Liverpool John Moores University

Title:	SOFTWARE DEVELOPMENT FOR GAMES AND WORKSHOP
Status:	Definitive
Code:	**7048COMP** (103307)
Version Start Date:	01-08-2011
Owning School/Faculty:	Computing and Mathematical Sciences
Teaching School/Faculty:	Computing and Mathematical Sciences

Team	Leader
Sud Sudirman	Y

Academic Level:	FHEQ7	**Credit Value:**	30.00	**Total Delivered Hours:**	72.00
Total Learning Hours:	300	**Private Study:**	228		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Practical	48.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Individual essay on critical evaluation of recent developments in games production and research.	20.0	
Technology	AS2	Group project on 2D game development.	30.0	
Technology	AS3	Group project on 3D game development.	50.0	

Aims

To develop the student's skills and expertise in developing computer games
To introduce advanced techniques and platforms (API) and hardware applicable to game development

To examine current gaming hardware
To examine the role of application programming interfaces (APIs) applicable to modern game development.
To expose the students to the process, and techniques of creating advanced computer/video games under simulated conditions of a real-world video game software development company.

Learning Outcomes

After completing the module the student should be able to:

1 Apply advanced techniques applicable to games software.
2 Use an appropriate API (DirectX, OpenGL, etc…) to implement particular aspects of computer games development.
3 Apply and document Software Development Methodologies to game development.
4 Use appropriate Platform (PC or Console) to develop 3D games, using rapid prototyping and long term and large development.
5 Critically evaluate recent developments in games production and research.

Learning Outcomes of Assessments

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

Critical evaluation	5	
2D game development	2	3
3D game development	1	4

Outline Syllabus

A large part of this course is workshop based. Sessions will involve the design and development of a large piece of software developed through group-work, supported by lectures on the following subject:
Presentation of Windows Game Programming and Game APIs, e.g. DirectX
Mathematical principles of 2D and 3D graphics;
Programming techniques for 2D and 3D games: animation, sprites, collision detection, physics. GUI programming for games, Tile-based graphics, Sprites & bitmap animation, Collision detection, Page & side scrolling algorithms, Differing game types, modes, & perspectives, Game input devices, Physics based modelling, Optimisation techniques.
3D Game Engines Architecture
DirectX D3D, 3D Modelling and Rendering
Camera Setting and Animation
Meshes, Level Loading and Editing, LoD
3D Collision Detection
Spatial Data structure: Octree, BSP and PVS
Terrain Generation, Rendering and LoD
NPC Behaviour and 3D PathFinding : A, Flocking*

GPU Architectures and Shading languages
Game networking Issues: Architecture, Protocol, Event Synchronisation, Latency Compensation Techniques
Introduction to Console Architecture and Programming
Stages in games development process; modularity; testing;
Games project planning and management

Learning Activities

Lectures will be accompanied by hands-on practical laboratory sessions. Directed reading will be used to supplement course material.
Practical use of Software engineering techniques, game APIs and programming language, in game development for individual and team-based assignments.
The students should also define a game concept and negotiate the resources, milestones and deadlines with the tutor.

References

Course Material	Book
Author	Harbour, J.S.
Publishing Year	2006
Title	Beginning Game Programming
Subtitle	
Edition	2nd Edition
Publisher	Course Technology PTR
ISBN	1598632884

Course Material	Book
Author	Hight, J., Novak, J.
Publishing Year	2007
Title	Game Development Essentials: Game Project Management
Subtitle	
Edition	
Publisher	CENGAGE Delmar Learning
ISBN	1418015415

Course Material	Book
Author	Rucker, R.
Publishing Year	2003
Title	Software Engineering and Computer Games
Subtitle	
Edition	
Publisher	Addison Wesley
ISBN	0201767910

Course Material	Book
Author	DeLoura, M.
Publishing Year	2000
Title	Game Programming Gems
Subtitle	
Edition	
Publisher	Charles River Media
ISBN	1584500492

Course Material	Book
Author	DeLoura, M.
Publishing Year	2001
Title	Game Programming Gems 2
Subtitle	
Edition	
Publisher	Charles River Media
ISBN	1584500549

Course Material	Book
Author	Treglia, D.
Publishing Year	2002
Title	Game Programming Gems 3
Subtitle	
Edition	
Publisher	Charles River Media
ISBN	1584502339

Course Material	Book
Author	Sinan Si Alhir
Publishing Year	1998
Title	UML in a Nutshell
Subtitle	
Edition	
Publisher	O'Reilly and Assoc
ISBN	1565924487

Course Material	Book
Author	Lamothe, A.
Publishing Year	2002
Title	Tricks of the Windows Games Programming Gurus
Subtitle	
Edition	2nd Edition
Publisher	SAMS
ISBN	0672323699

Course Material	Book

Author	Luna, F.
Publishing Year	2003
Title	Introduction to 3D Game Programming with DirectX 9
Subtitle	
Edition	
Publisher	Wordware Publishing, Inc.
ISBN	1556229135

Course Material	Book
Author	Luna, F.
Publishing Year	2006
Title	Introduction to 3D Game Programming with Direct X 9.0c :A Shader Approach
Subtitle	
Edition	
Publisher	Wordware Publishing, Inc.
ISBN	1598220160

Course Material	Book
Author	Watt, A., Policarpo, F.
Publishing Year	2001
Title	3D Games: Real-time Rendering and Software Technology Vol 1
Subtitle	
Edition	
Publisher	Addison-Wesley
ISBN	0201619210

Course Material	Book
Author	Eberly, D.
Publishing Year	2001
Title	3D Game Engine Design
Subtitle	
Edition	
Publisher	Morgan Kaufmann
ISBN	1558605932

Notes

The main objective of this course is to expose the students to the process and techniques of creating advanced computer/video games under simulated conditions of a real-world video game software development company. Part of the assessment is achieved within group-works, and the students will be assessed individually via peer-assessment and individual conclusion in the report.