

### Summary Information

Module Code	4316ELE
Formal Module Title	Engineering Mathematics 1b
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 4
Grading Schema	40

### Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

### Learning Methods

Learning Method Type	Hours
Lecture	22
Tutorial	11

### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

### Aims and Outcomes

Aims	To provide a foundation in engineering mathematics for its application to the solution of engineering problems
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**After completing the module the student should be able to:**

## Learning Outcomes

Code	Number	Description
MLO1	1	Use vectors in the solution of engineering problems
MLO2	2	Use matrices in the solution of engineering problems and matrices
MLO3	3	Apply techniques in differentiation to the solution of engineering problems
MLO4	4	Apply techniques in integration to the solution of engineering problems
MLO5	5	Solve first order ordinary differential equations by the method of separation of variables and apply to the modelling of engineering problems
MLO6	6	Use and apply mathematical software to the solution of engineering mathematics problems

## Module Content

Outline Syllabus	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
Module Overview	This module provides a foundation in engineering mathematics for you. It enables you to apply this to the solution of engineering problems. Coursework assessment will be through online questions delivered using online assessment software.
Additional Information	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. Coursework assessment will be through online questions delivered using MapleTA online assessment software. Where this module is part of a Degree Apprenticeship programme, the knowledge learning outcomes is K1.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Test	Online Assessment	100	0	MLO1, MLO2, MLO3, MLO4, MLO5, MLO6

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Amir Asghari	Yes	N/A

### Partner Module Team

Contact Name	Applies to all offerings	Offerings
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