PROGRAMME SPECIFICATION

Bachelor of Science with Honours (SW) in Computer Games Development

Awarding institution	Liverpool John Moores University
Teaching institution	Liverpool John Moores University
JACS Code	I160
Programme Duration	
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 Games Development
	Bachelor of Science with Honours (SW) in Computer Games Development
	Bachelor of Science in Computer Games Development
	Bachelor of Science (SW) in Computer Games Development
	Diploma of Higher Education in Computer Games Development
	Certificate of Higher Education in Computer Games Development
Programme Leader	Abdennour El-Rhalibi

Educational aims of the programme

The specific aims of the programme are as follows:

-To provide students with a comprehensive understanding of current and developing computer games

technologies and research issues.

-To provide students with relevant technical skill and experience in computer games development.

-To provide a platform for career development, innovation and/or further postgraduate study.

-To develop students' analytical, creative, problem-solving and evaluation skills

-To help our students to develop the skills to become autonomous learners.

-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.

The Computer Game Development programme meets the QAA benchmark statements for the subject of Computing. In addition, the programme has also addressed the guidance provided by IGDA and Skillset.

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:

After completing the fifth level, students should have a good understanding of the principles of computer games technology and programming. They should be able to apply this knowledge and its underpinning computing background to solve problems related to computer games development. They should be able to analyse the effectiveness of the solution by means of testing and evaluation. They should be able to interpret available information and make comparisons. They should be able to demonstrate a range of skills including problems-solving as individual or as part of a group.

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. Be able to demonstrate sound understanding and knowledge of the fundamentals of computing and computer systems.

2. Be able to apply their basic knowledge in a broad range of computing subject to derive solutions to general computing problems.

3. Have analysed and developed a major piece of work in the area individually or as part of a group.

4. Be able to review the theoretical and conceptual frameworks of software and computer game development.

5. Be able demonstrate comprehensive understanding of the current and state-of-the-art computer game technologies.

6. Be able to apply their subject specific knowledge together with its underpinning computing background to solve wide range of familiar problems related to computer games development.

7. Be able to use their knowledge to propose and implement solutions to unfamiliar problems related to computer games development.

8. Be able to analyse and critically evaluate the effectiveness of their solutions using structured evaluation and testing methodologies.

9. Be able to explain the core concept behind computer graphics and computer animation techniques.

10. Be able to explain the core mathematics principles used in computer graphics applications and computer game software.

11. Be able to demonstrate comprehensive understanding in Object Oriented approach to computer game development using appropriate tools and computer programming languages.

12. Be able to demonstrate good understanding in data representation and manipulation and their relevance to computer game development.

13. Have sound knowledge on aspects of programming languages suitable in computer games development.

14. Have good understanding on the Memory, CPU and GPU optimization processes to improve the performance of game software.

15. Design, develop, prototype and evaluate a computer game as part of a team.

16. Apply structured and formal software engineering techniques in the development of game software.

17. Describe design decisions in a computer game development using appropriate diagrams and schematics.

18. Confidently use a range of high level programming languages to implement a computer game design.

19. Use Integrated Development Environment software to manage a software development project.

20. Select and use appropriate data structures to optimally solve computer game programming problems.

21. Safely manage memory allocation and hardware resources in a game programming context.

22. Use appropriate software tools to create 3D models with animations and export them to game development project.

23. Develop two-dimensional and three-dimensional graphical application using appropriate graphics API.

24. Use relevant mathematical and physics concepts in game software development.

25. Use a wide range of optimisation tools and algorithms and benchmark the results.

26. Compile a professional portfolio of work which demonstrates the student's ability and experience.

27. Apply project management skills to enhance problem solving efficiency and effectiveness.

28. Work effectively both as an individual and as a member of a team.

29. Report on research findings in an analytical and critical way.

30. Apply desktop applications to enhance problem solving efficiency and professionalism.

31. Communicate effectively in various ways using a range of media.

32. Exhibit self-motivation and respond positively to supervision.

33. Identify job roles and opportunities that reflect personal interest and expertise.

Teaching, Learning and Assessment

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

Core knowledge and understanding are achieved through the use of a range of appropriate teaching methods.

Based on the philosophy that students learn through active participation, these methods will incorporate, whenever possible, student-oriented activities and practical work.

Students are motivated by being given a specific task with an achievable outcome, ranging from completion of a small tutorial exercise to a full-scale individual project at level three.

Acquisition of programme outcomes are done through a combination of lectures, tutorials, workshop, laboratory work, seminars, coursework (both individual and team work), project and guided independent study.

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

The Knowledge and Understanding Learning Outcomes will be assessed via formal examination, individual and team coursework, demonstration of practical work, and completion of final year project.

Assessment method for each module is specified in modules specification. Each module is assessed by examination and/or coursework.

Subject specific skills are developed through a mixture of small group tutorials, workshops, team working and course work assignments.

Subject specific skills are assessed by coursework and formal exams.

The final year project will demonstrate the student's ability in this area.

Assessment method for each module is specified in modules specification. Each module is assessed by examination and / or coursework.

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 Library.

Practical skills are reinforced by the use of workshop-based sessions at each level, and the production of a portfolio of game project.

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.

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 inherent within the programme.

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 coursework and projects. Skill 2 is developed through report writing for coursework and projects, written examinations, teamwork, presentations, and group discussion. Skill 3is developed through a combination of research-related coursework, guided independent study, and projects. Skill 4 is developed via the study of real life game development team and through coursework.

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

Programme structure - programme rules and modules

The programme is modular in construction. Modules are normally 24 credits (equivalent to 240 hours of study) delivered over two semesters, with one 36-credit final year project module and one 12-credit option module at level six. Students are required to study a total of 120 credits per level. There are core (compulsory) modules at each level, plus a number of choice modules at level six.

Students normally will undertake a placement year between levels 5 and 6. Students successfully completing the assessment of the placement year are eligible for a Sandwich award.

At level 6 students must select one 24 credit option and one 12 credit option. The 24 credit option should be selected from the following:

6059COMP MULTIPLAYER ONLINE GAMES DEVELOPMENT

6054COMP GAME CONSOLE TECHNOLOGIES AND PROGRAMMING

The 12 credit option should be selected from the following:

6037COMP COMPUTING IN EDUCATION

6038COMP WORK PLACEMENT EVALUATION

6046COMP CLOUD COMPUTING

6053COMP EMPLOYABILITY AND THE WORKPLACE

6055COMP GREEN AND SUSTAINABLE COMPUTING

6061COMP TECHNOLOGY ENTREPRENEURSHIP

6067COMP MAINFRAME COMPUTING

Level 6	Potential Awards on completion	Bachelor of Science with Honours (SW)
Core	Option	Award Requirements
6000PROJ PROJECT (36 credits) 6041COMP ADVANCED COMPUTER GAMES DEVELOPMENT (24 credits) 6065COMP ADVANCED COMPUTER GRAPHICS (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) 6054COMP GAME CONSOLE TECHNOLOGIES AND PROGRAMMING (24 credits) 6055COMP GREEN AND SUSTAINABLE COMPUTING (12 credits) 6059COMP MULTIPLAYER ONLINE GAMES DEVELOPMENT (24 credits) 6061COMP TECHNOLOGY ENTREPRENEURSHIP (12 credits) 6067COMP MAINFRAME COMPUTING (12 credits)	84 core credits at level 6 36 option credits at level 6

Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5002MATHS MATHEMATICS AND 3D COMPUTER GRAPHICS (24 credits) 5025COMP COMPUTER GAMES DESIGN AND TECHNOLOGY (24		120 core credits at level 5 0 option credits at level 5

credits) 5046COMP OBJECT ORIENTED SOFTWARE DEVELOPMENT (24 credits) 5059COMP COMPUTER GAMES DEVELOPMENT (24 credits) 5066COMP DIGITAL STORYTELLING AND MACHINIMA (24 credits)		

Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4001COMP INTRODUCTION TO COMPUTER PROGRAMMING (24 credits) 4004COMP COMPUTING AND SOCIETY (24 credits) 4008COMP COMPUTER SYSTEMS (24 credits) 4012COMP INTERACTIVE MEDIA AND GAMES DEVELOPMENT (24 credits) 4013COMP MATHEMATICS AND 2D COMPUTER GRAPHICS (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)

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

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.