

PROGRAMME SPECIFICATION

Bachelor of Science with Honours in Computer Security

Awarding institution	Liverpool John Moores University
Teaching institution	YPC International College (Kolej Antarabangsa YPC)
JACS Code	
Programme Duration	Full-Time: 3 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Computing (2007)
Programme accredited by	
Description of accreditation	
Validated target and alternative exit awards	Bachelor of Science with Honours in Computer Security Diploma of Higher Education in Computer Security Certificate of Higher Education in Computer Security
Link Tutor	Glyn Hughes

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.

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 a range of practical aspects of computing and apply the associated tools and techniques used in them.
- Discuss computer systems at the hardware and software levels and basic security concepts.
- Understand the basics of the field of computing.
- Understand the 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

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 assurance methods (e.g. risk analysis).

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

Use object-oriented design in formulating an implementation.

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.

Target award Learning Outcomes - Bachelor of Science with Honours

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 to medium to large systems.
2. Use the software development process, including secure software development.
3. Have an awareness of professional and ethical issues.
4. Use Networking concepts to solve problems and perform network investigations.
5. Use Programming Fundamentals: Software development process, syntax and semantics, problem analysis, testing, debugging.
6. Have professionalism: organisational theory, management theory, professional ethics.
7. Use IT infrastructure: hardware / network configurations, communication, types of systems, development tools, developing technologies.
8. Have knowledge of Security: Physical and logical security, legal issues, privacy, internet security, protection including forensics.
9. Knowledge and understanding of facts, concepts, principles and theories relating to computer security.
10. Collect and synthesise information from a variety of sources.
11. Utilise methods and skills to solve well-defined computer-based problems.
12. Reflect on the impact of new technologies / standards / legal requirements in the area.
13. Critically evaluate and test theories, concepts and systems.
14. Demonstrate the skills necessary to plan, conduct and report a research project.
15. Specify, design and construct programs to be used for the purpose of computer security.
16. Analyse evidence data for an investigation.
17. Evaluate investigation methodologies in terms of general attributes.
18. Work as a member of a team.
19. Identify appropriate tools and techniques to be used for an investigation.
20. Conduct research into Computer Security and related topics.
21. Use information technology, e.g. Web and internet, for effective information retrieval.
22. Apply numerical skills to cases involving a quantitative dimension.
23. Communicate effectively by written or verbal means.
24. Plan and manage learning and development.

Teaching, Learning and Assessment

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

Acquisition of the skills 1 - 24 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

Level 6	Potential Awards on completion	Bachelor of Science with Honours
Core	Option	Award Requirements
6600YPROJ PROJECT (40 credits) 6602YCOM NETWORK FORENSICS (20 credits) 6613YCOM NETWORK DEFENCE (20 credits) 6617YCOM ETHICAL HACKING (20 credits) 6618YCOM 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
5600YCOM RESEARCH SKILLS (10 credits) 5601YCOM PROFESSIONAL ISSUES (10 credits) 5602YCOM DATABASE SYSTEMS (20 credits) 5603YCOM OPERATING SYSTEMS (20 credits) 5618YCOM SECURE SOFTWARE DEVELOPMENT (20 credits) 5619YCOM INFORMATION ASSURANCE (20 credits) 5630YCOM DATA STRUCTURES AND ALGORITHMS (20 credits)		120 core credits at level 5 0 option credits at level 5
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4600YCOM INTRODUCTION TO PROGRAMMING (20 credits) 4601YCOM COMPUTER SYSTEMS (20 credits) 4602YCOM INTERNET AND WEB TECHNOLOGIES (20 credits) 4603YCOM PERSONAL AND PROFESSIONAL DEVELOPMENT (10 credits) 4604YCOM DATA MODELLING (10 credits) 4605YCOM INTRODUCTION TO COMPUTER FORENSICS AND SECURITY (20 credits) 4614YCOM PROBLEM SOLVING FOR COMPUTER SECURITY (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: 4603YCOM 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: 5601YCOM 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.

Criteria for admission

Other

For admission to Level 4 of the programme. School/College leavers who have reached 17.5 years on admission would normally be required to have achieved the following:

STPM (Malaysian Higher School Certificate) - two (2) principal passes + two (2) subsidiary passes (equivalent to A-levels) in appropriate subjects.

OR - Foundation in Business & Information Technology from YPC International College.

OR - Any qualification deemed equivalent by the Programme Team and Link Tutor as entry-level education.

For admission directly to Level 5 of the programme, a student would normally be required to have achieved the following:

SPM - 3 credits in English Language and other relevant subjects (equivalent to O-levels) plus a YPC International College Diploma in Cyber Security with a minimum 2.5 Cumulative Grade Point Average (CGPA) score.

OR

SPM - 3 credits in English Language and other relevant subjects (equivalent to O-levels) plus a MQA approved Diploma in an appropriate discipline - with a minimum 2.5 Cumulative Grade Point Average (CGPA) score.

In each case the YPC International College Programme Co-Ordinator will assess English Language capability (such as MUET Band 3 / IELTS 5.5) and if necessary, place students on an appropriate English Language programme.

The content of the MQA approved Diploma will be subject to LJMU's RP(E)L process.

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.