

Module Specification

Module Summary Information

1	Module Title	Programming for Game Engines
2	Module Credits	20
3	Module Level	5
4	Module Code	CMP5334

5	Module Overview
This module will build on the principles taught in the level 4 module 3D Game Programming. It will focus on 3D game engine functionality and how they manage and working with 3D objects, worlds and spaces. The programme aims to emphasise the important technical skills associated with making computer games where this module enhances knowledge of game engine concepts and programming skills with a game engine in a number of different contexts such as high-specification and low-specification PCs and converting (porting) source code to other operating systems. Being programming based it also enhances your transferrable skills to other computing and software engineering disciplines. Skills acquired while studying this module can be applied to other areas of the programme for example when programming for games consoles and using low-level 3D graphics APIs. The module also enables you to develop your confidence in gaining important technical skills and become independent problem solver willing to take on new challenges and experiences. Our teaching approach is practical based where you will get ‘hands-on’ experience of programming with a game engine. You will investigate how to utilise game engine features to enhance 3D graphics performance and/or aesthetics. Practical sessions will be augmented with mini-lectures and tutorials covering important concepts that underpin game engine programming practice. In addition there will be opportunities to gain formative feedback on program’s developed in sessions and on the assessment.	

6	Indicative Content
• Game engine architecture. • Scene management and scene object types. • Models and animation. • Materials and textures. • Input management and movement. • Cameras. • Collision detection and simple rigid body physics. • Procedurally generated scene objects. • 3D maths for games. • Managing build configurations. • Performance analysis and optimisation. • Porting source code. • Using an audio engine to implement game 2D/3D sound. • Using shaders to implement advanced rendering techniques. • Special effects particle systems, lighting, shadows, fog, reflections, billboards. • 2D graphics, sprites, text/font and user interface (UI).	

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Develop a prototype 3D game level scene using a graphics/game engine to meet a number of criteria and establish baseline performance, e.g. RAM, CPU.	
	2	Analyse and present baseline performance results from a prototype game scene.	
	3	Develop a fully optimised 3D game level scene using a game engine and port it to different operating systems gathering performance data.	
	4	Present a longitudinal evaluation of the performance of a fully optimised and ported 3D game scene.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4			X

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		92
Private Study (PS) includes preparation for exams		60
Total Study Hours:		200