

Liverpool John Moores University

Title: APPLIED ENGINEERING MATHEMATICS
Status: Definitive
Code: **5100BEUG** (118089)
Version Start Date: 01-08-2019

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Civil Engineering

Team	Leader
Steve Wylie	Y
Felicite Ruddock	

Academic Level: FHEQ5 **Credit Value:** 24 **Total Delivered Hours:** 87
Total Learning Hours: 240 **Private Study:** 153

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	36
Tutorial	48

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	3
Report	AS2	Report	30	

Aims

To develop skills in advanced engineering mathematics for application to the solution of Civil and Building Services Engineering problems.

Learning Outcomes

After completing the module the student should be able to:

- 1 Use advanced mathematics in the solution of Civil and Building Services Engineering problems.
- 2 Apply statistical tests and investigate correlation.
- 3 Apply numerical methods to Civil and Building Services Engineering problems.
- 4 Solve relevant mathematical problems

Learning Outcomes of Assessments

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

EXAMINATION	1	3	4
REPORT	2		

Outline Syllabus

The solution of linear first order ODE's by the integrating factor method.
The solution of inhomogeneous second order ODE's by the method of undetermined coefficients.
Functions of several variables. Partial differentiation with application to optimization.
Numerical techniques, including the Newton-Raphson method
Eigenvalues and eigenvectors.
Solution of two homogeneous simultaneous ODE's with constant coefficients up to second order. Application to normal modes for a two degree of freedom system.
Use of integration to find centre of mass
Finite Difference and finite element methods
Forecasting techniques and queuing theory
Linear Programming and Network Models
Hypothesis testing
Correlation and regression.
Control theory and applications in Civil and Building Services Engineering
Applications of mathematics in Materials; stress/strain/elasticity, fracture equations, materials quality control, steel weldability
Applications of mathematics in Surveying; advanced trigonometry
Wave theory

Learning Activities

Lectures and tutorials.

Notes

This module provides a foundation in applying advanced engineering mathematics to the solution of Engineering problems. Materials knowledge is developed through the application of relevant mathematics.

