**This Version is No Longer Current**
The latest version of this module is available here

## MODULE DESCRIPTOR

### Module Title

Mathematics 1

| | | | |
|---|---|---|---|
| Reference | EN1902 | Version | 2 |
| Created | August 2021 | SCQF Level | SCQF 7 |
| Approved | May 2020 | SCQF Points | 30 |
| Amended | August 2021 | 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 v2 |
|---|---|

| 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 the student must achieve a minimum of a grade D. Non-submission of any component will result in an NS grade.

| Module Grade | Minimum Requirements to achieve Module Grade: |
|---|---|
| **A** | Two A's and one B in any component. |
| **B** | Two B's and one C in any component. |
| **C** | Two C's and one D in any component. |
| **D** | D in all components. |
| **E** | E in one or more components. |
| **F** | F in one or more components. |
| **NS** | Non-submission of work by published deadline or non-attendance for examination |

## Module Requirements

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|---|---|
| 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.