

## Pre Masters Maths

### Module Information

2022.01, Approved

#### Summary Information

Module Code	6601PMEC
Formal Module Title	Pre Masters Mathematics
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

#### Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

#### Partner Teaching Institution

Institution Name
Study Group

#### Learning Methods

Learning Method Type	Hours
Lecture	26
Seminar	39

#### Module Offering(s)

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

## Aims and Outcomes

Aims	To refresh and further develop the common mathematical skills necessary to support those students who require additional preparation in mathematics for progression to postgraduate programmes in Engineering and Computing.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Demonstrate an in-depth knowledge and understanding of the core concepts of calculation and manipulation of mathematics as applied to engineering principles.
MLO2	2	Identify and apply mathematical methods to solve key engineering concepts.
MLO3	3	Proficiently use symbolic mathematical software (e.g. Mathcad) in the solution to complex problems involving topics on the syllabus.

## Module Content

Outline Syllabus	The solution of second order ODE's by the method of undetermined coefficients. Application to single degree of freedom oscillating systems. Functions of several variables. Partial differentiation with application to optimisation and error estimation. Eigenvalues and eigenvectors. By manual calculation for low order matrices. Use of software for matrices of larger order. Solution of two first and second order, homogeneous simultaneous ODE's with constant coefficients. Application to normal modes for a two degree of freedom system. Laplace transforms. Concepts. Use of tables. The inverse transform. Application to the solution of ODE's. Transfer functions and stability. Periodic functions. Fourier series for functions of any period. Harmonics. Numerical solution of ODE's. Euler's method and application of software. Introduction to vector calculus. Divergence, gradient and curl and their physical meanings and applications. Z transforms. Definition and properties. Inversion. Applications. The use of a symbolic mathematical package e.g. Mathcad in the solution of problems involving the above topics.
Module Overview	
Additional Information	This module will provide students with the knowledge and skills required to study a postgraduate level programme in Engineering or Computing.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Test	In class test	40	0	MLO1, MLO2, MLO3
Exam	Examination	60	2	MLO1, MLO2, MLO3

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Mike Shaw	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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