

## PROGRAMME SPECIFICATION

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### Bachelor of Science with Honours (SW) (Fnd) in Computer Networks

<b>Awarding institution</b>	Liverpool John Moores University
<b>Teaching institution</b>	LJMU
<b>UCAS Code</b>	I113
<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 (2007)
<b>Programme accredited by</b>	BCS, The Chartered Institute for IT
<b>Description of accreditation</b>	Initial CITP and CEng (partial fulfilment). *Confirmation of full accreditation will be sought in 2021.
<b>Validated target and alternative exit awards</b>	<p>Bachelor of Science with Honours (Fnd) in Computer Networks</p> <p>Bachelor of Science with Honours (SW) (Fnd) in Computer Networks</p> <p>Diploma of Higher Education (Fnd) in Computer Networks</p> <p>Diploma in Higher Education (SW) (Fnd) in Computer Networks</p> <p>Certificate of Higher Education (Fnd) in Computer Networks</p>
<b>Programme Leader</b>	Denis Reilly

### Educational aims of the programme

The two principal themes in the programme are the development of computer science skills relating to networked digital information systems (from here on 'Computer Networks'), and the associated software engineering, technology and analysis skills required to develop and maintain successful Computer Networks. The main aims are:

- To provide students with the technical skills required for the development of Computer Network 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 technology management skills required to implement and maintain Computer Networks
- To provide students with the knowledge of the wider issues involved in the implementation of Computer Networks, 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 Networks research issues.
- 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 (Fnd)**

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

- Develop computer programs using elementary programming constructs.
- 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 computer networking concepts.
- Understand a range of core concepts in Computer Science.
- Understand different approaches required to solve computer-based problems.
- Demonstrate 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 (Fnd)**

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

- Apply research skills to support the analysis of a problem and the development and evaluation of a solution.
- Understand various ethical, professional and legal issues involved in working in the computing industry.
- Understand how databases are structured and how to query them for information to solve computing problems.
- Describe the structure of a typical operating system and apply principles to administer a networked system.
- Implement appropriate data structures and algorithms to computing problems.
- Understand the distributed system paradigm and how it makes use of computer networks.
- Understand the demands of mobile computing in terms of constraints on computer networks.

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) (Fnd)**

*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 computing problems.
2. Appreciate the software development process, including for networked software.
3. Demonstrate awareness of professional, legal, security and ethical issues.
4. Understand networking principles including data communication, protocols, performance.
5. Use a computer programming language to develop a networked application.
6. Display professionalism: organization, management, team work, and ethics.
7. Understand IT infrastructure, especially the Internet and related technologies.
8. Appreciate security threats and risks in networked systems, including vulnerabilities, attacks, privacy, and forensics.
9. Apply a range of contemporary tools & techniques used in the development of complex networked systems.
10. Demonstrate how to effectively manage and maintain a computer network.
11. Apply knowledge and understanding of facts, concepts, principles and theories relating to computer networks.
12. Collect and synthesise information from a variety of sources.
13. Utilise methods and skills to solve well-defined computer-networks problems.
14. Reflect on the impact of new technologies / standards / legal requirements in the area.
15. Evaluate and test theories, concepts and systems.
16. Demonstrate the skills necessary to plan, conduct and report a research project.
17. Specify, design and construct programs to be used for the purpose of computer networking.
18. Analyse user requirements for a networked system.

19. Plan, manage, diagnose and maintain a small-scale computer network.
20. Work effectively as a member of a team.
21. Identify appropriate tools and techniques to be used in computer networks.
22. Use information technology, e.g. Web and internet, for effective information retrieval.
23. Apply numerical skills to cases involving a quantitative dimension.
24. Communicate effectively by written or verbal means.
25. Plan and manage learning and development.

## Alternative target awards

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

Bachelor of Science with Honours (Fnd) in Computer Networks -

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 core knowledge and understanding is through a combination of lectures, tutorials, practical sessions and laboratory work.

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.

Knowledge and understanding is assessed via formal examination, individual and team coursework, demonstration of practical work, and a full-scale individual project at Level 6.

Cognitive skills are partly assessed via formal examinations, but mainly through coursework assessment. The Level 6 project allows a student to demonstrate his/her cognitive skills.

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 such as virtual machines and private-cloud systems are available in department-maintained labs or remotely from specified PCs in the libraries.

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.

Key skills are assessed as part of coursework, projects, written examinations and presentations.

## Programme structure - programme rules and modules

The placement year, module 5108COMSCI, will follow Level 5 and students will be enrolled on a 600 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 600 credit honours with study abroad programme. Of those 600 credits, 120 will be taken via a Level 5 study abroad module 5118COMSCI. 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) (Fnd)
Core	Option	Award Requirements
6100COMP PROJECT (40 credits) 6113COMP NETWORK DEFENCE (20 credits) 6114COMP INFRASTRUCTURE AND SERVICES (20 credits)		120 core credits at level 6 0 option credits at level 6

6116COMP INTERNET OF THINGS (20 credits) 6133COMP Advanced Topics in Networking (20 credits)		
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) 5103COMP OPERATING SYSTEMS (20 credits) 5115COMP DISTRIBUTED SYSTEMS (20 credits) 5116COMP MOBILE COMPUTING (20 credits) 5132COMP NETWORK TECHNOLOGIES (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) 4102COMP INTERNET AND WEB TECHNOLOGIES (20 credits) 4103COMP PERSONAL AND PROFESSIONAL DEVELOPMENT (10 credits) 4104COMP DATA MODELLING (10 credits) 4112COMP PRINCIPLES OF COMPUTER NETWORKS (20 credits) 4113COMP NETWORK SOFTWARE DEVELOPMENT (20 credits)		120 core credits at level 4 0 option credits at level 4
Level 3	Potential Awards on completion	
Core	Option	Award Requirements
3100FNDET Algorithms and Computing (10 credits) 3101FNDCMP Engineering and Technology Practice (20 credits) 3102FNDET Foundation Mathematics for Engineering and Technology 1 (20 credits) 3103FNDET Foundation Mathematics for Engineering and Technology 2 (20 credits) 3106FNDET Programming (10 credits) 3107FNDET Introductory Foundation Physics (20 credits) 3109FNDCMP Information Systems Development (20 credits)		120 core credits at level 3 0 option credits at level 3

## 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.

5108COMSCI Sandwich Year Computer Networks - 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 88 UCAS points with a maximum of 20 points from AS level qualifications.

### BTEC National Diploma

BTEC Extended Diploma

To the value of 88 UCAS points.

BTEC Diploma / 90 Credit Diploma / Subsidiary Diploma /Certificate

To the value of 88 UCAS points when combined with other qualifications.

### Irish Leaving Certificate

Applicants should have or expect to obtain a total of 88 UCAS points overall.

### Scottish Higher

Applicants should have or expect to obtain a total of 88 UCAS points overall.

### International Baccalaureate

Applicants should have or expect to obtain a total of 88 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 Computer Networks to MCOMP Computer Networks 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.

Admissions to the Foundation Year will follow the University Admissions policies on widening participation, equal opportunities, and students with disabilities.

### 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.*