WORKSHOP PRACTICE

UNIT CODE: 0713441 07A

TVET CDACC UNIT CODE: ENG/CU/MDE/CC/02/5/MA
UNIT DURATION: 70 HOURS

Relationship to Occupational Standards

This unit addresses the unit of competency: Perform workshop practice

Unit Description

This unit covers competences required to perform workshop practice. It involves applying workshop safety practice, controlling OSH hazards, implementing OSH programs, controlling environmental pollution, demonstrating sustainable resource use, implementing specific environmental programs, monitoring activities on environmental protection programs, preparing workshop tools, equipment and materials, using workshop machines and tools and storing electrical tools and materials.

Summary of Learning Outcomes

S/No.	Learning Outcome	Duration in hours.
1.	To apply workshop safety practice	8
2.	To control OSH hazards	4
3.	To implement OSH programs	6
4.	To control environmental Pollution	4
5.	To demonstrate sustainable resource use	4
6.	To implement specific environmental programs	4
7.	To monitor activities on Environmental protection/Programs	6
8.	To prepare workshop tools, equipment and materials	10
9.	To use of workshop machines and tools	20
10.	To store Electrical tools and material	4
	TOTAL	**70**

Learning Outcomes, Content and Suggested Assessment Methods:

Learning Outcome	Content	Suggested Assessment Methods
1. Apply workshop safety practice	1.1 Workshop rules 1.2 Safety regulations 1.3 Importance of safety in workshop 1.4 Meaning of PPE 1.5 Types of PPEs 1.5.1. Mask 1.5.2. Gloves 1.5.3. Goggles 1.5.4. Safety hat 1.5.5. Overall 1.5.6. Ear protector 1.6 Standard operating procedure in PPE 1.7 Hazards in workshop 1.7.1. Electrical hazards 1.7.2. Fire 1.8 Fire 1.8.1. Classes of fire 1.8.2. Causes of fire 1.8.3. Various methods of fire extinguishing 1.9 First Aid	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
2. Control OSH hazards	2.1 Meaning of Hazards 2.2 Risks hazards 2.2.1. Physical hazards – impact, illumination, pressure, noise, 2.2.2. vibration, extreme temperature, radiation	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence

	2.2.3. Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.2.4. Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.2.5. Ergonomics 2.2.6. Psychological factors – over exertion excessive force, awkward static positions, fatigue, direct pressure, 2.2.7. varying metabolic cycles 2.2.8. Physiological factors – monotony, personal relationship, work out cycle 2.2.9. Safety hazards (unsafe workplace condition) –confined space, excavations, falling objects, gas leaks, electrical, poor storage of materials and waste, spillage, waste and debris) 2.2.10. Unsafe workers' act (Smoking in off-limited areas, Substance and alcohol abuse at work) 2.3 Hazard indicators 2.3.1. Increased of incidents of accidents, injuries 2.3.2. Increased occurrence of sickness or health complaints symptoms 2.3.3. Common complaints of	• Written Assessment • Oral Questioning

	workers related to OSH 2.3.4. High absenteeism for work-related reasons 2.4 OSH concerns 2.4.1. Workers 'experience observance on presence of work hazards 2.4.2. Unsafe unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) 2.4.3. Reasons for compliance non-compliance to use of PPEs or other OSH procedures policies guidelines 2.5 Hazard prevention and control measures 2.5.1. Appropriate risk controls in order of impact are as follows: 2.5.2. Eliminate the hazard altogether (i.e., get rid of the dangerous machine) 2.5.3. Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 2.5.4. Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one)	

	2.5.5. Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage) 2.5.6. Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users) 2.5.7. Use personal protective equipment (i.e., wear gloves and goggles when using the machine) 2.6 Contingency measures 2.6.1. Evacuation 2.6.2. Isolation 2.6.3. Decontamination 2.6.4. (Calling designed) emergency personnel 2.7 Emergency 2.7.1. Chemical spills 2.7.2. Equipment vehicle accidents 2.7.3. Explosion 2.7.4. Fire 2.7.5. Gas leak 2.7.6. Injury to personnel 2.7.7. Structural collapse 2.7.8. Toxic and or flammable vapors emission 2.8 Emergency procedure 2.8.1. Fire drill 2.8.2. Earthquake drill 2.8.3. Basic life support CPR	

	2.8.4. First aid 2.8.5. Spillage control 2.8.6. Decontamination of chemical and toxics 2.8.7. Disaster preparedness 2.8.8. Use of fire extinguishes	
3. Implement OSH programs	3.1 Company OSH programs 3.2 OSH standards and procedures 3.3 OSH-related records 3.3.1. Medical health records 3.3.2. Incident accident reports 3.3.3. Sickness notifications sick leave application 3.3.4. OSH-related trainings obtained	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
4. Control environmental pollution	4.1 Meaning of environmental pollution 4.2 Types of environmental pollution 4.3 Environmental pollution control measures 4.3.1. Methods for minimizing or stopping spread and ingestion of airborne particles 4.3.2. Methods for minimizing or stopping spread and ingestion of gases and fumes 4.3.3. Methods for minimizing or stopping spread and ingestion of liquid wastes 4.4 Procedures for solid waste management are observed	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	4.5 Methods for minimizing noise pollution	
5. Demonstrate sustainable resource use	5.1 Organizational waste management 5.2 Methods for minimizing wastage 5.2.1. Reduce 5.2.2. Reuse 5.2.3. Recycle 5.3 Waste management procedures 5.3.1. Sorting 5.3.2. Storing of items 5.3.3. Recycling of items 5.3.4. Disposal of items 5.4 Methods for economizing and reducing resource consumption 5.5 Resources 5.4.1. Electricity 5.4.2. Water 5.4.3. Fuel 5.4.4. Telecommunications 5.4.5. Supplies 5.4.6. Materials 5.6 Resource conservation plan development	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
6. Implement specific environmental programs	6.1 Define specific environmental programs 6.2 Individual responsibilities in implementing specific environmental programs 6.3 Problems encountered in implementing specific environmental programs 6.4 Resolving problems encountered in implementing specific environmental programs	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written

	6.5 Organizations' policies and guidelines 6.5.1. supply chain, procurement and purchasing 6.5.2. quality assurance 6.5.3. making recommendations and seeking approvals 6.6 Stakeholders consulted in implementing specific environmental programs	Assessment • Oral Questioning
7. Monitor activities on Environmental protection Programs	7.1 Activities periodically monitored on Environmental protection Programs 7.2 Activities evaluated based objectives of the environmental program. 7.3 Recommendations submission 7.4 Management support systems establishment 7.5 Environmental incidents reports	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
8. Prepare workshop tools, equipment and materials	8.1 Classification of workshop tools and equipment 8.1.1. Mechanical tools 8.1.2. Electrical tools 8.2 Uses of workshop tools, materials and equipment 8.3 Care and Maintenance of workshop tools and Instruments 8.4 Tools and instruments for an Electrical practical 8.4.1. Preparation of a list of tools	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	and instruments for an Electrical practical. 8.4.2. Issuing and confirmation of tools and instruments before and after practical 8.5 Safety measures on workshop tools, equipment and materials	
9. Use workshop machines and tools	9.1 Health and safety procedures 9.2 Workshop machines 9.2.1. Safety precautions 9.2.2. Operation of machines e.g. Lathe, Grinder, 9.3 Common sheet metals 9.3.1. Forming in sheet metal 9.4 Workshop tools 9.5 Use of tools 9.5.1. Marking out 9.5.2. Filing 9.6 Mechanical joining of metal 9.6.1. Welding 9.6.2. Riveting 9.7 Machine operation	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
10. Store Electrical tools and material	10.1. Classification of workshop tools and materials 10.2. Tools machines and equipment cleaning 10.3. Checking of tools and equipment 10.4. Maintenance of tools, equipment and machines 10.5. Storage of workshop tools and equipment	• Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	10.6. Waste management	

Suggested Methods of Instruction

- Practical
- Projects
- Demonstrations
- Group discussions
- Interactive lectures
- Industrial attachment
- Viewing of related videos
- Field trips

Recommended Resources for 25 trainees

S No.	Category Item	Description Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	**Learning Materials**			
1.	Textbooks	J.K. Gupta & R.S. Khurmi Workshop technology	5 pcs for each	1:5
2.	Installation manuals	Electrical machine manuals	5 pcs	1:5
3.	Charts	Machine Charts	1 pcs for each	1:25
4.	Power point presentations	For trainer's use	1	1:25
B	**Learning Facilities & infrastructure**			
5.	Lecture theory room	$60m^2$	1	1:25
6.	Workshop	$150m^2$	1	1:25
C	**Tools and Equipment**			

7.	Pliers		25 pcs	1:1
8.	Tape measure		25 pcs	1:1
9.	Try Square		25 pcs	1:1
10.	Spirit level		25 pcs	1:1
11.	Assorted Screw driver		25 pcs	1:1
12.	Assorted hammers		25 pcs	1:1
13.	Crimping tools		5 pcs	1:5
14.	PPEs		25 pcs	1:1
15.	Multimeters		5 pcs	1:5
16.	Clamp meters		5 pcs	1:5
17.	Earth resistance meter		5 pcs	1:5
18.	Stocks & Dies		5 pcs	1:5
19.	Vices		5 pcs	1:5
20.	Pipe bending Machine		5 pcs	1:5
21.	Bending machine		5 pcs	1:5
22.	Installation boards		13 pcs	1:2
23.	PCB prototyping machine		2	1:13
24.	Solder guns		25 pcs	1:1
25.	Hot air gun		5 pcs	1:5
26.	Drilling machines		5 pcs	1:5
27.	Work stations		25	1:1
28.	Welding Machine		5 pcs	1:5
29.	Lathe Machine		5 pcs	1:5
30.	Metal sheets		5 pcs	1:5
31.	Grinding machine		5 pcs	1:5
32.	Punch tool		5 pcs	1:5