Liverpool John Moores University

Title: APPLIED BUILT ENVIRONMENT MATHS
Status: Definitive
Code: **4018BEUG**   (102740)
Version Start Date: 01-08-2016

Owning School/Faculty: Applied Mathematics
Teaching School/Faculty: Applied Mathematics

Team	Leader
Ian Malabar	Y

Academic Level:	FHEQ4	**Credit Value:**	12	**Total Delivered Hours:**	50
Total Learning Hours:	120	**Private Study:**	70		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Online	12
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	unseen	60	2
Report	AS2	application of theory to practical problems	40	

Aims

To introduce the student to the fundamentals of pure mathematics, mechanics, structures and statistics with reference to applications within the construction industry.

Learning Outcomes

After completing the module the student should be able to:

1   Manipulate formulae, solve equations and make use of geometry and trigonometry.
2   Process raw data and perform statistical analysis with and understand the terms variable, discrete, continuous, mean, median, mode, variance and standard deviation including the use of Excel.
3   Apply the basic theory of probability and the use of hypothesis testing.
4   Use appropriate formulae to solve problems involving shear forces, bending moments and deflections for steel and timber beams and perform basic analysis relating to the design of retaining structures.

Learning Outcomes of Assessments

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

EXAM   1   2   4

REPORT   1   2   3

Outline Syllabus

Fundamentals of pure mathematics, simultaneous equations, quadratic equations, graphical representation, functions and matrices, geometry and trigonometry, series, indices, logarithms and areas under curves.
Introduces the use of vectors and scalars including forces, velocity and acceleration, energy and momentum.
Properties of sections, centroids, point loads and UDL's, shear forces and bending moments, simple beam design and retaining structures.
Introduction to the theory of probability, statistics, hypothesis testing and confidence limits, correlation and linear regression.

Learning Activities

The module will be lecture based using PowerPoint and Excel presentations and will include tutorial sessions to reinforce technological and numerical skills.
The module will promote working with others in managing tasks and solving problems.
The development of written communication with regard to assumptions made and explanation of the method of solution to practical problems related to the construction industry.

Notes

The module builds on the fundamentals of pure mathematics and is concerned with

the application of simple quantitative techniques to problems in the construction industry. The module covers the calculations involved in the design of simple load bearing structures that are commonly used in construction practice.