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Module specification

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Module Code	GME702
Module Title	Advanced Game Systems & Mechanics
Level	7
Credit value	20
Faculty	FACE
HECoS Code	101020
Cost Code	GAGM

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Computer Game Development	Core
MSc Computer Game Development (with Advanced Practice)	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	21 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**21** hrs
Placement / work based learning	0 hrs
Guided independent study	179 hrs
Module duration (total hours)	**200** hrs

For office use only	
Initial approval date	10/05/2023
With effect from date	September 2023

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Date and details of revision	March 22 Change of module code from COM751
Version number	2

Module aims

This module will focus on the design and implementation of games using contemporary game systems and mechanics. This aim of the module is to empower students to develop a comprehensive understanding of the current technical issues that relate to the development of modern games and the processes by which they could be published/deployed.

Students will be required to consider current techniques and trends relating to application monetisation, deployment, market awareness and ethical issues. The balance between security, the user interface, performance and accessibility will be also be examined.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Integrate concepts of Object-Oriented Programming within the scope of game systems and mechanics.
2	Design and develop appropriate Data Structures, Classes, and Objects to solve programming-based problems.
3	Evaluate Visual and Non-visual programming strategies within a game engine to relate them to suitable uses.
4	Create a game that demonstrates contemporary game systems and mechanics.

Assessment

The module will be assessed through the implementation of a technical design and development portfolio. The portfolio will be divided into two key areas; Product Design and Product Development. The product design phase will demonstrate current techniques relating to requirements gathering, design, market analysis and ethical considerations. The fundamental objective is to ensure students generate ideas and concepts that are fit for purpose, appropriate to the development platform and compliant with modern legal and ethical standards. The product development phase will demonstrate a prototype game that is appropriate to the development platform, reflective of the product design phase and rigorously tested as part of a cohesive test strategy.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3, 4	Coursework	100%

Derogations

None

Learning and Teaching Strategies

In line with the Active Learning Framework, this module will be blended digitally with both a VLE and online community. Content will be available for students to access synchronously and asynchronously and may indicatively include first and third-party tutorials and videos, supporting files, sections of code/diagrams or any additional content that supports their learning.

As this module progresses, a structured strategy will be used to support the students engaging with the key threshold concepts relating to the learning outcomes. The module will include a balanced mixture of engaging tutor-led lectures, demonstrations, and facilitation. As the module continues experiential and peer learning strategies will be encouraged as the students' progress with their coursework.

Indicative Syllabus Outline

An indicative syllabus outline will include:

- Game Interface Design
- Human-Computer Interaction
- Event Driven Programming
- Player Inputs & Devices
- System Services
- Collision Detection
- Artificial Intelligence Systems
- Multitasking and Running Thread
- Networking for Game Development
- Resource and Memory management
- Graphics Programming
- Materials & Visual Effects
- Testing & Debugging

Indicative Bibliography:

Essential Reads

Doran, J. P., Sherif, W., Whittle, S. (2019), *Unreal Engine 4.x Scripting with C++ Cookbook: Develop quality game components and solve scripting problems with the power of C++ and UE4*, Second Edition, Birmingham: Packt Publishing.

Other indicative reading

Borromeo, N. A. (2021), *Hands-On Unity 2021 Game Development: Create, customize, and optimize your own professional games from scratch with Unity 2021*, Second Edition, Birmingham: Packt Publishing.

Marques, G., Sherry, D., Pereira, D., Fozi, H. (2022), *Elevating Game Experiences with Unreal Engine 5: Bring your game ideas to life using the new Unreal Engine 5 and C++,* Second Edition, Birmingham: Packt Publishing.

Romero, M., Sewell, B. (2022), *Blueprints Visual Scripting for Unreal Engine 5: Unleash the true power of Blueprints to create impressive games and applications in UE5*, Third Edition, Birmingham: Packt Publishing.

Ulibarri, S. (2020), *Unreal Engine C++ the Ultimate Developer's Handbook: Learn C++ and Unreal Engine by Creating a Complete Action Game*, New York: Stephen Ulibarri.