

## **BEng Electronic Engineering (4yr)**

**UCAS code: H601**

Awarding Institution:  
Teaching Institution:  
Relevant QAA subject benchmarking group(s):  
Faculty of Science  
For students entering Part 1 in 2002  
Programme Director: Mr C.G. Guy  
Programme Adviser: Mr C.G. Guy  
Board of Studies: Electronic Engineering  
Accreditation: Institution of Electrical Engineering

The University of Reading  
The University of Reading  
Engineering  
Programme length: 4 years  
Date of profile: February 2001

### **Summary of programme aims**

To allow entry to a professionally accredited engineering degree programme by students who do not meet the normal entry requirements. To develop the students' knowledge of the theory and practice of modern electronic engineering, necessary for them to secure employment as professional electronic engineers in a wide variety of industries. A full statement of the educational aims and learning outcomes of the programme is given later in the programme specification.

### **Transferable skills**

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology.

As part of this programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, using standard and mathematical software, scientific programming), scientific writing, oral presentation, team-working, problem-solving, use of library resources, time-management, career planning and management, and business awareness.

### **Programme content**

The profile which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the "selected" modules). Students must choose such additional modules as they wish, in consultation with their programme adviser, to make 120 credits in each Part. The number of modules credit for each module is shown after its title.

#### **Part 0 (three terms)**

##### *Compulsory modules*

		<i>Credits</i>
<b>CE0EA2</b>	<b>Mechanical Science A</b>	<b>20</b>
<b>CE0EB2</b>	<b>Mechanical Science B</b>	<b>20</b>
<b>CE0EC2</b>	<b>Mathematics A</b>	<b>20</b>
<b>CE0ED2</b>	<b>Mathematics B</b>	<b>20</b>
EE0A2	<i>Electrical Science A</i>	20
EE0B2	<i>Electrical Science B</i>	20

<b>Part 1 (three terms)</b>		<i>Credits</i>	<i>Level</i>
<i>Compulsory modules</i>			
CY1A2	<i>Cybernetics and Its Application</i>	20	C
CE1A2	<i>Introduction to Computer Systems</i>	10	C
CS1G2	<i>Introduction to Algorithms</i>	10	C
SE1B2	<i>Systems and Circuits</i>	20	C
EG1C2	<i>Engineering Mathematics</i>	20	C
EE1A2	<i>Electronic Devices and Telecoms</i>	20	C
<b>and either both</b>			
CS1A2	<i>Programming 1</i>	10	C
CS1B2	<i>Programming 2</i>	10	C
<b>or both</b>			
CS1C2	<i>Introductory Programming 1</i>	10	C
CS1D2	<i>Introductory Programming 2</i>	10	C
<b>Part 2 (three terms)</b>			
<i>Compulsory modules</i>			
CY2A2	<i>Control and Measurement</i>	20	I
EG2P2	<i>Engineering Applications</i>	20	I
CE2A2	<i>Signals and Telecoms</i>	20	I
EE2A2	<i>Embedded Microprocessor Systems</i>	20	I
EE2B2	<i>Electromagnetism and its applications</i>	20	I
EE2C2	<i>Digital Circuit Design</i>	10	I
EE2Q2	<i>IC Design</i>	10	I
<b>Part 3 (three terms)</b>			
<i>Compulsory modules</i>			
EE3P2	<i>Electronic Engineering Project</i>	30	H
EM3C2	<i>Law, Econ., Management and QA</i>	20	H
EE3A2	<i>Digital Signal Processing</i>	10	H
EE3B2	<i>Advanced Digital Design</i>	10	H
EE3C2	<i>Digital &amp; Data Communications</i>	10	H
EE3D2	<i>Power Electronics</i>	10	H
EE3E2	<i>State Space Analysis</i>	10	H
<i>Optional modules (a total of 20 credits to be chosen):</i>			
EE3F2	<i>Video Engineering</i>	10	H
EE3G2	<i>Advanced Digital Signal Processing</i>	10	H
EE3Q2	<i>Advanced Data Networking</i>	10	H
XX3??	<i>Foreign Language</i>	10	H
CY3K2	<i>Sensors and Actuators</i>	10	H
CY3L2	<i>Mechatronics</i>	10	H

### **Progression requirements**

To proceed to Part 1 students must obtain an overall average mark of 55% **and** no mark lower than 50% in any module.

In order to progress from Part 1 to Part 2 and from Part 2 to Part 3, a student shall normally

be required to:

- Achieve an overall average of 40% in 120 credits taken in Part 1; and
- Achieve not less than 30% in modules taken in Part 1 (or 2). *Marks of less than 30% in a total of 20 credits will be condoned provided that the candidate has pursued the course for the module with reasonable diligence and has not been absent from the examination without reasonable cause.*

If an overall average mark of greater than 60% is obtained then students may request to be reregistered for the MEng in Electronic Engineering.

To be eligible for Honours, students must obtain an overall average mark of 40% **and** no mark lower than 30% in any module **and** at least 40% in EE31A Electronic Engineering Project.

Part 2 contributes one third of the overall assessment and Part 3 the remaining two thirds.

### **Summary of teaching and assessment**

Teaching is organised in modules that typically involve both lectures and practical work.

Most modules are assessed by a mixture of coursework and formal examination. However, some modules are assessed only as coursework. Details are given in the relevant module descriptions.

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

GCSE or O-level: Grade C Mathematics

A-level: 200 points, not necessarily science subjects, or equivalent. Overseas students with non A Level backgrounds but competent in English will be considered. Mature students wishing to study electronic engineering are encouraged to apply.

Admissions Tutor: Mr Hugh Campbell-Lendrum

### **Support for students and their learning**

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@IL) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

Within the providing Department additional support is given through practical laboratory classes. The development of problem-solving skills is assisted by appropriate assignment and project work. There is a Course Adviser to offer advice on the choice of modules within the programme. Course handbooks are provided for each Part of the course: these give more details about the modules which make up the degree. In addition, the School of Computer Science, Cybernetics and Electronic Engineering produces a Handbook for Students, which provides general information about the staff and facilities within the school.

### **Career prospects**

In recent years most students who have followed this programme have gone into jobs involving electronic systems design. These include manufacturers of mobile phones,

computers, computer networking products, and integrated circuits. Others have joined research groups in university and industry, the public service, and the teaching professions. Graduates from this programme are partially exempt from the professional examinations of the Institution of Electrical Engineers. After a further year of higher education and a period of professional experience, a graduate can expect to achieve Chartered Engineer status.

### **Opportunities for study abroad**

N/A

### **Educational aims of the programme**

To develop the students' knowledge of the theory and practice of modern electronic engineering, necessary for them to secure employment as professional electronic engineers in a wide variety of industries; to encourage their critical and analytical skills; and to develop their skills in applying theoretical concepts to the practice of electronic systems design.

### **Programme Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

#### ***Knowledge and Understanding***

##### **A. Knowledge and understanding of:**

1. appropriate mathematical techniques.
2. science underlying electronic engineering systems.
3. information technology.
4. design of electronic engineering systems.
5. business context.
6. engineering practice.

##### **Teaching/learning methods and strategies**

The knowledge required for the basic topics is obtained via lectures, tutorials, laboratory practicals, assignments and project work. Appropriate IT packages are taught. Demonstrators in laboratory and project supervisors advise students, and feedback is provided on all continually assessed work. As the course progresses, students are expected to show greater initiative and undertake independent research.

##### **Assessment**

Most knowledge is tested through a combination of practicals, assignments and formal examinations: students write reports on most assignments after part 1, and oral presentations also contribute.

### *Skills and other attributes*

#### **B. Intellectual skills – able to:**

1. select and apply appropriate scientific principles, mathematical and computer based methods for analysing general electronic engineering systems.
2. analyse and solve electronic engineering problems.
3. organise tasks into a structured form.
4. understand the evolving state of knowledge in a rapidly developing area.
5. transfer appropriate knowledge and methods from one topic within the subject to another.
6. plan, conduct and write a report on a project or assignment.
7. prepare an oral presentation.
8. understand commercial risk evaluation.

#### **Teaching/learning methods and strategies**

Appropriate mathematical, scientific and IT skills and tools are taught in lectures, and problems to be solved are given as projects or assignments. Project planning is part of the Part 3 project, and written and oral presentations are required for various assignments and projects.

8 is provided by a module provided specifically for engineering students.

#### **Assessment**

1-5 are assessed partly by examination, though sometimes also by project or assignment work. 6 and 7 are assessed as part of project work. 8 is assessed by an exam.

#### **C. Practical skills – able to:**

1. use appropriate mathematical methods or IT tools.
2. program a computer to solve problems.
3. use relevant laboratory equipment and analyse the results critically.
4. design, build and test a system.
5. research into electronic engineering problems.
6. utilise project management methods.
7. present work both in written and oral form.

#### **Teaching/learning methods and strategies**

Mathematics and IT tools are introduced in lectures and their use is assessed by examinations and assignments.

Programming assignments are set, and students may write programs to solve other projects.

Laboratory practicals and projects are used to teach about 3, and projects are used for 4, 5, 6 and 7.

#### **Assessment**

1 and 5 are tested in coursework and in examinations. 2, 5 and 7 are tested by assignments and projects, 3 is assessed in practicals and sometimes in projects, 4, 5 and 6 are assessed through project work.

**D. Transferable skills – able to:**

1. use IT tools.
2. acquire, manipulate and process data.
3. use creativity and innovation.
4. solve problems.
5. communicate scientific ideas.
6. give oral presentations.
7. work as part of a team.
8. use information resources.
9. manage time.

**Teaching/learning methods and strategies**

IT tools are taught partly in lectures, mainly through laboratory sessions and assignments. Data skills are acquired in laboratory and projects. Creativity and innovation and problems solving are experienced through projects, as are team working, time management and presentations. Use of information resources, such as the library and IT methods is experienced through projects and assignments.

**Assessment**

Some skills, like the use of IT tools and ability to communicate orally and in written form are directly assessed, in assignments or projects, other skills are not directly assessed but their effective use will enhance the students overall performance.

*Please note:* This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in module and programme handbooks.