MODULE SPECIFICATION

Part 1: Information			
Module Title	Game Engine Programming		
Module Code	UFCF9M-30-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module type:	Project		
Pre-requisites	Game Development Evolution 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: Pre-requisites: Students must take UFCFWA-30-1 Entertainment Software Development AND UFCFF5-30-1 Games Development Evolution

Educational Aims: Regardless of your position in the modern games industry, you will be expected to work with complex game engine software and asset pipeline, typically developed and maintained in-house, or licenced from a third party developer.

Through this module, students examine software design and implementation aspects of modern game engines and their pipelines, and in groups, complete selected components and asset pipelines starting from a supplied, skeletal, game engine implementation.

Although the overall engine and pipeline will be produced as a group, each team member will “take ownership” of a sub-system, asset pipeline or interface a standard aspect of simulation or graphics coding with the wider engine implementation.

Will also produce a technical report on their development, design and implementation process of this sub-system, etc.

Outline Syllabus: The following provides an indicative list of module content, which may vary with delivery to respond to current trends:

Game engine / framework programming paradigms to handle:
Asset management
Event conceptualisation and modularity
Finite State Machines
Asset Pipeline

Game Engine Implementation as Software Engineering:
Managers / subsystems
Engine design and component / subsystem interaction
Source control / build management
Design for productivity
Appropriate Design Documentation

Interface of Low Level Programming features with Game Engine systems:
IIO / Interaction
Graphics / Audio
Physics / Simulation
Threading
Networking
Collision detection
Data management (arrays / lists / queues / lookup tables / etc.)

Teaching and Learning Methods: Lectures and seminars will introduce and discuss game engine and software implementation concepts, these will directly follow into studio sessions. These will be used to practically explore in-depth implementation aspects of the taught concepts, and to support students through their assessment tasks.

To reflect standard practice in the industry group work will be used extensively in this module. To support their group work, students will be introduced to, and expected to use, collaborative software development tools, processes and working practices such as those used in industry.

Part 3: Assessment

This is a project module where the assessment is split into three parts:

A group design and implementation task to complete a number of components for a provided, skeletal, game engine. Industry standard collaborative tools will be used, providing an introduction to industry development practice, which will be developed further in the third year. Teams will be required to agree on their own distribution of group marks for this element.

An individual reflection on the group work.

Individual Technical Report based on ownership of a given sub-system of the wider engine.

Formative assessment:

Formative feedback will be offered throughout the module, through the practical studio sessions.

Weekly progress meetings with each team will provide a vehicle for continuous formative feedback, which will further feed into each student’s individual reflection at the end of the module.

First Sit Components	Final Assessment	Element weighting	Description
Report - Component A	✓	30 %	Technical report and individual reflection on design and implementation
Practical Skills Assessment - Component A		70 %	Group game engine design, implementation and documentation
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Portfolio - Component A	✓	100 %	Game Engine Design, Implementation and Documentation exercise, including reflection and technical report

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Implement programming paradigms underpinning a selected sub-system of a game engine (e.g. events, asset pipeline, render, hud management) or standard simulations used in a games development context (e.g. particle systems, rigid/softbody physics, lighting, shadows, or other graphical effects)	MO1
Discuss & Implement sub-systems of a game engine, with a focus on critical game engine architecture principles, such as modularity and reusability, and their impact on engine performance and development efficiency	MO2
Design and Implement Asset Pipeline functionality guided by potential requirements of the art and design side of a game development team	MO3
Write engine code demonstrating an understanding of the mathematics, data structures and techniques required to store and manipulate content within interactive environments	MO4
Use appropriate industry best practice for the design and documentation of game engine systems	MO5
Use typical profiling and optimisation strategies used in game engine development	MO6
Work as a member of a games development team, employing industry standard tools for source control and project management	MO7

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72

	Hours to be allocated	300
	Allocated Hours	300
Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufcf9m-30-2.html	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Games Technology [Sep][SW][Frenchay][4yrs] BSc (Hons) 2018-19

Games Technology [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19