

## Engineering Mathematics 1b

### Module Information

2022.01, Approved

#### Summary Information

Module Code	4502USST
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
LJMU Partner Taught

#### Partner Teaching Institution

Institution Name
University of Shanghai For Science and Technology

#### Learning Methods

Learning Method Type	Hours
Lecture	22
Tutorial	11

#### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	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	Apply vectors in the solution of engineering problems
MLO2	2	Apply 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	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. Gradient of curve, 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. Linear independence, Rank of a Matrix, Symmetric Matrix; Reduction to Canonical form; Higher order differentiation and Optimization on one variable function.
Module Overview	
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.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Examination	100	2	MLO1, MLO2, MLO3, MLO4, MLO5, MLO6

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Stewart Chidlow	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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