Liverpool John Moores University

Title: ADVANCED MATHEMATICS
Status: Definitive
Code: **5511TECSBC**   (113902)
Version Start Date: 01-08-2018

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: The Sino-British College

Team	Leader
Russell English	Y

Academic Level:	FHEQ5	**Credit Value:**	12	**Total Delivered Hours:**	27
Total Learning Hours:	120	**Private Study:**	93		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Practical	5

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	60	2
Essay	AS2	Coursework	40	

Aims

To introduce the application of advanced mathematical techniques to the analysis of signals and systems, appropriate to industrial electronics, control and manufacturing engineering.

Learning Outcomes

After completing the module the student should be able to:

1 employ numerical techniques to solve linear systems
2 employ Matlab/Simulink for dynamic system simulations.
3 understand system dynamics and employ differential equations to model dynamics of mechanical or manufacturing systems.
4 employ mathematical concept and techniques to understand and treat signals and systems.

Learning Outcomes of Assessments

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

EXAM   1   3   4

CW   2   4

Outline Syllabus

Differential equations, mathematical modeling of dynamics in mechanical systems.
Numerical methods: Euler and Range-Kutta methods for the solution of linear systems.
Introduction to Matlab, functions, M-files, solving differential equations with Matlab.
Introduction to Simulink, input/output format, calling Simulink models.
Fourier transform, use of Fourier analysis for signal processing.

Learning Activities

A series of lectures and computer based laboratory sessions. Mathematical software packages, e.g. MATLAB, SIMULINK, will be used for analysis and simulation.

Notes

This module applies advanced mathematical techniques required for the analysis, design and simulation of electrical signals and systems