Module specification

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Module code	COM728
Module title	3D Design & Optimisation
Level	7
Credit value	20
Faculty	FAST
Module Leader	Nathan Roberts
HECoS Code	101019
Cost Code	GACP

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Computer Game Development	Core
MA Game Art	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	12 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	9 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	21 hrs
Placement / work based learning	0 hrs
Guided independent study	179 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	28/11/2018
With effect from date	01/09/2019
Date and details of revision	August 21 addition of MA Game Art

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Version number	2

Module aims

This module will focus on the design, implementation and optimisation of 3D game assets. This will enable students to develop a broad understanding of the current issues that affect the development of technical art such as efficient topology, utilisation of real world data and script automation of complex tasks.

Students will be required to incorporate professional standards and techniques within the design and production of 3D assets in accordance to a specific set of requirements and constraints. The balance between form and function will be examined and the problems associated with incorporating real world data.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Design, implement, optimise and test 3D game assets in accordance to a set of requirements and constraints
2	Demonstrate a critical awareness of design issues encountered when developing industry standard assets
3	Capture, evaluate and incorporate real world data within a 3D technical art project

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Students will be provided a series of briefs, each one related to specific components taught in the module and evidenced within a reflective journal.

As the module progresses, assessment briefs will evolve to encourage the use of more complex techniques alongside those identified earlier, providing the opportunity to deliver more sophisticated methods, specifically that related to development associated to game engines.

Assessment will require students to conform to a series of self-assessment components managed and analysed through the use of a short quiz. These will be available at checkpoints within key areas of delivery, in order to review a student's familiarity with any associated processes. These will be used to ensure that a required level of knowledge has been attained which may be fundamental to the application of other areas, in addition it will quickly identify the needs for any additional support necessary alongside with the use of the reflective journal.

Assessment will be reviewed continually through the mechanisms discussed and students will be required to attend an interview at the end of the module to demonstrate their work and discuss their knowledge of the practices they adopted. in addition, the meeting also provides an opportunity for students to engage on a one to one basis and any associated feedback.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1-3	Coursework	100%

Derogations

None

Learning and Teaching Strategies

This module is supported through a series of practical sessions that are deployed as classroom demonstrations. The module is delivered both by the tutor and through electronic learning resources; demonstrations are recorded and delivered as video tutorials for reference after.

The module is designed to introduce students to the acquisition of data and the delivery of 3D models while also investigating the considerations associated to their deployment within a game engine. The module will investigate the professional practices adopted by the industry and replicate these to provide work that conforms to a professional standard and quality but also considers the many restrictions and resolutions to satisfy the requirements specific to real-world scenarios.

Each session will introduce students to a core component of 3D development and encourage application of their knowledge though a series of briefs that introduce a specific problem scenario that requires skills acquired from class sessions.

Progression will dictate the formulation of the briefs, allowing more complex scenarios as the sessions advance and incorporate the application of knowledge from previous ones.

To promote the student's learning outside of the classroom each brief will provide scope to apply solutions that can be determined from additional study, found in the recommended reading and online resources associated to the module.

Indicative Syllabus Outline

Data Capture (Acquisition and utilisation of real-world data):

- Terrain Generation (Satellite and OS Topography)
- Photogrammetry (Drones/SUA)
- Motion Capture

Efficient Design and Optimisation of Model Topology
Efficient Mapping Techniques (UV, Diffuse, Normal, Displacement, Specular, Transparency)
Shading Networks
Character Rigging and Animation (Kinematics, Controllers, Constraints)
Scripting and Expressions

Lighting and Rendering
Processing Optimisation (Level of Detail, Baking, Blending)
VR/AR Assets, Full-Dome Environments

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Palamar, T. (2015) *Mastering Autodesk Maya 2016*: Autodesk Official Press.

Other indicative reading

Ahearn, L. (2016) *3D Game Textures: Create Professional Game Art Using Photoshop*, 4th ed. A K Peters/CRC Press, Boca Raton, FL.

Derakhshani, D. (2015) *Introducing Autodesk Maya 2016*: Autodesk Official Press, Sybex.

Herbez, A. (2016) *Maya Programming with Python Cookbook*. Packt Publishing.

Professional Body Websites:
The British Computer Society (BCS) http://www.bcs.org/

The Institution of Engineering and Technology (IET) http://www.theiet.org/

The Institute of Electrical and Electronics Engineers (IEEE) http://www.ieee.org

The Association of Computing Machinery (ACM) http://www.acm.org/

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes
Engaged
Enterprising
Creative
Ethical

Key Attitudes
Commitment
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets

Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Emotional Intelligence
Communication