Liverpool John Moores University

Title:	Engineering Mathematics 1b
Status:	Definitive
Code:	**4102MAN** (121947)
Version Start Date:	01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Stewart Chidlow	Y

Academic Level:	FHEQ4	**Credit Value:**	10	**Total Delivered Hours:**	22
Total Learning Hours:	100	**Private Study:**	78		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	16.5
Tutorial	5.5

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	Use vectors in the solution of engineering problems
2	Use matrices in the solution of engineering problems and matrices
3	Apply techniques in differentiation to the solution of engineering problems
4	Apply techniques in integration to the solution of engineering problems
5	Solve first order ordinary differential equations by the method of separation of variables and apply to the modelling of engineering problems
6	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 5 6

Outline Syllabus

Introduction of the use of a computer algebra system e.g. MATHCAD. Use of the software applied to the syllabus items below

Basic vector algebra including Cartesian components and products. Differentiation of vectors. Applications.
Basic matrix manipulation including the inverse matrix. Solution of systems of linear equations.
Differential calculus of one variable: Gradient of curve, derivatives of standard functions, linearity, derivatives of composite functions, products and quotients. Applications. Stationary points. Rates of change.
Integral calculus as inverse of differentiation and as a limit of a sum. Standard integrals, linearity, integration of composite functions. Other methods of integration. Numerical integration.
Ordinary differential equations. First order linear, constant coefficient equations. Separation of variables. Application to modelling

Learning Activities

A combination of lectures and tutorials.

Notes

This module provides a foundation in engineering mathematics for level four students in mechanical and electrical engineering, to enable them to apply this to the solution of engineering problems.
For each topic area of the syllabus, relevant commands will be given for application of a symbolic algebra package, e.g. Mathcad to more difficult problems.
Coursework assessment will be through online questions delivered using using MapleTA online assessment software.

In this module, the knowledge learning outcomes are K1.