Liverpool John Moores University

Title:	ADVANCED ENGINEERING MATHEMATICS
Status:	Definitive
Code:	**5024ENG** (105492)
Version Start Date:	01-08-2011
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Engineering

Team	Leader
Leslie Fletcher	Y

Academic Level:	FHEQ5	**Credit Value:**	12.00	**Total Delivered Hours:**	26.00
Total Learning Hours:	120	**Private Study:**	94		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	18.000
Tutorial	6.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	50.0	2.00
Essay	AS2	Coursework	50.0	

Aims

To provide a foundation in advanced engineering mathematics for its application to the solution of engineering problems

Learning Outcomes

After completing the module the student should be able to:

1 apply complex numbers to the solution of engineering problems
2 solve first and second order ordinary differential equations and apply to the modelling of engineering problems
3 use Laplace transforms in the solution of engineering problems
4 use Fourier methods in the solution of engineering problems
5 apply Z-transforms to signal processing
6 apply mathematical software to the solution of engineering problems

Learning Outcomes of Assessments

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

EXAM	1	2	3	4	5	
CW	1	2	3	4	5	6

Outline Syllabus

Complex numbers: Complex arithmetic, complex conjugate, Argand diagram. Rectangular, polar forms. Magnitude and phase. Euler's formula.
The solution of first order ODE's by for example, separation of variables
The solution of inhomogeneous second order ODE's by the method of undetermined coefficients.
Periodic functions. Fourier series for functions of any period. Harmonics.
Laplace and Fourier transform: Definitions, properties, inversion and applications
The z-transform: Definitions, properties, inversion of z-transform. Applications to signal processing.
Apply mathematical software eg. MATHCAD or DERIVE to the solution of engineering problems

Learning Activities

A combination of lectures and tutorials

References

Course Material	Book
Author	Stroud, K.A. and Booth,D.J.
Publishing Year	2003
Title	Advanced Engineering Mathematics
Subtitle	
Edition	
Publisher	Palgrave Macmillan
ISBN	

Course Material	Book

Author	James, G
Publishing Year	2004
Title	Advanced Modern Engineering Mathematics
Subtitle	
Edition	
Publisher	Pearson Prentice-Hall
ISBN	

Course Material	Book
Author	Croft, A et al
Publishing Year	2001
Title	Engineering Mathematics
Subtitle	
Edition	
Publisher	Addison Wesley
ISBN	

Notes

Advanced methods in engineering mathematics are studied and applied