

**Summary Information**

<b>Module Code</b>	4603IYO
<b>Formal Module Title</b>	Engineering Mathematics 1b
<b>Owning School</b>	Engineering
<b>Career</b>	Undergraduate
<b>Credits</b>	10
<b>Academic level</b>	FHEQ Level 4
<b>Grading Schema</b>	40

**Module Contacts**
**Module Leader**

Contact Name	Applies to all offerings	Offerings
Lonnie Readioff	Yes	N/A

**Module Team Member**

Contact Name	Applies to all offerings	Offerings
Mohamed Kara-Mohamed	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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**Teaching Responsibility**

LJMU Schools involved in Delivery
LJMU Partner Taught

## Partner Teaching Institution

Institution Name
Study Group

## Learning Methods

Learning Method Type	Hours
Lecture	12
Seminar	24

## Module Offering(s)

Offering Code	Location	Start Month	Duration
APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks

## Aims and Outcomes

<b>Aims</b>	To provide a foundation in engineering mathematics for its application to the solution of engineering problems. This module is a continuation from 4602IYO - Engineering Mathematics 1a.
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## Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Use vectors and matrices in the solution of engineering problems.
MLO2	Apply techniques of integration or differentiation in the solution of engineering problems.
MLO3	Solve first order ordinary differential equations by the method of separation of variables and apply to the modelling of engineering problems.
MLO4	Use and apply mathematical software to the solution of engineering problems.

## Module Content

### Outline Syllabus

Introduction of the use of a computer algebra system (for example MATLAB or similar). 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, numerical integration. Applications of integration.

Ordinary differential equations. First order linear, constant coefficient equations. Separation of variables. Application to modelling.

### Module Overview

#### Additional Information

This module provides a foundation in engineering mathematics for level 4 students in mechanical and electrical engineering to enable them to apply this to the solution of engineering problems.

### Assessments

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