BSc Consumer Electronics

UCAS code: H614

For students entering Part 1 in 2007

Awarding Institution: The University of Reading
Teaching Institution: The University of Reading
Relevant QAA subject benchmarking group(s): Engineering
Faculty of Science Programme length: 3 years
Date of specification: 27/03/09
Programme Director: Dr Oswaldo Cadenas
Programme Adviser: Dr Oswaldo Cadenas, Eur Ing Dr Simon Sherratt
Board of Studies: Electronic Engineering
Accreditation: 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. 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, 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)		*Credits*	*Level*
Compulsory modules			
SE1SC5	*Computer Science Roadmap*	20	C
SE1EA5	*Electronic Circuits*	20	C
SE1EB5	*Computer and Internet Technologies*	20	C

	SE1SA5	*Programming*		20	C
	SE1SB5	*Software Engineering*		20	C
	SE1CB5	*Engineering Maths*	*[If have A level Maths]*	20	C
or	MA116	*Mathematics for Computer Science*	*[otherwise]*	20	C

Part 2 (three terms)		*Credits*	*Level*
Compulsory modules			
CS2B6	*Operating Systems*	10	I
CS2J7	*Programming with Java*	10	I
CS2K7	*XML and Web Technologies*	10	I
CS2L7	*Human Computer Interaction*	10	I
EE2A2	*Embedded Microprocessor Systems*	20	I
EE2C2	*Digital Circuits Design*	10	I
EE2D6	*Advanced Digital Design*	10	I
SE2A2	*Signals and Telecoms*	20	I
SE2P6	*Engineering Applications*	20	I

Part 3 (three terms)		*Credits*	*Level*
Compulsory modules			
EE3A2	*Digital Signal Processing*	10	H
SE3C9	*Computer Networking*	20	H
EE3U9	*Universal Serial Bus*	10	H
EE3P2	*Electronic Engineering Project*	30	H
EE3V7	*Functional Verification*	10	H
SE3Z5	*Social, Legal and Ethical Aspects of Science and Engineering*	20	H
Optional modules: Choose module(s) worth 20 credits from the following:			
CS2A6	*Compilers*	10	I
CS3U7	*Image Analysis*	10	H
CS3V7	*Visual Intelligence*	10	H
CS3TZ4	*Network Security*	10	H
EE3F2	*Video Engineering and Digital Media*	10	H
EE3G2	*DSP in Communications*	10	H
LA3XX	*Language from IWLP*	20	H

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 C level 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.

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. 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.

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 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 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. Since students have done the same modules as other accredited programmes, graduates may opt to

go for the individual case procedures to become Chartered Engineer. We have also verified that no compatible degree is found in the Electronic Industry Alliance. Accreditation is to be sought from the IET.

Opportunities for study abroad or for placements
N/A

Educational aims of the programme
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. 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.

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:	**Teaching/learning methods and strategies**
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 used in Consumer Electronics products. 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.	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:	**Teaching/learning methods and strategies**
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.	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:

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

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 processes or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.