



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
MULT-453	3D Game Development	6
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
MULT-361	Design & Multimedia	Fall, Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Elective	Multimedia	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
1 <sup>st</sup> Cycle	Dr C G Christou	3 <sup>rd</sup> /4 <sup>th</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Corequisites</b>
Face-to-Face	N/A	

### Course Objectives:

The main objectives of the course are to:

- Introduce the student to concepts of 3D computer games and how to design and develop them.
- Develop three genres of 3D games: First-Person and Third-Person Shooters and Skill games (FPS, TPS, Skill).
- Create game narratives, objectives and game logic.
- Provide students with an appreciation of textures, materials and lighting and how to use them effectively in game level design.
- Introduce students to the Unity3D game engine and to basic scripting in C#
- Prepare 3D characters for games and apply animations to them.
- Introduce animation and animation timelines. Looped and triggered animations.
- Design and develop environments including realistic lighting, sky-boxes, particle-systems.
- Introduce the concept of Artificial Intelligence as applied to non-player character (NPC) navigation.

### Learning Outcomes:

After completion of the course students are expected to be able to:

1. Create a game description for a 3D game and a plan its development.
2. Explain the principles of creating interactive 3D games-based Mechanics, Dynamics and Aesthetics models of games and differentiate between different game genres in terms of MDA.
3. Demonstrate expertise in the design of game art and an understanding of how to create a particular scenario and mood.
4. Create innovative 3D environments for gameplay and construct natural looking illumination and use appropriately designed and applied materials.
5. Demonstrate an understanding of character creation and character preparation for use in computer games.
6. Write simple scripts in C# for basic user interaction and for game management and control.
7. Create a simple game-manager for switching between scenes based on game events.
8. Understand the different methods used to create FPS, TPS and skill games.
9. Design appropriate user interfaces and user controls for ease of use.

### Course Content:

1. Class Overview - Study materials, software, tools.
2. Introduction to the Unity3D game engine.
3. Game Design Documents, Creating Effective Gameplay.
4. 3D Level design: textures, materials and lighting.
5. Physics, collisions, triggers.
6. Acquiring Game Assets: Models, Textures, Audio.
7. Level Design, Obstacles, Puzzles and Challenges, Game Art, Textures and Tools.
8. Creating 3D Game Characters, Skinning, Rigging, Exporting Game characters.
9. The Navigation Mesh. AI, Non-player components.
10. Sound, Voice-over's and Music for Games.
11. Special Effects and Particle Systems.
12. Creating a Game Objective/Mission.

### Learning Activities and Teaching Methods:

Lectures, Lab Presentations, Practical Exercises and Assignments.

**Assessment Methods:**

<b>Assessment Type</b>
Assignment 1
Assignment 2
Assignment 3
Final Project
Homework (preparation, reading lists, research)

**Required Textbooks / Readings:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Learning C# by Developing Games with Unity 2019	Harrison Ferrone	Packt	2019	1789532051

**Recommended Textbooks / Readings:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#	Jeremy Gibson Bond	Pearson Education	2017	9780134659886
Unity 2017 Game Development Essentials (3 <sup>rd</sup> Ed.)	Tommaso Lintrami	Pearson	2018	978-1786469397