

Module specification

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Module Code	GME609
Module Title	Advanced Games Programming
Level	6
Credit value	20
Faculty	FACE
HECoS Code	101020
Cost Code	GAGM
Pre-requisite module	N/A

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
BSc (Hons) Game Development	Core

Breakdown of module hours

Learning and teaching hours	24 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	0 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	24 hrs
Placement hours	0 hrs
Guided independent study hours	176 hrs
Module duration (Total hours)	200 hrs

Module aims

This module aims to do the following:

- Evaluate graduate-level expectancy in relation to gameplay programming in the contemporary game industry.
- Combine all previous experience with traditional and contemporary programming and culminate it in an industry-capable portfolio piece.
- Explore and demonstrate effective communication of technical professionals when dealing with existed code bases.
- Develop bug identification and design solution skills within an existing code base despite lack of documentation.

Module Learning Outcomes

At the end of this module, students will be able to:

1	Critically evaluate effective solutions to game development-based problems.
2	Implement gameplay mechanics using advanced game engine tools and strategies.
3	Critically analyse and assess existing game-based project(s) or brief(s) to identify development strategies and flaws.
4	Appraise effectiveness of development in terms of game engine optimisation.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1:

Assessment 1 will represent a technical demo demonstrated as part of a graduate-level portfolio piece. Students will be tasked with constructing a code-based project, based on a theme and/or structure within class and will be tasked to recreate/restructure/amend a core set of mechanic concepts and implementations to produce something novel that demonstrates and communicates their technical skills. Indicatively, this should be demonstrated as part of a finalised graduate-ready technical portfolio piece ready for external viewers.

Assessment 2:

Assessment 2 primarily focuses on an existing project/code base that is unfamiliar to the student cohort. Instead of the focus being on development, this assignment will focus on themes such as code communication and collaboration and its relationship with technical documentation. Indicatively, this could represent an existing project without technical documentation that students are therefore expected to construct based on the existing project. This will allow the students to focus on suspected implementation strategies and evaluate effectiveness of code and suggest alternative strategies where relevant.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1, 2	Coursework	N/A	50%	N/A
2	3, 4	Coursework	N/A	50%	N/A

Derogations

None

Learning and Teaching Strategies

The primary skill base of this module will be delivered through a series of lectures, demonstrations and practical work that will equip the students with the technical skills and confidence to develop complex game mechanics. This content will also be fully represented online through VLE content and will be available to students as they progress with the module. Indicatively these could be sections of code/diagrams/PDF tutorials/pre-recorded videos depending on what is most appropriate.

The second assessment will encourage some further seminar-based sessions, discussing particular strategies and concepts as a class or in groups.

Welsh Elements

Students will have the right to submit assessed work in Welsh, to receive academic supervision and access learning resources and correspondence in Welsh. Students are encouraged to engage with Welsh cultural themes, creative elements and enterprising opportunities as part of student-led activities and assignments to facilitate wider contextual awareness and distinctive creative outputs.

Indicative Syllabus Outline

Indicative Syllabus includes the following topic areas:

- Object-Oriented Programming Paradigm

- Inheritance & Derived Classes
- Polymorphism in Game Development
- Pointers, References & Memory Allocation
- Interfaces in C++
- Optimisation and Object Pooling
- Source Control & GitHub
- Technical Portfolio Development
- Technical Documentation Communication
- Object Dependency & Coupling
- Game Programming Patterns

Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads:

Nystrom, R. (2014), *Game Programming Patterns*, New York: Genever Benning.

Other indicative reading:

Butler, S., Oliver, T. (2024), *Game Development Patterns with Unreal Engine 5: Build maintainable and scalable systems with C++ and Blueprint*, Birmingham: Packt Publishing.

Ferrone, H. (2025), *Learning C# by Developing Games with Unity 6: Get to grips with coding in C# and build simple 3D games in Unity from the ground up*, Eighth Edition, Birmingham: Packt Publishing.

Madhav, S. (2018), *Game Programming in C++: Creating 3D Games*, London: Addison Wesley.

Administrative Information

For office use only	
Initial approval date	July 2026
With effect from date	September 2027
Date and details of revision	
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