Liverpool John Moores University

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Title: Science and Mathematics for Designers
Status: Definitive
Code: **4050ENG**   (117164)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Jamie Finlay	Y
Clifford Mayhew	

Academic Level:	FHEQ4	**Credit Value:**	24	**Total Delivered Hours:**	54
Total Learning Hours:	240	**Private Study:**	186		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	6
Tutorial	24

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Presentation	Present		60	
Practice	Practice		40	

Aims

This module aims to give students a foundation in engineering science and mathematics which will enable them to perform fundamental analysis of mechanical and electrical engineering systems.

Learning Outcomes

After completing the module the student should be able to:

1   Apply engineering mathematics to solve engineering design problems.
2   Demonstrate a clear understanding of a range of mechanical systems and their underlying physical principles
3   Demonstrate a clear understanding of a range of electrical systems and their underlying physical principles
4   Apply the principles of mathematics and the physical sciences to the design and realisation of a principle proving prototype.

Learning Outcomes of Assessments

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

Presentation   4

Lab exercise and test   1   2   3

Outline Syllabus

Applied Mathematics – Algebraic functions. Fundamentals and notation of calculus (Gradient, rate of change, area beneath a function). Plotting and interpreting data in graphical formats. Trigonometry and geometry. Scalar and vector values. Coordinate systems in 2D and 3D space. Engineering units. Characteristics of signals and waves (Frequency, period, amplitude, wavelength).

Mechanical Systems – Solid mechanics (Stress & Strain, Mechanical properties of isotropic materials). Fundamentals of mechanics (Masses, springs and dampers in translational and rotational systems. Newton's laws of motion. Practical concepts of work, energy and power.).

Electrical Systems – Electrical circuits, Ohms Law (Voltage, Resistance and Current), Kirchhoff's Laws. Electromechanical systems (Motors, Relays, Solenoids).

Learning Activities

This module will be taught through a combination of lectures, tutorials, case studies and practical laboratory exercises. Students will also be expected to undertake significant private study

Notes

The module will provide the fundamental science and mathematics required for designers and provides a platform for further investigation in other modules where science and mathematics are evident in design.