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MODULE DESCRIPTOR

Module Title

Mathematics 1

Reference	EN1902	Version	1
Created	March 2020	SCQF Level	SCQF 7
Approved	May 2020	SCQF Points	30
Amended		ECTS Points	15

Aims of Module

To provide the student with the ability to apply introductory level mathematics to engineering problems.

Learning Outcomes for Module

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

1	Apply vectors, complex numbers and trigonometry to problems in engineering.
2	Use standard techniques of calculus in solving engineering applications.
3	Apply matrix techniques and elementary probability theory to problems in engineering.
4	Apply rules of calculus to solve engineering problems including differential equations.
5	Use a computational package to solve introductory level engineering mathematics problems.

Indicative Module Content

Trigonometry: Trigonometric identities and their application in solving trigonometric equations. The combination of simple waveforms using standard trigonometric formulae. Vectors: Simple vector algebra. The scalar and vector products. Complex numbers: The arithmetic of complex numbers. Rectangular and polar forms. The Argand diagram. De Moivre's theorem and complex roots. Differential Calculus: Differentiation of elementary functions. The rules of differentiation: chain rule, product rule, quotient rule. Integral Calculus: Integration of elementary functions. Partial fractions. Application to problems in engineering. Matrices: Simple matrix algebra. Determinants. Applications to the solution of simultaneous linear equations. Differential Equations: Solution of 1st order ODEs by separation of variables and integration factor methods. Power series for elementary functions. Partial differentiation. Statistics: Simple descriptive statistics. Probability and reliability. Elementary probability distributions. The use of a computer mathematics package for solving problems in engineering mathematics.

Module Delivery

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

Module Ref:	EN1902 v1

Indicative Student Workload	Full Time	Part Time
Contact Hours	120	N/A
Non-Contact Hours	180	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	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:	Coursework	Weighting:	30%	Outcomes Assessed:	1, 5
Description:	Two equally weighted tests, one class based and the other a computer based laboratory test.				

Component 2

Type:	Examination	Weighting:	35%	Outcomes Assessed:	2
Description:	Closed book examination.				

Component 3

Type:	Examination	Weighting:	35%	Outcomes Assessed:	3, 4
Description:	Closed book examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

To pass the module, you must achieve a 40% weighted average mark over all components. In addition, you need to achieve at least 35% in both of the examination components.

Module Grade	Minimum Requirements to achieve Module Grade:
A	70-100%
B	60-69%
C	50-59%
D	40-49%
E	35-39%
F	0-34%
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	STROUD, K.A. AND BOOTH, D.J., 2020, Engineering Mathematics, 8th ed, Red Globe Press.
2	SINGH, K., 2011, Engineering Mathematics Through Applications, 2nd ed, Palgrave.
3	JAMES, G. and DYKE. P. 2020 Modern Engineering Mathematics, 6th ed, Pearson.