

**BSc Consumer Electronics**  
**For students entering Part 1 in 2008/9**

**UCAS code: H614**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Engineering
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	10/Aug/2010
Programme Director:	Dr Oswaldo Cadenas
Programme Advisor:	Dr Oswaldo Cadenas
	Eur Ing Dr R. Simon Sherratt
Board of Studies:	Electronic Engineering
Accreditation:	Accredited by the IET

**Summary of programme aims**

The programme aims to provide a working knowledge in the theory and practice of the electronics, computational, networking and packaging aspects of state-of-the-art embedded systems. A particular emphasis is paid to audio and video applications of these systems in order to meet the growing demand of skilled engineers in this field thus satisfying a high level of employability. It aims to produce graduates who have some experience of hardware and software techniques, an appreciation of wider computational issues such as networking and security and a range of appropriate subject-specific and transferable skills.

**Transferable skills**

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills in line with the University's Strategy for Learning and Teaching. In following this programme, students will have had the opportunity to develop such skills, in particular relating to communication, interpersonal skills, learning skills, numeracy, self-management, use of IT and problem-solving and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

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, and 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 and the level of each module are shown after its title.

**Part 1 (three terms)**

*Compulsory modules*

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
SE1EA5	Electronic Circuits	20	4
SE1EB5	Computer and Internet Technologies	20	4
SE1SA5	Programming	20	4
SE1SB5	Software Engineering	20	4
SE1SC5	Computer Science Roadmap	20	4

*And*

SE1CB5	Engineering Maths [for students who have A-level Maths]	20	4
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*Or*

MA116	Mathematics for Computer Science [otherwise]	20	4
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**Part 2 (three terms)**

### *Compulsory modules*

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
CS2B6	Operating Systems	10	5
CS2K7	XML and Web Technologies	10	5
CS2L7	Human Computer Interaction	10	5
EE2A2	Embedded Microprocessor Systems	20	5
EE2C2	Digital Circuit Design	10	5
EE2D6	FPGAs and HDLs	10	5
SE2P6	Engineering Applications	20	5
CS2J7	Programming with Java	10	5
EE2T9	Telecommunications	10	5
CY2G2	Signals	10	5

### **Part 3 (three terms)**

#### *Compulsory modules*

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
EE3A2	Digital Signal Processing	10	H
SE3C9	Computer Networking	20	H
EE3U9	Universal Serial Bus	10	H
EE3P2	Electronic Engineering Project	30	H
SE3Z10	Social, Legal and Ethical Aspects of Science and Engineering	10	H

*Optional modules: Choose module(s) worth 40 credits from the following:*

CS2A6	Compilers	10	5
CS3U7	Image Analysis	10	6
EE3V7	Functional Verification	10	6
CS3TZ4	Network Security	10	6
EE3M9	FPGA Embedded Processing	10	6
EE3G2	DSP in Communications	10	6
LAXXX	Language from IWLP	20	4/5/6

### **Progression requirements**

To gain a threshold performance at Part 1 and qualify for the CertHE a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, where all the credits are at level 4 or above, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1, and to have obtained at least 40% and have no module mark below 30%.

To gain a threshold performance at Part 2 and qualify for the DipHE 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.

A student must obtain at least 40% in the project (EE3P2) to be eligible for honours. Part 2 contributes one third of the final assessment and Part 3 the remaining two thirds.

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

Teaching is organised in modules that typically involve lectures, tutorials and lab practicals. Most modules are assessed by a mixture of coursework and formal examinations. The formal assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks. The pass mark in each module is 40%. Modules in Part 1 and 2 are assessed by a mixture of coursework and formal examination. There are some modules which are assessed wholly by coursework and others wholly by examination; the details are given in the module descriptions.

Projects with a general nature of Electronic and Computer Science challenges with a particular application within the context of Consumer Electronics will be allocated.

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

Grade C or better in English in GCSE; and achieved

UCAS Tariff: A Level: 280 points including grade C in Science or Mathematics; or

International Baccalaureat: 29 points; or

Advanced GNVQ: or

Scottish Highers:

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

**Admissions Tutor:** Dr B Potter

### **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, School Senior Tutors, the Students' Union, the Medical Practice and the Student Services Directorate. The Student Services Directorate is housed in the Carrington Building and includes the Careers Advisory Service, the Disability Advisory Service, Accommodation Advisory Team, Student Financial Support, Counselling and Study Advisors. Student Services has a Helpdesk available for enquiries made in person or online ([www.risisweb.reading.ac.uk](http://www.risisweb.reading.ac.uk)), or by calling the central enquiry number on (0118) 378 5555. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions on everything from accommodation to finance. The Carrington Building is open between 8:30 and 17:30 Monday to Thursday (17:00 Friday and during vacation periods). Further information can be found in the Student website ([www.reading.ac.uk/student](http://www.reading.ac.uk/student)).

Within the contributing departments additional support is given though practical classes in Part 1. The development of problem-solving skills is assisted by extensive provision of model solutions to problems. There is a Course Adviser to offer advice on the choice of modules within the programme.

### **Career prospects**

This programme is suitable for anyone aiming for a job involving electronics and/or computer systems design. These include manufacturers of mobile phones, computer consoles and game programmers, embedded systems, MP3, DVD players, consumer electronic products for home entertainment and appliances, computer networking products. Graduates could consider becoming Chartered Engineer as this programme is accredited to Bachelors level by the IET, requiring further learning at Masters level to meet all the educational requirements.

### **Opportunities for study abroad or for placements**

N/A

### **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 to help model and analyse systems, and use mathematics as a tool for communicating results and concepts
2. Science underlying Electronic Engineering systems and Computer Systems that Consumer Electronics products are made of
3. Information Technology, and networking
4. Integration of electronic 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 and quality control
6. Electronic Engineering and Computing Science practice related to consumer products

### 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 are also assessed.

## 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. Be innovative and creative
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 in electronic engineering 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 Consumer Electronics products
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:

### Teaching/learning methods and strategies

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

Some IT tools are taught in lectures, but most through laboratory sessions and assignments. Data skills are acquired in laboratory and projects. Creativity, innovation and problem 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 the 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 be expected 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 the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.**