

MATERNITY EQUIPMENT

UNIT CODE: 0914451 20A

TVET CDACC UNIT CODE: ENG/CU/MDE/CR/04/5/MA

UNIT DURATION: 120 Hours

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Perform Maternity Equipment Maintenance.

Unit Description

This unit specifies the competencies required to Perform Maternity Equipment Maintenance. It involves maintaining infant incubator, Continuous Positive Airway Pressure (CPAP) Machine, phototherapy machine, resuscitatiare, delivery bed, weighing balance, cardiotocography (CTG) machine and room warmers.

Summary of Learning Outcomes

S/No	Learning Outcome	Duration in hours.
1.	To maintain infant incubator	25
2.	To maintain continuous positive airway pressure (CPAP) machine	20
3.	To maintain phototherapy machine	10
4.	To maintain resuscitatiare	10
5.	To maintain delivery bed	15
6.	To maintain weighing balance	15
7.	To maintain cardiotocography (CTG) machine	10
8.	To maintain room warmers	15
	TOTAL	120

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Maintain Infant Incubator	<p>1.1. Maternity layout.</p> <p>1.2. Need of infant incubators</p> <p>1.3. Parts of infant incubator</p> <ul style="list-style-type: none"> 1.3.1. Hood/Canopy 1.3.2. Control valve 1.3.3. Heating element 1.3.4. Control panel 1.3.5. Distilled water reservoir 1.3.6. Air filter 1.3.7. Temperature probe 1.3.8. Fans <p>1.4. Principles of operation of different types of infant incubators</p> <p>1.5. Heat source (types –bulbs, elements)</p> <p>1.6. Temperature range</p> <p>1.7. Temperature control</p> <p>1.8. Ventilation</p> <p>1.9. Fan fail and alarm</p> <p>1.10. Oxygen supply and control</p> <p>1.11. Humidity source and control</p> <p>1.12. Safety alarms</p> <p>1.13. Typical faults</p> <p>1.14. Maintenance procedures of infant incubators</p> <p>1.15. Calibration and safety tests</p>	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	on infant incubators	
2. Maintain continuous positive airway pressure (CPAP) Machine	<p>2.1.Definition and purpose indications of CPAP</p> <p>2.2.Types and components of CPAP</p> <p>2.3.Principle of operations</p> <p>2.4.Fault diagnosis</p> <p>2.5.Service kit components</p> <ul style="list-style-type: none"> 2.5.1. Air filters 2.5.2. O-rings 2.5.3. Mask replacement <p>2.6.Maintenance procedures</p>	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
3. Maintain Phototherapy Machine	<p>3.1.Applications of phototherapy</p> <p>3.2.Principle of Phototherapy</p> <ul style="list-style-type: none"> 3.2.1. Wavelength of light used 3.2.2. Mechanism of action <p>3.3.Types and components of phototherapy machine.</p> <p>3.4.Installation and Operation</p> <p>3.5.Fault diagnosis</p> <p>3.6.Maintenance procedures</p> <p>3.7.Safety procedures</p>	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
4. Maintain Resuscitaire	<p>4.1.Importance of resuscitation in newborns</p> <p>4.2.Components of the Resuscitaire Machine</p> <ul style="list-style-type: none"> 4.2.1. Radiant Warmer 4.2.2. Suction Unit 4.2.3. Oxygen Delivery System 	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	<p>4.2.4. Bag-and-Mask Ventilation</p> <p>4.2.5. Heart Rate and Oxygen Saturation Monitors</p> <p>4.3. Principle of operation</p> <p>4.4. Fault diagnosis</p> <p>4.5. Maintenance procedures</p> <p>4.6. Safety procedures</p>	
5. Maintain Delivery Bed	<p>5.1. Functions of a delivery bed</p> <p>5.2. Classification of delivery beds</p> <p>5.2.1. Hydraulic-mechanical</p> <p>5.2.2. Electro-hydraulic</p> <p>5.2.3. Electro-mechanical</p> <p>5.3. Working principles of various types of delivery bed</p> <p>5.4. Maintenance procedures of a delivery bed</p>	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
6. Maintain Weighing balance	<p>6.1. Use of baby weighing scale/balance</p> <p>6.2. Parts of baby weighing scale/balance</p> <p>6.2.1. Base</p> <p>6.2.2. Platter</p> <p>6.2.3. Strain Gauge</p> <p>6.2.4. Load cell</p> <p>6.3. Principle of operation</p> <p>6.3.1. Beam type – Spring type – Transducer principles (resistive, inductive and capacitive)</p> <p>6.4. Fault diagnosis</p>	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

	6.5.Maintenance procedures 6.5.1. Calibration procedures on baby weighing scales	
7. Maintain Cardiotocography (CTG) Machine	7.1.Use of CTG machine 7.2.Parts of CTG Machine 7.2.1. Transducer probes 7.2.2. Monitor 7.2.3. Doppler 7.3.Principle of operation Foetal Monitoring Techniques 7.4.Fault diagnosis 7.5.Maintenance procedures 7.5.1. Calibration procedures	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning
8. Maintain Room Warmers	8.1.Use of Room Warmers 8.2.Parts of Room Warmers 8.2.1. Heating elements 8.2.2. Temperature regulator 8.2.3. Fan 8.3.Principle of operation 8.4.Fault diagnosis 8.5.Maintenance procedures	<ul style="list-style-type: none"> • Practical Assessment • Project • Third Party Report • Portfolio of Evidence • Written Assessment • Oral Questioning

Suggested Methods of Instruction

- Practical
- Projects
- Demonstrations
- Group Discussions
- Role Play

- Interactive lectures
- Individual Assignments
- Industrial Attachments
- Viewing of Related Videos
- Clinical and Hospital Trips

Recommended Resources for 25 trainees

S No.	Category Item	Description Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	Learning Materials			
1.	Reference books	Sound Design for the maternity by David Grenfell: Principles of Instrumental Analysis by Douglas A. Skoog, F. James Holler, and Stanley R. Crouch Electrical Measurements and Instrumentation 2 nd edition	5 pcs for each	1:5
2.	Maintenance manuals	Assorted Systems component Maintenance reports, manufacture's manuals and data sheets Instrumentation Handbooks	5 pcs for each	1:5
3.	Charts	Assorted maternity equipment diagrams Equipment block diagram charts	1 pc for each	1:25
4.	Software	Assorted installation software for the equipment	25 pcs for each	1:1

5.	Audio visual presentations	Projector	1	1:25
B	Learning Facilities & Infrastructure			
6.	Lecture theory room	60m ²	1	1:25
7.	Workshop	150m ²	1	1:25
8.	Simulation Lab	100m ²	1	1:25
9.	Clinical Rotations	Maternity departments	1	1:25
C	Consumable Materials			
10.	Installation materials	Insulation tape, cables.	25 pcs for each	1:1
11.	Maintenance materials	Wipes, spare batteries, sanitizer, service kits.	25 pcs for each	1:1
12.	Assorted electrical components	Contactors, transformer, overload relays, timers.	25 pcs for each	1:1
13.	Assorted instrumentation components	Sensors, transducers, actuators.	25 pcs for each	1:5
D	Tools & Equipment			
14.	Assorted tools and equipment	Side cutters, Allen keys set, Side cutters, Pliers, Screw driver, Crimping tools, Multi-meter, Oscilloscope, Solder guns.	25 pcs for each	1:1
15.	PPEs	Safety boots, overall, masks, gloves, antistatic shoes.	25 pcs for each	1:1
16.	Hot air gun		5 pcs	1:5
17.	Blower		5 pcs	1:5
18.	Drilling machines		5 pcs	1:5

19.	Infant Incubator		2 pcs	1:12
20.	CPAP) Machine		2 pcs	1:12
21.	Phototherapy Machine		3 pcs	1:8
22.	Resuscitaire		2 pcs	1:12
23.	Delivery Bed		1 pc	1:25
24.	Weighing balance	Assorted	2 pcs	1:12
25.	Cardiotocography		2 pcs	1:12
26.	Room Warmers		5 pcs	1:5