**COMP2007**

**Game Development**

**20 CREDIT MODULE**

**ASSESSMENT: 100% Coursework W1: 30% Set Exercises**

**W2: 70% Report**

**MODULE LEADER: Wang Miao**

**MODULE AIMS**

* To establish an understanding of the skills required to develop games.
* To develop technical and creative skills for games sector production.
* To implement high-quality prototypes using industry standard production methods.

**ASSESSED LEARNING OUTCOMES (ALO):**

1. Apply the game design process to formulate the game idea and identify a range of game technologies for concept validation, game development and quality monitoring.
2. Utilise appropriate strategies for asset integration, player feedback and gameplay design.
3. Iteratively develop a game mechanic prototype delivering effective gameplay.

**Overview**

This document contains all the necessary information pertaining to the assessment of *COMP2007 Game Development*. The module is assessed via **100% coursework**, across two elements: *30% Set Exercises* and *70% Assignment*.

The sections that follow will detail the assessment tasks that are to be undertaken. The submission and expected feedback dates are presented in Table 1. All assessments are to be submitted electronically via the respective DLE module pages before the stated deadlines.

|  |  |
| --- | --- |
|  | Submission Deadline |
| Set Exercises (30%) | **11-March @4:00pm** |
| Assignment (70%) | **18-April @4:00pm** |

Table 1: Assessment Deadlines

All assessments will be introduced in class to provide further clarity over what is expected and how you can access support and formative feedback prior to submission. Whilst the assessment information is provided at the start of the module, it is not necessarily expected you will start this immediately – as you will often not have sufficient understanding of the topic. The module leader will provide guidance in this respect.

Set Exercises

There are three set exercises for you to complete during the course of the module. Each of these exercises should take you approximately 8 hours to complete and you have four weeks to complete them.

**Assessment 1: Set Exercises**

**Set Exercise 1:**

3D modelling - create a small asset with textures and animations

Model and texture a Loot Chest with opening animation

The theme for the art style is entirely up to you, it does not have to match the art style chosen for your assignment.

Some suggestions:

* Modern day
* Fantasy
* Scifi/space
* Simple polygon
* Voxel

Opening animation

* The animation has to be presented while running in the Unity editor
* All of the assets must be fully integrated into unity
* Use the Unity or your preferred 3D modelling software to create the animation

Model

* A Loot Chest/Treasure chest with an opening animation
* A light shining from inside the chest signifying treasure

Texturing

* Model is textured correctly in UVW space
* Additional textures for normal maps/specular etc. if your art style requires.

Materials

* Use Unity standard material for URP
* Or use Lit/Unlit etc. according to your art style choice
* Use multiple materials if required

**Deliverables**

Provide a short video of the animation running with a short explanation of the 3D model and texturing used.

Explain the following in the video:

* Show the 3D models in software (unity/blender etc) with and without textures
* Show the animation running in the Unity editor
* Show the flat texture images

Video specifications:

* 2-5 minutes playtime
* At least 720p
* MP4 format

Use free screen recording software like OBS or your own choice for the video.

Please do not include any flashy intros, animated text or video FX.

**Assessment 1: Set Exercises**

**Set Exercise 2:**

Programming – Create a custom animated Health Bar

UI Component

* Create an animated health bar using Unity UI and C#.
* Use a UI Slider component for the health bar display

<https://docs.unity3d.com/2022.1/Documentation/Manual/script-Slider.html>

Custom component

* Create a custom component to run your health bar using the UI Slider
* Create the following public methods in the component:
  + TakeDamage
  + AddHealth
* Note that in an actual game, taking damage would run the TakeDamage method and adding health (a pickup or health regen etc) would run the AddHealth method
* Add test code to the component to trigger the events in game from keyboard input

Custom art

* Create custom art for the bar and background, with an overlay and icon
* You are free to choose any art style you wish
* Use the taught module art software or your own preference.

Animation for each event

* Use the animation curve to achieve “juicy” animation effects in in your code

<https://docs.unity3d.com/2022.1/Documentation/Manual/animeditor-AnimationCurves.html>

<https://docs.unity3d.com/2022.1/Documentation/ScriptReference/AnimationCurve.html>

**Deliverables**

Provide a short video of the animation running with a short explanation of the custom component code and artwork used.

Explain the following in the video:

* Show both animation states running in the game using the test functionality in the custom component
* Show the custom component code and briefly explain how it works
* Show the flat texture images

Video specifications:

* 2-5 minutes playtime
* At least 720p
* MP4 format

Use free screen recording software like OBS or your own choice for the video.

Please do not include any flashy intros, animated text or video FX.

**Assessment 1: Set Exercises**

**Set Exercise 3:**

Game Start screen – create a start screen for a game with sound FX and music

Some theme ideas for your Game Start Screen:

* Ambient
* Horror
* Retro
* Sci-fi
* Fantasy

Create a start button with sound FX

* Create custom art for the start button
* When the button is clicked, play sound FX to start the game
* Create your sound FX using the taught module software or your own choice
* Or gather a collection from other sources
* Or a mix of both!
* Make the sound less than 10 seconds long

Add a musical/ambient background

* Music can be just ambience or a musical score
* Or from other source
* Or a remix of an existing music track
* The music track sound should be shorter than roughly 1 minute

Add custom art to the background

* Add a title for the game using the font of your choice
* Provide a simple scene for the background, 2D or 3D
* Use lighting and animations if appropriate
* You can also include video as a background if you wish

Use the Unity AudioMixer to apply appropriate settings and FX to each sound.

* Utilize the Unity AudioMixer to add FX and control each sound
* Create a channel for music and sound FX for mixing your sounds

**Deliverables**

Provide a short video of Game Start Screen running with a short explanation of the application UI, sound and background art.

Explain the following in the video:

* Show that sound effect is attached to the button when clicked
* Show that music is played on loop in the background
* Show that volume is appropriate for both sounds
* Show custom UI for button
* Show background image(s) or short video

Video specifications:

* 2-5 minutes playtime
* At least 720p
* MP4 format

Use free screen recording software like OBS or your own choice for the video.

Please do not include any flashy intros, animated text or video FX.

**Assessment Criteria:**

A Rubric will be used to assess and provide feedback on the submissions. This is provided below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3rd (40%+) | 2:2 (50%+) | | 2:1 (60%+) | | 1st (70%+) | | | Grade | |
| Modelling | | | | | | | | | |
| A minimal 3D model is provided | Detail geometry is added for the model  Model is a discernible art style | | Ground geometry is provided under the model | | At least 3 background scene geometry objects are provided | | | /25 | |
| Texturing | | | | | | | | | |
| A premade or standard texture is provided  Appropriate lighting is provided in the scene | At least one custom texture is provided for the model | | Custom textures are provided for the ground and scene geometry | | Add a custom skybox texture | | | /25 | |
| Animation | | | | | | | | | |
| A linear transition is provided for crate opening | Use easing in the opening animation | | Apply an animated light to the scene as part of the opening animation | | Apply a subtle animation to the camera as part of the opening animation (screen shake or similar effect) | | | /25 | |
| Background and UI art | | | | | | | | |
| Button is present and working | | Custom UI art is provided for the button  A background image is used | | A small scene using 2D or 3D assets | | A short looping silent video is used in the background – loop from 10 seconds to 1 minute OR a small, animated scene using 2D or 3D assets | /15 | |
| Music & Sound FX | | | | | | | | |
| Sound is provided for the button | | Background music is provided | | The background music loops, and the button sound activates every time the button is pressed | | All sound levels are appropriate, button sound is clearly audible above music | /10 | |

**Assessment 2: Assignment**

**Task:**

Create a game on a scene, e.g., a maze, forest or street, with interactive elements. Use a first-person camera view to control the player directly. You will build your elements including the 3D models, terrain, texturing, skybox and code. You can use the 3D modelling and drawing software you feel comfortable with or the recommended software as part of the module. You can use sound FX and music from other sources or create them yourself using the recommended software. You are encouraged to use the free animation service Mixamo for any character animations you need or other services if you prefer, you are not required to create complex character animations for the module.

Interactive elements

* Your character will navigate the scene using keyboard/mouse input, using a First-person camera controller
* The character should have some sort of interaction with the world, choose one or more from the following
  + Picking things up/putting them down
  + Physics interactions – jumping, climbing, skidding
  + Flying/gliding/hovering using physics forces and gravity etc
  + Collecting things
  + Shooting things
* Optional: Artificial intelligence/non-player characters
  + You can code other characters into your experience if required
  + Examples
    - Invaders
    - Monster chase (horror survival games)
    - Shopkeepers
    - Quest givers

Game Camera

You can control the game camera using a first-person camera controller, this will be provided as part of the module content. You may create your own camera controller, for example a 3rd person or top-down camera, or some other cameras in Unity if you wish.

3D models – created using Probuilder (taught software) or other software (blender, max etc)

* Provide all of your 3D assets with your textures including:
  + A game character (if required for 3rd person or top-down camera)
  + At least one building
  + At least one rock or obstacle
  + At least one piece of vegetation or street item (lamp post etc)
  + A terrain using the unity terrain system or 3D model terrain you created in other software
  + You may use the standard skybox textures provided with Unity or create your own

Shaders

* You may use the standard shaders provided by Unity
* You can create your shaders using the taught software (Unity shader graph)
* You may program your shaders in HLSL (not covered in this module)

Maze/Street scene

You are free to use your own ideas for a theme so long as:

* It fits within the maze/street scene context
* It is discussed and agreed with the module tutors first

Here is a list of theme/game mechanic suggestions

* Haunted/horror
  + Explore and interact with the supernatural as you walk down this scary lane of surprises.
* Memory lane
  + A street is a place of memories, achievements and future aspirations
* Murder mystery
  + Can you piece together the clues and solve who, how and what with Mrs. Sponge
* Treasure quest
  + Can you find all the treasure before the egg timer runs out
* Rescue mission
  + Can you find all the survivors and transport them to safety within the time limit?
* Survival
  + Defend your town against waves of invaders

Sound FX/Music

* You can use free resources as long as they are linked in your repository readme
* You can remix audio using the taught software or your own software choice

Create an itch.io page for your project.

**Deliverables**

Your source code must be stored in a GitHub repository and the module leader must be added as a collaborator. The implementation of the source code must be as instructed in the tasks given above.

Minimum project deliverables:

1. A working Windows EXE of your experience
   1. A video is between 5-10 minutes in length (3-5 minutes of gameplay and 3-5 minutes of game explanation). If the video is too large to be submitted in the DLE, you can split the video into two before submitting.
   2. 3D scene with models and textures
   3. Appropriate lighting
   4. A skybox
   5. Movement around the scene for the player
   6. Identifiable theme and game mechanic
2. Itch.io page
   1. Downloadable version of the game for Windows
   2. A description of the game and gameplay
   3. Install instructions

**Assessment Criteria:**

The assignment is graded through the use of a rubric. The rubric is provided below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3rd (40%+) | 2:2 (50%+) | 2:1 (60%+) | 1st (70%+) | Grade |
| Application | | | | |
| The application runs with little to no crashes  The player can explore the scene  Start, pause, game and game over UI is implemented with appropriate game states | The character can perform one action in the game apart from the movement  Custom start screen background art | UI uses custom art (not including fonts)  Appropriate use of post-processing for the scene | UI has custom animation FX/transitions  Implement an in-game tutorial explaining the controls and the game objectives | /25 |
| Code base | | | | |
| The working camera follows the player in 3rd person or top-down view  Working movement code for the character | Player character animations are present with working code to activate them  Appropriate use of assessors for use in the unity inspector | One or more non-player characters or interactive elements included (e.g., dialogue or follow/chase the player)  Use of commenting in the code base and appropriate naming for classes, methods and fields. | Good use of OOP in the code base – use of design patterns if possible  Writing reusable and extendable code for each part of the game using virtual methods, interfaces or abstract classes | /25 |
| Mechanism | | | | |
| The game character has a 3D model in the game  The environment has appropriate lighting and a skybox  At least one game asset is present for:  -building,  -rock/obstacle  -plant/street item | At least one game asset has a custom model and texture  The game character has an animation for moving and idle – or the vehicle has appropriate animations for movement | Most game assets have custom models and textures  The game character is a custom model with custom textures | The environment has a custom skybox  All game assets have custom models and textures | /20 |
| FX | | | | |
| Appropriate in-game or menu music is provided  The player character has sound FX and or particle FX | Most game assets have sound FX and/or particle FX | All game assets have sound FX and/or particle FX  UI has sound FX for interactions where appropriate | At least one custom shader is used in the scene  Use of the audio mixer to generate dynamic sound FX | /20 |
| Itch.io page | | | | |
| A link to a working game executable  A game description with a list of controls and instructions for installation | Include at least three gameplay screenshots  A header title art image for the top of the page | Custom background art for the sides of the page  Custom header image artwork | A YouTube gameplay video linked on the page  The video is from 30 seconds to 2 minutes long | /10 |

**General Guidance**

**Extenuating Circumstances**

There may be a time during this module where you experience a serious situation which has a significant impact on your ability to complete the assessments. The definition of these can be found in the University Policy on Extenuating Circumstances here:

<https://www.plymouth.ac.uk/uploads/production/document/path/15/15317/Extenuating_Circumstances_Policy_and_Procedures.pdf>

**Plagiarism**

All of your work must be of your own words. You must use references for your sources; however you acquire them. Where you wish to use quotations, these must be a very minor part of your overall work.

To copy another person’s work is viewed as plagiarism and is not allowed. Any issues of plagiarism and any form of academic dishonesty are treated very seriously. All your work must be your own and other sources must be identified as being theirs, not yours. The copying of another persons’ work could result in a penalty being invoked.

Further information on plagiarism policy can be found here:

Plagiarism: <https://www.plymouth.ac.uk/student-life/your-studies/essential-information/regulations/plagiarism>

Examination Offences: <https://www.plymouth.ac.uk/student-life/your-studies/essential-information/exams/exam-rules-and-regulations/examination-offences>

Turnitin (<http://www.turnitinuk.com/>) is an Internet-based 'originality checking tool' which allows documents to be compared with content on the Internet, in journals and in an archive of previously submitted works.  It can help to detect unintentional or deliberate plagiarism.

It is a formative tool that makes it easy for students to review their citations and referencing as an aid to learning good academic practice. Turnitin produces an ‘originality report’ to help guide you. To learn more about Turnitin go to:

<https://guides.turnitin.com/01_Manuals_and_Guides/Student/Student_User_Manual>

**Referencing**

The University of Plymouth Library has produced an online support referencing guide which is available here: <http://plymouth.libguides.com/referencing>.

Another recommended referencing resource is [Cite Them Right Online](http://www.citethemrightonline.com.plymouth.idm.oclc.org/); this is an online resource which provides you with specific guidance about how to reference lots of different types of materials.

The Learn Higher Network has also provided a number of documents to support students with referencing:

References and Bibliographies Booklet:

<http://www.learnhigher.ac.uk/writing-for-university/referencing/references-and-bibliographies-booklet/>

Checking your assignments’ references:

<http://www.learnhigher.ac.uk/writing-for-university/academic-writing/checking-your-assigments-references/>