

Glasgow School of Art Course Specification
Course Title: Serious Game Design & Implementation



Course Code	HECOS Code	Academic Session
PSGV104		2023-24

Course Title	Serious Game Design & Implementation
Course Contact	Fraser Dougan

Credits	40
SCQF Level	11
When Taught	Semester 1

Associated Programmes	MSc Serious Games and Virtual Reality
Lead School	School of Innovation and Technology
Other Schools	N/A
Date of Approval	Programme Approval March 2023

Course Introduction

This course is split into three key topics, and is intended to provide students with an introduction to serious games design and provide while also providing them with an opportunity to develop their 3D modelling and interactive visualisation techniques and approaches.

In part one of this course, , students will acquire the principal skills and knowledge required to successfully design a serious game to a specified theme. Students will work in small groups to develop a novel serious game prototype that will be non-digital in nature, allowing students to focus on game design, interaction and knowledge transfer rather than concerns about how to implement rules digitally.

In parts two and three of this course, students will work with commercial game engine and 3D modelling software and use this to submit a digital portfolio of work that showcases their skills and knowledge of 3D modelling and digital game development (including basic game scripting/programming). For students new to these technologies, taught classes will focus on developing and building appropriate foundational skills, knowledge and understanding. For students with more prior experience, mentoring will support students in developing projects that allow them to further consolidate and grow their existing knowledge and skills.

Course Aims

This course aims are to:

- Introduce the fundamental principles of, and critical approaches to, game design, with particular focus on serious game design
- Introduce and consolidate the fundamental principles and practices for design and development of interactive 3D visualisation/simulation using modern commercial game engines.
- Introduce and consolidate the fundamental principles and practices for digital 3D modelling using commercial and/or open-source 3D modelling software for modelling and animation.
- Provide a grounding in design and technical skills for design and implementation of serious games, across game design, 3D modelling and game development.
- Develop communication, documentation and interpersonal skills for communicating design goals and collaborative working to complete work according to a shared vision

Course Intended Learning Outcomes

By the end of this course students will be able to:

1. Demonstrate a critical understanding of, and effective practice in, 3D modelling, design and development of interactive 3D visualisations
2. Demonstrate a critical understanding of the history of and contemporary issues in serious games design, and the application of visualisation and interaction methods within this context
3. Demonstrate understanding of, and apply, workflows, communication and interpersonal practices relevant to modelling and serious game design and implementation

Indicative Content

Teaching on this course is split across three key topics: Serious Game Design; 3D Modelling; and Interactive Application Development. Across these topics, this course will cover issues including:

- Serious Game Design:
 - Current practices in serious games research
 - Entertainment and serious games taxonomy
 - Game-based learning and applications
 - Serious games and their mechanics (Game mechanics, learning mechanics, serious games mechanics)
 - Game design, game study, game theories, gamification
 - Evaluation and assessment of the effectiveness serious games
 - Examples of serious games for education, training, and teaching
- 3D Modelling:
 - 3D Coordinate systems (units & scale, 2D, 3D)
 - Scene organisation and file/data handling
 - 3D Modelling methodologies and specialisms
 - Texturing, materials and shading for game assets & environments
 - Reference gathering for production methods
 - Lighting & Cameras in real-time & pre-rendered workflows
 - Composition & graphic design principles for game asset production
 - Introduction to Animation principles in 3D Software
- Interactive Application Development:
 - An introduction to computer game platforms, technologies, and techniques.
 - Interactive computer graphics fundamentals for 3D and 2D representations
 - Techniques for input, animation, collision detection, and similar interactive systems and tools used in application development.
 - Fundamental programming concepts
 - Implementing game states and object-oriented scripting techniques in game development

Description of Learning and Teaching Methods

Learning and teaching in the three topic areas is through a combination of lectures, in-class discussions and studio-based supported practical 'lab' sessions, along with student self-directed study and practice.

Teaching is primarily based in the studios, supported by asynchronous/online learning. All elements make extensive use of the GSA's web-based virtual learning environment and video lecture delivery platform, supporting student engagement with independent learning and practice.

Indicative Contact Hours	Notional Learning Hours
80 Hours	400 Hours

Description of Formative Assessment and Feedback Methods

Regular individual and group feedback is available during tutorial/lab sessions.

Specific sessions or submissions are scheduled for providing feedback are also arranged at key stages of the course (mid-semester):

- Serious Game Design: Game play test sessions with peer and tutor verbal feedback. This is a group activity and can provide rich qualitative feedback on game design progress.
- 3D Modelling: 3D development milestone block out/detailing stage submission
- Individual diorama interactive demo submission (interactive application development) with written tutor feedback.

Description of Summative Assessment arrangements

Coursework 1: Students will work in a group to design and develop a playable serious game (board game) and submit this with an project design journal – The game, game design, journal and presentation are together assessed for 35% weight of the total course grade.

Coursework 2: Interactive visualisation. A group project, 35% weight of the final course grade. Of this, 20% will be based on a short individual report (500-1000 words) and reflection, taking individual contributions to the group project into account, the remaining 80% based on the practical project submission. Students will be assessed on their ability to:

- design and develop a prototype of 3D serious game, visualisation or simulation system using appropriate professional tools;
- demonstrate ability to work in a team and collaboratively manage a small project

Coursework 3: A 3D modelling project which demonstrates a critical knowledge of 3D modelling and animation techniques and practice worth 30% of the total course grade; This may be a standalone project and may include 3D content developed for inclusion in the other projects.

Students should:

- show an understanding of the practice and theory contexts in relation to which their project is positioned;
- exhibit appropriate level of skill demonstrated in each area of modelling and animation;
- demonstrate good documentation practices and critical self-reflection on the development process.
- demonstrate ability to structure tasks and overall workload

Submissions will be assessed and moderated in line with the Code of Assessment. Written feedback will be given.

Reassessment opportunities where a student has not passed the course are outlined in the Code of Assessment.

Description of Summative Assessment Method	Weight %	Submission week
Serious Game Design, Prototype & Presentation (board game)	35	Week 13
3D interactive simulation/visualisation, with individual reflective report	35	Week 12
Production of a 3D modelling portfolio	30	Week 13

Exchange/Study Abroad	
Can this course be taken by Exchange/Study Abroad students?	No
Are all the students on the course taught wholly by distance learning?	No
Does this course represent a work placement or a year of study abroad?	No
Is this course collaborative with any other institutions?	No
If yes, then please provide the names of the other teaching institutions	N/A

Reading and On-line Resources

The key resource lists for this course can be found here:

MSc Serious Games and VR list <https://gsa.keylinks.org/#/list/594>

MSc Visualisation Core reading list <https://gsa.keylinks.org/#/list/595>

Some of the most important key resources from these lists are:

Fullerton, T., 2014. *Game Design Workshop: A Playcentric Approach to Creating Innovative Games*,. 3rd ed. Boca Raton: A K Peters/CRC Press.- ISBN-13: 978-1482217162

International Journal of Serious Games -

<http://journal.seriousgamessociety.org/index.php?journal=IJSG>

Harteveld, C. 2011. *Triadic Game Design: Balancing Reality, Meaning and Play* – ISBN-13: 978-1849961561

Autodesk, 3DS Max Tutorials <http://docs.autodesk.com/3DSMAX/16/ENU/3ds-Max-Tutorials/>

Hocking, J., (2022) *Unity in Action, 3rd Edition*, Multiplatform game development in C#

Unity Learning Website. <https://unity3d.com/learn>