MEng Mobile and Web Computing

Programme Specification 2011/12

PROGRAMME SPECIFICATION

Course Record Information	
Name and level of final & intermediate Awards	MEng Mobile and Web Computing BEng (Honours) Mobile and Web Computing BEng Mobile and Web Computing Diploma of Higher Education Certificate of Higher Education
Awarding Body	University of Westminster
Location of Delivery	Cavendish Campus
Mode of Study	Full Time
UW Course Code	U09FUMWE
JACS Code	G6
UCAS Code	GH4P
QAA Subject Benchmarking Group	Computing Benchmark Statement
Professional Body Accreditation	To be submitted to BCS
Date of initial course approval/last review	April 2009
Date of Programme Specification	May 2011

Admissions Requirements
MEng Mobile and Web Computing: 240 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 software engineering, and practical experience enabling them to be effective in a varied and fast-developing range of careers in distributed mobile and web applications development.

3. To provide students with sound knowledge and expertise of software engineering principles across the whole software development lifecycle;

4. Establish an understanding of the importance of distributed software systems in a variety of sectors of industry and public services, and to encourage a disciplined and professional attitude towards the development of such systems;

5. To provide students with the knowledge and practical use of industry tools and techniques to develop distributed applications;

6. 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.

MEng Mobile and Web Computing course aims includes **all** of the above plus:

A7 To provide students with specialised knowledge in software Engineering and practical skills in analysing the complexity of algorithms and evaluating software systems design.

A8 To give students substantial professional experience of working on an Industrial group project.

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 service delivered to students.

Graduates would typically be part of a team building and or maintaining distributed and stand-alone mobile and web-based applications. Graduates may also work on platform building and embedded and real-time stand-alone or distributed systems. The actual role within the team may be designer, programmer, systems administrator, and commerce developer.

Study opportunities within the University of Westminster: PhD study.

Learning Outcomes

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 Have a firm understanding of Internet based distributed systems and be able to specify a system based on given requirements.

LO.2 Design and implement a typical distributed or stand-alone application, working within an industry-standard framework such as J2ME/J2EE, or .NET.

LO.3 Apply software engineering principles in the development of mobile and web applications to ensure software quality.

LO.4 Conceive, plan and execute independent work in the field of mobile and web computing

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

Knowledge and Understanding

With respect to mobile and web computing, 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 three current programming languages.

K3 An understanding of client-server technology and the particular requirements of software development for mobile distributed applications.

K4 A thorough understanding of the 'dimensions of mobile computing' and their impact on mobile application development.

K5 To understand the role of information and content systems, and the impact of distributed data and applications on the mobile environment.

K6 A thorough understanding of the role of modeling and design in software systems.

K7 An understanding of disciplined, engineering-based approaches to software development, and the role and responsibilities of a professional software developer.

K8 An understanding of the principles of data management.

K9 An understanding and appreciation of the professional and ethical issues relevant to the computing industry.

On completion of the MEng course, the students will have (including the above):

K10 A thorough understanding of the principles of software frameworks and design patterns as well as ability to evaluate them for re-usability in problem solving.

K11 Detailed understanding of the mathematical science and practical issues of advanced algorithms for solving complex problems.

Specific Skills

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

LO.1 Be able to design and specify a software system using industry standard techniques.

LO.2 Implement a typical distributed application, working within an industry-standard framework such as J2ME, .NET or web services in at least two different programming languages.

LO.3 Be able to design and specify and implement both thin and thick client applications for mobile devices.

LO.4 Have working knowledge of real-time and embedded systems.

On completion of the MEng course, the student will be able to (including the above):
LO.5 Demonstrate a critical understanding of existing software frameworks and system architectures as well as competence in the design of large scale software systems.

LO.6 Critically evaluate the efficiencies and complexity of advanced algorithms in order to implement them correctly for a software system.

Key Transferable skills

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.

On completion of the MEng course, the student will be able to (including the above):

HE7 Show professional competence in developing a work programme to accommodate ongoing software system developments and to exercise leadership in unfamiliar situations.

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.

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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 BEng course is offered full time over 3 years based on 2 teaching semesters per year. The MEng course is offered full time over 4 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. Modules at Level 7 are generally 20 credits (200 hours of student effort) and make up a total of 120 credits of study. The *ECSC699 Computer Science Project* is 30 credits and the *Industrial Group Project* is 40 credits.

Part time study is possible at all levels. Full-time Undergraduate students study 120 credits or 8 modules per year. The BEng 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 MEng Mobile and Web Computing. Student choice is allowed for by designating a number of modules at levels 5 and 6 as subject-specific *options*. Some, but not all, of these modules will have to be taken to gain the award of MEng Mobile and Web Computing. The course specific regulations in Section 5 of this handbook give full details of what must be taken and passed in order to gain an award.

MEng (Hons) Mobile and Web Computing: Module List

Code	Title	Core/Option	Semester
ECSC410	Software Engineering Principles	Core	30
ECSC404	Computer Systems Fundamentals	Core	15
ECSC405	Software Development Principles (Java)	Core	15
ECSC407	Web Technology	Core	15
ECSC408	Mathematics for Computing	Core	15
ECSC409	Software Engineering Principles II	Core	15
ECSC400	Communication and Learning Skills in Computer Science	Core	15

Award of Certificate of Higher Education available

ECSE501	Object-Oriented Development	Core	30
ECSE502	Algorithms and Data Structures	Option	15
ECSE507	Network Software Development	Option	15
EIGA501	Introduction to 3D Graphics	Option	15
EBSY505	Database Design and Practice I	Option	15
ECWM506	Mobile Computing Principles	Core	15
ECWM511	Mobile Application Development	Core	15
ECWM512	Web Programming	Core	15
EBSY501	Project Management	Option	15
ECSC500	Professional Practice in Computer Science	Core	15
EIMM514	Human Computer Interface Design	Option	15

Award of Diploma of Higher Education available

ECWM601	Native Programming	Core	15
ECWM602	Service Oriented Architecture	Core	15
ECWM604	Advanced Web Technologies	Core	15
ECWM611	Real-Time and Embedded Systems	Core	15
ECWM618	Semantic and Social Web	Core	15
ECSE609	Computer Systems Security	Option	15
ECSE614	Computer Forensics Investigation	Option	15
ECSE615	Computer Systems Administration	Option	15
EBSY605	Advanced Topics in Databases	Option	15
EIMM609	Mobile User Experience	Option	15
EICG602	Networking Games Design and Implementation	Option	15
ECSE608	Requirements Engineering	Option	15
ECSC699	Computer Science Project	Core	30

Award of BEng available

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

Credit Level 7 (MEng)

Code	Title	Status	Value
ECSC798	Research Methods and Professional Practice	Core	20
ECSE703	Software Engineering Context	Core	20
ECSC701	iPhone Application Development	Core	20
ECSE799	Industry Group Project	Core	40
ECSE706	Enterprise Development	Option	20
ECSF701	Computer Forensics Fundamentals	Option	20
ECSC705	Resource Virtualisation	Option	20
	Total Level Six Credit Value Required		180

Award of MEng in Mobile and Web Computing available

Academic Regulations

The MEng Mobile and Web Computing 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.

Assessment of Modules (Level 7)
A *pass* in a module is achieved when the overall mark is greater then or equal to 50%; with at least 40% in the final assessment and any qualifying marks and/or sets achieved as detailed in the module handbook.

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.

In order to progress to Level 6 of the MEng course (or transfer from Level 5 of the BEng to Level 6 of the MEng course), a student must normally obtain a minimum of 120 credits at Level 5. In addition, the average mark obtained from the best modules worth 120 credits at Level 5 must normally be at least 60%. In order to progress from Level 6 to Level 7 of the MEng course, a student must obtain a minimum of 120 credits at Level 6. A student cannot normally attempt any module at the next level until they have fulfilled the progression requirement to that level. In addition, specific prerequisites and co-requisites have to be achieved in order to study each individual module at Credit Levels 5, 6 and 7.

MEng Award

In respect of the modules described in this course scheme, to qualify for the award of MEng Mobile and Web Computing a student must:

(a) have obtained at least 480 credits including:
i) a minimum of 120 credits at Level 4 or higher, of which no more than 15 shall be condoned; and
ii) a minimum of 120 credits at Level 5 or higher, and
iii)a minimum of 120 credits at Level 6 or higher, including the Individual Project, and
iv) a minimum of 120 credits at Level 7 or higher, including the Project

(b) have attempted modules worth no more than 470 credits at Levels 5, 6 and 7. (An attempt

includes a first attempt and any subsequent retake of any module but does not include reassessment without attendance)

An overall average mark for Levels 6 and 7 is calculated with a weighting of 40% for the best 15 modules worth 120 credits at Level 6 and a weighting of 60% for the best modules worth 120 credits at Level 7. The MEng may be awarded with **Distinction** if this overall mark is at least 70% *else* with **Merit** if this overall mark is at least 60% *else* an MEng degree if this overall mark is at least 50%

A student enrolled on the MEng course who fails to fulfil the requirements to be awarded an

MEng degree (or who wishes) may instead be considered for the award of BEng (Honours) degree or BEng degree in accordance with the regulations for those courses. In such cases, credits and marks awarded for Level 6 MEng modules may substitute for Level-6 BEng modules. Other substitutions of Level 7 modules for Level-6 BEng modules may be made at the discretion of the Conferment Board

BEng Honours Award
To qualify for the award of BEng Mobile and Web Computing , 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 to 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 to 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 MEng Mobile and Web Computing course course is under the Computer Science and Software Engineering Department (CSSE) and the management structure supporting the course is as follows:

- Ms Anne-Gaelle Colom, 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:

Mobile and Web Computing BEng/MEng Honours;
http://www.westminster.ac.uk/schools/computing/subjects/computer-science-and-software-engineering/beng-honours-mobile-and-web-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 Baldwin
E: baldwim@wmin.ac.uk

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.