ELECTRONIC HOME APPLIANCES TECHNICIAN

TRAINER GUIDE

National Vocational Certificate Level 2

Version 1 - March 2014

EUROPEAN UNION
Kingdom of the Netherlands
german cooperation DEUTSCHE ZUSAMMENARBEIT
NORWEGIAN EMBASSY
Supported by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Islamic Republic of Pakistan
اسلامی جمہوریہ پاکستان
Islāmī Jumhūrī-ye Pākistān
NAVTTC

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 Reform Support Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Layout & design
SAP Communications

Photo Credits
TVET Reform Support Programme

URL links
Responsibility for the content of external websites linked in this publication always lies with their respective publishers. TVET Reform Support Programme expressly dissociates itself from such content.

This document has been produced with the technical assistance of the TVET Reform Support Programme, which is funded by the European Union, the Embassy of the Kingdom of the Netherlands, 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
July, 2015
Islamabad, Pakistan

ELECTRONIC HOME APPLIANCES TECHNICIAN

TRAINER GUIDE

National Vocational Certificate Level 2

Version 1 - March 2014

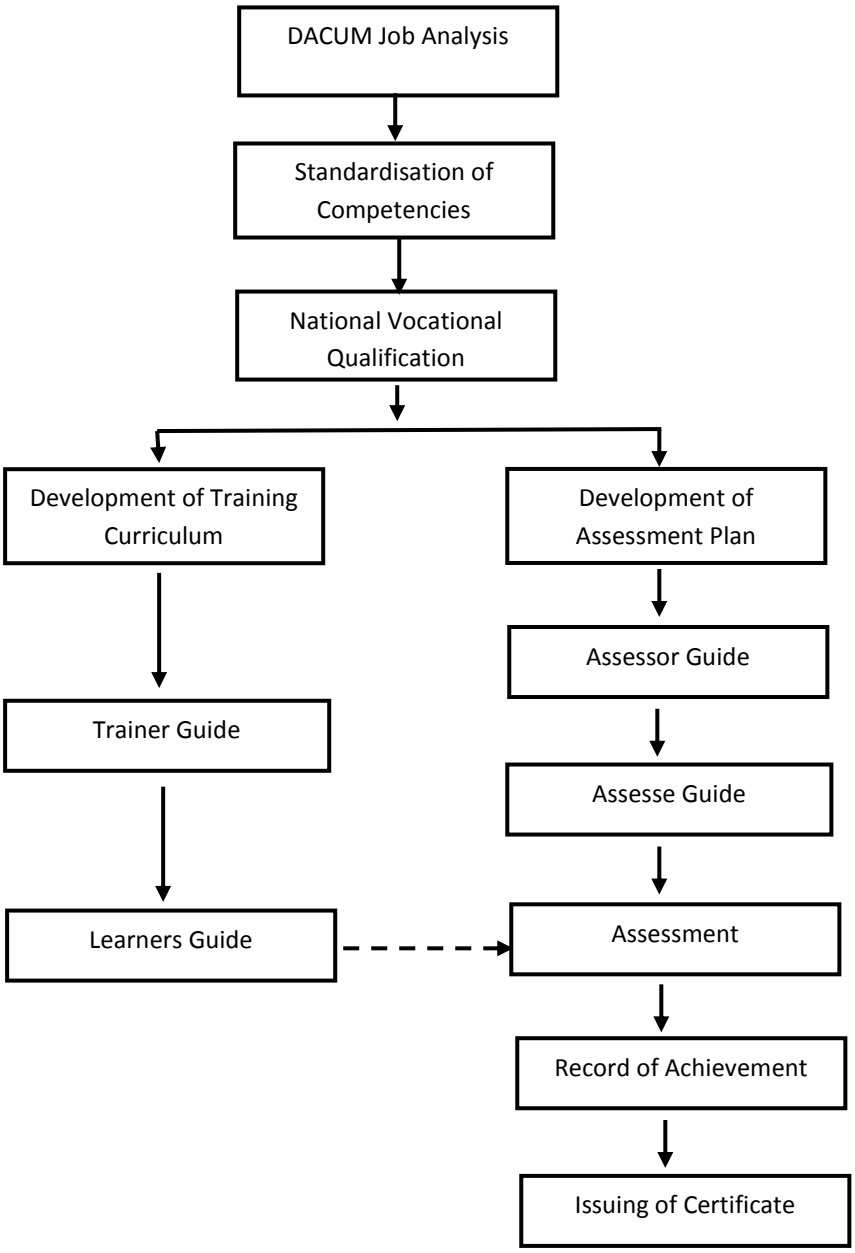
Contents

INTRODUCTION

This Guide supportsthe Competency-Based Training Curricula that will enable the trainees to achieve the competency standards that have been set by the relevant industry group.

The NVQF Competency-Based Training Curricula along with the associated Training Guides and the Assessment Guides are all developed from the skill competency standards established by the Industry Advisory Group (IAG).

Figure 1 outlines the process of developing the competencies, developing the curriculum and the assessment requirements, and delivering the training program and the assessments necessary to certify achievement of the competencies.



The Trainer Guide provides guidelines and instructions to Trainers on the approaches that are required and on the organisation and delivery of the curriculum training program.

Curriculum

The Curriculum Manual is included in the Training and Learning Materials Package.

The curriculum is organised as a series of modules. Each module is broken down into a series of Learning Units. Each Learning Unit includes Learning Outcomes, Learning Elements, an estimate of the time needed, a list of materials required and the location for the learning to take place.

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials needed	Location

Lesson Plans

The Trainer will need to develop a coherent set of lesson plans for each module of the curriculum. This Guide includes a Lesson Plan Template. The Lesson Plans must be filed for later review if necessary.

Assessment

It is necessary to assess the knowledge and skills of the trainees at the completion of each module. (See the Assessment Guide for further details)

Evaluation of Training Material

Trainers are invited to evaluate the Training Materials based on their experience of delivering the training. A template is provided to assist.

EVALUATION OF TRAINING MATERIAL

The trainers/instructors who implement this training material can inform NAVTTC promptly of any shortcomings in training material on the followingformat. Please consider it as one of your responsibilities.

Format

Trade:			
Training Material	**Module Title & Module Code**	**Learning Unit Title & Learning Unit Code**	**Suggested amendments/ feedback/proposal**
Trainer Guide			
Learner Guide			
Trainer Name:		Training Centre:	
Signature of Trainer:		Date:	

GUIDELINES FOR WRITING LESSON PLAN

The template for lesson plan has been provided at next page. These guidelines are for trainers for writing their own lesson plans which are as follows:

1. Introduce yourself and the Learning Unit, and state the Learning Outcomes of the session clearly to activate attention of learners.

2. In **Introduction**part of lesson plan state the Learning Objectives of the lesson. This allows the learners to organize their thoughts on what they will learn and to perform. Also state some questions to recall prior knowledge of learners to arouse their interest and motivation.

3. In **Body** part of lesson plan present the new information or material that is to be learned. Demonstration of a skill relevant with the Learning Unit is also stated here. Also mention the teaching and learning methods for each leaning element from *Trainer Guidelines*, the relevant media including handouts, power-point slides, videos, white board and time duration for each activity in the relevant columns.

4. In **Conclusion** part list the strategies used for summarizing and reviewing the lesson delivered. Also mention the strategies for formative assessment to ensure that the transfer of knowledge and skill has been achieved.

LESSON PLANS

Dear Instructors,

Model Lesson Plans for one module have been provided in this trainer guide. A format and guidelines for writing Lesson Plans have also been provided in the succeeding pages. You are advised to prepare your own lesson plans for the remaining Learning Units using the suggested format and guidelines.

LESSON PLAN - 1			
Module 3	**Repair of Home Appliance**		
Learning Unit 1	**Perform test run**		
Learning Outcomes **After completion of session the trainee will be able to:** • Understand uses of User Manual. • Check appliances with series and direct testing board. • Connect with main power supply • Measure current, voltage and power of appliances. • Perform operational / run test as mention in User Manual. • Observe personal and workplace safety at all times.			
Methods	Key Notes	Media	Time
Introduction			
Lecture	Introduce the Learning Unit. Motivate the learners to create interest. Tell them about the following learning objectives: • Knowledge about User Manual • Procedure of measurement of different parameters as per User Manual. • Knowledge about series and direct test board.	White Board	10 min
Main Body			
Lecture -do -do -do -do Demonstration -do	• Describe the importance of safety precaution. • Explain application of User Manual of different appliances. • Define procedure of uses of series and direct testing board. • Describe procedure of measurement s of electrical parameters by using multi-meter. • Demonstrate run operation / test of different appliances.	Learner Guide Electrical toaster, - Information Sheet.	2 ½ h

-do -do	• Demonstrate measurement of voltage, current and power. • Demonstrate to Toung tester for current measurement.		
Group performance	• Demonstration by learners to ensure that the learners acquired relevant skill.		20 min
Conclusion			
Lecture Question and Answers	Summarize the lesson by reviewing important concepts. Ask questions to ensure that the learners acquired relevant knowledge.		30 min
		Total time:	3 ½ h

DEMONSTRATION OF SKILL

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

1. Read the Procedure mentioned in the Learner Guide for the relevant Learning Unitbefore demonstration.
2. Arrange all tools, equipment and consumable material which are required for demonstration of a skill.
3. Practice the skillbefore demonstration to learners, if possible.
4. Introduce the skill to learners clearly at the commencement of demonstration.
5. Explain how the skill relates with the skill(s) already acquired and describe the expected results or show the objects to learners.
6. Carry out demonstration in a way that it can be seen by all learners.
7. Perform each step slowly and read out each step of the Performance Guide loudly so that all learners can hear and understand.
8. Identify critical or complex steps, or steps that involve safety precautions to be followed.
9. Explain theoretical knowledge where applicable and ask questions to learners to test their understanding.
10. Repeat critical steps in demonstration, if required.
11. Summarize the demonstration by asking questions to learners.

OVERVIEW OF PROGRAMME

Course: Electronics Home Appliances

Course Overview:

Home appliances are electrical/mechanical machines which accomplish some household functions, such as cooking or cleaning. Home appliances can be classified into:

- Major appliances, or white goods
- Small appliances,
- Consumer electronics, or brown goods

This course consists of six modules the details of which are given below.

Module	Learning Unit	Duration
1: Ensure Occupational Health & Safety	LU1. Apply personal safety measures LU2. Apply Tools and equipment safety measures LU3. Apply environment safety measures LU4. Apply safety measures according to job	108 hours
2: Perform Basic Installation of Home Appliances	LU1. Use Installation manual LU2. Install appliances according to manual LU3. Perform test run	140 hours
3: Perform Repairing of Home Appliance	LU1. Perform test run LU2. Dismantle appliance LU3. Diagnose fault of appliances LU4. Repair of washing machine LU5. Repair of microwave LU6. Repair electrical Iron LU7. Repair of vacuum cleaner LU8. Repair of fans LU9. Repair of emergency light LU10. Repair of toaster LU11. Repair of kitchen appliances LU12. Assemble appliance	230 hours

4: Perform Replacement Components of Home Appliances	LU1. Identify faulty component LU2. Replace electrical components LU3. Replace mechanical parts LU4. Replace module	148 hours
5: Perform Preventive Maintenance	LU1. Inspect equipment LU2. Clean equipment LU3. Lubrication mechanical parts LU4. Align equipment LU5. Ensure parts life cycle LU6. Demonstrate equipment	50 hours
6: Develop Professionalism	LU1. Communicate with co-workers LU2. ManageTime LU3. Upgade Skills LU4. Keep the work place clean LU5. Working with the team	22 hours

TRAINER GUIDELINES			
Module 1: Ensure Occupational Health and Safety			
Learning Unit	**Suggested Teaching/ Learning Activities**	**Delivery Context**	**Media**
LU1: Apply personal safety measures	Give illustrative talk for the following learning elements: • Importance of personal safety • Importance of personal protective tools and equipment (PPE)	Class Room	Learner Guide/ Hand Outs
	Give illustrative talk along with the demonstration of PPE for the following learning element: • Utilization of personal protective components e.g. Gloves, Head Cover, Safety shoes, Safety belts, Goggles etc	Lab./ Workshop	Learner Guide/ Hand Outs and PPEs (Gloves, Head Cover, Safety shoes, Safety belts, Goggles etc)
	Give illustrative talk the following learning elements: • Utilization of emergency contacts • Importance of personal safety • Personal safety risk assessment and risk management • Identification of hazardous components and their control measures • Question and Answer activity	Class Room	Learner Guide/ Hand Outs and List of Emergency Contacts
LU2: Apply Tools and equipment safety measures	Give illustrative talk with discussion for the following learning elements:		

	• Selection of effective safety tools • Effective utilization of safety tools • Understand operating procedures • Maintain operational data	Class Room	Learner Guide/ Hand Outs, White Board, Marker and List of Safety Tools
	Give illustrative talk along with the demonstration of testing of safety tools for the following learning element: • Testing of safety tools	Lab./Workshop	Learner Guide/ Hand Outs and Safety Tools
	Give illustrative talk supplemented with Question and Answering activity for the following learning element: • Knowing the safety	Class Room Lab./Workshop	Learner Guide/ Hand Outs and Safety Tools
	Demonstrate of the following learning elements: • Observation of necessary safety measures during handling • Precautions and guidelines		Learner Guide/ Hand Outs Video (through Multimedia)
	Give illustrative talk added with display of video for the following learning elements: • Description of safety hazards and controlling instruction • Control of hazardous operation • Risk assessment and risk management • Questions and Answer activity	Class Room	
LU3: Apply environment safety measures	Give illustrative talk for the following learning element: • Understanding of environmental safety and security	Class Room	Learner Guide/ Hand Out
	Demonstrate of the following		

	learning elements: • Job site housekeeping • Cleaning and sanitation Give illustrative talk for the following learning elements: • Emergency rule statement • Safe disposal and dumping Give illustrative talk supplemented with video or PPT Presentation for the following learning elements: • Environmental contaminating agents and their safe control • House pests and rodents • Control of house pest through integrated management systems. • Questions and Answer activity	Lab./ Workshop Class Room	Learner Guide/ Hand Out. Cleaning and Sanitation agents Learner Guide/ Hand Out, Emergency rule chart, Learner Guide/ Hand Out, video / PPT Presentation through Multimedia
LU4: Apply safety measures according to job	Give illustrative talk for the following learning elements: • Work permits and their importance • Different hazards prevailing on work place • Risk assessment at work place • Risk management considering all three physiological, biological and mechanical hazards • The key work barricade present at jobsite • Best control of and over coming of barricades Demonstration with display of video/ PPT presentation for the following learning elements:(Moreover Resource Person from 1122 can be called) • Types of first aid tools • Utilization of first aid kit	Class Room Lab./workshop	Learner Guide/ Hand Out. Work permits copy Charts of Different hazards First aid kit Video or PPT through Multimedia

	• Causes of fire in work site • Safe control of fire • Usage of different fire controlling tools and equipments like fire extinguisher, sand and others • Questions and Answers activity.		Bucket of Sand, Fire extinguisher, Video or PPT through Multimedia
LU5: Perform test run	Give illustrative talk for the following learning elements: • Electrical circuits series, parallel etc • Leakages and its reasons Demonstration for the following learning elements: • Arranging the required connection and supply means. • Assessing the leakage of electricity • Assessing of water leakage Discuss the following learning elements: • Importance of earthling system • Verification and conformation of supply source through observing the standards Demonstrate the following learning elements: • Earthling test procedure for different appliances • Test run following service manual • Standard operating work and methodology • Specification of appliances • Operating methodology of appliances	Class Room Lab./Workshop Class Room Lab./Workshop	Learner Guide/ Hand Out. Instructional/ User Manual Series Test Board, Mager Learner Guide/ Hand Out. Series Test Board, Mager User Manual IEEE Standards Table of Specification Use Manual
LU6: Understand requirements of workplace health, safety and security.	Give illustrative talk for the following learning elements: • Requirements for a safe working environment	Class Room	Learner Guide/ Hand Out. Maintenance

	• Maintenance procedures for machinery, equipment, appliances, tools Demonstrate the following learning element: • Handling tools and equipment properly Controlled Group discussion for the following learning elements: • Ergonomics suitable for the work environment • Health, safety and security guidelines	Lab./Workshop Class Room	charts/video Complete Tool Kit, Multimeter, Oscilloscope, etc Learner Guide/ Hand Out.
LU7: Follow workplace health, safety and security procedures.	Give illustrative talk for the following learning elements: • Hazard Identification processes • Risk assessment and control processes • Precautionary measures and their utilisation to preventing damage to health. • Questions and Answers activity	Class Room	Learner Guide/ Hand Out. Precautionary measures Charts
LU8: Maintain safe work area	Give illustrative talk for the following learning element: • Manage cables related issues Demonstrate the following learning elements: • Use and handling of electronic equipment Discuss the following learning elements: • Precautions to minimise electrical risks. • Importance of Proper dressing	Lab./Workshop Class Room	Learner Guide/ Hand Out and Cable Chart Learner Guide/ Hand Out .

	Demonstrate the following learning elements: • Keeping the workplace organized • Use of appropriate tools	Lab. Workshop	Learner Guide/ Hand Out and Tool Kit

Module 2: Perform basic installation of Electronics Home Appliances

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media

LU1: Use Installation manual	Give illustrative talk for the following learning elements: • Fundamental of electricity • Fundamental of electronic • Basic electrical and electronic drawings • Measurements of fundamental units • Reading of instruction manual Demonstrate the following learning elements: • Safe shifting of tools and equipment at proper work place • Standards procedures, code of practices and operational guidelines • Unpacking of the tools and equipments • Arranging the tool properly and their house keeping • User manual and instruction intended for appliances • Confirmation of product model and its accessories according to checklist provided in user manual • Understanding the drawing of equipment Conduct Group Demonstration for the following learning elements: • Explanation of instructional manual • Equipment unpacking procedure • Understanding of installation procedure • Questions and answers activity	Class Room Lab. / Workshop	Learner Guide/ Hand Out, Electric and Electronic Drawings User/ Instruction Manual Trays, Tool Kit, Equipment IEEE Trays, Tool Kit, equipment User Manual Circuit Drawings Instructional/user manual
LU2: Install of appliances according to manual	Give illustrative talk for the following learning element: • Site specification and where about premises Arrange a Site visit for	Class Room	Learner Guide/ Hand Out.

	demonstration following learning element. • Visiting the installation site for feasibility of installation Demonstrate the following learning elements. • Installation tools & equipment. • Enlist of installation tools and equipment Give illustrative talk for the following learning elements: • Arranging the relevant man power for installation of appliances • Skills for handling the different manpower for installation and appliances handling Arrange a Site visit for demonstration following learning elements. • Selecting the point of installation • Marking the site for installation • Fixing the base for installation of appliances • The importance of fixing good base and installation station • Requirements of equipments • Reading and understating of tool installation drawing • Installation procedures like alignment, calibration and validation etc. • Installation procedure and measuring the units • Individual Tasks performance	Work Site Lab./ Workshop Class Room Work Site	Papers , pencils, Measuring Tap, Marker, etc Installation Tools & Equipment Learner Guide/ Hand Out. Learner Guide/ Hand Out. Installation Tools and Equipments, Bases as per requirement of appliance, Installation Drawings. Tolls for alignment

Module 3: Repair of Home Appliance

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Perform test run	Give illustrative talk with the help of PPT presentation for the following learning elements:		

	• Understand information getting procedure of appliances • Electricity (voltage, current, resistance, ohm's law) • Electrical circuits(series, parallel) Demonstrate the following learning elements: • Operate the multi-meter (analog, digital) to check circuits, mains supply • Operate toung tester / Clamp meter • Perform tests according to jobs • Compare the parameters • Individual task for Measurement of current, voltage and resistance etc.	Class Room Lab./ Workshop	Learner Guide/ Hand Out, PPT Presentation through Multimedia Multi-meter (analog, digital), Clamp meter Operational sheet.
LU2: dismantle appliances	Give illustrative talk for the following learning elements: • Different tools for dismantling of appliances • Electrical/ electronics symbols • Mechanical drawing symbols • Layout drawings Demonstrate the following learning elements: • Different type of tools, equipment functions • Tagging techniques of connections	Class Room Lab./ Workshop	Learner Guide/ Hand Out. Symbol Charts (Electrical, Electronics & Mechanical) Drawing Layouts Tool kit, Multimeter, Oscilloscope Tags Soldering and De-

	• Apply soldering and de-soldering techniques • Apply assembling techniques • Perform systemic inspection and apply specific testing procedure • Individual tasks for each learner		soldering Station
LU3: diagnose fault of appliances	Give illustrative talk with the help of PPT presentation for the following learning elements: • Fault diagnose techniques • Classification of faults • Electrical/ electronic components faults • Mechanical faults Demonstrate the following learning elements: • Electrical measurement (voltage, current, resistance) • Electrical, mechanical power and measurement • Electrical test of appliances • Mechanical test • Characteristics of electrical/electronic components • Tagging of wire, components and follow standards	Class Room Lab./ Workshop	Learner Guide/ Hand Out. Flow Chart, PPT , Multimedia, Computer Multimeter Tags
LU4: Repair of washing machine	Give illustrative talk for the following learning elements: • Washing machine working principles • Wash phenomena • Type and structure of washing	Class Room	Learner Guide/ Hand Out.

	machine • Rotor/ gearbox faults Demonstrate the following learning elements: • Troubleshoot rotor/ gear box faults • Measurement of electrical/electronic characteristics machine • Control penal functions • Troubleshooting of control penal faults • Type of leakages • Sealing materials • Leakage removal procedures • Perform leakage removal operation • Leakage test • Pressure switch • Level indicator • Fuzzy function • Demonstrate machine operations to Customer • Individual Tasks	Lab./Workshop	Learner Guide/ Hand Out. Washing machine, Tool kit Sealing materials , Pressure switch.
LU5: repair of micro wave	Give illustrative with PPT Presentation talk for the following learning elements: • Micro wave working principles • Type and structure of micro wave • Describe magnetron faults Demonstrate the following learning elements:	Class Room Lab./Workshop	Learner Guide/ Hand Out. Computer & multimedia Learner Guide/ Hand Out, Magnetron, H.V. Rectifier,

	• Troubleshooting of magnetron rectifier faults • Measurement of electrical characteristics of Microwave Oven • High voltage Transformer • High voltage Capacitor • Problem of Cavity • Heat principals and transformation • Revolving motor & Hub problem • Perform measurement of temperature • Front control penal functions • Perform front control penal faults • Demonstrate Microwave Oven operations • Individual performance tasks		HV Transformer, HV Capacitor, Revolving Motor, Hub, Microwave Oven Plate, Manual Timer Switch, Touch Control Panel. Operation/ user Manual
LU6: repair of electrical Iron	Give illustrative talk for the following learning elements: • Iron working principles • Type and structure of iron • Heating element set • Heating principals of electrical elements Demonstrate the following learning elements: • Perform element faults • Measurement of electrical characteristics iron • Describe control instrument functions • Perform control instrument	Class Room Lab./ Workshop	Learner Guide/ Hand Out. Different types of Irons Different types of iron elements, Multimeter, Tool Kit, Thermostat Operation/ User

	faults • Demonstrate machine operations • Practical tasks		Manual
LU7: repair of vacuum cleaner	Give illustrative talk for the following learning elements: • Vacuum cleaner working principles • Type and structure of vacuum cleaner machine • Describe universal motor Demonstrate the following learning elements: • Perform universal motor faults • Maintenance of motor • Perform measurement of electrical characteristics universal motor machines • Describe control penal functions • Perform control penal faults • Demonstrate machine operations • Individual tasks	Class room Lab./ Workshop	Learner Guide/ Hand Out. Vacumm Cleaners of Different Brands. Universal Motor Universal Motor, Multimeter, Manual and Touch Control Panel. Operation/ User Manual
LU8: repair of electrical fans	Give illustrative talk for the following learning elements: • Electrical fans working principles • Type and structure of fans • Describe parts of fans motors • Perform stator side faults • Perform measurement of electrical characteristics fans • Perform measurement of fan speed and air throw • Describe front control penal		Learner Guide/ Hand Out. Different Fans Fan Motor Stroboscope Pressure guage , Wind speed meter/air flow meter Manual and Touch Control Panel.

	functions • Perform front control penal faults • Demonstrate fans machine operations		
LU9: repair of emergency light	Give illustrative talk for the following learning elements: • Emergency light working principles • Type and structure of emergency light • Describe low voltage, high voltage and control side faults • Charging faults Demonstrate the following learning elements: • Measurement of electrical characteristics • Describe front control penal functions • Perform front control penal faults • Demonstrate light operations • Individual Tasks	Class Room Lab./Workshop	Learner Guide/ Hand Out. Emergency Light of Different Brands Multimeter, Front control Penal, Operation/ User Manual
Light LU10: Repair of electrical toaster	Give illustrative talk for the following learning elements: • Electrical toaster working principles • Type and structure of toaster • Describe electrical elements set faults Demonstrate the following learning elements: • Measurement of electrical characteristics	Class Room Lab./ Workshop	Learner Guide/ Hand Out. Electric Toaster of different Brands Multimeter, Control Penal, Operation/ User Manual

	• Heat principals and transformation • Perform measurement of temperature • Describe front control penal functions • Control penal faults • Demonstrate machine operations		
LU11: Repair of kitchen appliance machines	Give illustrative talk for the following learning elements: • Describe kitchen appliance working principles • Categories kitchen appliance • Type and structure of appliance • Describe appliances electrical, mechanical faults Demonstrate the following learning elements: • Troubleshoot electrical motor faults removal • Troubleshoot motor mechanical faults • Perform measurement of electrical characteristics machine • Perform mechanical characteristics measurement,(speed, torque, direction) • Describe front control penal functions • Perform front control penal faults • Demonstrate machine operations	Class Room Lab./Workshop	Learner Guide/ Hand Out. Different Brands of Kitchen Appliances Multimeter, Universal motor, Tool Kit, Tachometer, Manual and Touch Control Penal Operation/ user manual

LU12: Assemble appliances	Give illustrative talk for the following learning elements: • Understand assembling principals and procedures • Explain type of assembling tools and equipment • Describe appliances assembling procedures Demonstrate the following learning elements: • Perform assembling procedure • Perform measurement of electrical characteristics • Perform test run of appliance • Demonstrate machine operations • Individual Tasks	Class Room Lab. / Workshop	Learner Guide/ Hand Out. Un-assemble Appliances Un-assemble Appliances Assembling guide Assembling tools

Module 4: Perform Replacement Components of Home Appliances

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Identify faulty component/parts	Demonstrate the following learning elements: • Source and availability of components parts of the appliances • Quality and warranty formalities • Requisition raising and its specification • Inspection of components parts and specification • Testing procedures of required components.	Lab./ Workshop	Learner Guide/ Hand Out/ Operation sheet Warranty Cards, Requisition form/ sheet, Tables of specification Inspection Form/ sheet
LU2: Replace electronic/electrical components	Demonstrate the following learning elements: • Understanding the test procedures of components • Testing of new components • Confirmation of compatibility	Lab./ Workshop	Learner Guide/ Hand Out/ Operation sheet, Components, Tools, Isolating mica sheet, Silicon/ Heat

	of new components • Understanding about the installation of new parts • Understanding the importance of proper connection and soldering • Knowing about the source and point of the connection • Confirmation of required connection • Understanding about the importance of insulation • Knowing about the insulation methodology and insulator types • Knowing about the hazards of short circuit • Understanding the procedure of replacement • Quez		conducting past, Soldering Station, Solder Wire and Past. Insulation tape Heat shrink slave
LU3: Replace mechanical parts	Demonstrate the following learning elements: • Identification of faulty part • Disposition and dumping of faulty part • Arrangement of new part • Checking and confirmation of new part • Arrange tools and equipment required for replacement • Technical installation of new part • Inspection and fixation Fixing and inserting part properly • Describe procedure of replacement • Explain adjustment procedure • Explain lubrication procedure • Quiz	Lab. /Workshop	Learner Guide/ Hand Out/ Operation sheet, Installation Sheet, Mechanical Parts, Tools, Different lubricants, etc.

Module 5: Perform Preventive Maintenance

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Inspect equipment	Demonstrate the following learning elements: • Physical and mechanical condition of appliances • Importance of inspection of appliance • Types of inspection • Preventive maintenance schedule • Installation of learning guidance charts and animations • Prioritisation of different parts and components of the appliance • Specification of different parts • Functionality of all parts of each appliance • Life cycle of each parts Conduct individual activates for the following learning element. • understanding the checklist of different appliances	Lab./ Workshop	Learner Guide/ Hand Out/ Operation sheet Inspection sheet learning guidance charts and animations , Computer and Multimedia Warranty Card
LU2: Clean equipment	Discuss the following learning elements: • Importance of cleanliness • Cleaning agents and their efficacy Demonstrate the following learning elements: • Arranging sources of cleaning agents • Different types of cleanliness Discuss the following learning elements: • Cleanliness and Explain cleaning schedule	Class Room Lab./ Workshop Class Room	Learner Guide/ Hand Out Cleaning Agents

	• Importance of clean filter • Different types of filers • Disadvantages of Carbon/ Oxidization in electrical connection Demonstrate the following learning element: • Methodology of cleaning of electrical connection / equipments Give illustrative talk for the following learning elements: • Life of components use in equipment • Cleaning parameters of parts • Questions and Answers activity	Lab./ Workshop Class Room	WD40 Spray Contact cleaner spray
LU3: Lubrication of mechanical parts	Give illustrative talk for the following learning elements: • Understanding the importance of lubrication • Methods of lubrication • Types of different lubricants Give illustrative talk for the following learning elements: • Identification of moving parts • Functionality of different parts • Time period of lubrication • Lubrication formalities like cleaning • Standard methodology of lubrication of different moving parts • Quiz	Class Room Lab./ Workshop	Learner Guide/ Hand Out Mechanical Parts Tables Lubricating Agents
LU4: Align equipment	Give illustrative talk for the following learning elements: • Importance of alignment • Phenomenon of alignment • Basic principle of alignment	Class Room	Learner Guide/ Hand Out

	• Alignment tools Demonstrate the following learning elements: • Enlist alignment tools • Procedure of alignment • Disadvantage of high noise in appliances • Test procedure of noise procedure • Individual task assignment	Lab./ Workshop	Alignment tool, appliances Sound Level Meter
LU5: Ensure parts life cycle	Give illustrative talk for the following learning elements: • Understanding the relevant performance of parts • Knowing the optimization of tentative out put • Knowing about the mechanical specification of different parts of appliances • Understanding the intended working of different parts • Knowing about the performance life of component • Understanding the different attributes of appliances parts • Questions and Answers Activity	Class Room	Learner Guide/ Hand Out Tables of Specification
LU6: Demonstrate equipment	Give illustrative talk for the following learning elements: • Understanding about different powers sources • Efficacy and importance of different power sources • Tentative arrangements of powers sources • Realizing the importance of power back up and alternate means • The necessary accessories of subject appliance	Class Room	Learner Guide/ Hand Out List of power source available

	• Arrangement of different accessories to avoid any delay or misuse • Benefits of test running Demonstrate the following learning elements: • Methodology of test running • Performance of test running Questioning / Answering Activity for the following learning elements: • specification of appliances • Functionality of parts Give illustrative talk for the following learning elements: • Compliance of customers quarries • Understanding of work order, job card and completion reports	Lab. / Workshop Class Room	Instruction/ User Manual. Learner Guide/ Hand Out

Module 6: To develop professional attitude and maintain professionalism at workplace environment

Learning Unit	Suggested Teaching/ Learning Activities	Delivery Context	Media
LU1: Communicate with co-worker	Give illustrative talk supplemented with PPT Presentation for the following learning elements: • Communication Tools • Communication ethics • Dealing with vendors and other organisations. • Appropriate use of electronic and relative media when required • Effective communication with Junior staff and Co workers • Communication within the department and interaction with other departments	Class Room	Learner Guide/ Hand Out PPT Presentation, Multimedia, Computer

	• Quiz		
LU2: Manage time	Give illustrative talk supplemented with PPT Presentation for the following learning elements: • Importance of Punctuality • Maintain task calendars • Importance of multitasking • Checking of work (self / supervisors) • Importance of managing time according to task priorities, involving management and co-workers. • Questions and answers activity	Class Room	Learner Guide/ Hand Out PPT Presentation, Multimedia, Computer
LU3: Upgrade skills	Give illustrative talk supplemented with PPT Presentation for the following learning elements: • Importance of staying up-to-date • Development of personal skills and efficiency • Improvement of skill sets over time by way of seminars, workshops and competitions. • Importance of trends and market research to work role • Questions and answers activity	Class Room	Learner Guide/ Hand Out PPT Presentation, Multimedia, Computer
LU4: Keep the workplace clean	Give illustrative talk supplemented with PPT Presentation for the following learning elements: • Requirements of a clean and organised workplace • Effective and efficient organisation of work area • Importance of observing hygiene	Class Room	Learner Guide/ Hand Out PPT Presentation, Multimedia, Computer

	• Questions and answers activity		
LU5: Working within a team	Give illustrative talk supplemented with PPT Presentation for the following learning elements: • Skills required to successfully participate in teams • Workplace standards for professional appearance as a • Interpersonal skills required to work within teams • Requirements for work ethics for r role. • Quiz	Class Room	Learner Guide/ Hand Out PPT Presentation, Multimedia, Computer

National Vocational and Technical Training Commission (NAVTTC)

5th Floor Evacuee Trust Complex Sector F-5/1, Islamabad.
+92 51 9044 04
+92 51 9044 04
info@navttc.org
www.navttc.org