LEEDS BECKETT UNIVERSITY
SCHOOL OF BUILT ENVIRONMENT, ENGINEERING AND COMPUTING

Assessment Brief

MAIN ASSESSMENT – Component 1

Module name and CRN	Advanced Manufacturing Technology 14479 – AUT-202110			
Module Leader	Bal Singh			
Semester 1	**Level**	6	**Approx. No of Students**	33

COMPONENT TITLE: Proof of Concept

COMPONENT WEIGHTING: 30%

HAND-OUT DATE: 29/09/2022

SUGGESTED STUDENT EFFORT: 60 Hours for this component

SUBMISSION DATE: Sunday, 23/10/22, at 23:59

SUBMISSION INSTRUCTIONS: Upload a dedicated submission box on My Beckett

FEEDBACK DATE: within 3 weeks of submission

FEEDBACK MECHANISM: Typed feedback on MyBeckett

LEARNING OUTCOMES ADDRESSED BY THIS COMPONENT:

LO1: Students will be able to critical appraise where and how computer simulation (i.e. discreet event simulation, CAD/CAM, DFM/DFA, computer aided process planning) can benefit an organisation and its role in design, planning and control of production systems.

LO2: Students will be able to critical analysis modern design methodologies and their implementation in product design and development processes.

LO3: Students will be able to identify the key elements of Lean and Agile engineering and be able recommend possible solutions to a given scenario.

LO4: Develop an advance creative solution for a chosen engineering scenario.

NOTES:
The usual University penalties apply for late submission.

This is an individual assessment. Submission of an assessment indicates that you, as a student, have completed the assessment yourself and the work of others has been fully acknowledged and referenced.

By submitting this assessed work, you are declaring that you are fit to submit, and you will therefore not normally be eligible to submit a request for mitigation for this work.

If your result for this component is recorded as Non-Submission, or your mark for this component and for the whole module is below 40%, you will have opportunity to take reassessment with a submission in April 2023, with the date to be confirmed on the MyBeckett module site and your mark capped at 40% (see Reassessment information below). If you are granted deferral through the mitigation process, you may complete the reassessment with a full range of marks available.

If you are granted deferral through the mitigation process, you may take the reassessment test with a full range of marks available.

For further information, please refer to your Course Handbook or University Assessment Regulations.

DETAILS OF THE ASSESSMENT
This module introduces students to the key principles and tools for designing and prototyping mobile games. Through hands on practical exercises students will learn about the mobile game production techniques using modern development tools.

The Brief:

Engineering disciplines are crossing boundaries with other disciplines such as computer science and creative technologies. New and innovative tools from for example games development are being used for manufacturing simulation, medical training, health and wellbeing and architectural visualisations. Their low or no actual cost availability and flexibility of platform deployment is gaining popularity in a range of new areas. They have advanced features such as Artificial Intelligence (AI), machine learning, augmented and virtual reality to name a few. For this module, we will use a game engine called Unity and create 3D navigational environment. Interactions will be implemented using the C# programming language.

Component 1: Proof of concept (30 marks)

Upload to MyBeckett by 11:59 pm on Sunday 23/10/2022
For this component, you will be introduced to the game engine. Weekly tutorials will allow you to gain essential skills to create interactive 3D environment. All the necessary assets will be provided. C# programming support will enable you to learn to interact with the game engine to perform a variety of tasks. The proof-of-concept component will contain a range of completion elements required to interaction systems as shown below:

Prototype Element	Description
Moving object Control System	Implementation of 3rd person user input to for controlling a movable object and dynamic Camera Tracking
UI system	UI elements such as buttons/sliders for user input and text labels for user feedback
Animated 3rd Person Character	Preferably an in-engine Animation Controller (Mecanim). Unity Standard or 3rd Party asset.
White Boxed Manufacturing Environment	Integration of primitive or placeholder assets to implement manufacturing environment to be used for pathfinding by AI agents.

Unity uses the concept of **scenes**. For your first component, you need at least two scenes:

- A start screen containing some information about you, your project and a button to enter an interactive scene.
- An interactive scene containing:
    - a number of fixed objects
    - A moveable object, preferably an animated character
    - Collision detection implementation between moveable and fixed objects.
    - Optional: sound effects, visual effects.

Submission requirements for component 1: You need to upload an archive named to your student ID that should contain the following:
- A Unity project.
- A screen captured video with voiceover to illustrate all aspect of your project.

MARKING SCHEME / CRITERIA

Component 1 (30%): Proof of Concept				
Excellent (70%+)	Very Good (60%+)	Good (50%+)	Satisfactory (40%+)	Unsatisfactory. (<40%)
A Mark of 70%+ is awarded to students who have clearly demonstrated an excellent grasp of the core concepts taught and implemented those elements effectively and efficiently in the project. The project consists of all elements with no significant errors in the code that would cause it not to function correctly. Script is well documented throughout.	A Mark of 60%+ is awarded to students who demonstrate a very good and practical understating of the concepts taught and have applied that knowledge to proficient effect in the project. The project will be functional, with all the key elements included. There may be some lack of consistency or functionality in the code structure.	A Mark of 50%+ is awarded to students who demonstrate a competent understanding and application of the key aspects of the specification. There may be some incomplete functionality, but the student will have demonstrated a good understanding of applied methods.	A Mark of 40%+ is awarded when work submitted may be lacking in or incomplete in functionality as specified in the brief. There will be a demonstration of the basic functionalities and attempted systems implementation. The student has demonstrated a grasp of the basic skills required to deploy a game engine in a manufacturing simulation setting.	A Mark of -40% is awarded when there is limited evidence of an understating of the brief objectives or implementation of the outlined tasks or objectives. The work submitted may not be functional and may be missing key components that are essential to the assessment criteria.

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Assessment Brief

MAIN ASSESSMENT – Component 2

Module name and CRN	Advanced Manufacturing Technology 14479 – AUT-202110			
Module Leader	Bal Singh			
Semester 1	**Level**	6	**Approx. No of Students**	33

COMPONENT TITLE: Project

COMPONENT WEIGHTING: 70%

HAND-OUT DATE: 29/09/2021

SUGGESTED STUDENT EFFORT: 140 Hours for this component

SUBMISSION DATE: Sunday, 08/01/23, at 23:59

SUBMISSION INSTRUCTIONS: Upload a dedicated submission box on My Beckett

FEEDBACK DATE: within 3 weeks of submission

FEEDBACK MECHANISM: Typed feedback on MyBeckett

LEARNING OUTCOMES ADDRESSED BY THIS COMPONENT:

LO1: Students will be able to critical appraise where and how computer simulation (i.e. discreet event simulation, CAD/CAM, DFM/DFA, computer aided process planning) can benefit an organisation and its role in design, planning and control of production systems.

LO2: Students will be able to critical analysis modern design methodologies and their implementation in product design and development processes.

LO3: Students will be able to identify the key elements of Lean and Agile engineering and be able recommend possible solutions to a given scenario.

LO4: Develop an advance creative solution for a chosen engineering scenario.

NOTES:
The usual University penalties apply for late submission.

This is an individual assessment. Submission of an assessment indicates that you, as a student, have completed the assessment yourself and the work of others has been fully acknowledged and referenced.

By submitting this assessed work, you are declaring that you are fit to submit, and you will therefore not normally be eligible to submit a request for mitigation for this work.

If your result for this component is recorded as non-submission or your mark for this component and for the whole module is below 40%, you will have opportunity to take reassessment with a submission in April 2022, with the date to be confirmed on the MyBeckett module site and your mark capped at 40% (see Reassessment information below). If you are granted deferral through the mitigation process, you may complete the reassessment with a full range of marks available.

If you are granted deferral through the mitigation process, you may take the reassessment test with a full range of marks available.

For further information, please refer to your Course Handbook or University Assessment Regulations.

DETAILS OF THE ASSESSMENT

Component 2: Project (70 marks)
Upload to MyBeckett by 11:59 pm on Sunday 8/01/2023

For this component of the assessment, you will extend the project you created for component 1 by incorporating artificial intelligence for an autonomous AI agent to navigate a target location. The system should contain:

- An AI (navmesh) agent, preferably animated
- A navmesh path for movement
- A range of variable tariff walkable areas:
    - Safe walkable area for a shortest route to destination
    - Higher cost areas emulating oil spills, hazardous storage, etc. for the AI agent to avoid
- Off mesh links for the AI agent to jump across to find a shortest route
- Nav mesh obstacles for the AI agent to avoid
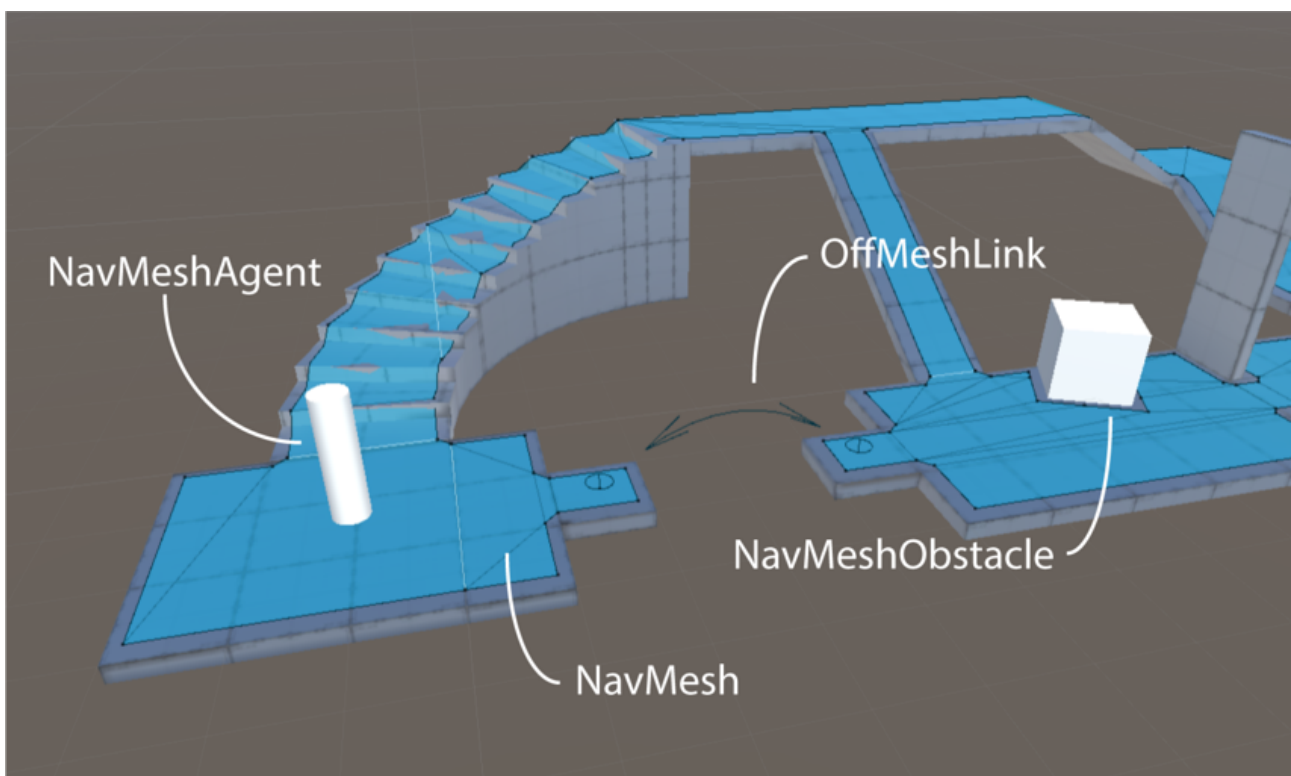
You will implement the above in a number of separate scenes selectable using buttons from the main menu scene. Each scene will have a button to navigate back to the main menu.

Submission requirements for component 2: You need to upload an archive named to your student ID that should contain the following:
- A Unity project.
- A screen captured video with voiceover to illustrate all aspect of your project.

MARKING SCHEME / CRITERIA

Component 2 (70%): Project				
Excellent (70%+)	Very Good (60%+)	Good (50%+)	Satisfactory (40%+)	Unsatisfactory. (<40%)
A Mark of 70%+ is awarded when students have clearly demonstrated an excellent grasp of the core concepts taught and implemented those elements effectively in creating a simulated manufacturing environment. There is an excellent use of interaction systems and AI for pathfinding works flawlessly.	**A Mark of 60%+** is awarded when students demonstrate a very good and practical understating of the concepts taught and have applied that knowledge to proficient effect in the final product. There is evidence of good understanding of the AI implementation for pathfinding.	**A Mark of 50%+** is awarded when students demonstrate a competent understanding and application of the key aspects of the project brief. There may be some incomplete functions, assets or features in the final product, or errors in how the AI works.	**A Mark of 40%+** is awarded when work submitted may be lacking in or incomplete in functionality or content as specified in the brief. There may be issues in the functionally of the product or use of the AI in pathfinding.	**A Mark of -40%** is awarded when there is limited evidence of an understating of the brief objectives or implementation of the outlined tasks or objectives. The project submitted may not be functional and may be missing key components or content that is essential to the assessment criteria.

Late Submission

Without any form of extenuating circumstances, standard penalties apply for late submission of assessed work. These range from **5% per day to 100% of the possible total mark**, depending on the number of days late. Full details (section 3.12) of the penalties for late submission of course work are available at:

academic-regulations-202122.pdf (leedsbeckett.ac.uk)

Academic integrity: Cheating, Plagiarism and Other Forms of Unfair Practice

Academic misconduct occurs when you yourself have not done the work that you submit. It may include cheating, plagiarism, self-plagiarism, collusion and other forms of unfair practice. See section 10 of the regulations guide in the above link.

More information about referencing can be found at:

[Harvard referencing - Quote, Unquote Online - The Library at Leeds Beckett University](#)

Reassessment and Deferral Opportunities

Component 1: Make good on original assignment.
Component 2: Make good on original assignment.

The same assignment will be used as reassessment and deferral.

Please discuss reassessment/resubmission/deferral work with your module tutor.

NOTE: You must attempt both components of the module in order to pass it.