

# ENGINEERING MATHEMATICS

**UNIT CODE:** ENG/CU/EI/CC/01/4/A

## Relationship to Occupational Standards

This unit addresses the unit of competency: Apply engineering mathematics

**Duration of Unit:** 30 hours

## Unit Description

This unit describes the competencies required by a technician in order to apply algebra, binomial expansion, coordinate geometry, trigonometric functions, mensuration, statistic, matrix, vectors and calculus.

## Summary of Learning Outcomes

1. Apply Algebra
2. Apply Coordinate Geometry
3. Carry out Mensuration
4. Apply Matrix
5. Apply Vectors

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## Learning Outcomes, Content and Suggested Assessment Methods

Building Technology Curriculum		
Learning Outcome	Content	Suggested Assessment Methods

1. Apply Algebra	<input type="checkbox"/> Base and Index <input type="checkbox"/> Law of indices <input type="checkbox"/> Indicial equations <input type="checkbox"/> Laws of logarithm <input type="checkbox"/> Logarithmic equations <input type="checkbox"/> Conversion of bases <input type="checkbox"/> Use of calculator <input type="checkbox"/> Reduction of equations <input type="checkbox"/> Solutions of simultaneous linear equations in two unknowns <input type="checkbox"/> Solution of quadratic equation	<input type="checkbox"/> Written tests <input type="checkbox"/> Oral questioning <input type="checkbox"/> Assignments <input type="checkbox"/> Supervised exercises
2. Apply Coordinate Geometry	<input type="checkbox"/> Polar equations <input type="checkbox"/> Cartesian equation <input type="checkbox"/> Graphs of polar equations <input type="checkbox"/> Normal and tangents	<input type="checkbox"/> Written tests <input type="checkbox"/> Oral questioning <input type="checkbox"/> Assignments <input type="checkbox"/> Supervised exercises
3. Carry out Mensuration	<input type="checkbox"/> Units of measurements <input type="checkbox"/> Perimeter and areas of regular figures <input type="checkbox"/> Volume of regular solids <input type="checkbox"/> Surface area of regular solids <input type="checkbox"/> Area of irregular figures <input type="checkbox"/> Areas and volumes using Pappus theorem	<input type="checkbox"/> Written tests <input type="checkbox"/> Oral questioning <input type="checkbox"/> Assignments <input type="checkbox"/> Supervised exercises
4. Apply Matrix methods	<input type="checkbox"/> Matrix operation <input type="checkbox"/> Determinant of 2x2 matrix <input type="checkbox"/> Inverse of 2x2 matrix <input type="checkbox"/> Solution of linear simultaneous equations in 2 unknowns <input type="checkbox"/> Application of matrices	<input type="checkbox"/> Assignments <input type="checkbox"/> Oral questioning <input type="checkbox"/> Supervised exercises <input type="checkbox"/> Written tests
5. Apply Vector	<input type="checkbox"/> Vectors and scalar in two dimensions <input type="checkbox"/> Operations on vectors: Addition and Subtraction <input type="checkbox"/> Dot and Cross product <input type="checkbox"/> Gradient, Divergence and curl <input type="checkbox"/> Position vectors <input type="checkbox"/> Resolution of vectors	<input type="checkbox"/> Assignments <input type="checkbox"/> Oral questioning <input type="checkbox"/> Supervised exercises <input type="checkbox"/> Written tests

**Suggested Delivery Methods**

- Group discussions
- Demonstration by trainer
- Exercises by trainee

**Recommended Resources**

- Scientific Calculators
- Rulers, pencils, erasers
- Charts with presentations of data
- Graph books
- Dice
- Computers with internet connection

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