

## PROGRAMME SPECIFICATION

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### Bachelor of Science with Honours (SW) in Software Engineering

<b>Awarding institution</b>	Liverpool John Moores University
<b>Teaching institution</b>	Liverpool John Moores University
<b>JACS Code</b>	I300
<b>Programme Duration</b>	
<b>Language of Programme</b>	All LJMU programmes are delivered and assessed in English
<b>Subject benchmark statement</b>	Computing (2007)
<b>Programme accredited by</b>	British Computer Society
<b>Description of accreditation</b>	CITP (Full Fulfilment), CEng and CSci (Partial Fulfilment) <a href="http://www.engc.org.uk/education--skills">http://www.engc.org.uk/education--skills</a>
<b>Validated target and alternative exit awards</b>	<p>Bachelor of Science with Honours in Software Engineering</p> <p>Bachelor of Science with Honours (SW) in Software Engineering</p> <p>Bachelor of Science in Software Engineering</p> <p>Bachelor of Science (SW) in Software Engineering</p> <p>Diploma of Higher Education in Software Engineering</p> <p>Certificate of Higher Education in Software Engineering</p>
<b>Programme Leader</b>	Martin Randles

### 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 World of Work programme, including World of Work Skills Certificate and, as a first step towards this, to complete Bronze (Self Awareness) Statement.

## **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. Apply a variety of tools and techniques for website design including Human-Computer Interaction (HCI) principles. Discuss the technical challenges of social computing and investigate the ethical, commercial and economic issues within this field. Discuss a range of practical aspects of computing and apply the associated tools and techniques used in them. Discuss computer architecture at the hardware and software levels and basic security concepts. On the completion of Level 4 of the programme, the student will have a good understanding of the basics of the field of computing. They will understand the different approaches required to solve computer-based problems. They will have the skills and ability to communicate their ideas and take personal responsibility for their learning.

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

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

From level 5 material the students will have an understanding of the software development process. Been introduced to formal methods. Use object-oriented design in formulating an implementation. Be able to design, create and maintain a database. Analyse the structure of computer networks, architectures and their protocols. Identify the professional skills required within the computing industry.

## **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. Computer Programming as applied to medium to large systems.
2. The software development process.
3. Relationship of hardware to software.
4. The role and use of formal methods and modelling techniques.
5. Awareness of professional and ethical issues.
6. Problem solving in the context of large computer based systems.
7. Systems modelling of computer-based systems as part of the development process.
8. Evaluation of tools and methods for selection and use in the development process.
9. Evaluation and testing of systems against requirements.
10. Algorithm selection and deployment.
11. Develop and test software systems.
12. Effectively manage software projects.
13. Work as a member of a software development team.
14. Carry out practical systems evaluation.
15. Use a full range Software Development tools
16. Effective use of computer systems.
17. Use information technology, e.g. Software Development tools.
18. Apply numerical and formal methods skills to cases involving a quantitative dimension.
19. Communicate effectively by written or verbal means.
20. Plan and manage learning and development.

## **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.

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.

Skills are developed by a mixture of small group tutorials, workshops, team working and applying skills to independent practical work.

Assessment of skills is by coursework and examinations.

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. Some of these skills are practised in the placement year.

Specialist software is available in School labs or from specified PCs in the Learning Resource Centres.

Assessment is normally by course work.

The placement year is assessed on a pass/fail basis dependent on satisfactory Company and University Supervisor reports and the student's own report.

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. Skill 4 is developed via the management of learning tasks and deadlines for coursework and projects.

Key skills are assessed as part of coursework (1-4), projects (1-4), written examinations (2,3) and presentations (3).

## Programme structure - programme rules and modules

The programme is modular in construction. Modules are normally 12, 24 or 36 credits (equivalent to 120/240/360 hours of study). Students study 120 credits per level. There are core (compulsory) modules at each level, plus a number of optional modules at level 6. Students will undertake a professional placement year between levels 5 and 6. Students successfully completing the placement year are eligible for a Sandwich award.

Level 6	Potential Awards on completion	Bachelor of Science with Honours (SW)
Core	Option	Award Requirements
6001PROJ SOFTWARE DEVELOPMENT PROJECT (36 credits) 6044COMP ADVANCED SOFTWARE DEVELOPMENT (24 credits) 6060COMP REAL-TIME SYSTEMS (24 credits) 6062COMP USABILITY ENGINEERING (24 credits)	6037COMP COMPUTING IN EDUCATION (12 credits) 6038COMP WORK PLACEMENT EVALUATION (12 credits) 6046COMP CLOUD COMPUTING (12 credits) 6053COMP EMPLOYABILITY AND THE WORKPLACE (12 credits) 6055COMP GREEN AND SUSTAINABLE COMPUTING (12 credits) 6061COMP TECHNOLOGY ENTREPRENEURSHIP (12 credits) 6067COMP MAINFRAME COMPUTING (12 credits)	108 core credits at level 6 12 option credits at level 6
Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5019COMP DATABASE DESIGN, APPLICATIONS AND MANAGEMENT (24 credits) 5030COMP PRINCIPLES OF SOFTWARE ENGINEERING (24 credits) 5041COMP COMPUTER NETWORKS (24 credits) 5046COMP OBJECT ORIENTED SOFTWARE DEVELOPMENT (24 credits)		120 core credits at level 5 0 option credits at level 5

5067COMP DATA STRUCTURES AND ALGORITHMS (24 credits)		
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4000COMP WEB DESIGN AND HCI (24 credits) 4001COMP INTRODUCTION TO COMPUTER PROGRAMMING (24 credits) 4004COMP COMPUTING AND SOCIETY (24 credits) 4005COMP COMPUTING IN PRACTICE (24 credits) 4008COMP COMPUTER SYSTEMS (24 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)

Industrial Placement - Students are encouraged to undertake a 12 month placement (including statutory holiday entitlement) in the programme-related area that is part of the Sandwich degree.

To pass the industrial placement:

- The University Tutor must award at least a pass grade (the mid-point on a five point scale)
- The Company Tutor must award at least a pass grade (the mid-point on a five point scale)
- The University Tutor must award at least a pass grade (the mid-point on a five point scale) to the Professional Placement Report written by the student

-The student must complete a period of no less than 12 continuous months (including statutory holiday entitlement) of approved professional training.

Level 6:- 6038COMP Computing in Education (Option) - Students who are interested in a career in teaching can apply for consideration at a position with a local school or college, attending one half day per week. This gives them first-hand experience of teaching computing in schools or colleges and allows them to develop their World of Work skills.

Level 6:- 6037COMP Work Placement Evaluation (Option) - This option module allows the student to reflect on their work placement in greater depth than their placement report, evaluate their development of graduate skills during the placement year, and plan their future learning requirements to enhance their employability.

Level 6:- 6053COMP Employability and the Workplace (Option) - LJMU's WoW initiative has been recognised as an innovative approach to improving the employability skills of graduates. This module operates in conjunction with a development programme at LJMU's Graduate Development Centre and enables students to critically evaluate their own employability skills and further improve on these via the GDC WoW certification process if desired.

Level 6:- 6061COMP Technology Entrepreneurship (Option) - This module prepares those students who wish to enter the world of self-employment upon graduation by examining the production of a business plan to support their own idea. With on-going support from the team at the University's Centre for Entrepreneurship, students will be guided in developing their idea through the initial stages of business development.

Level 6:- 6067COMP Mainframe Computing (Option) - This module prepares those students who wish to undertake possible future professional accreditation in the field of mainframe computing. Delivered in conjunction with IBM, this module provides hands-on theory and experience in using mainframe technologies and follows the IBM certificated curriculum.

Further information about Graduate Skills can be found at:

<http://www.ljmu.ac.uk/worldofwork/123832.htm> (The World of Work Careers Centre website)

<http://www.ljmu.ac.uk/eaqs/128262.htm> (Methods of Practice - Section 5 Work Related Learning and Additional Information)

## Criteria for admission

### **A/AS Level**

280 UCAS points to include 2 A-levels or Double Award

### **BTEC National Diploma**

280 UCAS points

### **AVCE**

280 UCAS points

### **Irish Leaving Certificate**

280 UCAS points

### **Scottish Higher**

280 UCAS points

### **International Baccalaureate**

25 points

### **Access**

Pass

### **Higher national diploma**

Pass

### **Other**

In addition to 280 UCAS points applicants should have five GCSEs at grade C or above including GCSE Mathematics grade C and English Language grade C

### **Mature entry**

Without the necessary qualifications but relevant experience are encouraged to apply and may be requested to attend an interview and aptitude test.

### **Overseas qualifications**

Offers will be based on individual qualifications and experience. All applicants should have achieved IELTS 6.0.

## 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](http://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.*