

Liverpool John Moores University

Title: ADVANCED MATHEMATICS
Status: Definitive
Code: **5500ICPDCE** (126994)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 18
Total Learning Hours: 200 **Private Study:** 182

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	15

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	100	3

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 Apply statistical tests and investigate correlation.

- 2 Apply numerical methods to Civil and Building Services Engineering problems.
- 3 Solve first order ordinary differential equations relevant to engineering problems.
- 4 Solve second order ordinary differential equations relevant to engineering problems.

Learning Outcomes of Assessments

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

Examination	1	2	3	4
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Outline Syllabus

Use advanced mathematics in the solution of Civil and Building Services Engineering problems.

Correlation analysis, Linear regression

Numerical integral: determine the integral of functions using mid-ordinate, trapezoidal and Simpson's rules

Numerical estimation methods: method of bisection, Newton-Raphson iteration method, estimates of scientific functions

First order differential equations: engineering use, separation of variables, integrating factor method, complementary function and particular integral

Application of second order differential equations:

Introduction to Finite Difference and finite element methods

Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:

By a series of lectures and tutorials and through participation within practical sessions for problem solving.

In-class participation and case studies are key features of this module.

A recommended resource list - indicating key reading, internet support and physical learning assistance, is provided to help enable students to undertake self-directed study.

Notes

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