

**BSc Software Engineering**  
**For students entering Part 1 in 2009/0**

**UCAS code:**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	13/Sep/2011
Programme Director:	Dr Hong Wei
Programme Advisor:	Dr Gerard McKee Dr Lily Sun
Board of Studies:	UG Systems Engineering
Accreditation:	Accreditation not yet available

**Summary of programme aims**

This programme aims to prepare students for a career in the software or information technology industry, with a specific emphasis on the development of software within a whole system (hardware, software, people) context. In particular, students will understand the complexities of bringing together organisational needs and technological capabilities, through the medium of the software development team. A strong background in project management and team-working and communication skills should fit graduates to become key players in large software system development and business change programs underpinned by IT system development and deployment.

**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 career management, communication (both written and oral), information handling, numeracy, problem-solving, team-working, and use of information technology and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

**Programme content**

The profile below states which modules must be taken (the compulsory part), together with 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 credit for each module is shown in the second column from the right. The codes 4, 5, 6, 7 in the right most column show the level of each module. Note the choice of optional modules will in some cases be restrained by the timetable. Students should consult the Programme Advisor to ensure that a coherent set of modules are followed.

**Part 1 (three terms)**

*Compulsory modules*

<i>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
SE1EB9	Computer and Internet Technologies	20	4
SE1SB9	Software Engineering	20	4
SE1SC9	Computer Science Roadmap	20	4
SE1SA5	Programming	20	4

Select 40 credits from the following optional modules:

SE1TR5	e-Business 1	20	4
SE1TQ5	COTS 1	20	4
MM1F10	Student Enterprise	20	4
MA115	Codes and Code Breaking	20	4

Either				
MA116*	Mathematics for Computer Science*	20	4	
or				
SE1CB9*	Engineering Mathematics*	20	4	

\*Students with A Level Maths at Grade C or above (or equivalent) take SE1CB9, otherwise MA116.  
Other options (including a foreign language from the IWLP) may be selected with the approval of the Course Advisor.

## Part 2 (three terms)

### Compulsory modules

<i>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
CS2TD7	Databases	10	5
CS2J7	Programming with Java	10	5
CS2TS6	Software Engineering 2 and Career Management	20	5
CS2TA6	Information Systems Engineering	20	5
CS2L7	Human Computer Interaction	10	5
SE2C10	Computer Architecture	10	5
CS2G7	Essential Algorithms	10	5

Select 10 credits from:

CS2B6	Operating Systems	10	5
CS2A6	Compilers	10	5
CS2K7	XML and Web Technologies	10	5
CS2Q7	Artificial Intelligence	10	5
CS2R7	Space Robotics	10	5

Select 20 credits from:

CS2TR6	E-Business 2	20	5
MM270	Practice of Entrepreneurship	20	5

## Part 3 (three terms)

### Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
SE3IP11	Individual Project	40	6
SE3SL11	Social, Legal and Ethical Aspects of Science and Engineering	10	6
SE3SQ11	Software Quality and Testing	10	6
CS3TC4	Project Management	10	6

### Optional modules

Select 50 credits from:

SE3AC11	Advanced Computing	20	6
SE3CN11	Computer Networking	20	6
SE3RD11	Requirements, Domains and Soft Systems	10	6
SE3NS11	Network Security	10	6
MM374	Informatics for e-Enterprise	20	6

### **Progression requirements**

To gain a threshold performance at Part 1 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 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 obtain at least 30% in all compulsory modules.

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.

To be eligible for Honours, students must obtain an overall average mark of 40% and pass the Individual Project (SE3IP11).

### **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, while others are assessed solely by examination. Details are given in the relevant module descriptions.

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

UCAS Tariff: 300 points from 3 A levels or 340 points from 3 A levels and 1 AS. Total points exclude Key Skills and General Studies.

Grade B in Mathematics and Grade C in English in GCSE

International Baccalaureate: Pass Diploma and achieve 6,6,5 in three higher level subjects

Irish Highers: AABBB

Equivalent qualifications are acceptable.

**Admissions Tutor:** Dr G Di Fatta

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

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Student Employment, Experience and Careers Centre (SEEC), In-sessional English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and 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 advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing. 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 and runs workshops and seminars on a range of topics. For more information see [www.reading.ac.uk/student](http://www.reading.ac.uk/student)

Within the School of Systems Engineering 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 Programme 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 Systems Engineering produces a Handbook for Students, which provides general information about the staff and facilities within the school.

### **Career prospects**

It is expected that most graduates from this programme will pursue careers in the software industry, either for software companies or within the software development branch of large companies. Graduates in Software Engineering could be expected to have the following generic job titles:

software engineer

systems analyst

systems manager  
applications developer  
web developer  
network administrator  
database administrator  
project manager  
data analyst

### Opportunities for study abroad or for placements

N/A

### Programme Outcomes

#### Knowledge and Understanding

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

1. Software including:
  - 1a) Programming languages
  - 1b) Structuring of data and information
2. Practice
  - 2a) Problem identification and analysis
  - 2b) Design, development and evaluation
  - 2c) Management and organisation
  - 2d) Professionalism and ethics
3. Hardware
  - 3a) The link between systems software and hardware operations
  - 3b) Hardware as a component structure of a system
4. Communication and interaction
  - 4a) The team as responsible for production of the system.
  - 4b) The team including customer, users, analysts, developers, implementers and maintainers.
5. Theory
  - 5a) Systems design theory
  - 5b) Psychological theories underlying team working

##### Teaching/learning methods and strategies

The knowledge required for the basic topics is obtained via lectures, exercises, practicals, assignments and project work. Appropriate IT and other software packages are taught. Practical demonstrators 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.

##### *Assessment*

Most knowledge is tested through a combination of practicals, assignments and formal examinations. Students write reports on many assignments, and also make oral presentations of their work.

#### Skills and other attributes

##### B. Intellectual skills - able to:

select and apply appropriate computer based methods, mathematical and scientific principles for analysing systems;  
analyse and solve problems;  
organise tasks into a structured form;  
plan, conduct and write a report on a project;  
recognise and conform to appropriate professional, ethical and legal practices;  
prepare and deliver an oral presentation.

##### Teaching/learning methods and strategies

Appropriate software, 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 a major element of the degree, taught in SE1SB5, CS2TS6 and CS3TC4, and applied on a significant scale in CS3Q2.

##### *Assessment*

Skills 1-4 are assessed in a variety of individual modules via coursework and examination. Skill 5 is assessed via essay, online discussion, and portfolio generation in SE3Z5. Skill 6 is assessed in CS3Q2.

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

specify, design and construct software systems;  
use a variety of languages and approaches to implement system construction;  
critically appraise existing systems in terms of fitness for purpose, possibility of upgrading or necessity of replacement;  
manage a team comprised of individuals with varied intellectual skills to achieve a project goal;  
present work in a variety of formats and using a variety of presentation methods (written, oral, in-person, electronically...);  
make effective use of computer systems.

### **D. Transferable skills - able to:**

use software tools.  
acquire, manipulate and process data.  
use creativity and innovation.  
solve problems.  
communicate scientific ideas.  
give oral presentations.  
work as part of a team.  
use information resources.  
manage time.  
use Information Technology effectively.

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

The design and implementation of software systems is the core of the degree course, and students will be shown practical examples as well as theoretical abstractions for these. A variety of programming languages and development tools are presented in the lectures, while a wider range of tools are available within the School for students to gain experience with, particularly in their individual project work.

Group project work in second and third year modules give students experience on working within and managing a team.

As a computing degree, students are expected to do all aspects of their work using computer systems, providing ample opportunity for improving communication and IT skills.

#### *Assessment*

Skills 1 and 2 are tested with practical assignments in coursework and overall understanding of systems and solution options are tested in examinations.

Skills 3 and 4 are exercised in the Software Engineering and Project Management modules, and likewise assessed in coursework and examination.

Skills 5 and 6 are assessed in almost all modules by using coursework assignments.

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

Software tools are taught partly in lectures, mainly through practical 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 software 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 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.**