

PROGRAMME SPECIFICATION

Course record information

Name and level of final award:	BSc Honours The <i>BSc (Hons) Computer Science</i> is a <i>B.Sc. Honours</i> degree that is Bologna FQ-EHEA first cycle degree or diploma compatible.
Name and level of intermediate awards:	BSc in Computer Science Diploma in Higher Education (Dip HE) in Computer Science Certificate in Higher Education (Cert. HE) in Computer Science
Awarding body/institution:	University of Westminster
Status of awarding body/institution:	Recognised Body
Location of delivery:	Central London (Cavendish)
Language of delivery and assessment:	English
Course/programme leader:	Dr Philip Trwoga
Course URL:	http://www.westminster.ac.uk/courses/subjects/computer-science-and-software-engineering/undergraduate-courses/full-time/u09fucsr-bsc-honours-computer-science
Mode and length of study:	3 years full-time or 4 years full-time sandwich
University of Westminster course code:	U09FFCFC U09FUCSR
JACS code:	
UCAS code:	G401,G402
QAA subject benchmarking group:	Computing
Professional body accreditation:	British Computer Society (BCS)
Date of course review:	November 2013
Date of programme specification:	November 2013

Admissions requirements

Level 4 entry: 240 UCAS points (A2 - CCC)

Aims of the course

1. To provide students with knowledge and understanding of the fundamental principles and technologies that underpin the discipline of computing;
2. Give students technical expertise in computer science and practical experience enabling them to be effective in a varied and fast-developing range of careers in computing;
3. To provide students with sound knowledge of software engineering principles across the whole software development lifecycle;
4. To provide students with the knowledge and practical use of industry tools and techniques to develop software applications;
5. To provide the ability to apply this knowledge and skills to a range of practical situations to resolve business and technical problems and to encourage a disciplined and professional attitude towards the development of such systems;
6. To provide a motivating and inclusive environment with the opportunity to develop themselves intellectually and socially and to encourage students to develop as independent and self-critical problem solvers;
7. To prepare students for continued study at an advanced level, either in formal postgraduate study or as continued professional development.

Employment and further study opportunities

Today's organisations need graduates with both good degrees and skills relevant to the workplace, ie employability skills. The University of Westminster is committed to developing employable graduates by ensuring that:

- Career development skills are embedded in all courses
- Opportunities for part-time work, placements and work-related learning activities are widely available to students
- Staff continue to widen and strengthen the University's links with employers in all sectors, involving them in curriculum design and encouraging their participation in other aspects of the University's career education and guidance provision
- Staff are provided with up-to-date data on labour market trends and employers' requirements which will inform the service delivered to students.

Graduates would typically be part of a team designing, implementing and or maintaining sophisticated distributed applications. The actual role within the team may be, for example; designer, programmer, systems administrator or systems analyst. Other types of roles possible are in computer science research for either a commercial company or academic institution.

Further study opportunities within the University of Westminster are Masters degree or PhD study.

Learning outcomes

Learning outcomes are statements on what successful students have achieved as the result of learning. These threshold statements of achievement are linked to the knowledge, understanding and skills that a student will have gained on successfully completing a course.

Learning outcomes for Level 4

Knowledge and Understanding (Level 4)

By the end of level 4 students will be able to:

- K1. confidently plan, design and implement algorithms using fundamental procedural programming constructs;
- K2. design and represent the flow of simple computer programs in a standard design language;
- K3. describe and use the basic concepts of classes and objects in computer programs;
- K4. create and manipulate simple databases;
- K5. describe the structure of a computing system, the design of its basic components and explain the interactions of hardware and software components;
- K6. manipulate data and data representation through logical and numerical techniques;
- K7. understand fundamental concepts of network tools;
- K8. describe the file architecture and the organization of a web site;
- K9. describe the main ethical, social, legal and professional issues in Computer Science and Software Engineering;
- K10. apply appropriate mathematical techniques as used in Computer Science.

Specific skills (Level 4)

By the end of level 4 students will be able to:

- S1. implement and test software solutions using a software development environment;
- S2. create and format a web site with basic interactive elements using a mark-up language.

Key Transferable skills (Level 4)

By the end of level 4 students should be able to:

- T1. take responsibility for individual study with appropriate guidance;

- T2. evaluate and reflect on their own learning and personal planning processes, with guidance;
- T3. work effectively as part of a team, with guidance
- T4. carry out a literature research on a given topic, with guidance, using a range of resources;
- T5. demonstrate the origins of their ideas by referencing sources used in their work;
- T6. prepare and present the findings from literature and personal tutorial activities in an appropriate academic form of communication;
- T7. express themselves in writing for different professional and academic audiences;
- T8. prepare their CV;

Learning outcomes for Level 5

Knowledge and Understanding (Level 5)

By the end of level 5 students will be able to:

- K11. demonstrate competency in object oriented programming;
- K12. employ a standard design language for the design, representation and formal specification of software;
- K13. apply the principles of algorithm and data structure design in the implementation of algorithms;
- K14. use, compare and contrast software frameworks and architectures;
- K15. explain and demonstrate how data is persistently stored, manipulated, and retrieved in object-oriented software development;
- K16. employ knowledge of software engineering principles to successfully plan and execute a software project;
- K17. apply software lifecycle models and software projects methodology;
- K18. discuss ethical, social, legal and professional issues in software engineering;
- K19. identify the main roles and responsibilities of a professional software engineer;
- K20. apply the main HCI principles for software systems;

Specific Skills (Level 5)

By the end of level 5 students will be able to:

- S3. define, develop, and implement a small-scale software project using the OOD development paradigm;
- S4. apply their specialist pathway knowledge to a computing problem or project;
- S5. manage a dedicated role within a software project team.

Key Transferable skills (Level 5)

By the end of level 5 students will be able to:

- T9. interact effectively within a team or group, planning, collaborating and exchanging information and ideas;
- T10. carry out literature searches on a given subject to locate relevant academic books, electronic resources or journal articles, evaluating their relevance;
- T11. present ideas and arguments in a clear and structured manner in written or oral form with reference to sources;
- T12. work effectively as part of a team on a group development project;

Learning outcomes for Level 6

The third year of studies builds upon specific skills that have been developed in Level 5 to more advanced and professional level.

Knowledge and Understanding (Level 6)

By the end of level 6 students will be able to:

- K21. identify and use appropriate software engineering principles to successfully design and develop a software project;
- K22. apply requirements engineering techniques in the design of projects;
- K23. identify and appraise the main threats to computer systems security and integrity;
- K24. assess how software quality issues impact on software design;
- K25. carry out a piece of independent research and produce a report on it;

Specific Skills (Level 6)

By the end of level 6 students will be able to:

- S6. elicit and document the requirements for a medium software project;
- S7. choose and justify an appropriate software lifecycle model;
- S8. design and implement software, to meet a designated set of requirements using appropriate languages and tools and software methodology;

Key Transferable skills (Level 6)

By the end of level 6 students should be able to:

- T13. autonomously manage a project with respect to time and task management;
- T14. make decisions independently with respect to the needs and limitations of a task or project;
- T15. produce coherent reports showing evidence of critical thinking.

- T16. plan and manage a major project, time-management and task allocation;
- T17. work professionally in a group in a variety of situations and on a range of tasks and deal independently with a range of situations within group work;
- T18. produce coherent reports showing evidence of critical thinking

Learning, teaching and assessment methods

Learning

Students exercise their critical evaluation and reflection skills in tutorials, which promote the review of taught material and the analysis of new material such as journals, articles and technology white papers.

Teaching

Lectures are used to set the context of material and to impart fundamental knowledge. Practical skills are primarily developed through task and problem-oriented activities in laboratories. Most programming and development modules will be entirely lab based giving the students maximum opportunity to develop practical skills and hands-on experience.

Assessment

A variety of assessment methods are adopted based around traditional academic techniques such as practical and essay-based coursework and exams. Assessment shall include opportunity for self-reflection and contain an element of performance monitoring to ensure student's perform to their abilities and will make full use of the University virtual learning environment.

Assessment will adhere to the standard practice in the Framework for Undergraduate Courses (360 credits) and the Handbook of Academic Regulations.

Course structure

This section shows the core and option modules available as part of the course and their credit value. Full-time Undergraduate students study 120 credits or 8 modules per year.

The BSc Computer Science course is offered full time over 3 years based on 2 teaching semesters per year. Modules at Levels 4, 5 and 6 are generally 15 credits (150 hours of student effort), each Level having 120 credits of study. The ECSC697 Computer Science Project at Level 6 is 45 credits.

Full-time Undergraduate students study 120 credits or 8 modules per year. The BSc course is also offered on a sandwich mode where you undertake a one-year placement in industry in the third year.

The list below shows the core and option modules that are available as part of the course and their credit value. A *core* module is one that must be attempted to gain the award of BSc Computer Science. Student choice is allowed for by designating a number of modules at levels 5 and 6 as subject-specific *options*. The option modules are grouped to form a set of recommended pathways, however these do not result any specific named awards. Students are not required to take all modules in a specific pathway and are free to choose modules from all the options (timetable dependant) though should seek advice from their personal tutor and other academics concerning their choice.

Some, but not all, of these modules will have to be taken to gain the award of BSc Computer Science. The course specific regulations give full details of what must be taken and passed in order to gain an award.

This section shows the core and option modules available as part of the course and their credit value. Full-time Undergraduate students study 120 credits per year.

BSc Computer Science – Core Modules

Credit Level 4 - Core					
Module code	Module title	Status	UK credit	ECTS	Course Learning Outcomes
ECSC400	Communication and Career Management for Computer Scientists and Software Engineers	Core	15	7.5	K9
ECSC404	Computer Systems Fundamentals	Core	15	7.5	K5,K6,K7
ECSC405	Software Development Principles II	Core	15	7.5	K1,K3
ECSC407	Web Technology	Core	15	7.5	K1,K8
ECSC408	Mathematics for Computing	Core	15	7.5	K6,K10
ECSC410	Software Development Principles I	Core	30	15	K1,K2
ECSC411	Information Systems	Core	15	7.5	K5
Award of Certificate of Higher Education available					
Credit Level 5 - Core					
Module code	Module title	Status	UK credit	ECTS	Course Learning Outcomes
ECSC501	Object Oriented Programming I	Core	15	7.5	K11,K13
ECSC502	Object Oriented Programming II	Core	15	7.5	K11,K13,K14,K15
ECSC503	Software Development Group Project	Core	30	15	K12, K16, K17,K 21, K20
ECSC500	Professional Practice	Core	15	7.5	K18
Award of Diploma of Higher Education available					
Credit Level 6 - Core					
Module code	Module title	Status	UK credit	ECTS	Course Learning Outcomes
ECSC697	Computer Science and Software Engineering Project	Core	45	22.5	K21,K 22,K 24,K 25
ECSE609	Security and Forensics	Core	15	7.5	K23

BSc Computer Science – Pathway Option Modules

Credit Level 5 – Options - Mobile and Web Computing Pathway				
Module code	Module title	Status	UK credit	ECTS
ECWM506	Mobile Computing Principles	Option	15	7.5
ECWM512	Web Server-side Programming	Option	15	7.5
ECWM511	Mobile Application Development	Option	15	7.5
ECWM502	Advanced Client-side Web Development	Option	15	7.5
Credit Level 6 – Options - Mobile and Web Computing Pathway				

ECWM603	Mobile User Experience	Option	15	7.5
ECWM601	Native Programming	Option	15	7.5
ECWM604	Advanced Web Technology	Option	15	7.5
ECWM618	Web Intelligence	Option	15	7.5
ECWM606	Web Analytics and Marketing	Option	15	7.5

Credit Level 5 – Options – Games and Computer Graphics Development Pathway				
Module code	Module title	Status	UK credit	ECTS
EICG501	3D Graphics Programming	Option	15	7.5
EICG509	Applied Maths and Physics	Option	15	7.5
EICG503	Game Engine Architecture	Option	15	7.5
ECWM501	3D Modelling and Animation	Option	15	7.5
Credit Level 6 – Options – Games and Computer Graphics Development Pathway				
EICG601	Advanced Maths for Games Development	Option	15	7.5
ECWM605	Advanced Animation Techniques	Option	15	7.5
ECWM601	Native Programming	Option	15	7.5

Credit Level 5 – Options – Software Engineering Pathway				
Module code	Module title	Status	UK credit	ECTS
EBSY505	Database Design and Practice I	Option	15	7.5
EBSY506	Database Design and Practice II	Option	15	7.5
ECSC504	Algorithms and Complexity	Option	15	7.5
Credit Level 6 – Options – Software Engineering Pathway				
ECWM611	Real-time and Embedded Systems	Option	15	7.5
ECSE615	Computer Systems Administration	Option	15	7.5
ECSE610	Formal Specification	Option	15	7.5
ECWM618	Web Intelligence	Option	15	7.5

Credit Level 5 – Options – Multimedia Computing Pathway				
Module code	Module title	Status	UK credit	ECTS
ECWM500	Advanced Interactive Product Development	Option	15	7.5
ECWM502	Advanced Client-side Web Development	Option	15	7.5
ECWM506	Mobile Computing Principles	Option	15	7.5
Credit Level 6 – Options – Multimedia Computing Pathway				
ECWM603	Mobile User Experience	Option	15	7.5
ECWM604	Advanced Web Technology	Option	15	7.5
ECWM606	Web Analytics and Marketing	Option	15	7.5
ECWM605	Advanced Animation Techniques	Option	15	7.5

Award of BSc available

Award of BSc Honours available.

Please note: Not all option modules will necessarily be offered in any one year.

Academic regulations

The BSc Honours Computer Science and its intermediate awards operate in accordance with the University's Academic Regulations and the *Framework for Higher Education Qualifications in England, Wales and Northern Ireland* published by the Quality Assurance Agency for Higher Education (QAA) in 2008.

All students should make sure that they access a copy of the current edition of the general University handbook called Essential Westminster, which is available at westminster.ac.uk/essential-westminster. The following regulations should be read in conjunction with the Modular *Framework for Undergraduate Courses* and relevant sections of the current *Handbook of Academic Regulations*, which is available at westminster.ac.uk/academic-regulations.

Award

To qualify for the award of BSc Computer Science, a student must:

- obtained at least 360 credits including:
 - passed 75 credits at credit Level 4 or higher and achieved at least a condoned credit in each of the remaining modules worth 45 credits at Level 4; and
 - passed a minimum of 120 Credits at credit Level 5 or higher; and
 - passed a minimum of 120 credits at credit Level 6 or higher.
- attempted modules with a maximum value of 330 credits at credit Levels 5 and 6; and
- satisfied the requirements contained within any course specific regulations for the relevant course scheme.

Course Specific Regulation

In addition to the standard University progression regulations, in order to progress from level 4 to level 5 a student must pass ECSC410 Software Development Principles.

The class of the Honours degree awarded is decided by two criteria, the average of the best 105 credits passed at credit Level 6 being in the range of the class to be awarded, and the average of the next best 105 credits passed at credit Levels 5 and 6 provided the next best 105 credits passed are no more than one classification below this.

Support for students

Upon arrival, an induction programme will introduce students to the staff responsible for the course, the campus on which they will be studying, the Library and IT facilities and to the School Registry. Students will be provided with the Course Handbook, which provides detailed information about the course. Students are allocated a personal tutor who can provide advice and guidance on academic matters.

Learning support includes four libraries, each holding a collection of resources related to the subjects taught at their School. Students can search the entire library collection online through the Library Search service to find and reserve printed books, and access electronic resources (databases, e-journals, e-books).

Students can choose to study in the libraries, which have areas for silent and group study, desktop computers, laptops for loan, photocopying and printing services. They can also choose from several computer rooms at each campus where desktop computers are available with the general and specialist software that supports the courses taught at their School. Students can also securely connect their own laptops and mobile devices to the University wireless network.

The University uses a Virtual Learning Environment called Blackboard where students access their course materials, and can communicate and collaborate with staff and other students.

At University level, Services for Students provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues, careers and the chaplaincy providing multi-faith guidance. The International Office provides particular support for international students. The University of Westminster Students' Union also provides a range of facilities to support all students during their time at the University.

Reference points for the course

Internally

University Teaching and Learning policy statements,
University Quality Assurance Handbook and Modular Frameworks,
staff research.

Externally

QAA Subject Benchmark statements,
Professional, Statutory, Regulatory Body requirements/guidance,
University and SEEC (credit consortium) level descriptors.

Professional body accreditation

British Computer Society (BCS) Criteria

Quality management and enhancement

Course management

The BSc (Honours) Computer Science course is under the Computer Science and Software Engineering Department (CSSE) and the management structure supporting the course is as follows:

- Dr Philip Trwoga, Course Leader is responsible for day to day running and overall management of the course and development of the curriculum
- Dr Alexandra Psarrou, Head of Department, holds academic responsibility for the course and other courses within the Department
- Professor Jane Lewis, Dean of Faculty, holds overall responsibility for the course, and for the other courses run by the Faculty

Course approval, monitoring and review

The course was initially approved by a University Validation Panel in 2009 and reviewed in 2013. The panel included internal peers from the University and external subject specialists from academia and industry to ensure the comparability of the course to those offered in other universities and the relevance to employers. Periodic course review helps to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers.

The course is monitored each year by the School to ensure it is running effectively and that issues which might affect the student experience have been appropriately addressed. Staff will consider evidence about the course, including the outcomes from each Course Committee, evidence of student progression and achievement and the reports from external examiners, to evaluate the effectiveness of the course. The Annual Monitoring Sub-Committee considers the School action plans resulting from this process and the outcomes are reported to the Academic Council, which has overall responsibility for the maintenance of quality and standards in the University.

Student involvement in Quality Assurance and Enhancement

Student feedback is important to the University and student views are taken seriously. Student feedback is gathered in a variety of ways. The most formal mechanism for feedback on the course is the Course Committee. Student representatives will be elected to sit on the Committee to represent the views of their peer group in various discussions. The University and the Students' Union work together to provide a full induction to the role of the Course Committee.

All students are invited to complete a Module Feedback Questionnaire before the end of each module. The feedback from this will inform the module leader on the effectiveness of the module and highlight areas that could be enhanced. The University also has an annual Student Experience Survey which elicits feedback from students about their course and University experience.

Students meet with review panels when the periodic review of the course is conducted to provide oral feedback on their experience on the course. Student feedback from course committees is part of the Schools' quality assurance evidence base.

For more information about this course:

Computer Science BSc Honours;

<http://www.westminster.ac.uk/courses/subjects/computer-science-and-software-engineering/undergraduate-courses/full-time/u09fucsr-bsc-honours-computer-science>

For further information and advice contact the Course Enquiries Team on +44 (0)20 7915 5511 or course-enquiries@westminster.ac.uk

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Senior Tutor: Wendy Purdy
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Disability Officer: Cheng Lee
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Please note: This programme specification provides a concise summary of the main features of the course and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. This specification should be read in conjunction with the Course Handbook provided to students and Module Handbooks, which provide more detailed information on the specific learning outcomes, content, teaching, learning and assessment methods for each module.

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