WORKSHOP TECHNOLOGY I (MECHANICAL)

10.1.0

10.1.1

Introduction

This module unit involves the study of safety regulations, hand tools and equipment, machine tools, diesel and petrol engines and water pumps. It is designed to equip the trainee with: knowledge, skills and attitudes that enable him/her to perform basic workshop tasks.

General Objectives

By the end of the me

By the end of the module unit, the trainee should be able to:

- a) understand safety regulations in the workshop
- b) identify tools to be used in a conventional workshop
- c) understand the operations of petrol and diesel engines as well as pumps
- d) understand fundamentals of electrical installation
- e) understand fundamentals of building trades

10.1.3 Module Unit Summary and Time Allocation – (66 Hours)

Code	Sub	Content	Time Hours		
	Module	Ne	Theory	Pract	Total
	Unit	5			10
10.1.01	Safety	Health and Safety	4	6	10
	Regulations	Dealing with			
		Fatal			
		 Accidents 			
		• Fires		6	18
10.1.02	Hand Tools	• Classification	12	0	10
		• List			
		• Fires		6	12
10.1.03	Machine	 Description of 	6	0	
	Tools	Machine			
		Tools			
		 Classification 			
		Safety	 	6	10
10.1.04	Diesel and	Diesel and Petrol	4		
	Petrol	Engines			
	Engines	• Fuel Systems			
	Liigines	• Engine			
		Construction	10	6	16
10.1.05	Water	• Types	10		
3.1.03	100 000	Working			
	Pumps				

 Principles • Maintenance		30
	36	130
 otal		

SAFETY REGULATIONS 10.1.01

10.1.01T1

Content Health and Safety A

- obligation of employees
- obligation of h employer
- Factories Ac
- Personal hygin
- clothing
- persona] cleanliness

Personal hygiene 10.1.01T2 Dealing with fatal 10.1.01T3

- accidents first aid kit
 - first aid procedures
 - electrical shock
 - burns
 - chemical bums
 - fractures/strains
 - provision of ambulance
- accident reporting Fires extinguishers
 - classification
 - extinguisher

Practice

10.1.01P0

10.1.01T4

Specific Objectives By the end of the submodule unit, the trains should be able to:

 a) identify safety hazards in workship environment

Theory

10.1.01TO Specific Objectives By the end of the sub module unit, the traince should be able to:

- a) state the responsibility of employee under the Health And Safety Act
- b) state the need of personal hygiene
- c) explain first aid procedures in the event of accident in workshop
- d) classify fire extinguishers

10.1.01C Competence

The trainee should have the ability to:

- identify safety hazards and avoid them
- ii) behave responsibility as obligated by law
- iii) minimize, control or avoid contact with environmental pollutants
- iv) classify fire extinguishers

- b) identify the dangers associated with polluted environment
- c) demonstrate the use of firefighting equipment

Content

10.1.01P1

Safety hazards in the workshop

- workshop tidiness
- safety clothing
- machine guards
- fumes

10.1.01P2 Dangers of polluted environment

- fumes
- liquids
- gases
- explosives
- noise
- dust

10.1.01P3

Fire fighting equipment

- heat extinguishers
- carbon dioxide (CO2)
- foam
- hallogen

10.1.02

HAND TOOLS

Theory

10.1.02T0

Specific Objectives By the end of the submodule unit, the trainee should be able to:

- a) classify hand tools
- b) list down hand tools
- c) care and maintenance of hand tools

10.1.02C

Competence

The trainee should have the ability to:

- i) Use had tools to perform simple tasks in mechanical engineering workshop
- ii) Use had tools to perform simple tasks in mechanical engineering workshop

Content

10.1.02T1 Classification of hand

tools

10.1.02T2 List of hand tools

10.1.02**T**3

Care and maintenance of cutting tools

- sharpening
- oiling
- lubricating
- repairs of hands
- reconditioning
- storage

Practice

10.1.02P0

Specific Objectives By the end of the submodule unit, the trainee should be able to:

- a) identify hand tools
- b) select hand tools
- make appropriate use of measuring equipment
- d) use hand tools appropriately

105

tasks under the trainer should be able to: a) describe machine tools 10.1.0370 10.1.02P4 10.1.02P4 10.1.02P5 10.1.02P6 10.1.02P6 10.1.0370 10.1.0		e) perform simple tasks using hand		iii) obtain flat Surface using the shaping machine
f) care and maintain cutting tools Content identify hand tools select hand tools select hand tools make appropriate use of measuring equipment using hand tools appropriately perform simple tasks using hand tools perform tasks using hand tools 10.1.02P5 perform tasks using hand tools 10.1.03P6 care and maintaining of tools 10.1.03P7 Theory 10.1.03P8 By the end of the submodule unit, the trainee should be able to: a) describe machine tools 10.1.03C Competence The trainee should have the ability to: i) turn, drill, face and bore on the lathe machine ii) cut plane surfaces on the milling machine iii) cut plane surfaces on the machine tools in mechanical engineer iii cut plane surfaces on the machine tools in machine tools in machine tools in m		tasks dance		Content
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ii) cut plane surfaces on the milling machine 10.1.03P3 - drilling - boring Shaping machine - holding work chuck - reciprocating head/cutter		1 1 1 1 1 1 1 2 2 2 2 2 3		17.22
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machine 10.1.03P3 Shaping machine - holding works chuck - reciprocatings		ii) cut plan		- drilling
machine 10.1.03P3 Shaping machine - holding works chuck - reciprocatings		on the surfaces	10 1 00-	- boring
- holding work chuck - reciprocating		77. Chr. 1 1 1 1 1 1 2 2 2 2	10.1.03P3	Shaping machine
- reciprocating hand/cutter		entite		- holding work
- reciprocating			1	chuck
hand culto				Chick
106 head/cuito				- recipiocal
			106	head/cutte

10.1.03P4 10.1.04

10.1.03P4 safety on use of machine tools

10.1.04 DIESEL AND PETROL ENGINES

Theory

10.1.04T0 Specific Objectives
By the end of the submodule unit, the train should be able to:

- a) describe simple petrol and diesel engines
- b) describe the fuel systems
- c) differentiate
 between diesel and
 petrol/engines

10.1.04C Competence
The trainee should have the ability to service two and four stroke diesel/petrol engines

Content

10.1.04T1 Simple petrol and diesel engine

- construction
- operation
 - o two stroke
 - o four stroke
 - o adjustment
 - o magnet ignition

10.1.04T2 Fuel systems

- petrol
- diesel
- oil filters
- fuel pumps
- maintenance
- injector pumps

- carburetors
10.1.04T3 Engine construction

- sketches to
 illustrate
 component parts
- body and component materials
- dresel and petrol engines
- body construction
- carburetor operation
- fuel pump operation
- injection pump operation
- ignition operation and adjustment

Practice

By the end of the submodule unit, the trainee should be able to:

- a) sketch a cross section of two stroke engine
- b) sketch a cross section of four stroke engine
- c) service engines
- d) service a two stroke engine
- e) service a four stroke engine

Content

10.1.04P1 Sketching a cross section of two stroke diesel/petrol engine

10.1.04P2	Sketching a cross section of four stroke		Practice
10.1.04P3	engine	10.1.05P0	Specific Objectives
10.1.04P4	remig chighnes	CAMPACONS SEES.	By the end of the sub
12	diesel/petrol		should be able . Tank
10.1.04P5	Service a four stroke diesel/petrol engine		a) describe types of
			b) maintain and servite
10.1.05	WATER PUMPS		for specific use
	Theory		d) identify pump controls
10.1.05T0	Specific Objectives By the end of the sub-		e) service water pung
	module unit, the trainee		Content
	should be able to:	10.1.05P1	Types of water pumps
	a) describe types of	10.1.05P2	Maintain water pumps
	water pumps	10.1.05P3	Pump selection
	b) explain the working	10.1.05P4	Pump controls
	principles of water pumps	10.1.05P5	Servicing water pumps
10.1.050	Sys,		
10.1.05C	Competence		Suggested
	The trainee should have		Teaching/Learning
	the ability to:		Methods
	 operate service and 		- Lectures
	maintain water		
	pumps		- Demonstrations
	ii) identify types of	9.5	- Practicals
-	water pumps		 Field visits
		14 7 E	- Discussion
10 1 0000	Content		
10.1.05T1	Types of water pumps		Suggested
10.1.05T2	or o		Tank
	water pumps		Teaching/Learning
	rpo		Resources
			 Textbooks
			- Charts
			- Pump manuals

Suggested Assessment Methods

- Practical tests
- Project work
- Written tests
- Assignments

Tools and Equipment

- Cutting tools
- Measuring tools

- Fastening tools
- Forming tools
- Lath machine
- Milling machine
- Shaping machine
- Simple diesel engines
- Simple petrol engines
- Water pumps

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