

## Liverpool John Moores University

Title: ENGINEERING MATHEMATICS  
Status: Definitive  
Code: **4501NCCG** (129384)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Nelson Campus

Team	Leader
Christian Matthews	Y

**Academic Level:** FHEQ4  
**Credit Value:** 20  
**Total Delivered Hours:** 60  
**Total Learning Hours:** 200  
**Private Study:** 140

### Delivery Options

Course typically offered: S1, S2, Sum, NS2 (S2 for Jan)

Component	Contact Hours
Lecture	60

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	Test	Multiple-choice online test	50	1.5
Report	Assignment	Written Assignment	50	

### Aims

*The aim of this module is to develop students' skills in the mathematical principles and theories that underpin the engineering curriculum. Students will be introduced to mathematical methods and statistical techniques in order to analyse and solve problems within an engineering context.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the relevance of mathematical methods to a variety of conceptualised engineering examples.
- 2 Investigate applications of statistical techniques to interpret, organise and present data.
- 3 Use analytical and computational methods for solving problems by relating sinusoidal wave and vector functions to their respective engineering applications.
- 4 Examine how differential and integral calculus can be used to solve engineering problems.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Multiple-choice online test	2	3
Written Assignment	1	4

## Outline Syllabus

*Mathematical concepts: Dimensional analysis arithmetic and geometric progressions*

*Functions: Exponential, logarithmic, trigonometric and hyperbolic functions*

*Statistics: Mean, standard deviation, correlation, regression*

*Probability theory*

*Trigonometric functions: Sine waves, trigonometric and hyperbolic identities*

*Vectors: Notation and properties, 3-dimensional vectors*

*Calculus: Differentiation (including chain, product and quotient rules) and integration (including integration by parts, substitution)*

*Exponential functions*

*Engineering applications of mathematics*

## Learning Activities

### Lectures

These will not normally be traditional didactic lectures in which the student plays little active part, but will be delivered in small groups of up to 20 students in which their interaction with their tutor is a key ingredient of their learning experience.

Students will receive approximately 30 hours of taught material, supported by in-class exercises and discussions designed to help student assimilate learning and to provide early informal feedback on their progress.

### Independent Study

Students are expected to undertake personal reading and research into topic areas that have been stimulated from the lectures and seminars. This reading will enhance their academic work and enable valid contribution to lectures and seminars.

VLE support

This will provide links to academic web-sites and on-line journals, facilitate group discussion outside of the classroom, access to outline lecture notes, and provide students with assessment details

## **Notes**

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