

APPLIED MATHEMATICS

UNIT CODE: CON/CU/ARC/CC/01/5/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply mathematical skills

Duration of Unit: 80 hours

Unit Description

This unit describes the competencies required by a technician in order to apply a wide range of mathematical skills in their work; apply ratios and proportions to solve problems; use algebraic and graphical techniques to analyse mathematical problems; apply concepts of probability; perform commercial calculations and collect, organise and analyse statistical data.

Summary of Learning Outcomes

1. Apply Algebra
2. Apply Trigonometry and hyperbolic functions
3. Apply Coordinate Geometry
4. Carry out Mensuration
5. Apply Statistics
6. Apply Matrix

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply Algebra	<ul style="list-style-type: none">• Base and Index• Law of indices• Indicial equations• Laws of logarithm• Logarithmic equations• Conversion of bases• Use of calculator• Reduction of equations• Solution of equations reduced to quadratic form• Solutions of simultaneous linear equations in three unknowns	<ul style="list-style-type: none">• Written tests• Oral questioning• Assignments• Supervised exercises

	<ul style="list-style-type: none"> Solutions of problems involving AP and GP 	
2. Apply Trigonometry	<ul style="list-style-type: none"> Half -angle formula Factor formula Trigonometric functions Parametric equations Relative and absolute measures Measures calculations 	<ul style="list-style-type: none"> Written tests Oral questioning Assignments Supervised exercises
3. Apply Coordinate Geometry	<ul style="list-style-type: none"> Polar equations Cartesian equation Graphs of polar equations Normal and tangents Definition of a point Locus of a point in relation to a circle Loci of points for given mechanism 	<ul style="list-style-type: none"> Assignments Oral questioning Practical tests Observation Supervised exercises Written tests
4. Carry out Mensuration	<ul style="list-style-type: none"> Units of measurements Perimeter and areas of regular figures Volume of regular solids Surface area of regular solids Area of irregular figures <ul style="list-style-type: none"> Areas and volumes using Pappus theorem 	<ul style="list-style-type: none"> Assignments Supervised exercises Written tests
5. Apply Statistics	<ul style="list-style-type: none"> Classification of data <ul style="list-style-type: none"> Grouped data Ungrouped data Data collection Tabulation of data <ul style="list-style-type: none"> Class intervals Class boundaries Frequency tables Diagrammatic and graphical presentation of data e.g. 	<ul style="list-style-type: none"> Oral questioning Written tests Assignments Supervised exercises

	<ul style="list-style-type: none"> • Histograms • Frequency polygons • Bar charts • Pie charts • Cumulative frequency curves • Measures of central tendency mean, mode and median • Measures of dispersion <ul style="list-style-type: none"> • Variance and standard deviation • Definition of probability • Laws of probability • Expectation variance and S.D. • Types of distributions • Mean, variance and SD of probability distributions 	
6. Apply Matrix methods	<ul style="list-style-type: none"> • Matrix operation • Determinant of 3x3 matrix • Inverse of 3x3 matrix • Solution of linear simultaneous equations in 3 unknowns • Application of matrices 	<ul style="list-style-type: none"> • Assignments • Oral questioning • Supervised exercises • Written tests

Suggested Methods of Instruction

- 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