Liverpool John Moores University

Title:	Engineering Mathematics A
Status:	Definitive
Code:	**4501MTC** (125775)
Version Start Date:	01-08-2019
Owning School/Faculty:	Maritime and Mechanical Engineering
Teaching School/Faculty:	Maritime and Mechanical Engineering

Team	Leader
Stewart Chidlow	Y

Academic Level:	FHEQ4	**Credit Value:**	10	**Total Delivered Hours:**	34
Total Learning Hours:	100	**Private Study:**	66		

Delivery Options
Course typically offered: Summer

Component	Contact Hours
Online	24
Tutorial	10

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	Weekly online coursework delivered using a virtual learning environment	100	

Aims

To provide a foundation in engineering mathematics for its application to the solution of engineering problems

Learning Outcomes

After completing the module the student should be able to:

1	Apply a knowledge of algebraic manipulation, mathematical functions, exponentials and logarithms to solve engineering problems.
2	Use basic trigonometry to describe engineering waves in mechanical and electrical systems
3	Apply complex numbers in the solution of engineering problems.
4	Use and apply mathematical software to the solution of engineering mathematics problems

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Online Assessment	1	2	3	4

Outline Syllabus

Introduction of the use of a computer algebra system e.g. MATLAB (MuPAD). Use of the software applied to the syllabus items below

Revision of basic algebraic techniques:
Substitution, simplification, factorisation, indices, evaluation and transposition of formulae, fractions and partial fractions. Linear and quadratic equations, linear simultaneous equations

Functions: Notation, types of function, composite and inverse, graphs.
Trigonometry: Angles and circular measure. Trigonometric ratios for right-angled triangles. Sine and cosine rules. Trigonometric functions and their graphs, simple trigonometric identities and equations. Engineering waves in mechanical and electrical problems.
Exponential function: Properties and graph. Natural logarithm as inverse of exponential function, graph and properties. Definitions and calculation of hyperbolic functions including inverse functions.
Complex numbers: Complex arithmetic, complex conjugate, Argand diagram. Rectangular, polar forms. Magnitude and phase. Very basic treatment of Euler's formula.

Learning Activities

A combination of online lectures and tutorials and campus based tutorials.

Notes

This module provides a foundation in engineering mathematics (pre-calculus) for application to the solution of engineering problems.

Assessment will be through weekly online questions delivered using MapleTA (or similar) online assessment software.