MEng Electronic Engineering

UCAS code: H603

For students entering Part 1 in 2002

Awarding Institution: The University of Reading
Teaching Institution: The University of Reading
Relevant QAA subject benchmarking group(s): Engineering
Faculty of Science
Programme length: 4 years
Date of specification: 11/03/05
Programme Director: Eur Ing Dr Simon Sherratt
Programme Adviser: Eur Ing Dr Simon Sherratt
Board of Studies: Electronic Engineering
Accreditation: Institution of Electrical Engineering

Summary of programme aims

To develop the students' knowledge of the theory and practice of modern electronic engineering, necessary for them to meet the educational requirements set out by the Engineering Council for Chartered Engineer status. 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 1		*Credits*	*Level*
Compulsory modules			
CY1A2	*Cybernetics and Its Application*	20	C
SE1A2	*Introduction to Computer Systems*	10	C
CS1G2	*Introduction to Algorithms*	10	C
SE1B2	*Systems and Circuits*	20	C
EG1C2	*Engineering Mathematics*	20	C
EE1A2	*Electronic Devices and Telecoms*	20	C
and either both			
CS1A2	*Programming 1*	10	C
CS1B2	*Programming 2*	10	C

or both			
CS1C2	*Introductory Programming 1*	10	C
CS1D2	*Introductory Programming 2*	10	C
Part 2			
Compulsory modules			
CY2A2	*Control and Measurement*	20	I
SE2P4	*Engineering Applications*	20	I
SE2A2	*Signals and Telecoms*	20	I
EE2A2	*Embedded Microprocessor Systems*	20	I
EE2B2	*Electromagnetism and its applications*	20	I
EE2C2	*Digital Circuit Design*	10	I
EE2Q2	*IC Design*	10	I
Part 3			
Compulsory modules			
EE3P2	*Electronic Engineering Project*	30	H
SE3A2	*Law, Econ & Management*	20	H
EE3A2	*Digital Signal Processing*	10	H
EE3B2	*Advanced Digital Design*	10	H
EE3C2	*Digital & Data Communications*	20	H
EE3G2	*DSP in Communications*	10	H
Optional modules	*(a total of 20 credits to be chosen):*		
EE3D2	*Power Electronics*	10	H
EE3F2	*Video Engineering & Digital Media*	10	H
CY3C2	*State Space*	10	H
CY3D2	*Measurement Systems*	10	H
CY3L2	*Mechatronics*	10	H
Part 4			
Compulsory modules			
EE4P2	*Industrial project*	60	M
EE4H2	*Wireless Communications and Networking*	20	M
Optional modules	*(a total of 40 credits to be chosen):*		
CE4A2	*Reliability*	10	M
CE4B2	*Creative Problem Solving*	10	M
SE4G2	*Advanced Digital Signal Processing*	10	M
CY4D2	*Terahertz Technology*	10	M
CY4J2	*Manipulator Robotics*	10	M
CY3L2	*Mechatronics*	10	H
XX3??	*Foreign Language*	20	H

Progression requirements

In order to progress to Part 2 a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, and a mark of at least 30% in individual modules amounting to not less than 120 credits.

To gain a threshold performance at Part 2 a student shall normally be required to achieve:

an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual

modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2,

Summary of teaching and assessment

Teaching is organised in modules that typically involve lectures and tutorial or laboratory practicals. Most modules are assessed by a mixture of coursework and formal examination. Some modules, in particular the Part 3 and Part 4 projects are assessed only as coursework. Details are given in the relevant module description.

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 EE4P2 *Industrial Project*.

Part 2 contributes 20% of the final degree assessment, Parts 3 and 4 each contribute 40%.

Admission requirements

Entrants to this programme are normally required to have obtained:

Grade C or better in English in GCSE; and achieved

A Level: 300 points with grade B in A Level Mathematics and Physics; or

International Baccalaureat: 30 points including 6 in Higher Mathematics; or

Advanced GNVQ: Distinction in one of the following subject areas: Engineering, Information Technology or Science, accompanied by A Level Mathematics Grade B; or

Scottish Highers: Grade A in Mathematics and Bs in three other subjects

Irish Leaving Certificate: Grade A in Mathematics and three Bs and a C in four other subjects; or

BTEC: with mostly distinctions in individual subjects but including at least a distinction in Mathematics.

Two AS grades are accepted in place of one A-Level (except for Mathematics)

Admissions Tutor: Dr S.A. Shirsavar

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 though 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 exempt from the professional examinations of the Institution of Electrical Engineers. After 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 meet the educational requirements set out by the Engineering Council for Chartered Engineer status; to encourage their critical and analytical skills; to develop their skills in applying theoretical concepts to the practice of electronic systems design; to provide experience of industrial engineering practice; and to provide a firm foundation for a career in design, management, or research and development.

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, including the use of mathematics as a tool for communicating results, concepts and ideas.
2. science underlying electronic engineering systems.
3. information technology.
4. design of electronic engineering systems, including the methods of applying engineering principles to create new products and systems, but including the constraints in applying inappropriate technology and the needs of commercial risk evaluation.
5. management and business practices, including finance, law, marketing, personnel and quality control.
6. electronic 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. be creative and innovative.
3. analyse and solve electronic engineering problems.
4. organise tasks into a structured form.
5. understand the evolving state of knowledge in a rapidly developing area.
6. transfer appropriate knowledge and methods from one topic within the subject to another.
7. plan, conduct and write a report on a project or assignment.
8. prepare an oral presentation.

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. Creativity and innovation is embedded into the course, in laboratory classes and project work.

Assessment

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

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. manage projects effectively.
7. present work both in written and oral form, using appropriate technology.

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.