

Module Information

2022.02, Approved

Summary Information

Module Code	5210COMP
Formal Module Title	Software Engineering for Games
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Workshop	44

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To practically apply the concepts Object-Oriented Design and Programming to games software such as Software Design Patterns To explain the models, tools and techniques of the software development process for game software. For students to critically evaluate the phases of the Software Development Lifecycle and different methodologies that are used in the games industry. To explain formal principles of game software modelling. To provide skills in using software APIs relevant for the computer games industry. To manage the software development lifecycle using industry-standard approaches to Software Configuration Management (SCM) using Version Control Systems (VCS) To practically apply the principles of Agile Development to the design and development of a non-trivial game application.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Design and manage the development of a specified software game using appropriate software engineering tools and methods
MLO2	2	Use an object-oriented programming language and one or more appropriate Application Programming Interface (API) to implement a non-trivial software design
MLO3	3	Define and construct Object-Oriented Designs and code specifications relating to common gameplay challenges and game design patterns
MLO4	4	Evaluate various tools and techniques used in the Software Development Lifecycle of a software game

Module Content

Outline Syllabus	Games Software Engineering characteristics and Software Engineering paradigms. The Software Development Lifecycle as applied to Games Software Software Planning and Project Management – Software Configuration Management as a standard. The Agile Manifesto and its application to games development. Object-Oriented Design Techniques and UML Modelling. The syntax and semantics of class specification and Object creation. Encapsulation Association, Aggregation and Composition and the language concepts which facilitate these. Inheritance, Sub-Typing, Polymorphism and the role of Dynamic Dispatch. Language constructs and Standard Libraries for Memory Management Software Architectures: SOLID Principles, Cohesion and Coupling Data-Driven games development Quality Assurance and Testing. Introduction to Parametric Polymorphism. Game Object representation and Object Models Software Design Patterns for Games Architectures. Program Structures and Execution Models CPU vs GPU Software Engineering Introduction to Concurrent Programming. Common Optimisation Techniques Test Driven Development.
Module Overview	In this module, you will build upon your foundational programming skills by introducing “ in both a practical and theoretical manner “ some of the fundamental ideas of software engineering, enabling you to develop and communicate designs for small scale games software systems. As a group, you will apply the Agile Development methodology and its associated design techniques using Object-Oriented principles to produce solutions for games development scenarios using Object-Oriented Programming. You will gain experience of Software Engineering techniques for the design, development and testing of game software and understand the impact of these techniques on the architecture of modern games application, using industry-led tools and techniques.
Additional Information	In this module, students will build upon their foundational programming skills by introducing – in both a practical and theoretical manner – some of the fundamental ideas of software engineering, enabling students to develop and communicate designs for small scale games software systems. As a group, students will apply the Agile Development methodology and its associated design techniques using Object-Oriented principles to produce solutions for games development scenarios using Object-Oriented Programming. Students will gain experience of Software Engineering techniques for the design, development and testing of game software and understand the impact of these techniques on the architecture of modern games application, using industry-led tools and techniques.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Technology	Object-Oriented Game App	60	0	MLO2, MLO1
Centralised Exam	Examination	40	1.5	MLO4, MLO3

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Christopher Carter	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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