Glasgow School of Art Course Specification
Course Title: Heritage Visualisation 2

Course Code	HECOS Code	Academic Session
PIHV212		2023-24

Course Title	Heritage Visualisation 2
Course Contact	Prof Stuart Jeffrey

Credits	40
SCQF Level	11
When Taught	Semester 2

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

The core practical element of this course is in the digital documentation and visualisation of one or more heritage sites and/or heritage objects. Students work in groups to document sites/objects of interest using 3D scanning and photographic approaches, and make use of data so captured (with additional data resources as appropriate) in the creation of novel visualisations.

Students will also continue to learn more about approaches to data acquisition and visualisation, and apply this knowledge in their group projects.

Previous projects have worked on medieval sites such as Glasgow Cathedral, Provan Hall or Paisley Abbey, or at Govan Old Parish Church, a more modern building that houses 'The Govan Stones' - a large collection of early medieval carved stones, located on a site of great historical significance. Other projects have had a more contemporary focus, working with e.g. The Alasdair Gray Archive – documenting the studio workspace of this noted Scottish author and artist.

Student groups visualisations are self-directed, with each group able to choose how to interpret and present the heritage data – whether through pre-rendered animation, interactive application, or other process.

Course Aims

- Introduce the theory and practice of 3D scanning technologies as an approach to data acquisition for heritage visualisation
- Provide students with skills for carrying out 3D scanning using survey methodologies and techniques
- Explain metadata recording for all data acquisition, describe a sound workflow and instil its importance for digital archiving
- Enable students to conduct and manage a small-scale self-contained heritage visualisation project, including basic desk-based research on the selected site
- Provide students with a broad understanding of the key theoretical, ethical and practical issues involved in digital documentation projects in real-world situations.

Course Intended Learning Outcomes

By the end of this course students will be able to:
1. Demonstrate extensive and detailed knowledge and understanding in 3D scan survey methodology for example projects from data capture including backup, processing of data to create a mesh, and archiving methodology of the acquired digital documentation.
2. Demonstrate a significant range of the skills and techniques associated with data acquisition and processing and for heritage visualisation, for documentation and production of interpretation materials.
3. Demonstrate a clear understanding of contextual research methods for heritage sites and the appropriate means of engaging with site stakeholders.

Indicative Content

This course will cover issues including
- Common surveying methodologies and techniques
- Understanding the uses and limitations of a range of 3D and 2D data acquisition scanning devices and methods such as:
  - Laser scanning
  - Digital photogrammetry
  - RTI
- Capture resolution, range and accuracy of 3D laser scanning
- Complete pipeline from data acquisition, processing, 3D reconstruction, to presentation and interpretation of the heritage structure, site or object/s, including:
  - Processing of laser scanner data
  - Register scan data, export the data and process it to create mesh data
  - Mesh processing and visualisation stages
- Case studies in 3D data acquisition and processing,
- Basics of DSLR Photography & digital photography & how to process the data and overlay the results onto scan data
- Metadata, back-up and archiving methodologies
- Risk assessment for field work, associated risks when acquiring digital data in the field to the personnel involved, the public and the heritage structure, site or object itself
- Various software packages for data processing and visualisation
- Health & Safety for fieldwork
- Approaches to interpretation

Description of Learning and Teaching Methods

Teaching is through a combination of lectures, discussion and practical work in studio and through fieldwork.
Fieldwork of at least three days equivalent is a core feature of this class, providing practical experience of data-acquisition in a realistic setting.
Supervised field trips for data-acquisition will be arranged by the course tutors.

Indicative Contact Hours	Notional Learning Hours
70 Hours	400 Hours

Description of Formative Assessment and Feedback Methods
Individual feedback is available during tutorials to provide verbal formative assessment. Formative assessment is also given through peer feedback and formative class presentations on project development and topics.

Description of Summative Assessment arrangements
The learning outcomes will be assessed through a group fieldwork project for data acquisition and visualisation. This will entail working with the raw data demonstrating competency in approach to a scanning project, recording metadata, following back up procedures, registering, processing the data, creating mesh models and using these in a visualisation. The students should be able to apply knowledge and understanding of key visualisation techniques to create a simple visualisation of the processed data.

Students are assessed through a group project with individual components, and individual reports plus log book.

Coursework weighting:

Groupwork: Processing and preparation of data for visualisation (fly-through or interactive) and archive: 40%

Individual report and log book: 60%.
Each student should maintain an individual log book documenting and commenting on their part in fieldwork, data capture and processing. This is supplemented with an individual critical reflective report (2500 words). The discussion within the individual reports should reflect the range of theoretical and critical issues covered in semester 1 and from within this course.

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
Group work: Processing and preparation of data for visualisation (fly-through or interactive) and archive	40	Week 13
Individual Report and Log Books	60	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

Current keylinks for Heritage Visualisation Canvas course https://gsa.keylinks.org/#/list/591
MSc Visualisation Core reading list https://gsa.keylinks.org/#/list/595

Notable resources for this course include:
English Heritage (2011), 3D Laser Scanning for Heritage, 2nd Edition, Available at:
https://historicengland.org.uk/images-books/publications/3d-laser-scanning-heritage2/ [Accessed January 15, 2018].
Ioannides, M., et al (eds.), (2012) *Progress in Cultural Heritage Preservation - 4th International Conference*, EuroMed 2012, Lemessos,, Available at:
http://www.springer.com/computer/information+systems+and+applications/book/978-3-642-34233-2 [Accessed May 4, 2014].
Stanco, F., Battiato, S., and Gallo, G. (Eds.), (2011) *Digital Imaging for Cultural Heritage Preservation: Analysis, Restoration, and Reconstruction of Ancient Artworks*. CRC Press, ISBN 978-1439821732