

Liverpool John Moores University

Title: APPLIED MATHEMATICS 1
Status: Definitive
Code: **4111EDSTUD** (117571)
Version Start Date: 01-08-2016

Owning School/Faculty: Education
Teaching School/Faculty: Education

Team	Leader
Marcus Hill	Y

Academic Level: FHEQ4 **Credit Value:** 24 **Total Delivered Hours:** 51
Total Learning Hours: 240 **Private Study:** 189

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	36
Workshop	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Set of extended problems for modelling and solution, using ICT where appropriate.	50	
Exam	AS2	Terminal exam	50	3

Aims

This module will introduce students to a deeper understanding of the three principal branches of applied mathematics. The module will deepen and extend students' knowledge of statistical processes, mechanical modeling and concepts in decision mathematics and develop their appreciation of the links between these and other areas of mathematics.

Learning Outcomes

After completing the module the student should be able to:

- 1 Select and use appropriate mathematical techniques to the solution of applied problems in unseen contexts
- 2 Understand and apply a range of modeling techniques, with appreciation of the limitations of the model and the need to validate and revise models, and an understanding of the link between the applications and areas of pure mathematics.
- 3 Employ appropriate technological tools to find exact or approximate solutions to a variety of problems.

Learning Outcomes of Assessments

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

Assignment 1	2	3
Assignment 2	1	

Outline Syllabus

Mathematical modelling;

Analysis of simple data sets, confidence intervals and t-tests;

Regression analysis, simple linear regression with one independent variable in detail, including analysis of variance, confidence intervals, plotting ideas for diagnostic assessment;

Multiple linear regression. Examples with two, three and many independent variables;

Model selection and stepwise regression;

One-way analysis of variance.

Probability and Bayes' Theorem

Kinematics, forces and vectors linking to vector algebra in Pure Mathematics

Circular motion, rotating axes and orbits linking to use of polar coordinates

Vibrations

Linear programming linking to Gaussian elimination,

Networks

Logic, decision trees linking with Bayes' Theorem and basic ideas of induction

Learning Activities

Mathematical concepts will be explored in of interactive lectures and workshops backed up by tasks for independent learning. These will use a mix of media e.g. web-based materials including video tutorials and on-line practice exercises, practical activities using ICT as well as more traditional text-book approaches.

Notes

Core module for Mathematics and Education Studies