**CA – Obstacle course (20%) of Animation and Game Engine Pipeline Module**

## **CA – Obstacle course (35%) of Software Engineering Module**

## **Brief**

For this assignment you are going design and create an obstacle course game level and your own unique character(s) for which you will create a library of animations in which to animate your character through the level. You will build assets in Blender and import them into Unreal Engine 5, where you will build game interactivity such as character control, game mechanics, collision detection and heads-up display.

This is a cross module assessment between Animation and Game Engine Pipeline and Software Engineering.

## **Learning Objectives**

For this assignment you will design, model and rig characters which you will animate for an obstacle course. You are also required to create an environment that includes an obstacle course with full game functionality for your character to clear.

You need to demonstrate the following criteria:

* You are required to submit concept work for your character animations and environmental models
* You are required to model, texture and rig a character.
* You are required to design the environment for your character.
* You are required to animate a character and create an animation library.
* Your animation should encompass the principles of animation (see the animation survivors kit).
* Creation of models for your level environment.
* You are required to keep a written document of the processes you used to create your Animation.
* You are required to import your character into Unreal Engine and create the appropriate blueprints necessary for animation and interaction within the scene.
* **You are only allowed limited use of external 3D assets.**
* You are required to submit a (working) design document detailing your progress:
  + Concept designs for environment
  + Branding
  + This will include a working grey box solution for your level.
  + A detailed well explained definition and theme for your game including your core mechanic
  + Evidence of user testing and how the game has evolved as a result of this testing.
* Trello or similar for project management and planning
* Your project must use source control during its development.
* The project must be built out and playable as an application.
* Using UMG and blueprints your level is required to:
  + Unique game mechanic and concept
  + Make use of the sequencer for post processing and camera animations
  + Make use of the Niagara particle system
  + Make use of Lumen lighting system
  + Advanced use of the material editor
  + Use of material physics components
  + UI linked to in-game variables… e.g. Health, Speed, Energy, Time
  + Menu screens with options and End game screens
  + Saving and loading system
  + Enemy Spawn System
  + Enemy AI using behavior tree
  + Audio using in built Unreal systems
* You are required to demonstrate the following programming principles during the development of your game
  + Data: Variables
  + Input reading of values from input devices (keyboard, I/O, disk drives)
  + Output: writing of information to any output device (screen, disk drive, printer)
  + Operations: comparing values, assigning values, combining values
  + Conditions / Selections: Branch Nodes
  + Loops / Iterations
  + Subroutines / Modules: Functions
  + Arrays

## **Deliverables**

This CA will be delivered across three parts:

1. **Concept** work and design document featuring user tested grey box of your environment **5th March. Presentation** to show concept, gameplay and 90 second grey box screencast. 5 + 2 presentations. **Design document** due **10th March.**
2. **Alpha** game of your concept featuring evidence of user testing (This version does not require all features or models present) **9th April. Presentation** and screencast demo. 5 + 2 presentations.
3. **Beta** game which represents your final build of your game **30th April**. Presentation, 2 screencasts - gameplay and the making of. Should present character, environment, HUD and explanation of code. Making of (3 minutes), gameplay (2 minutes).
4. **Final documentation** including production log, reflection, and lessons learned due **5th May**.

You will upload a word design document, documenting the tools and techniques as well as the process involved in this assignment to Moodle with links to your screencast video clips, and a link to your source control files and project folders.

**Rubric**

**Adv Animation and Game Engine Pipeline Module**

1. Concept work including character designs, level designs and level plan **10%**
2. Alpha Presentation for character and level development and progress **25%**
3. Beta Presentation of **completed** game level including texture, shading, and lighting implementation and character animation performance **40%**
4. Keep a journal using screen grabs include a reflective learning section on how you have arrived at your final game artifact. Designs, storyboard, models, animation, game play, blueprints and any relevant resource material should be included in your document. 2000 words **15%**
5. Short, edited 2-minute Screencast of final piece (requirement for both modules) **5%**
6. In class presentation, demonstration, and Q&A (requirement for both modules) **5%**

**Software Engineering Module**

**Design document and User Testing Grey Box 10%**

**Part 1** (70%): **Game Design Document**

1. Defining a game concept (including user experience goal)
2. Defining gameplay mechanics
3. Defining the interface
4. Defining Artwork and theme
5. Defining narrative elements
6. Defining audio
7. Defining level design

**Part 2** (30%)**: Grey Box Video with User Testing Feedback and Reflection**

1. Questionnaires
2. Sampling decisions
3. Reflective analysis of feedback
4. Thoughtful and well-designed grey box

**Alpha 10% and Beta 15%**

1. Achieving the user experience goal. 10%
2. Your appropriate use of unreal blueprints and source control covering the requirements of the brief. 35%
3. Extending the use of unreal blueprints beyond the scope of the brief. 20%
4. Design document which details how you arrived at your design decisions, this should detail each stage in the software development lifecycle and give evidence of user testing and design changes as a result. 25%
5. Short, edited 2-minute Screencast of final piece. 5% (requirement for both modules)
6. In class presentation, demonstration and Q&A. 5% (requirement for both modules)

Generative artificial intelligence (AI) tools are not restricted for this assessment task. In this assessment, you can use generative artificial intelligence (AI) to assist you in any way. Any use of generative AI must be appropriately acknowledged (in accordance with DkIT Academic Integrity Policy and Procedures, https://www.dkit.ie/about-dkit/policies-andguidelines/academic-policies.html).