PROGRAMME SPECIFICATION

Course Record Information	
Name and level of final & intermediate Awards	BSc (Hons) Computer Science BSc Computer Science BSc (Hons) Computer Science (Sandwich) BSc Computer Science (Sandwich) Diploma of HE Certificate of HE
Awarding Body	University of Westminster
Location of Delivery	Cavendish Campus
Mode of Study	Full Time 3 years full-time 4 years full-time with foundation 4 year full-time sandwich
UW Course Codes	U09FFCFC U09FUCSR
JACS Code	
UCAS Code	G401,G402
QAA Subject Benchmarking Group	QAA subject benchmark for Computing / Software Engineering British Computer Society guidelines on accreditation South East England Consortium (SEEC) of HE Institutions Level descriptors.
Professional Body Accreditation	British Computer Society (BCS)
Date of initial course approval/last review	June 2010
Date of Programme Specification	April 2012

Admissions Requirements
BSc Computer Science: 240 UCAS points BSc Computer Science with Foundation: 160 UCAS points

Aims of the course

1. To provide students with knowledge and understanding of the fundamental principles and technologies which 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, i.e., 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 services 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 for Level 3 (Foundation year)

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

Knowledge and Understanding for Level 3 (Foundation year)

Upon successful completion of the course, students will be able to:-
1. Understand basic algebraic and arithmetic properties,
2. Write structured programs,
3. Use a range of software tools in the computing environment;
4. Model well defined problems, mathematically and computationally;
5. Describe, at various levels, the function of a computer and its components,
6. Apply appropriate communication skills in an academic environment,
7. Make an informed choice of degree option from the alternatives presented.

Specific Skills for Level 3 (Foundation year)

Upon successful completion of the course, students will be able to:-
1. Solve mathematical problems involving basic numeracy, algebra, trigonometry and coordinate geometry; number systems, Boolean algebra, logic circuits, sets and relations,
2. Demonstrate skills in the use of operating systems and a range of application packages,
3. Specify, select and evaluate hardware to implement a specified computer system,
4. Apply theory and practice to the analysis, design, implementation and testing of software.

Key Transferable skills for Level 3 (Foundation year)

Upon successful completion of the course, students will be able to:-
1. Produce structured written work in a variety of formats;
2. Make oral presentations and participate in discussions and seminars;
3. Use a range of learning resources to support their work;
4. Manage self directed learning with support;
5. Work effectively in a group environment,
6. Apply time management techniques to organise effectively study time and resources,
7. Apply note taking skills in order to develop more useful revision resources.

Learning Outcomes (BSc Computer Science)

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

On completion of the course, the student will be able to:

LO.1 The architecture and structural design of complex computerized systems from both a hardware and software perspective.

LO.2 The various stages, phases, milestones and deliverables of the development lifecycle which constitute the relevant frameworks to successfully undertake a large IT project with a view to develop software systems.

LO.3 The software engineering principles that support the analysis, design, development, testing and implementation of software systems.

LO.4 The underlying theoretical and practical concepts – mathematical, communicational, ethical and professional – necessary to become a good quality IT practitioner.

LO.5 Take a proactive approach to the management of their future career and personal development.

Knowledge and Understanding (BSc Computer Science)

With respect to BSc Computer Science, on successful completion of the course the student will have:

K1 An understanding of the principles of computer systems organization, and specific knowledge and experience of current operating systems and network technology.

K2 A thorough understanding of the principles of computer programming, and detailed knowledge of at least two current programming languages.

K3 A thorough understanding of the principles of computer security and the threats to computer systems security and integrity and be able to make and justify security implementation choices in a variety of situations

K4 Specialized knowledge of an area within computer science such as networks, web-based systems, mobile applications or intelligent systems.

K5 A thorough understanding of the role of modeling and design in software systems.

K6 An understanding of disciplined, engineering-based approaches to software development, and the role and responsibilities of a professional software developer.

K7 An understanding of the principles of data management.

K8 An understanding and appreciation of the professional and ethical issues relevant to the computing industry.

Specific Skills (BSc Computer Science)

On completion of the course, the student will be able to:

1. Design, develop, and critically assess software systems developed through the application of software engineering principles and utilising the main features of at least one commercial programming language

2. Demonstrate a critical awareness of the issues involved in the analysis and design of a computer-based system with the implementation of the design on an industry standard commercial database

3. Discuss a range of commercial computing software and hardware applications and identify implications with their use

4. Critically discuss wider issues of quality, ethical principles, legislative compliance and the social and economic implication in relation to the computer industry

5. Demonstrate competency in the analysis and design in an additional area of Computer Science (e.g. Business Information Systems, Web Development, Information Security or Intelligent Systems).

Key Transferable Skills (BSc Computer Science)

HE1 Experience and skills in group based working.

HE2 Expertise in using a range of learning resources, and skills in information and data retrieval.

HE3 An understanding of the importance in professional life of working to standards, and the ability to work to such standards.

HE4 Skills in self-organization and independent working, and the ability to be objectively critical.

HE5 Well-developed communication skills, including report writing, presentations and the use of IT to support communication.

HE6 The ability to analyse a problem or requirement, propose and carry through a suitable and appropriately documented solution.

Learning, Teaching and Assessment Methods (BSc Computer Science)

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 Structures

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 ECSC699 Computer Science Project at Level 6 is 30 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* 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.

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.

Credit Level 3 Structure ((BSc Computer Science – Foundation Year)

Code	Title	Status	Value
EBSY301	Thinking About Technology	Core	15
EICG301	Introduction to Programming & Games Design Project	Core	15
ECSC302	Foundation Mathematics	Core	15
EECT300	The Computer	Core	15
EBSY302	Spreadsheets & Databases	Core	15
ECSC301	Discrete and Continuous Maths	Core	15
EBSY300	Professional & Transferable Skills	Core	15

Credit Levels 4, 5, and 6 Structure (BSc Computer Science)

BSc (Hons) Computer Science

Code	Title	Core/Option	Value
	LEVEL 4		
ECSC410	Software Development Principles I	Core	30
ECSC404	Computer Systems Fundamentals	Core	15
ECSC405	Software Development Principles II	Core	15
ECSC407	Web Technology	Core	15
ECSC408	Mathematics for Computing	Core	15
ECSC409	Software Engineering Principles	Core	15
ECSC400	Communications and Learning Skills in Computer Science	Core	15
	LEVEL 5 - Core		
ECSE501	Object-Oriented Development	Core	30
ECSC500	Professional Practice in Computer Science	Core	15
	LEVEL 6 - Core		
ECSC699	Computer Science Project	Core	30
ECSE609	Computer Systems Security	Core	15

LEVEL 5 & 6 - Options

Students can choose 75 credits at level 5 and 75 credits at level 6 from the following option modules.

Computer Games

Level 5

Code	Title	Core/Option	Value
EIGA501	Introduction to 3D Graphics	Option	15
EICG507	Real-time Graphics	Option	15
EIMM508	Image Processing	Option	15
ECWM506	Mobile Computing Principles	Option	15
EICG502	Physics for Games Programming	Option	15

Level 6

Code	Title	Core/Option	Value
EICG602	Networking Games Design and Implementation	Option	15
EICG601	Advanced Maths for Games Programming	Option	15
EIMM610	Pervasive Computing and Interactive Platforms	Option	15
EIMM609	Mobile User Experience	Option	15
ECWM601	Native Programming	Option	15

Multimedia

Level 5

Code	Title	Core/Option	Value
ECWM512	Web Programming	Option	15
EIMM508	Image Processing	Option	15
EIMM507	Multimedia Development Tools	Option	15
EIMM514	Human Computer Interface Design	Option	15

Level 6

Code	Title	Core/Option	Value
EIMM602	Experimental Usability	Option	15
EIMM610	Pervasive Computing and Interactive Platforms	Option	15
EIMM609	Mobile User Experience	Option	15

| EIMM608 | Multimedia Retrieval | Option | 15 |
| EIMM618 | Semantic and Social Web | Option | 15 |

Mobile and Web Development
Level 5

ECWM506	Mobile Computing Principles	Option	15
ECMW511	Mobile Application Development	Option	15
ECWM512	Web Programming	Option	15
EIMM514	Human Computer Interface Design	Option	15

Level 6

ECWM604	Advanced Web Technologies	Option	15
ECWM602	Service Oriented Architectures	Option	15
ECWM601	Native Programming	Option	15
ECWM618	Semantic and Social Web	Option	15
EIMM609	Mobile User Experience	Option	15

Software Engineering, Networks and Security
Level 5

ECSE507	Network Software Development	Option	15
ECSE502	Algorithms and Data Structures	Option	15
ECWM506	Mobile Computing Principles	Option	15
EBSY505	Database Design and Practice I	Option	15
EBSY506	Database Design and Practice II	Option	15
EBSY501	Project Management	Option	15

Level 6

ECSE615	Computer Systems Administration	Option	15
ECSC603	Concurrent Programming	Option	15
ECWM611	Real-time and Embedded Systems	Option	15
ECSE607	Software Quality and Testing	Option	15
ECSE608	Requirements Engineering	Option	15
ECWM602	Service Oriented Architectures	Option	15
EICG602	Networking Games Design and Implementation	Option	15

Option modules reviewed in 2009 but not running

ECSC515	Computational Intelligence
ECSE513	E-Commerce and Intranet Systems
ECSE514	Introduction to Symbolic Reasoning
ECSC612	Functional Programming
ECSC613	Programming Language Translation
ECSC614	Computer Forensics Investigation
ECSC615	AI Applications I
ECSC616	AI Applications II
ECSC619	Data Mining

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 2010/11** which is available at westminster.ac.uk/essential-westminster. The following regulations should be read in conjunction with the Modular Fr*amework for Undergraduate Courses* and relevant sections of the current *Handbook of Academic Regulations*.

A *pass* in a module is achieved when the overall mark is greater then or equal to 40%; with at least 30% in the final assessment and any qualifying marks and/or sets achieved as detailed in the module handbook.

Condoned Credit
A student may be awarded condoned credit at Levels 3 and 4 four only, on the condition that the failed element(s) of assessment has been attempted at both the first and referred opportunity, and where he/she has achieved:

a)   an overall module mark of greater than or equal to 30% but less than 40%;
b)   an overall mark of 40% or greater but not reached the required qualifying
         mark(s) and/or qualifying set(s) as detailed in the module handbook.

Where a student is awarded condoned credit, the recorded module mark will be capped at 40%. Condoned credit will count towards any credit limits for specified awards. Where a student is awarded condoned credit in a module but subsequently achieves an overall pass at a re-take, credit may contribute only once to an award.

Progression
To progress from Level 3 to Level 4 and from Level 4 to Level 5 in full time study, a student must achieve an average of 40% across 120 credits; to progress from Level 5 to Level 6 full-time study, a student must pass at least 165 credits, including 75 credits at Level 5.

To qualify for the award of Computer Science, a student must:
a)   Obtained at least 360 credits including:
         - passed 75 credits at Level Four or higher and achieved at least a condoned
            credit in each of the remaining modules worth 45 credits at Level 4; and
         - a minimum of 120 Credits at Level 5 or higher; and
         - a minimum of 120 credits at Level 6 or higher.
b)   attempted modules with a maximum value of 330 credits at Levels 5 and 6
c)   Satisfied the requirements contained within any course specific regulations for
         the relevant course Scheme.

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

Support for Students

On 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 the Library which, across its four sites, holds print collections of 360,000 books, 1,600 journal subscriptions and substantial audio visual collections. Access to all resources including over 6,500 electronic resources (databases, e-journals, e-books, exam papers and links to recommended websites) is facilitated through Library Search, a new online service

There are over 3,500 computers spread over the four University campuses available for students use. The University uses a Virtual Learning Environment called Blackboard where students can access course materials and communicate with staff and other students via message boards.

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, and staff research.

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

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 Graham Megson, Dean of School, holds overall responsibility for the course, and for the other courses run by the School

Course approval, monitoring and review
The course was initially approved by a University Validation Panel in 2009. 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 comment is 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 asked to complete a Module Feedback Questionnaire at 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 provides valuable feedback about a range of University services.

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 are part of the Schools' quality assurance evidence base.

For more information about this course:

Computer Science BSc Honours;
http://www.westminster.ac.uk/schools/computing/subjects/human-interaction-and-multimedia/bsc-multimedia-computing

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

Admissions Tutor: Mark Baldwim
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Senior Tutor: Wendy Purdy
E: purdyw@westminster.ac.uk

Disability Officer: Cheng Lee
E: leec@westminster.ac.uk

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.