

Technology Mathematics

Module Code:	ENM4001-B
Academic Year:	2018-19
Credit Rating:	20
School:	Department of Biomedical and Electronics Engineering
Subject Area:	Engineering Mathematics
FHEQ Level:	FHEQ Level 4
Module Leader:	Dr Farshid Sefat

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	48
Tutorials	24
Directed Study	126
Examinations DO NOT USE	2

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims

This module develops a comprehensive/robust set of numeracy & algebraic skills fundamental to the majority of quantitative work in Engineering BSc courses, including paper-based numeracy, basic/advanced use of calculators for efficient computation, use & application of graph drawing facilities, and algebraic skills up to solving small linear systems, complex numbers and calculus.

Outline Syllabus

Block 1: Natural numbers, integers, rationals, irrationals, decimals. Approximation and accuracy. Arithmetic rules (BIDMAS). Rationals & manipulation. Indices & manipulation. Elementary statistics: data representation, mean, median, standard deviation.

' Block 2: Equations. Basic rules of algebra (BIDMAS). Expansion of brackets and their formation by factoring. Method of Factorisation. Manipulation of algebraic terms with indices. Rearranging equations. Linear equations and solutions. Simultaneous linear equations (graphical and analytical solutions). Quadratic equations (graphical, factoring and formula solutions). Plotting similar linear and similar quadratic functions. Types of curve, reduction of non-linear forms to linear.

' Block 3: Introduction to angles and basic trigonometric functions. Periodicity. Plotting similar trigonometric functions. Finding unknown lengths and angles of triangles using appropriate formulas. Vector notation and use in problem solving. Complex numbers; algebra and properties; polar and exponential forms; applications to general engineering systems.

' Block 4: Differentiation: applications in technology and commerce, interpretation, derivatives of simple expressions, maxima/minima/inflexions, applications. Integration: applications in technology and commerce, interpretation, integrals of simple expressions, indefinite versus definite integration, simple rules - substitution. Computation: numerical methods, applications, problem solving.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 make appropriate choices of when to use arithmetic or algebraic calculation and complete the manipulation successfully.
- 2 have competency and confidence in paper/calculator-based arithmetic; will be able to use, calculate and present simple functions, manipulate algebraic expressions, solve algebraic equations, work with complex numbers and differentiate and integrate.
- 3 appreciate data management, presentation, and interpretation, scientific method, systematic problem solving.

Learning, Teaching and Assessment Strategy

Module material is blocked to assist self-paced learning. Principles, theory and practical calculation skills are developed in formal lectures, and practised in tutorials & calculator-based classes with continual reflection and oral feedback. Written classroom tests during the course (to facilitate formative written feedback) will assess both the application of practical skills to the knowledge base of the module and the wider learning outcomes expressed in the descriptor.

Mode of Assessment

Type	Method	Description	Length	Weightin g	Final Assess'
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Summative	Examination - closed book	Examination - closed book	2 hours	70%	Yes
Referral	Examination - closed book	Examination - closed book	3 hours	100%	No
Summative	Classroom test	1.50 hour test under exam conditions with immediate feedback and reflection session	0 hours	30%	No

Legacy Code (if applicable)

ENG1311L

Reading List

To view Reading List, please go to [rebus:list](#).