

Module Title Mathematics 1A Keywords Basic Algebra, Trigonometry, Complex Numbers, Calculus.	Reference CM1901 SCQF LevelSCQF 7 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved June 2002 AmendedApril 2005 Version No. 3
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This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

Entry requirements normally include a pass in SQA Higher Grade Mathematics.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to apply introductory level mathematics to engineering problems.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

Trigonometry: Pythagoras' theorem. The definitions of the trigonometric functions. Application of the Sine and Cosine rules. The combination of simple waveforms using standard trigonometric formulae.

Vectors: Simple vector algebra. The scalar and vector products. Application to engineering problems.

Complex numbers: The arithmetic of complex numbers. Rectangular and polar forms. The Argand diagram. De Moivre's theorem and complex roots.

Differential Calculus: Differentiation of elementary functions. The rules of differentiation: chain rule, product rule, quotient rule. The Taylor series for elementary functions. Applications to problems in engineering.

1. Solve algebraic and trigonometric equations by manipulation and use of formulae.
2. Apply vectors to problems in engineering mathematics, including the calculation of scalar and vector products.
3. Carry out basic operations on complex numbers and calculate their powers and roots.
4. Use standard techniques to differentiate elementary functions and apply them to problems in engineering.

Indicative Module Content

The syllabus will include:

Elementary algebra: The rules of indices and logarithms. transposition of formulae. The solution of linear, quadratic and simple simultaneous linear equations. The use of partial fractions. Simple binomial expansions.

Indicative Student Workload

<i>Contact Hours</i>	Full Time
Lectures	36
Tutorials	36
Assessment	6
<i>Directed Study</i>	
Directed Study	30
<i>Private Study</i>	
Private study	42

Mode of Delivery

The module is lecture and tutorial based.

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3,4

Component 1 - This is a closed book examination.

Indicative Bibliography

1. STROUD, K.A. AND BOOTH, D.J., 2013. Engineering Mathematics, 7th ed. Palgrave.