

PROGRAMME SPECIFICATION

Bachelor of Science with Honours (SW) in Software Engineering

Awarding institution	Liverpool John Moores University
Teaching institution	LJMU
JACS Code	I300
Programme Duration	Full-Time: 3 Years, Sandwich Thick: 4 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Computing (2007)
Programme accredited by	BCS, The Chartered Institute for IT
Description of accreditation	Initial CITP, CITP Further Learning and Full CEng. *Confirmation of full accreditation will be sought in 2019.
Validated target and alternative exit awards	Bachelor of Science with Honours in Software Engineering Bachelor of Science with Honours (SW) in Software Engineering Diploma of Higher Education in Software Engineering Diploma in Higher Education (SW) in Software Engineering Certificate of Higher Education in Software Engineering
Programme Leader	Andrew Laws

Educational aims of the programme

The overall aim of the course is to provide a balanced, integrated and practical based education in the tools, techniques and methods employed by the practitioner in the area of Software Engineering in organisations where software development is a major activity.

The specific aims of the course are as follows:

- To enable the student to acquire the skills needed in the investigation of user requirements and the development of a suitable design using the appropriate specifications and design methodologies.
- To enable the student to acquire the skills required to produce software, which meets an external specification to the appropriate timescale and standards.
- To enable the student to acquire the skills needed to determine the quality of software through the appropriate testing, verification and evaluation procedures.
- To enable the student to acquire an understanding of the techniques and methods used in the estimation, planning and control of software projects.
- To provide a suitable learning environment for the practical application of the concepts of software engineering in a realistic software development situation.
- To encourage students to fully engage with the development of employability skills by completing a self-awareness statement.
- To provide students with a fuller, systematic understanding of current and developing Software Engineering.
- To enable students to explore the issues surrounding Software Engineering in Industrial contexts.
- To facilitate students in the development of expertise and interest in topic areas of direct and complementary relevance to the workplace.
- For students undertaking a placement year the aim is to provide students with an extended period of work

experience at an approved partner that will complement their programme of study at LJMU. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment.

Alternative Exit/ Interim Award Learning Outcomes - Certificate of Higher Education

A student who is eligible for this award will be able to:

Develop computer programs using elementary programming constructs.

Understand the software development process.

Apply project management and process models to the development of software solutions.

Design and develop a website with client side functionalities using appropriate tools and techniques.

Discuss computer architecture at the hardware and software levels and basic security concepts.

Model data to create logical and physical entity relationship and construct a database.

Identify a personal development plan to support their career path and recognise ethical, legal and professional aspects that relate to the computing profession.

Communicate effectively and give presentations to an audience.

Alternative Exit/ Interim Award Learning Outcomes - Diploma of Higher Education

A student who is eligible for this award will be able to:

Use object-oriented design in formulating an implementation.

Design, create, maintain and connect to a database.

Identify and implement common data structures and algorithms.

Develop software for a variety of platforms.

Identify and justify choices in programming languages.

Identify the professional skills required within the computing industry.

Demonstrate a range of skills including problems-solving as an individual or as part of a group.

A student who successfully completes a placement year will be eligible for the Sandwich award and will, in addition to the above, be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.

Target award Learning Outcomes - Bachelor of Science with Honours (SW)

A student successfully completing the programme of study will have acquired the following subject knowledge and understanding as well as skills and other attributes.

A student who is eligible for this award will be able to:

1. Complete computer programming as applied to medium to large systems.
2. Undertake a software development process.
3. Understand the relationship of hardware to software.
4. Apply formal methods and modelling techniques.
5. Possess awareness of professional and ethical issues.
6. Have a critical awareness of developing practices in Software Engineering.
7. Effectively manage software development.
8. Use knowledge with originality and be innovative in Software Engineering.
9. Complete problem solving in the context of large computer based systems.
10. Provide systems modelling of computer-based systems as part of the development process.
11. Evaluate tools and methods for selection and use in the development process.
12. Evaluate and test software systems against requirements.
13. Undertake algorithm selection and deployment.
14. Demonstrate systematic and comprehensive knowledge and understanding of Software Engineering

concepts, principles and theories.

15. Use such knowledge with originality in system modelling, requirements analysis and design.
16. Develop and test software systems.
17. Effectively manage software projects.
18. Work as a member of a software development team.
19. Carry out practical systems evaluation.
20. Use a full range Software Development tools.
21. Make effective use of computer systems.
22. Use information technology, e.g. Software Development tools.
23. Apply numerical and formal methods skills to cases involving a quantitative dimension.
24. Communicate effectively by written or verbal means.

Teaching, Learning and Assessment

The methods used to enable outcomes to be achieved and demonstrated are as follows:

Core knowledge and understanding is acquired via lectures, tutorials, practical work, workshops and guided independent study. Independent study is used where appropriate resource material is available and increases as the programme progresses. Specifically, acquisition of 1 is via a combination of lectures, projects, seminars, and guided independent study. Acquisition of 2, 3, 4, 5 and 6 is via a mixture of lectures, tutorials, laboratory work, coursework, and projects. Acquisition of 7 and 8 is via lectures, coursework, projects, seminars, and guided independent study. Students are given feedback on all work produced.

Assessment methods are specified in each module specification. All learning outcomes in a module are assessed and the type of assessment specified for each outcome. Each module is assessed by examination and/or course work. The nature of the course work varies for each module.

Cognitive skills are developed throughout the programme via tutorial, group discussion, teamwork, coursework, projects and presentations. Specifically, skill 1 is developed through tutorial group discussion, teamwork, coursework, projects, and presentations. Skills 2, 3, 4, 5, 6 and 7 are developed through laboratory work, coursework, and projects.

Assessment of skills is by coursework and examinations. The final year project will further demonstrate the student's ability in this area. The assessment method for each module is specified in the module's specification.

Practical skills are developed throughout the programme. The basic skills are provided at the lower levels. These are supplemented at higher levels by more advanced tools and techniques. The various computer programming modules at levels 4 and 5 provide relevant practice in industry standard languages. Problem solving skill is a key aspect of all programming related modules at each level. Some of these skills are practiced in the placement year. Specialist software is available in labs or from specified PCs in the libraries. The individual final year project provides an opportunity for students to apply all the techniques that they have been exposed to in a large-scale development.

Practical skills are assessed via laboratory sessions, workshops, submission of reports, demonstration of systems, industrial placement and individual projects.

Personal Development opportunities are embedded within the programme.

The placement year is assessed, by portfolio, on a pass / fail basis.

Key skills are developed throughout the programme in a variety of forms. Specifically through a combination of research related coursework, guided independent study and projects, examinations, group work and presentations. Skill 1 is developed through a combination of research-related coursework, guided independent study, and projects. Skill 2 is developed through study of technical methods, examinations, coursework, and projects. Skill 3 is developed through report writing for coursework and projects, written examinations, teamwork, presentations, and group discussion.

Key skills are assessed as part of coursework (1), projects (1), written examinations (2,3) and presentations (3).

Programme structure - programme rules and modules

The placement year, module 5106COMSCI, will follow Level 5 and students will be enrolled on a 480 credit honours sandwich programme. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5. Students successfully completing the assessment of the placement year are eligible for a Sandwich award.

Students not undertaking a placement year are registered on the non-sandwich version of the programme and

will have the opportunity of an additional study year abroad following Level 5. Students will be enrolled on a 480 credit honours with study abroad programme. Of those 480 credits, 120 will be taken via a Level 5 study abroad module 5116COMSCI. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5.

Level 6	Potential Awards on completion	Bachelor of Science with Honours (SW)
Core	Option	Award Requirements
6100COMP PROJECT (40 credits) 6110COMP USER EXPERIENCE DESIGN (20 credits) 6129COMP CONTEMPORARY SOFTWARE DEVELOPMENT (20 credits) 6130COMP CLOUD COMPUTING (20 credits) 6131COMP DISTRIBUTED AND EMBEDDED SYSTEMS (20 credits)		120 core credits at level 6 0 option credits at level 6
Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5100COMP RESEARCH SKILLS (10 credits) 5101COMP PROFESSIONAL ISSUES (10 credits) 5102COMP DATABASE SYSTEMS (20 credits) 5104COMP OBJECT ORIENTED SYSTEMS DEVELOPMENT (20 credits) 5117COMP DATA STRUCTURES AND ALGORITHMS (20 credits) 5129COMP PROGRAMMING LANGUAGE THEORY (20 credits) 5130COMP MOBILE AND WEB DEVELOPMENT (20 credits)		120 core credits at level 5 0 option credits at level 5
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4100COMP INTRODUCTION TO PROGRAMMING (20 credits) 4101COMP COMPUTER SYSTEMS (20 credits) 4103COMP PERSONAL AND PROFESSIONAL DEVELOPMENT (10 credits) 4104COMP DATA MODELLING (10 credits) 4120COMP SOFTWARE ENGINEERING PRINCIPLES (20 credits) 4121COMP SOFTWARE ENGINEERING WORKSHOP (20 credits) 4122COMP INTRODUCTION TO INTERNET AND WEB DEVELOPMENT (20 credits)		120 core credits at level 4 0 option credits at level 4

Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
<https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework>

Opportunities for work-related learning (location and nature of activities)

Level 4: 4103COMP Personal and Professional Development - this module provides students with an opportunity to consider their future role as a computing professional and develop a plan to enable them to progress in their chosen career.

Level 5: 5101COMP Professional Issues – this module provides further insight into developing the role of the student becoming a computing professional. Students will be encouraged to become student members of appropriate professional bodies for the computing industry (e.g. ACM, IEEE or BCS) as part of their development.

5106COMSCI Sandwich Year Software Engineering - The aim is to provide students with an extended period of work experience at an approved partner that will complement their programme of study at LJMU. This will give students the opportunity to develop professional skills relevant to their programme of study as well as the attitude and behaviours necessary for employment in a diverse and changing environment.

Criteria for admission

A/AS Level

Applicants should have or expect to obtain a total of 112 UCAS points with a maximum of 20 points from AS level qualifications.

BTEC National Diploma

BTEC Extended Diploma

To the value of 112 UCAS points.

BTEC Diploma / 90 Credit Diploma / Subsidiary Diploma /Certificate

To the value of 112 UCAS points when combined with other qualifications.

Irish Leaving Certificate

Applicants should have or expect to obtain a total of 112 UCAS points overall.

Scottish Higher

Applicants should have or expect to obtain a total of 112 UCAS points overall.

International Baccalaureate

Applicants should have or expect to obtain a total of 112 UCAS points overall.

Other

Qualifications deemed equivalent to the above upon completion of appropriate assessment will be considered acceptable.

Applicants should have five GCSE (or equivalent) passes of at least grade C including Mathematics and English (or IELTS 6.0).

BSc Software Engineering to MCOMP Software Engineering transfer is allowed with the permission of the Programme Leader and the maintenance of good academic performance, normally with averages above 60% at levels 4 and 5. Such requests for transfer must be made before the end of level 5 of the programme.

Mature entry

Mature applicants will be considered on a case-by-case basis. The admissions team will be particularly concerned with the length of time since any relevant academic study and relevant background from work experience or 'Access' courses.

Overseas qualifications

Applicants offering other awards will be considered on an individual basis in line with the agreed entry criteria. All applicants should have achieved IELTS 6 or equivalent.

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.
- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

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, teaching, learning and assessment methods of each module can be found in module and programme guides.