

## Liverpool John Moores University

Title: COMPUTER GAMES PROGRAMMING AND WORKSHOP  
Status: Definitive  
Code: **5026COMP** (102970)  
Version Start Date: 01-08-2011

Owning School/Faculty: Computing and Mathematical Sciences  
Teaching School/Faculty: Computing and Mathematical Sciences

Team	Leader
Mark Allen	Y

**Academic Level:** FHEQ5  
**Credit Value:** 24.00  
**Total Delivered Hours:** 74.00  
**Total Learning Hours:** 240  
**Private Study:** 166

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	48.000
Practical	24.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Group report	50.0	
Exam	AS2	Examination	50.0	2.00

### Aims

1. To develop the concepts of object oriented philosophy as applied to software systems analysis, design and development for computer games.
2. To develop programming skills and techniques suitable for application in games development
3. To provide some basic skill in using software API for computer games development.
4. To provide the students with the advanced knowledge, skills and experience in interactive application and game development.

5. To introduce students to different types of data structures in game programming

## Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate an understanding of the concepts of object oriented philosophy as applied to software systems analysis, design and implementation.
- 2 Implement various techniques applicable to the games software development life-cycle using object oriented notations.
- 3 Explain and implement 2D game programming techniques in the games software development life-cycle.
- 4 Demonstrate an understanding of, and utilise, the features in software API in computer games development.
- 5 Evaluate computer games design and implementation.
- 6 Utilise correct data structures in computer games programming.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Group report	2	3	4	5	6
Exam	1	4			

## Outline Syllabus

*Software development life cycle for games. Waterfall, Iterative, Agile methods. Functional, modular and object oriented programming approach. Object oriented philosophy. Classes and objects. Object oriented techniques: Encapsulation, Inheritance, Polymorphism. Introduction to object oriented programming. Class declaration, member data and member functions, instantiation. 2D Game Engine Architecture and Components. Game loop. Managing multiple game objects. Movement and sprite animation. 2D Collision detection. Resource Optimisation. Introduction to assembly language. Scrolling. Tiling. Clipping. Managing multiple game objects. Artificial Intelligence. Sound, Input/Output control. Game analysis and testing. One-dimensional arrays. Linked lists and operations on these data structures. Stacks and operations on stacks. Queues and operations on queues. Trees, binary trees, binary search trees, inserting and deleting objects in binary*

search trees.

## Learning Activities

Lectures incorporating demonstrations will be followed by tutor-led practical sessions. These will be supported by practical hands-on work in the laboratory.

## References

<b>Course Material</b>	Book
<b>Author</b>	Rabin, S.
<b>Publishing Year</b>	2005
<b>Title</b>	Introduction to Games Development
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Charles River Media
<b>ISBN</b>	1584503777

<b>Course Material</b>	Book
<b>Author</b>	Cawood, S.and McGee, P.
<b>Publishing Year</b>	2007
<b>Title</b>	Microsoft® XNA Game Studio Creators Guide
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	McGraw-Hill Osborne Media
<b>ISBN</b>	007149071X

<b>Course Material</b>	Book
<b>Author</b>	Shreiner, D.
<b>Publishing Year</b>	2005
<b>Title</b>	OpenGL Programming Guide: The Official Guide to Learning OpenGL
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Addison-Wesley Professional
<b>ISBN</b>	0321335732

<b>Course Material</b>	Book
<b>Author</b>	DeLoura, M.
<b>Publishing Year</b>	2000
<b>Title</b>	Game Programming Gems
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Charles River Media

<b>ISBN</b>	1958700492
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## **Notes**

In this module students will learn about computer games development, and programming in particular. Object orientation plays a significant part in the learning outcome. The implementation will use Microsoft XNA or OpenGL APIs. The coursework will require students to work in a group to produce a simple game.