LIVERPOOL JOHN MOORES UNIVERSITY

Engineering Mathematics 1b

Module Information

2022.01, Approved

Summary Information

Module Code	4102MECH
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

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	Introduction of the use of a computer algebra system e.g. MATHCAD. Use of the software applied to the syllabus items belowBasic 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 will provide a foundation in engineering mathematics for its application to the solution of engineering problems.
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.For each topic area of the syllabus, relevant commands will be given for application of a symbolic algebra package, e.g. Mathcad to harder problems.Coursework assessment will be through online questions delivered using MapleTA online assessment software.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Artefacts	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