Liverpool John Moores University

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Title:	Engineering Mathematics 1b
Status:	Definitive
Code:	**4316CIT** (125318)
Version Start Date:	01-08-2020
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Changshu Institute of Technology

Team	Leader
Clifford Mayhew	Y

Academic Level:	FHEQ4	**Credit Value:**	10	**Total Delivered Hours:**	50
Total Learning Hours:	100	**Private Study:**	50		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	48

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	50	2
Test	AS2	Mid Semester Test	20	
Report	AS3	Report	30	

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:

Examination	1	2				
Mid Semester Test	1	2	3	4	5	6
Report	1	2	3	4	5	6

Outline Syllabus

Introduction of the use of a computer algebra system e.g. MATLAB. 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 series of lectures, with some tutorial, presentation and feedback.

Notes

The module introduces students Engineering Mathematics of Mathematical Physics, and demonstrate the utility and limitations of a variety of powerful calculational

techniques and to provide a deeper understanding of the mathematics underpinning theoretical physics.