MODULE DESCRIPTOR

Module Title

Mathematics 3

Reference	EN3900	Version	4
Created	August 2021	SCQF Level	SCQF 9
Approved	June 2002	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

Aims of Module

To provide the student with the ability to apply advanced mathematics techniques to applied problems in engineering.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Calculate matrix eigenvalues and eigenvectors by hand or by computer as appropriate and apply eigen-methods to the solution of problems in engineering.
2	Derive and apply solutions of partial differential equations by separation of variables and Fourier series.
3	Derive and apply solutions of partial differential equations by finite difference methods.
4	Perform calculations using the vector differential operators grad, div and curl and apply these to problems in engineering.
5	Use computational packages in support of the other Learning Outcomes.

Indicative Module Content

Eigenvalues and eigenvectors of matrices and their relation to second order systems including degenerate systems. Development and solution of differential equations using eigen-methods. Partial differential equations using separation of variables and Fourier series to include heat flow in one dimension, one-dimensional vibration and Laplaces equation. Finite difference methods to solve PDEs. Div, grad and curl and their identities. Application of the vector operators to problems in Science and Technology.

Module Delivery

The module is delivered using a series of lectures with associated tutorials and computer laboratories where techniques can be applied.

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Indicative Student Workload	Full Time	Part Time
Contact Hours	48	N/A
Non-Contact Hours	102	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Practical Exam	Weighting:	30%	Outcomes Assessed:	5
Description:	Computer based laboratory test.				

Component 2

Type:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2, 3, 4
Description:	Closed book examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 30% and C2 is worth 70%.

Examination:

	Practical Exam: A	B	C	D	E	F	NS
A	A	A	B	B	E	E	
B	B	B	B	C	E	E	
C	B	C	C	C	E	E	
D	C	C	D	D	E	E	
E	E	E	E	E	E	F	
F	F	F	F	F	F	F	

NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	EN2901 Mathematics 2 or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	KREYSZIG, A., 2011. Advanced Engineering Mathematics. 10th ed. J Wiley.
2	STROUD, K.A. and BOOTH, D.J., 2011. Advanced Engineering Mathematics. 5th ed. Palgrave.