STUDENT AND ACADEMIC SERVICES

UWE Bristol | University of the West of England

MODULE SPECIFICATION

Part 1: Information			
Module Title	Foundation Mathematics: Algebra and Calculus		
Module Code	UFMFBG-30-0	Level	Level 3
For implementation from	2018-19		
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		
Contributes towards	Computer Security and Forensics [Oct][FT][GCET][4yrs] BSc (Hons) 2018-19 Automation and Robotics Engineering {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Mathematics with Qualified Teacher Status (QTS) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19 Software Engineering [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Robotics {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Robotics {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Mathematics and Statistics {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2018-19 Mathematics and Statistics {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19 Computer Security and Forensics {Foundation} [Sep] [FT] [GCET] [4yrs] BSc (Hons) 2018-19 Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Electronics and Telecommunication Engineering [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Mechanical Engineering and Vehicle Technology [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Computer Security and Forensics [Feb][FT][GCET][4yrs] BSc (Hons) 2018-19 Mechanical Engineering and Vehicle Technology [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Electronics and Telecommunication Engineering [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Automation and Robotics Engineering {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Instrumentation and Control Engineering {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Mathematics {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2018-19

	Software Engineering [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19
	Mathematics {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19
	Mechanical Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng 2018-19
	Mechanical Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng 2018-19
	Mechanical Engineering {Foundation} [Sep][FT][Frenchay][5yrs] MEng 2018-19
	Mechanical Engineering {Foundation} [Sep][SW][Frenchay][6yrs] MEng 2018-19
	Automotive Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Automotive Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Automotive Engineering {Foundation} [Sep][FT][Frenchay][5yrs] MEng 2018-19
	Automotive Engineering {Foundation} [Sep][SW][Frenchay][6yrs] MEng 2018-19
	Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Instrumentation and Control Engineering {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19
	Instrumentation and Control Engineering {Foundation} [Feb][PT][GCET][8yrs] BEng (Hons) 2018-19
	Instrumentation and Control Engineering {Foundation} [Oct][PT][GCET][8yrs] BEng (Hons) 2018-19
	Aerospace Engineering (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
	Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
	Aerospace Engineering (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
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 be able to:

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

Contact Hours	**Contact Hours**	
	Independent Study Hours:	
	Independent study/self-guided study	228
	Total Independent Study Hours:	228

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	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	