

ELECTRONICS

UNIT CODE: ENG/CU/ET/CR/02/6/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Demonstrate understanding of Electronics

Duration of Unit: 60 hours

Unit Description

This unit covers the competencies required to demonstrate understanding of Electronics. Competencies includes; Apply semiconductor theory, Applying semiconductor diodes, demonstrating understanding of transistors, Applying special semiconductor devices, Performing rectification and applying digital electronics

Summary of Learning Outcomes

1. Apply semiconductor theory
2. Apply semiconductor diodes
3. Demonstrate understanding of transistors
4. Apply Special semiconductor devices
5. Perform rectification
6. Apply digital electronics

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply semiconductor theory	<ul style="list-style-type: none">• Meaning of terms• Types of materials<ul style="list-style-type: none">• Insulators• Conductors• Semiconductors• Semiconductor materials• Types of semiconductor materials<ul style="list-style-type: none">• Intrinsic and Extrinsic	<ul style="list-style-type: none">• Observation• Oral questioning• Written tests

Learning Outcome	Content	Suggested Assessment Methods
2. Apply semiconductor diodes	<ul style="list-style-type: none"> • Meaning of terms • P-N junction • Semiconductor diodes • Forward and reverse Characteristics • Types of semiconductor diodes • Application of semiconductor diodes 	<ul style="list-style-type: none"> • Written tests • Oral questioning
3. Demonstrate understanding of transistors	<ul style="list-style-type: none"> • Bipolar junction transistors • Operation of NPN and PNP • Field effect transistors • Operation N and P channels • Types of FETs • BJT's and FET's biasing • BJT's and FET's configuration • Characteristics of transistors • Gain of transistors • DC/AC load lines 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests
4. Apply Special semiconductor devices	<ul style="list-style-type: none"> • Meaning of terms • Types of special semiconductor devices <ul style="list-style-type: none"> • UJT • SCR • LASCR • TRIAC • DIAC • SCS • Application of special semiconductor devices 	<ul style="list-style-type: none"> • Observation • Oral questioning • Written tests
5. Perform rectification	<ul style="list-style-type: none"> • Meaning of Terms • Classification of rectifiers • Types of rectifiers • Application of rectifiers 	<ul style="list-style-type: none"> • Written tests • Oral questioning
6. Apply digital electronics	<ul style="list-style-type: none"> • Meaning of terms • Numbers systems e.g. <ul style="list-style-type: none"> • Decimal • Octal 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Practical tests • Observation

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> • Hexadecimal • Binary • Number system representation • Conversion of number systems e.g. <ul style="list-style-type: none"> • Decimal to binary • Binary to decimal • Decimal to hexadecimal • Hexadecimal to decimal • Hexadecimal to binary • Binary to hexadecimal • ASCII conversions • Boolean algebra and arithmetics • Logic gates e.g. <ul style="list-style-type: none"> • AND • OR • NOR • NAND • Combination of logic circuits e.g. <ul style="list-style-type: none"> • XOR • XNOR • Flip flops <ul style="list-style-type: none"> • Application of Flip-Flops • Registers and counters <ul style="list-style-type: none"> • Applications • Memories <ul style="list-style-type: none"> • Types of memories • Programmable logic controllers <ul style="list-style-type: none"> • Applications of PLC • Data communication 	

Suggested Methods of Instruction

- Discussions
- Site visits
- On-job-training

- Charts and Audio-visual presentations

Recommended Resources

Equipment

- Computers
- Printers
- Cameras
- Phones

Reference materials

- Manufacturers' catalogues
- Working drawings
- EMCA Act
- OSHA
- County by-laws

Materials and supplies

- Stationery

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