# MODULE SPECIFICATION

| Part 1: Information | | | |
|---|---|---|---|
| Module Title | Foundation Mathematics: Algebra and Calculus | | |
| Module Code | UFMFBG-30-0 | Level | Level 3 |
| For implementation from | 2019-20 | | |
| UWE Credit Rating | 30 | ECTS Credit Rating | 15 |
| Faculty | Faculty of Environment & Technology | Field | Engineering, Design and Mathematics |
| Department | FET Dept of Engin Design & Mathematics | | |
| Module type: | Standard | | |
| Pre-requisites | None | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

## Part 2: Description

**Educational Aims:** See Learning Outcomes

**Outline Syllabus:** Numbers and Calculations

Indices, Standard Form, Percentages, Logarithms. Compound Interest and Continuous compounding.

Algebra

Basic Algebra. Factorisation. Algebraic Fractions, Linear Equations. Rearranging Formulae. Simultaneous Linear Equations. Linear Equations and Graphs. Quadratic Equations. Solving Quadratics by completing the square. Graphs of Quadratic Functions. Simultaneous Solution of Quadratic and Linear Equations. Introduction to Partial Fractions. Arithmetic and Geometric Series.

Functions

Functions and inverses. Function of a Function. Properties of standard functions used in engineering: polynomial, rational, trigonometric, exponential and logarithmic functions.

Calculus

Differential Calculus. The Derivates of other Functions. Maxima and Minima. The Chain Rule (or Composite Rule). The Product Rule and Quotient Rule. The Second Derivative. Integration. The Definite Integral. Introduction to Integration by Parts and Integration by Substitution.

**Teaching and Learning Methods:** By classroom teaching and directed reading:

Students will be provided with essential course reading material in the form of a comprehensive module handbook containing lecture notes. There is support material in the form of downloadable video and audio files.

The learning strategy is to guide students through highly structured workbooks that encourage active learning. The video and audio files allow students to consolidate their understanding. The aim is to ensure that foundation level students have mastery and fluency of concepts, methods and communication of this material which underpins much of the analytical work they would encounter at level 1.

Students will be guided to extra resources on the web where necessary and they may consult the indicative reading list below to assist understanding.

Scheduled learning includes lectures with tutorial sessions.

Independent learning includes hours engaged in solving worksheet problems and preparation for assessments.

**Part 3: Assessment**

The assessment strategy uses component B to provide formative feedback to students so that they can assess their progress throughout the year and an end of module examination to assess whether students have reached an appropriate standard in mathematics to progress to single honours programmes in Engineering and Mathematics.

Component A: consists of an end of module examination to assess elements covered in both semesters.

Component B: consists of a series of e-assessments that provide instant feedback and a mid-sessional examination that will provide feedback on written work.

| First Sit Components | **Final Assessment** | **Element weighting** | **Description** |
|---|---|---|---|
| Online Assignment - Component B | | 12 % | e -Assessments |
| Examination - Component B | | 13 % | Mid-sessional test (January) |
| Examination - Component A | ✓ | 75 % | Examination (3 hours) |
| Resit Components | **Final Assessment** | **Element weighting** | **Description** |
| Online Assignment - Component B | | 25 % | e -Assessment |
| Examination - Component A | ✓ | 75 % | Examination (3 hours) |

**Part 4: Teaching and Learning Methods**

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

| Module Learning Outcomes | Reference |
|---|---|
| Perform numerical calculations to an appropriate level of accuracy | MO1 |
| Interpret an algebraic expression and select an appropriate method for changing the subject of the expression | MO2 |
| Solve equations that involve standard mathematical functions used in engineering | MO3 |
| Differentiate and integrate standard mathematical functions used in engineering | MO4 |
| Select and apply suitable mathematical techniques to solve extended problems | MO5 |
| Communicate mathematical arguments using clear, appropriate and consistent notation | MO6 |

Contact Hours

| | |
|---|---|
| **Independent Study Hours:** | |
| Independent study/self-guided study | 228 |
| **Total Independent Study Hours:** | 228 |
| **Scheduled Learning and Teaching Hours:** | |
| Face-to-face learning | 72 |
| **Total Scheduled Learning and Teaching Hours:** | 72 |
| **Hours to be allocated** | 300 |
| **Allocated Hours** | 300 |

Reading List

*The reading list for this module can be accessed via the following link:*

https://uwe.rl.talis.com/modules/ufmfbg-30-0.html

**Part 5: Contributes Towards**

This module contributes towards the following programmes of study:

Computer Security and Forensics [Feb][FT][GCET][4yrs] BSc (Hons) 2019-20

Computer Security and Forensics [Oct][FT][GCET][4yrs] BSc (Hons) 2019-20