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| **Digital Technologies** | **Digital Assets** | **T Course** | **Focus: Game Design and Programming** |
| **Unit Description**   1. The focus of this unit is on developing the students’ understanding of the building blocks of larger systems and developing the skills necessary to effectively design and develop digital assets for more complex data-driven systems. 2. Students will develop the skills and knowledge required to interpret and create their own digital assets for a range of purposes and audiences. 3. They analyse discrete components of existing processes and products, examining how they interact within a system and/or re-design and develop assets. | | | |
| **Specific Unit Goals**   1. Comprehensively apply a design process and develop the individual structures of data driven systems 2. Critically analyse, create, evaluate, and modify digital assets 3. Evaluate the nature and interactions of individual digital assets within the constraints of a larger system | | | |
| **Specific Unit Content**   1. **Design Process**    1. Critically analyse and apply a design process, evaluating opportunities and constraints, and explain the decision making when developing an asset    2. Critically analyse and apply the elements and principles of the creation of digital assets, for example, sections of code, web pages or 3D models    3. Apply the design process to evaluate and develop the architecture of the building blocks of basic systems, for example, pseudocode, wireframes, or flowcharts 2. **Strategies, methodologies and procedures**    1. Evaluate strategies, tools, and processes required to produce digital assets    2. Research and investigate a range of appropriate digital assets and justify design decisions    3. Analyse the selection and use of specific production tools which are appropriate for constructing digital assets    4. Create a digital asset. For example, sections of code, web pages or 3D models    5. Design assets using computational, algorithmic and/or data-driven thinking    6. Apply strategies to work both independently and collaboratively in time sensitive environments 3. **Theories, concepts and materials**    1. Critically analyse the theories affecting the design and development of a digital asset. For example, the importance of style guides, the theory of negative space in web design, and the polygon count for 3D model development    2. Critically analyse and apply fundamental computer science concepts for problem solving in the development of digital assets    3. Critically analyse the factors affecting the development of a digital asset within the context of its design environment    4. Critically analyse legal, social and ethical responsibilities associated with the development of digital assets 4. **Contexts**    1. Critically analyse how design is influenced by context including social, historical and cultural, and how the design of a digital assets may impact systems, solutions and projects    2. Critically analyse the human considerations and challenges involved in the design and development of digital assets. For example the ethical, environmental and legal contexts, or the development of controversial technology 5. **Communication**    1. Communicate accurately with others in an appropriate format both orally and in writing    2. Communicate ideas and insights in a range of appropriate mediums and justify ideas coherently    3. Explain the process of solving design problems and justify the choices made during the development of digital assets    4. Justify ideas coherently using appropriate evidence and accurate referencing 6. **Reflection**    1. Reflect on own learning style and performance including planning, time management to develop strategies to improve own learning. | | | |
| **Assessment:**  3 – 5 assessment tasks are mandated by the BSSS. The tasks here are designed to give you a starting point from which to work into your own teaching and learning strategies. Make sure you consult the BSSS guidelines, course document on assessment types and weightings to ensure that they meet the requirements stated. | | | |

| **Week** | **Topic** | **Content Descriptors** | **Elaborations/Big Questions** | **Learning Activities and Assessment Tasks** | **Resources** |
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| 1 | Game Theory and the Design Process | 1a.  .2a  2b.  3a.  3d.  4a.  4b.  5a. | * What is a Game? * What is meant by Game Theory? * What Is the Design Process? * Steps involved in the design process. * What is a Game Asset? | * Research what is a game and what is meant by a game asset. * Make notes in the general design process/Design Cycle. Steps involved tasks that are performed. * Use of project management tools such as a Gantt chart(Trello)   **Suggested Assessment Task**   * Journal/Logbook: Ongoing notes, sketches of models, algorithms, code snippets, reflections on the work, sources of data, tutorials etc. | * <https://www.gamedesigning.org/learn/tutorials/> |
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| 3 | Creating Digital Assets Part 1 – 3D Models | 1a.  1b.  1c.  2a.  2b.  2c.  2d.  2e.  2f.  3a.  3b. (implicit)  3c.  3d.  4a.  4b.  5a.  5b.  5c.  5d.  6a. | * What is 3D Modelling? * How do we create a 3D Model? * What programs are there to create a 3D Model? * Concepts of 3D Models   + Meshes   + Textures   + UV Mapping   + Rendering   + Simple Animation   + Rigging   + Weight Mapping   + Lighting * How can these be used in creating game assets? | * Develop 6 - 8 models ranging from simple primitives to compound models * Acquire textures (either create or download existing ones) and wrap them onto models * Use this as a platform to discuss development pipelines in the context of the design process * Simple Animations   + Motion Tweening   + Slide Transitions * Lighting and simple rendering of a scene containing previously designed and textured models   **Suggested Assessment Task**   * Portfolio of models created, * Documentation of the each model’s development process; screenshots, explanation of tools used etc). Could be included in their logbook/journal. | **Maya**   * <http://aie.edu.au/introduction-to-maya/> * [http://docs.autodesk.com/MAYAUL/2015/ENU/GettingStarted/](http://docs.autodesk.com/MAYAUL/2015/ENU/GettingStarted/?_ga=2.158812153.214880342.1561692042-2126855201.1518485859#!/url=./files/landing_page.htm)   **Blender**   * CG Cookie * Blender Guru * BornCG (YouTube Channel Blender 2.7)   **General - Textures**   * Polligon * [www.textures.com](http://www.textures.com)   **PDFs**   * **Beginner’s Guide to Blender (2.7) -**<https://www.blenderhd.com/wp-content/uploads/2015/08/BeginnersGuideToBlender.pdf> * **Blender Basics 5th Edition -** <http://www.cdschools.org/Page/455> |
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| 11 | Creating Audio Assets | 2b.  2c.  3a.  3b. (implicit)  3c.  3d.  4a.  4b.  5a.  5b. | * What types of audio are found in games? * How can we create audio for games? * What are the legal issues in using audio? | **Simple audio manipulation**   * Use Audacity or similar. * Manipulation could include:   + Changing timing   + Cutting   + Inserting   + Simple effects such as fade in/fade out | * Audacity * Garage Band * Audio Sauna * Anvil Studio - MIDI |
| 12 | Creating Programming Assets | 1b.  1c.  2a.  2d.  2e.  2f.  3a.  3b.  3c.  4a.  5a.  5b.  5c.  5d. | * What is a computer program? * How do we create a computer program? * What game development environment should we use? * What are the standard ways in which a program is assembled? * What programming language is best to use? * What are data structures and how are they used in a computer program? | **Programming Theory** (C# Language)   * Data types   + Integer, Character, Float * Control Structures:   + If Statements   + For Loops   + While Loops * Data Structures   + Arrays   + Lists * **Suggested Assessment Task**   + Series of small C# projects with or without using the Unity IDE | * Learn to Program with C# - Unity Beginner Tutorial: <https://youtu.be/BasabtdErXQ> * UDEMY Courses: They are relatively cheap when on special around $15 - $20 |
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| 18 | Catch Up Weeks/ Final Assessments | |  | * **Suggested Assessment Task**   + End of unit Theory Test, Set of Prac. Exercises |  |
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