Glasgow School of Art Course Specification
Course Title: Human Computer Interaction and Extended Reality

Course Code	HECOS Code	Academic Session
PSGV204		2023-24

Course Title	Human Computer Interaction and Extended Reality
Course Contact	Dr Matthieu Poyade

Credits	20
SCQF Level	11
When Taught	Semester 2

Associated Programmes	Core: MSc Serious Games & Virtual Reality Elective: available to students on PGT programmes MSc Heritage Visualisation and MDes Sound for the Moving Image
Lead School	School of Innovation and Technology
Other Schools	N/A
Date of Approval	Programme Approval March 2023

Course Introduction

This course provides students with an overview of the different techniques and methods to create interactive applications using advanced Human Computer Interaction paradigms and Extended Reality (XR) technologies. XR consists of an umbrella terminology which, among others, encompasses Virtual and Augmented Realities.
This course provides students with the critical understanding to start their own investigation into the use of interactive, immersive, and augmented technologies as applied to their own field of study.

Course Aims

The course aims are to:
- Introduce and review recent applications of Human Computer Interaction and Extended Reality to attain an understanding of production pipelines.
- Provide students with practical skills on XR implementation using advanced interaction paradigms
- Teach advanced visualisation and interaction paradigms (e.g. immersive stereoscopic visualisation, tracking and augmented interactions) and explore the creative possibilities these technologies offer through practical workshops and technical training
- Provide students with the practical skills and understanding of the use of interactive interfaces used in Virtual and Augmented Reality.

Course Intended Learning Outcomes

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

- Critically evaluate the theoretical and practical aspects and workflow involved in the development of interactive, and immersive & augmented simulations
- Critically assess different forms of interaction data and interfaces and investigate the associated problems which are inherent with each

- Appraise methods for combining advanced interaction paradigms to produce coherent Virtual and Augmented Reality solutions
- Handle and manipulate interaction data and interfaces to produce applications in line with industry practices to provide solutions, using advanced interactive and immersive or augmented 3D technologies

Indicative Content

This course will cover issues including:
- Extended Reality (VR/AR)
- Stereoscopic visualisation (such as in commercial VR Head-Mounted Devices and SDKs)
- Investigate appropriate computer hardware for motion tracking and haptic technologies, (e.g., electromagnetic, optical, mechanical linkages, game console controllers)
- Real-time motion tracking as an alternative input device for interactive applications
- Head tracking, hand tracking and haptic force feedback interfaces
- Gesture and posture in Human-Computer Interaction
- Applications of motion tracking and haptic technologies, XR in immersive simulations and serious games (e.g., exer-games and other genres of health games)
- User interface concerns in designing interactive applications with motion/haptic control

Students will be increasingly exposed to advanced interaction paradigms and XR technologies through a set of practical activities and be introductions about their functioning.

Description of Learning and Teaching Methods

Classes are taught in digital studios, with a mixture of lectures and a series of practical hands-on lab sessions which explore a range of user interaction and extended reality technologies.

Indicative Contact Hours	Notional Learning Hours
33	200 Hours

Description of Formative Assessment and Feedback Methods

A number of formative lab exercises provide students with opportunity to practice with a range of technologies through the course and obtain early feedback on concepts and implementation. Individual feedback is available during lab sessions to provide verbal formative assessment on a regular basis.

Description of Summative Assessment arrangements

The learning outcomes 1-2 will be assessed through a 2000-word written essay, weighted at 50% of the course grade, on a topic within the area related to Human Computer Interfaces and Augmented or Virtual Reality, to be submitted on week 8.

The Learning outcomes 3-4 will be assessed through an individual project in which the student will develop an interactive real-time visualisation of a virtual environment using the technologies that was introduced to them throughout the course. This is also weighted at 50% of the overall course grade, and to be submitted on week 13.

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
2000 word essay	50	Week 8
Individual Project	50	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: https://gsa.keylinks.org/#/list/929

The core text for this course is LaValle, S. (2016). Virtual Reality. http://lavalle.pl/vr/