

## MODULE SPECIFICATION – UNDERGRADUATE PROGRAMMES

### KEY FACTS

Module name	Foundation Year Module
Module code	EE0001
School	Science & Technology
Department or equivalent	Electrical and Electronic Engineering
UK credits	120
ECTS	60
Level	3
Delivery location (partnership programmes only)	City and Islington College 60% City University London 40%

### MODULE SUMMARY

#### Module outline and aims

This module provides students with the essential mathematical and scientific background necessary to progress to Stage 1 of the BEng programmes in Electrical and Electronic Engineering and Biomedical Engineering. The above degree programmes are accredited by the Engineering Council UK through the Institute of Engineering and Technology and the Institute of Measurement and Control. This module stimulates educational development and intellectual awareness, thus providing the optimum basis for the acquisition of successful habits and skills.

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

BEng Electrical & Electronic Engineering  
BEng Biomedical Engineering

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

#### Content outline

##### **1 MATHEMATICS**

*M1 Quadratic equations      M2 Vectors and complex numbers      M3 Matrices  
M4 Trigonometry      M5 Introduction to Calculus      M6 Further Calculus*

##### **2 ENGINEERING SCIENCE**

*S1 Conductors, Insulators, Intrinsic and Extrinsic Semi-Conductors  
S2 Scalars and Vectors      S3 Waves, Sound and Light  
S4 Temperature and Heat*

### **3 ELECTRICAL PRINCIPLES and ELECTRONICS**

*EP1 DC Circuits                      EP2 Capacitors                      EP3 Single phase AC Circuits*  
*E1 Electronic Materials, Components                      E2 Semiconductor Devices*  
*E3 Bipolar Device Switching and Amplification    E4 Power Supplies                      E5 FET*  
*Circuits                      E6 Surface Mount Technology/VLSI                      E7 Logic Gates*

### **4 PROGRAMMING**

*P1 Introduction to C Programming*  
*P2 Introduction to Object Oriented programming (JAVA)*

### **5 ELECTRICAL AND ELECTRONIC LABS**

*EE1 Voltage, Current & Resistance    EE2 Series and Parallel    EE3 Oscilloscope*  
*EE4 Capacitors    EE5 Diodes    EE6 Rectifiers    EE7 Transistors    EE8 Op Amps*  
*EE9 Logic Circuits*

### **COMPUTING**

*CO1 Number Systems    CO2 CPU and System Architecture    CO3 Assembly Language*  
*CO4 Interfacing Techniques*

### **BIOMEDICAL**

*BM1 Basics of Anatomy    BM2 Physiology of the Human Body    BM3 Physiological*  
*Signals    BM3 Medical Instrumentation    BM4 Data Acquisition of Physiological Signals*

### **6 STUDY SKILLS & LANGUAGES (Spoken or Programming)**

*ST1 Techniques to Improve Reading, Note Taking, Presentation Skills and*  
*Examination Performance*  
*L1 Greetings, Introductions, Times & Dates, Around the Home    L2 Shopping,*  
*Banking, Eating, Travel, Work*

## **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, Science, Electrical Principles and Electronics and IT, consistent with the further study of these and related subjects in Stage 1 of the BEng Electrical and Electronic Engineering Programme and BEng Biomedical Engineering Programme.

#### Skills:

- Demonstrate the skills required in the electronics laboratory.
- Demonstrate competence in communication skills necessary for Higher Education.
- Be familiar with the range of techniques appropriate to learning independently and in lectures, tutorials and practical work.

Values and attitudes:

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## HOW WILL I LEARN?

Lecture, tutorial and laboratory/coursework

*Table 1: Teaching pattern and (weighting):*

Teaching component	Teaching type	Contact hours (scheduled)	Self-directed study hours (independent)	Placement hours	Total student learning hours
Mathematics	Lecture	120	160	0	280
Electrical Principles and Electronics	Lecture	120	150	0	270
Programming	Lecture	60	80	0	140
Personal Development and Study Skills	Lecture	60	60	0	120
Engineering Science	Lecture	30	70	0	100
Computer hardware or	Lecture	60	70	0	130
Biomedical *	Lecture	60	70	0	130
Electrical and Electronics Labs	Lab	60	100		160
Total		510	690	0	1200

- For Biomedical Engineering students only instead of Computer Hardware

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

Assessments

Lecture, tutorial and laboratory/coursework

*Table 2: Assessment pattern:*

Assessment component	Assessment type	Weighting	Minimum qualifying mark	Pass/Fail?
Mathematics	Written Examination and Set Exercises	20	65	N/A
Electrical Principles and Electronics	Written Examination and Set Exercises	20	65	N/A
Programming	Written Examination and Set Exercises	10	60	N/A
Personal Development and Study Skills	Written Examination and Set Exercises	10	60	N/A
Engineering Science	Written Examination and Set Exercises	10	65	N/A
Computer hardware or	Written Examination and Set Exercises	10	65	N/A
Biomedical*	Written Examination and Set Exercises	10	65	N/A
Electrical and Electronics Labs	Written Examination and Set Exercises	20	65	N/A

- **For Biomedical Engineering students only instead of Computer Hardware**

#### 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.

#### 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 Programming 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**

#### Key texts:

##### Mathematics

Mathematics for Engineers and Scientists: Weltner, K 510.245

Modern Engineering Mathematics: James, G

Electronic and Engineering Mathematics Vol 2: Meadows, R 510.2462

##### Electrical principles

Electrical and Electronic Engineering Principles: Morris, N 621.3

Electrical Principles and Technology for Engineering: Bird, J 621.3076

##### Analogue and Digital Electronics

Electronics: Crecraft, D/Gorman, D 621.381

Basic Electronics: Plant, M 621.381

Practical Exercises in Microelectronics: Turner, D 621.3817

Digital Communications: Proakis, J 621.380413

Microelectronic Systems 3: Sinclair, I 621.3817

#### Useful Electronics Websites

EPTSOFT: An interactive software package containing maths, computer science, electronics, principles, microelectronics and mechanics.

Download from <http://www.eptsoft.com/learn/index.html>

Electronics Explained: [http://electronicsexplained.co.uk/transistor\\_circuits.htm](http://electronicsexplained.co.uk/transistor_circuits.htm)

Data Sheets La Trobe University Melbourne

<http://www.ee.latrobe.edu.au/internal/workshop/datasheet.html>

Electronics in Meccano <http://www.eleinmec.com/index.asp>

Electronics Component Suppliers RS <http://rswww.com>  
Maplin [www.maplin.co.uk](http://www.maplin.co.uk) Rapid <http://rapideducation.co.uk>

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

CODES		
HESA Code	Description	Price Group
119	Electrical, Electronic and Computer Engineering	B
JACS Code	Description	Percentage (%)
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.	25
G500	The study, design or application of computers systems which capture, process and transmit information.	25
H100	The study of design, construction, maintenance and development of any device which uses the resources of nature to turn energy into productive and useful work.	25
H600	The study of the principles of engineering as they apply to the practical uses of electricity. Involves the study of charged particles.	25