SCIENTIFIC PRINCIPLES

UNIT CODE: CON/CU/PL/CC/03/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Scientific principles.

Duration of Unit: 40 Hours

Unit Description

This unit describes the competence in applying scientific principles. It involves applying principles of: units of measurements, force, work, energy and power, friction, heat, acoustics, pressure in fluids, mechanical properties of materials and electrical.

Summary of Learning Outcomes

1. Apply principles of units of measurements
2. Apply principles of Force, work, energy and power
3. Apply principles of Friction
4. Apply principles of heat
5. Apply principles of acoustics
6. Apply principles of pressure in fluids
7. Apply mechanical properties of materials
8. Apply electrical principles

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply principles of units of measurements	• Terms and concepts • Selection of units of measurement • Conversion of units	• Written tests • Oral questioning • Assignments • Supervised exercises
2. Apply principles of Force, work, energy and power	• Terms and concepts • Laws ✓ Force ✓ Energy • Basic calculations of force, work, energy and power • Application of force, work, energy and power	• Written tests • Oral questioning • Assignments • Supervised exercises •

3. Apply principles of Friction	• Terms and concepts • Types of friction • Laws of friction • Causes of friction • Advantages and disadvantages of friction • Application of friction	• Written tests • Oral questioning • Assignments • Supervised exercises •
4. Apply principles of heat	• Terms and concepts • Sources of heat • Effects of heat on matter • Change of matter as heat varies • Methods of heat transfer • Water heating	• Written tests • Oral questioning • Assignments • Supervised exercises •
5. Apply principles of pressure in fluids	• Terms and concepts • Units of measurements of pressure • Definition of density • Variations of pressure • Laws • Solving simple problems involving liquids of different densities • Application of air pressure in relation to objects in everyday life e.g. Air lock in pipe work	• Written tests • Oral questioning • Assignments • Supervised exercises •
6. Apply principles of acoustics	• Terms and concepts • Sources of sound • Measurement of sound • Effects of sound on surrounding areas • Sound insulation methods	• Written tests • Oral questioning • Assignments • Supervised exercises •
7. Apply mechanical properties of materials	• Terms and concepts • Properties of materials • Tests • Advantages and disadvantages of materials	• Written tests • Oral questioning • Assignments • Supervised exercises •
8. Apply electrical principles	• Terms and Concepts • Electrical principles • Electrical circuits • Electrical safety	• Written tests • Oral questioning • Assignments • Supervised exercises

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Suggested methods of instructions

- Discussions
- Demonstration
- visiting Lecturer/Expert
- Industrial Visits

Recommended Resources

Tools and equipment

- Laboratory testing equipment
- Laboratory apparatus
- Hand tools
- Machine tools

Materials and supplies

- Stationery
- Material samples
- Oils
- Pins
- Electrical cables and accessory

Personal protective equipment (PPEs)

- Safety boots
- Gloves
- Dust coats
- First aid kit
- Ear muffs
- Dust masks
- Overalls
- Helmet
- Goggles