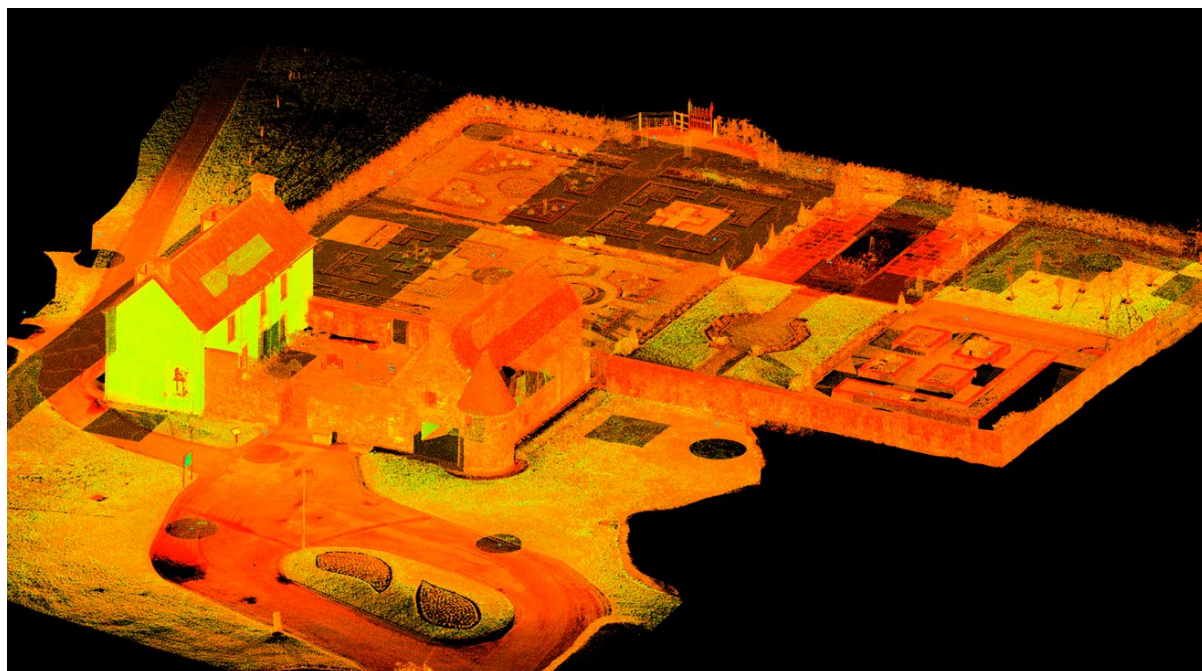


**Glasgow School of Art Course Specification**  
**Course Title: Heritage Visualisation 1**



Course Code	HECOS Code	Academic Session
PIHV105		2023-24

Course Title	Heritage Visualisation 1
Course Contact	Prof Stuart Jeffrey

Credits	40
SCQF Level	11
When Taught	Semester 1

Associated Programmes	MSc Heritage Visualisation
Lead School	School of Innovation and Technology
Other Schools	N/A
Date of Approval	Programme Approval March 2023

### Course Introduction

Studies in this course are split into three key topics, and is intended to provide students with an introduction to critical approaches to Heritage Visualisation while also providing them with an opportunity to develop their 3D modelling and interactive visualisation techniques and approaches. The topics covered are:

- Critical Issues in Heritage Visualisation: This topic provides a forum in which students will learn about and discuss a range of current practical and theoretical approaches to heritage and heritage visualisation including digital documentation, data uses, representation and archiving.
- 3D Modelling: This topic provides students with an introduction to 3D modelling and animation techniques by acquiring the principal skills and knowledge required to successfully create and animate 3D objects, and provide the student with the necessary skills to demonstrate this. It will look at various modelling, texturing, rendering, and animation techniques, which a focus on how these techniques are used in heritage visualisation.
- Interactive Application Development: this topic introduces students to interactive 3D application development and is designed to provide students with the programming/scripting techniques necessary to develop interactive visualisation applications using commercial software and tools.

### Course Aims

This course aims to provide:

- An introduction to fundamental principles of, and critical approaches to, design and development of interactive 3D visualisation/simulation for Heritage.
- A description of various methods and technologies used for digital documentation and interactive visualisations, their appropriate uses, capabilities and limitations.
- An understanding of heritage and digital documentation and a framework for critical reflection on the purpose of digital documentation academic, research and professional contexts.
- A clear understanding of the modes of analysis and interpretation of digital documentation from multiple perspectives.

- 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.

### **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 and in the development of interactive 3D visualisations
2. Demonstrate a critical understanding of the history of and contemporary issues in Heritage Visualisation, and the application of visualisation and interaction methods within this context
3. Demonstrate understanding of, and apply, good working and communication practices relevant to Heritage Visualisation

### **Indicative Content**

This course will cover topics including:

- Digital Documentation/Critical Issues in Heritage Visualisation:
  - Introduction to Heritage concepts and theory
  - Background and history to Heritage Visualisation including archaeological recording
  - Critical debates in heritage, with a focus on digital documentation and visualisation
  - Uses of 3D digital visualisation in Heritage, including research and analysis, co-design, co-production, community engagement and creative response.
  - History and current best practice for data archiving, access and long-term preservation
- 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 programming 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):

- Digital Documentation & Critical Issues: a peer assessed class conference with individual presentations and Q&A sessions on relevant Heritage Visualisation.
- 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: Digital Documentation.

Coursework 1 is a 3500 word written critical analysis of an existing Heritage Visualisation project from the professional or academic domain, 35% of the final course grade. Students are asked to consider documentation techniques and methodology, representation, audience focus and contextual data as well as a mandatory section on data preservation, access and reuse.

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
A 3500-word essay (analysis and interpretation)	35	Week 13
3D interactive heritage simulation/visualisation and individual reflective report	35	Week 13
Production of a 3D modelling portfolio	30	Week 14

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
<p>Keylinks for Heritage Visualisation Canvas course <a href="https://gsa.keylinks.org/#/list/591">https://gsa.keylinks.org/#/list/591</a>  MSc Visualisation Core reading list <a href="https://gsa.keylinks.org/#/list/595">https://gsa.keylinks.org/#/list/595</a></p> <p>Key resources include:  Journal of Cultural Heritage, Elsevier, 1296-2074  ACM Journal on Computing and Cultural Heritage, ACM, ISSN 1556-4673, EISSN 1556-4711  Hocking, J., (2018) <i>Unity in Action, 2<sup>nd</sup> Edition</i>, Multiplatform game development in C#  Unity Learning Website. (December 2016), <a href="https://unity3d.com/learn">https://unity3d.com/learn</a>  Autodesk, 3DS Max Tutorials <a href="http://docs.autodesk.com/3DSMAX/16/ENU/3ds-Max-Tutorials/">http://docs.autodesk.com/3DSMAX/16/ENU/3ds-Max-Tutorials/</a></p>