

Liverpool John Moores University

Title: Digital Games Content Production
Status: Definitive
Code: **5209COMP** (127988)
Version Start Date: 01-08-2021

Owning School/Faculty: Computer Science and Mathematics
Teaching School/Faculty: Computer Science and Mathematics

Team	Leader
William Hurst	Y
Yun Sheng	
Chris Carter	

Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 44
Total Learning Hours: 200 **Private Study:** 156

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Workshop	44

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Artefacts	AS1	3D Modelling and Material Detailing	50	
Artefacts	AS2	Avatar Animation and Game Scene Composition	50	

Aims

To explain the digital game content creation workflow.
To explain the requirements for geometric content and animations that are targeting games produced using modern game engines.
To develop theoretical knowledge of the concepts and techniques required for, 3D modelling, 3D animation and Material Representation.

*To provide students with an opportunity to practice the principles of 3D modelling and 3D animation using appropriate tools, techniques and methods.
To explain the concepts and techniques for integrating content into modern game engines.*

Learning Outcomes

After completing the module the student should be able to:

- 1 Identify and interpret artistic requirements of 3D models for use in modern games engines.
- 2 Apply appropriate polygon modelling operations and material creation to 3D models for incorporation into a game engine using the appropriate techniques and content creation workflow.
- 3 Apply the principles of 3D Animation to the production and conditioning of skeletally animated game content.
- 4 Synthesize a real-time, interactive virtual world composed of animated and static game content which conforms to an artistic scene specification.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

3D Modelling	1	2
Avatar Animation	3	4

Outline Syllabus

Digital Game Content Creation Pipeline: Game Production Timeline, Economic Constraints, Roles in the Game Production Team, Documenting Art Requirements, Exporting, Optimising and Importing into Games Technologies.

Asset Planning: Game Genre, Game Culture, Game World Planning, Scene Composition.

3D Modelling: Vertices, Edges, Polygons, Modelling in Quads, Primitives, Approaches to Modelling targeting Games applications, Operations in Modelling, Asset Conditioning and Optimisation for Game Engine applications

Rendering and Lighting: Rendering Pipeline, Direct and Indirect Lighting, Global Illumination, Cinematographic Rendering.

Material representation and modern techniques for representing lighting and object details and interactions with light in content creation.

3D Animation: Evolution of Computer Animation, Principles of 3D Computer Animation, Rigging, Skinning, Kinematics and Constraints.

3D Virtual Scene Composition: Asset planning, Reusing assets, Level of Detail (LoD). Indoor and Outdoor Scenes Scene Organization, Hierarchies and Relationships between different objects. Compositing Level, Scene Outlining and Logical Structuring and Layering.

3D Cameras and Cinematographic Concepts.

Learning Activities

Workshop to deliver the theoretical concepts applied to the production of geometric and visual game content and assets. Tutor-led practical session in the computer laboratory to introduce specific techniques and methods used in the production of both static and animated content for use in a modern, real-time game engine context.

Further exercises – additional exercises for students to work on in their own time.

Directed learning – provides additional reading to enable practical work to be completed.

Learning materials can be accessed digitally via University Virtual Learning Environment (VLE).

Notes

In this module, students learn about the associated techniques and tools for creating 3D models for 3D animation and games. This incorporates the digital content creation pipeline for games, rendering and lighting, in order to generate static and animated content that can be utilized inside a modern games' engine for representation of scene geometry and game avatars.

The focus of the module will be to cover the various tools and techniques that are used to build assets for games from conception to realization, with appropriate workflows for the creation of geometry, asset conditioning preparation for animation and articulation and surface detailing and lighting for the production of real-time scenes.

Students will be exposed to both Digital Content Creation Tools and in-engine editing tools in order to understand the workflow for creating real-time content.