BSc Computer Science with Industrial Year **UCAS code: G401**
For students entering Part 1 in 2015/6

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Computing
Faculty:	Science Faculty
Programme length:	4 years
Date of specification:	28/Nov/2016
Programme Director:	Dr Hong Wei
Programme Advisor:	Dr Lily Sun
Board of Studies:	UG Systems Engineering
Accreditation:	British Computer Society

Summary of programme aims
This programme aims to prepare students for a career in the software and computing industry, with a particular emphasis on technologically advanced software applications having a basis in science. Graduates will be well qualified to play a disciplined and creative part in a research, development or support environment. Students also benefit from spending their third year on a work placement in the Computing industry.

The programme also aims to develop the students' knowledge of the theory and practice of modern computer science, necessary for them to secure employment as professional software 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 computer systems design.

Transferable skills
During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to CMS (Career Management Skills) and project management which have been built into the curriculum, in communication, interpersonal skills, learning skills, self-management, use of IT, technical writing, 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, career planning and management, and business awareness.

Programme content
The following profile states which modules must be taken (the compulsory part), together with one or more lists of modules from which students 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 credits for each module is shown after its title.

Part 1 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
SE1PR11	Programming	20	4
SE1SE11	Software Engineering	20	4
SE1CA11	Computer Applications	20	4
SE1FC11	Fundamentals of Computing	20	4

Optional modules
Select modules worth 40 credits from:

SE1EA11	Enterprise, Architecture and e-Business Systems	20	4
SE1CY15	Cybernetics	20	4
SE1EE15	Electronics	20	4
MM1F10	Student Enterprise	20	4

MA115	Codes and Code Breaking	20	4
LA1XX1	Institution Wide Language Programme	20	4

Part 2 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
CS2SM16	System Design and Management	20	5
CS2CA16	Computer Architecture	10	5
CS2DB16	Databases	10	5
CS2FD16	Advanced Databases	10	5
CS2CO16	Compilers	10	5
CS2OS16	Operating Systems	10	5
CS2EA16	Essential Algorithms	10	5
CS2JA16	Java	20	5

Optional modules:

Code	*Title*	*Credits*	*Level*
CS2NN16	Neural Networks	10	5
BI2RS16	Robotic Systems	10	5
CS2HA16	HCI and Applications	20	5
CS2AM16	Enterprise Architecture Modelling	10	5
CS2SA16	Service-Oriented System Applications	10	5

Year abroad/Year away/Additional year (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
CS2IY16	Industrial Year	120	5

Part 3 (three terms)
Compulsory modules

Code	*Module title*	*Credits*	*Level*
CS3IP16	Individual Project	40	6
CS3SL16	Social, Legal and Ethical Aspects of Science and Engineering	10	6

Optional modules
Select modules worth 70 credits from:

Code	*Title*	*Credits*	*Level*
CS3AC16	Advanced Computing	10	6
CS3CS16	Concurrent Systems	10	6
CS3CN16	Computer Networking	20	6
CS3VR16	Virtual Reality	10	6
CS3IA16	Image Analysis	10	6
CS3DM16	Data Mining	10	6
CS3EC16	Evolutionary Computation	10	6
CS3IS16	Information Security	10	6
CS3SQ16	Software Quality and Testing	10	6

CS3RD16	Requirements, Domains and Soft Systems	10	6
MM374	Informatics for e-Enterprise	20	6

Progression requirements
In order to complete the programme with a degree, students must satisfy general progression rules from Part 1 to Part 2, Part 2 to Part 3, and then successfully achieve the threshold for final classification.
In order to graduate with this degree, students are required to achieve PASS in their industrial placement (module CS2IY16).

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 no module mark below 30% in any of the compulsory Part 1 modules.

To gain a threshold performance at Part 2, a student shall normally be required to achieve:
(i) a weighted average of 40% over 120 credits taken at Part 2;
(ii) marks of at least 40% in individual modules amounting to not less than 80 credits; and
(iii) marks of at least 30% in individual modules amounting to not less than 120 credits.
In order to progress from Part 2 to Part 3 and qualify for the DipHE, a student must achieve the threshold performance.

To be eligible for Honours, students must achieve at least 40% in modules amounting to 80 credits in the final Part, including the Individual Project (CS3IP16).
In order to graduate with this degree, students are required to achieve PASS in their industrial placement (module CS2IY16). Otherwise students will be eligible for the BSc Computer Science degree.

Summary of Teaching and Assessment
The University's honours classification scheme is:

Mark	Interpretation
70% - 100%	First class
60% - 69%	Upper Second class
50% - 59%	Lower Second class
40% - 49%	Third class
35% - 39%	Below Honours Standard
0% - 34%	Fail

For the University-wide framework for classification, which includes details of the classification method, please see: www.reading.ac.uk/web/FILES/exams/classification-post-2007.pdf.

The weighting of the Parts/Years in the calculation of the degree classification is

Four-year programmes, including placement year:
Part 2 one-third
Placement Year not included in classification
Part 3 two-thirds
(where students fail a placement year which does not contribute to classification they transfer to the three-year version of the programme)

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:
Grade B in Mathematics and Grade C in English in GCSE; and achieved
A level: ABB (320 points) from 3 A Levels, or 360 points from 3 A Levels and 1 AS Level (total points exclude General Studies)
International Baccalaureate: 32 points; or
Irish Highers: AAABB
Equivalent qualifications are acceptable.

Admissions Tutor: Dr Oswaldo Cadenas

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 Careers, Placement and Experience Centre (CPEC), 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, academic issues (eg problems with module selection) and exam related queries. 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

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

Career learning
In the School of Systems Engineering (SSE), students are given strong supports on career management/learning throughout their course.

- Students are introduced to the Placement & Careers Team in their welcome week, where they receive information of how the team supports their Careers/Placement.
- During their first year all students attend a one week intensive course, where a combination of presentations and workshops take place in: Placement/Graduate Job Search & using Social Media, Application Preparation & Research, Writing CV's & Covering Letters and completing Application Forms, Psychometric Testing (Numerical, Verbal & Diagrammatical Reasoning Tests), Competency Based Interviewing, Group Exercises & Presentations and Placement Presentations from 40+ employers.
- In the second year, students are prepared and encouraged to apply for a placement (either a three month summer Internship or a 12 month Industry placement).
- In the final year, students' graduate applications are supported by the Placement & Career Team with the following activities.

1. Organising an SSE Placement/Graduate Fair & Company presentations and source Placement & Graduate positions and send these out to the students
2. Arranging on site Interviews, Selection Skill Workshops with Employers & Placement Team
3. 1 - 1 Career/Placement support meetings

Career prospects
Most students who have followed this programme have gone into careers in the software industry. These range from small start-up companies to multi-nationals and several graduates have started their own businesses. Others have joined research groups in university and industry, the public service, and the teaching professions.

Opportunities for study abroad
N/A

Placement opportunities
Industrial placement is compulsory between Parts 2 and 3 (the third year).

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. Software engineering and theoretical issues in Computer Science 2. A range of programming languages and environments 3. Information technology 4. Appropriate mathematical techniques, including the use of mathematics as a tool for communicating results, concepts and ideas 5. Business context 6. Engineering practice	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:*	**Teaching/learning methods and strategies**
1. Select and apply appropriate computer based methods, mathematical and scientific principles for analysing general systems 2. Analyse and solve 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 and produce technical reports	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 part of the Part 3 project, and written and oral presentations are required for various assignments and projects. *Assessment* Skills 1-5 are assessed partly by examination, though sometimes also by project or assignment work. Skills 6 and 7 are assessed as part of project work.

C. Practical skills - *able to:*	**Teaching/learning methods and strategies**
1. Use appropriate software tools 2. Program a computer to solve problems 3. Use relevant software and analyse the results critically 4. Design, build and test a system 5. Research into computer science problems 6. Utilise project management methods 7. Present work both in written and oral form	Software 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. Practicals and projects are used to teach about skill 3, and projects are used for skills 4, 5, 6 and 7. *Assessment* Skills 1 and 5 are tested in coursework and in examinations. Skills 2, 5 and 7 are tested by assignments and projects, 3 is assessed in practicals and sometimes in projects, Skills 4, 5 and 6 are

assessed through project work.

D. Transferable skills - *able to:*

1. Use software 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

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.