What are possible career progressions in industry after attaining this certificate?	You shall be able to progress up to the level of supervisor after attaining sufficient experience, knowledge and skills during the job. Attaining additional relevant qualifications may aid your career advancement to even higher levels.
14. Is this certificate recognized by any competent authority in Pakistan?	This certificate is based on the nationally standardized and notified competency standards by National Vocational and Technical Training Commission (NAVTTC). The official certificates shall be awarded by the relevant certificate awarding body.
15. Is on-the-job training mandatory for this certificate? If yes, what is the duration of on-the-job training?	On-the-job training is not a requirement for final / summative assessment of this certificate. However, taking up on-the-job training after or during the course work may add your chances to get a job afterwards.
16. How much salary can I get on job after attaining this certificate?	The minimum wages announced by the Government of Pakistan in 2019 are PKR 17,500. This may vary in subsequent years and different regions of the country. Progressive employers may pay more than the mentioned amount.
17. Are there any alternative certificates which I can take up?	There are some short courses offered by some training institutes on this subject. Some institutes may still be offering conventional certificate courses in the field.
18. What is the teaching language of	The leaching language of this course is Urdu and English.

this course?	
19. Is it possible to switch to other certificate programs during the course?	Yes, you can switch to other training courses after completion of certain levels in the field and can attain other qualifications in other courses..
20. What is the examination / assessment system in this program?	Competency based assessments are organized by training institutes during the course which serve the purpose of assessing the progress and preparedness of each student. Final / summative assessments are organized by the relevant qualification awarding bodies at the end of the certificate program. You shall be required to be declared “Competent” in the summative assessment to attain the certificate.
21. Does this certificate enable me to work as freelancer?	You can start your small business in the form of services delivery for winding of Electrical Machines (Motor and Transformer).You may need additional skills on entrepreneurship to support your initiative.

Test Yourself (Multiple Choice Questions)

Level- 2

Please mark the correct one from the given options.

QNO 1: What is important to know for Arrangement of Tools & Equipment?

A. Identify of tool and Equipment's
B. Prepare list of tools
C. Specifications of tool & Equipment
D. Condition of tools & Equipment& equipment

QNO 2: Safe use of tools is ensured if the tools are :

A. Insulated
B. Accurate
C. Complete
D. Broken

QNO3: What is the unit of current?

A. Volts
B. Watt
C. Ampere
D. Ohms

QNO4: What will flow in circuit when voltage is applied?

A. Power
B. Current
C. Voltage
D. Resistance

QNO 5: What is opposing capacity of materials against the current flow?

A. Conductance
B. Inductance
C. Capacitance
D. Resistance

Q No 6: What you can measure with Megger?

A. Conductor resistance
B. Conductor capacitance
C. Insulation resistance
D. Insulation capacitance

Q N0 7: What is the measuring unit of Megger?

A. Kilo
B. Mega
C. Giga
D. Micro

Q No 8: What will be the value of current in short Circuit?

A. Zero
B. Minimum
C. Normal
D. Abnormal

Q No 9: What type of maintenance you will do after detection of fault?

A. Preventive
B. Corrective
C. Progressive
D. Protective

Q No 10: What type of maintenance you will do before arising of fault?

A. Preventive
B. Corrective
C. Progressive
D. Protective

Q No. 11: Zero adjustment of equipment is a part of?

A. Identification
B. Callibration
C. Representation
D. Preventation

Q No 12: Insulation failure cause fault of?

A. Open circuit

B. Working circuit
C. Short circuit
D. Healthy circuit

Q No 13: Tag must be displayed when machine is?

A. Off
B. Working
C. Connected
D. Isolated

Q No 14: When faulty machine received in workshop, it is mandatory to up date?

A. Cleanenance
B. Repair
C. Inventory
D. Connection

Q No 15: Moisture in transformer oil will effects its?

A. Dielectric properties
B. Thermal properties
C. Chemical properties
D. Phisical properties

Q No 16: Transformer oil can last up to?

A. 20 Years
B. 25 Years
C. 30 Years
D. 35 Years

Q No 17: It is a formal document that describes maintenance work to be completed?

A. MWD
B. MWR
C. MWA
D. MWM

Q No 18: The process of disconnection and isolation of a system from a source of energy is called :

A. De-energizing
B. Isolation
C. Dis-connection
D. Connection

Q No 19: TTR stands for?

A. Total Trace Ratio
B. Transformer Trace Ratios
C. Trace Turn Ratio
D. Transformer Turn Ratio

Q No 20:In factories/work shops load is shifted with the help of :

A. Fork Lifter
B. Loader
C. Chain Block
D. Tripod

Answers Key	
Question Number	**Correct Answer**
1	C
2	A
3	C
4	B
5	D
6	C
7	B
8	D
9	B
10	A
11	B
12	C
13	D
14	C
15	A
16	C
17	B
18	A
19	D
20	A

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