

# **MODULE DESCRIPTOR**

#### **Module Title** Mathematics 1 Reference EN1902 Version 3 Created May 2022 SCQF Level SCQF 7 Approved May 2020 SCQF Points 30 Amended June 2022 **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.

#### **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 v3	
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 boo	dy			

# **ASSESSMENT PLAN**

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

Component 1						
Туре:	Examination	Weighting:	50%	Outcomes Assessed:	1, 2	
Description:	Closed book examination.					
Component 2						
Туре:	Examination	Weighting:	50%	Outcomes Assessed:	3, 4	
Description:	Closed book examination.					

# MODULE PERFORMANCE DESCRIPTOR

## **Explanatory Text**

The overall grade is calculated using the following look-up table

		Examination:						
		Α	В	С	D	Е	F	NS
Examination:	Α	А	А	В	В	E	E	
	В	А	В	В	С	E	Е	
	С	В	В	С	С	E	E	
	D	В	С	С	D	E	E	
	Е	Е	Е	E	E	E	F	
	F	Е	Е	Е	Е	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination					ndance for	

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.