

## MODULE SPECIFICATION – UNDERGRADUATE PROGRAMMES

### KEY FACTS

Module name	Foundation Year Module
Module code	ME0001
School	Mathematics, Computer Science and Engineering
Department or equivalent	Mechanical Engineering and Aeronautics
UK credits	120
ECTS	20
Level	3
Delivery location (partnership programmes only)	Westminster and Kingsway College

### MODULE SUMMARY

#### Module outline and aims

A good foundation in mathematics and scientific principles is essential for engineering studies at degree levels. This module provides you with the mathematical and scientific background necessary to progress to Stage 1 of BEng programmes in Mechanical Engineering, BEng Aeronautical Engineering or BEng Engineering. These programmes are accredited by the Engineering Council UK through the Institution of Mechanical Engineers and The Royal Aeronautical Society.

#### Content outline

This module stimulates educational development and intellectual awareness, thus providing the optimum basis for the acquisition of successful habits and skills.

To provide you with the essential mathematical and scientific background necessary to progress to Stage 1 of the following programmes:

BEng Mechanical Engineering  
BEng Aeronautical Engineering  
BEng Engineering

To encourage the development of the student's awareness of the learning process and foster their intellectual development in order to produce you with a well-established sense of their competence as learners.

#### 1 MATHEMATICS

Core Unit CEM1 - Number

Core Unit CEM2 - Introduction to Algebra Core Unit CEM3 - Introduction to Graphs

Further Unit FEM1 - Introduction to Calculus Further Unit FEM2 - Trigonometry & Series Further Unit FEM3 - Further Calculus

Further Unit FEM4 - Vector Algebra & Complex Numbers

## 2 PHYSICS

Core Unit CEP1 - Fundamental Concepts of Physics

Core Unit CEP2 - Forces and Motion

Core Unit CEP3 - The Physics of the atom and electron

Further Unit FEP1 - Matter

Further Unit FEP2 - Capacitors & Resistor Circuits Further Unit FEP3 - Circular Motion and Elasticity Further Unit FEP4 - Oscillations

## 3 MECHANICS

Core Unit CMH1 - Core Mechanics

Further Unit FMH1 - Vectors, Kinematics and Newton's Laws

Core Unit FMH2 - Dynamic Friction and Equilibrium Further Unit FMH3 - Principles of Motion and Projectiles Further Unit FMH4 - Variable Acceleration

Further Unit FMH - Centres of Mass

## 4 COMPUTING & INFORMATION TECHNOLOGY

Core Unit CEC1 - Microcomputing Hands-On

Core Unit CIT1 - Presentation Software (Word and PowerPoint) Core Unit CIT2 - Data-handling with a Spreadsheet (EXCEL)

Further Unit CIT3 - Data-Handling with a Database Package (ACCESS) Further Unit CEC2 - Introductory Programming (with HTML)

## 5 Communication and Study Skills

### WHAT WILL I BE EXPECTED TO ACHIEVE?

**On successful completion of this module, you will be expected to be able to:**

#### Knowledge and understanding:

Demonstrate a substantial foundation in Mathematics, Physics and Mechanics, consistent with the further study of these and related subjects in the common Stage 1 of the Mechanical Engineering, Aeronautical Engineering and Engineering Programmes.

#### Skills:

Demonstrate the skills required in a science laboratory

Formulate problem solving strategies and plan and record individual and group work progress and activities

Demonstrate competence in the communication skills necessary for Higher Education

Be familiar with a range of techniques appropriate to learning independently and in lectures, tutorials and practical work

Values and attitudes:

Reflect appropriately upon lectures and demonstrations attended during the course

**HOW WILL I LEARN?**

Lectures, tutorials, coursework and use of computer programs.

Lectures are used as a means of covering the essential principles in sufficient detail to allow you to achieve the Knowledge and Understanding of the principles relevant to the subject matters.

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*Table 1: Teaching pattern:*

Teaching component	Teaching type	Contact hours (scheduled)	Self-directed study hours (independent)	Placement hours	Total study hours
Mechanics	Lecture	126	150	0	276
Computing & IT	Practical classes and Workshops	54	60	0	114
Communication & Study Skills	Practical classes and workshops	36	52	0	88
Mathematics	Lecture	180	210	0	390
Physics	Lecture	162	170	0	332
Total		558	642	0	1200

**WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?**

## Assessments

Unseen examinations provide a controlled, objective environment in which to assess learning outcomes, however some skills are best assessed continuously through coursework and practical assignments. Assessment spread over the academic year also helps develop and measure time & quality management skills.

*Table 2: Assessment pattern:*

<b>Assessment component</b>	<b>Assessment type</b>	<b>Weighting</b>	<b>Minimum qualifying mark</b>	<b>Pass/Fail?</b>
Mechanics	Written Exams and set exercises	22	65	N/A
Computing and IT	Written Exams and set exercises	18	60	N/A
Communication and Study Skills	Written Exams and set exercises	8	60	N/A
Maths	Written Exams and set exercises	24	65	N/A
Physics	Written Exams and set exercises	28	65	N/A

## Assessment criteria

Assessment Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate in order to complete an assessment successfully and Grade-Related Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate to achieve a certain grade or mark in an assessment. Assessment Criteria and Grade-Related Criteria for module assessments will be made available to students prior to an assessment taking place. More information will be available from the module leader.

## Feedback on assessment

Following an assessment, students will be given their marks and feedback in line with the Assessment Regulations and Policy. More information on the timing and type of feedback that will be provided for each assessment will be

available from the module leader.

### Assessment Regulations

For progression to an engineering degree programme at City, the Pass mark for the module is overall 65% plus pass mark 65% for individual assessment components listed in the Table 2 above except for Study Skills and Computing which must be passed at minimum 60%. The weighting for the different components can also be found above. The Programme Specification contains information on what happens if you fail an assessment component or the module.

### **INDICATIVE READING LIST**

#### Mathematics

Bostock, L. and Chandler, S. "Core Maths for Advanced Level". (Stanley Thornes, Cheltenham, 2000). ISBN: 0-7487-5509-8

#### Physics

Muncaster, R. "A-Level Physics". 4th edition. (Stanley Thornes, Cheltenham, 1993). ISBN: 07487-1584-3

Azzopardi, F. and Stewart, B. "Accesible Physics for A-Level" (Macmillan, Basingstoke, 1995). ISBN: 0-333-62780-6

#### Mechanics

Sadler, AJ. and Thorning, D. W.S. "Understanding Mechanics" (Oxford University Press, Oxford, 1998). ISBN: 019- 914675-6

Version: 5.0

Version date: Feb 2019

For use from: 2019-20

**Appendix:** see <http://www.hesa.ac.uk/content/view/1805/296/> for the full list of JACS codes and descriptions

### **CODES**

<b>HESA Code</b>	<b>Description</b>	<b>Price Group</b>
120	Mechanical, Aero and Production Engineering	B

  

<b>JACS Code</b>	<b>Description</b>	<b>Percentage (%)</b>
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F300	The study of the properties of matter and energy and the relationships between them, making extensive use of mathematical techniques and models. May include mechanics, optics, electricity, magnetism and acoustics. May also include atomic, nuclear, particle and solid state studies.	25
G100	The rigorous analysis of quantities, magnitudes, forms and their relationships, using symbolic logic and language, both in its own right and as applied to other disciplines.	50
G500	The study, design or application of computers systems which capture, process and transmit information.	25