

# PROGRAMME SPECIFICATION

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## Bachelor of Science with Honours (SW) in Computer Security

<b>Awarding institution</b>	Liverpool John Moores University
<b>Teaching institution</b>	LJMU
<b>UCAS Code</b>	I990
<b>JACS Code</b>	I100
<b>Programme Duration</b>	Full-Time: 4 Years, Sandwich Thick: 5 Years
<b>Language of Programme</b>	All LJMU programmes are delivered and assessed in English
<b>Subject benchmark statement</b>	Computing (2019)
<b>Programme accredited by</b>	BCS, The Chartered Institute for IT
<b>Description of accreditation</b>	Accredited by BCS, the Chartered Institute for IT for the purposes of fully meeting the academic requirement for registration as a Chartered IT Professional. Accredited by BCS, the Chartered Institute for IT on behalf of the Engineering Council for the purposes of partially meeting the academic requirement for registration as a Chartered Engineer
<b>Validated target and alternative exit awards</b>	Bachelor of Science with Honours in Computer Security  Bachelor of Science with Honours (SW) in Computer Security  Diploma of Higher Education in Computer Security  Diploma in Higher Education (SW) in Computer Security  Certificate of Higher Education in Computer Security
<b>Programme Leader</b>	Thomas Berry

## Educational aims of the programme

The two principal themes in the programme are the development of computer science skills relating to information security, and the associated software engineering, management and analysis skills required to enact successful information security within networked computing environments. This is underpinned by themes of computing, networking and software engineering. The main aims are:

- To provide students with the technical skills required for the development of computer security software solutions.
- To enable the student to acquire the skills needed in the investigation of user requirements and the development of a suitable software design using the appropriate specifications and design methodologies.
- To prepare students with the management skills required to implement Computer security.
- To provide students with the knowledge of the wide range of issues involved in the implementation of Computer security, such as legal, ethical and privacy requirements.
- To encourage students to engage with the development of employability skills by completing a self-awareness statement.
- To provide students with a comprehensive understanding, critical awareness and ability to conduct evaluation of current computer security research issues.
- To further develop students' originality in applying analytical, creative, problem solving and research skills.
- To provide advanced, conceptual understanding, underpinning career development, innovation and further study such as PhD in the area of Computer Security.
- 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.

Discuss computer systems at the hardware and software levels.

Understand the different approaches required to solve computer-based problems.

Discuss a range of practical aspects of computing and apply the associated tools and techniques.

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

Design and develop a website using appropriate tools and techniques.

Communicate their ideas and take personal responsibility for their learning.

Discuss a range of computing challenges specific to Computer Security.

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

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

Identify software security requirements and use secure development methods in an implementation.

Provide evidence of experience in a number of information security management methods (e.g. risk analysis).

Describe the structure of operating systems and apply the underlying principles.

Use security software tools to perform computer system vulnerability analysis.

Understand how databases are structured, how to query them for information and be able to develop a database to solve a problem.

Understand the ethical and professional issues involved in working in the computing industry.

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. Apply Computer Programming techniques to solve computer security problem.
2. Manage a software development process, including secure software development.
3. Work on computer security problems in an ethical way.
4. Design, plan and execute complex network security investigations.
5. Use a wide range of IT infrastructure such as hardware / network configurations, types of systems, development tools, and emerging technologies to solve computing problems.
6. Critically reflect on a wide range of security knowledge domains, such as physical and logical security, legal issues, privacy, internet security, and protection including forensics.
7. Deploy a wide range of appropriate computing tools, facilities and techniques to solve a computer security problem.
8. Utilise complex methods and skills to solve well-defined computer-based problems.
9. Reflect on the impact of new technologies / standards / legal requirements on the security domain.
10. Critically evaluate and test theories, concepts and systems relating to computer security.
11. Plan, conduct and report a research project.
12. Critically analyse evidence data for an security investigation.
13. Evaluate security investigation and response methodologies.
14. Work professionally as a member of a team.

15. Identify and deploy appropriate tools and techniques for ethical hacking and security investigations.
16. Conduct research into Computer Security.
17. Apply numerical methods to computing problems involving a quantitative dimension.
18. Communicate complex information effectively by written or verbal means.
19. Identify job roles and opportunities that reflect personal interest and expertise.
20. Plan and manage personal learning and development

## Alternative target awards

*A student who is eligible for the following awards will be able to:*

Bachelor of Science with Honours in Computer Security -

A student successfully completing this award will have acquired the subject knowledge and understanding as well as skills and other attributes as detailed above but will not have successfully completed a placement year.

## Teaching, Learning and Assessment

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

Acquisition of the skills is through a combination of lectures, tutorials, practical sessions and laboratory work.

These skills are assessed across the 3 levels of the programme in a range of different assessments such as coursework, presentations and examinations.

Throughout the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught / learnt and to broaden their individual knowledge and understanding of the subject.

## Programme structure - programme rules and modules

The placement year, module 5102COMSCI, 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 5112COMSCI. 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.

Students starting on this programme prior to September 2021 will be required to complete the modules specified in the programme specification in force when they commenced their study. This requirement may be varied should a student take a leave of absence or be required to complete final module attempts.

Level 6	Potential Awards on completion	Bachelor of Science with Honours (SW)
Core	Option	Award Requirements
6200COMP Project (40 credits) 6202COMP Network Forensics (20 credits) 6213COMP Network Defence (20 credits) 6217COMP Ethical Hacking (20 credits) 6218COMP Applied Cryptography (20 credits)		120 core credits at level 6 0 option credits at level 6
Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5200COMP Group Project (20 credits) 5202COMP Database Systems (20 credits)		120 core credits at level 5 0 option credits at level 5

5203COMP Operating Systems (20 credits) 5216COMP System Penetration Testing (20 credits) 5218COMP Secure Software Development (20 credits) 5219COMP Information Security Management (20 credits)		
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4200COMP Introduction to Programming (20 credits) 4201COMP Computer Systems (20 credits) 4203COMP Professional Practice (10 credits) 4204COMP Data Modelling (10 credits) 4205COMP Introduction to Computer Forensics and Security (20 credits) 4214COMP Problem Solving for Computer Security (20 credits) 4222COMP Introduction to 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: 4203COMP Professional Practice - 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: 5200COMP Group Project – this module provides further insight into developing the role of the student becoming a computing professional, via teamwork and consideration of professional issues within computer security. 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.

5102COMSCI Sandwich Year Computer Security - 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).

### **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](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.*