

Glasgow School of Art Course Specification
Course Title: Immersive Systems 1

Please note that this course specification is correct on the date of publication but may be subject to amendment prior to the start of the 2023-24 Academic Year.

Course Code:	HECOS Code:	Academic Session:
UISD102		2023-24

1. Course Title:
Immersive Systems 1

2. Date of Approval:	3. Lead School:	4. Other Schools:
PACAAG April 2020	School of Innovation and Technology	N/A

5. Credits:	6. SCQF Level:	7. Course Leader:
40	7	Daniel Livingstone

8. Associated Programmes:
BSc Immersive Systems Design

9. When Taught:
Semesters 1 & 2

10. Course Aims:
<p>This course will provide the students with a fundamental understanding of computer hardware and software systems, and a foundational set of knowledge and skills for developing immersive systems.</p> <p>This includes:</p> <ul style="list-style-type: none"> • The fundamentals of digital computing • A foundational understanding of, and ability to apply, structured and object-oriented programming with a high-level programming language • Introductory knowledge and skills for creating interactive 3D content using middleware (e.g. Unity3D/Unreal or other game engine) • Basic knowledge and skills for creating and modifying digital 2D images and 3D models using appropriate software tools

11. Intended Learning Outcomes of Course:
<p>By the end of this course students will be able to:</p> <ul style="list-style-type: none"> • Demonstrate an understanding of the fundamentals of digital systems, design and develop simple physical computing solutions (using e.g. Raspberry Pi or Arduino)

- Demonstrate an ability to design and develop small applications utilising basic structured and object-oriented programming techniques
- Demonstrate ability to design and develop simple interactive 2D or 3D experiences using a game engine (e.g. Blender Game Engine, Unreal, Unity3D, etc)
- Demonstrate and apply basic mathematics and physics concepts in the development of immersive systems
- Demonstrate ability to create basic 2D or 3D models and related content using appropriate modelling tools
- Use a range of problem solving approaches to address defined issues with a familiar contexts

12. Indicative Content:

- An introduction to the history and concepts of immersive systems
- Fundamentals of computer and digital systems
- Hardware devices and interfaces
- Introduction to game engines and core features
 - Interface essentials
 - Game Creation
 - Basic scripting
- Introduction to computer programming with high-level programming languages
 - Introduction to structured computer programming and basic concepts
 - IDEs, compilers and interpreters
 - Object Oriented Programming
- A basic introduction to 3D modelling concepts:
 - 3D Software and working in a 3D environment
 - Texturing and texture editing
 - Introduction to Lighting
 - Introduction to Animation Basics.
 - Rendering and postproduction
 - Design and Storyboarding
- Fundamental mathematics for immersive systems (geometry)
- Virtual Reality Interaction

13. Description of Summative Assessment Methods:

Assessment Method	Description of Assessment Method	Weight %	Submission week (assignments)
Portfolio of Work	Immersive Systems Work Portfolio	100%	Portfolio of work developed over duration of Studio, submission in week 27

13.1 Please describe the Summative Assessment arrangements:

Students will be given a series of practical project briefs for individual and small group work, under tutor guidance. Work will be assessed through a combination of student presentations, process journals and/or written reports, and tutor evaluations of finished coursework.

14. Description of Formative Assessment Methods:

Engagement with formative assessment is a mandatory requirement.

Verbal feedback during supported lab sessions will provide students with directed learning support and feedback on their performance.

Self-assessment online tests will be used to help students with self assessment.

14.1 Please describe the Formative Assessment arrangements:

In class discussion and review of project and lab work with tutors during regular schedule lab sessions.

Online-self assessment to be used by students in their own study time.

15. Learning and Teaching Methods:

Formal Contact Hours	Notional Learning Hours
86	400

15.1 Description of Teaching and Learning Methods:

Timetable: Final timetable to be confirmed.

This course will normally be taught intensively in the four opening weeks of each semester, to provide all students with the appropriate foundations for the Studio course.

16. Pre-requisites:

N/A

17. Can this course be taken by Exchange/Study Abroad students? Yes

18. Are all the students on the course taught wholly by distance learning? No

19. Does this course represent a work placement or a year of study abroad? No

20. Is this course collaborative with any other institutions? No

20.1 If yes, then please enter the names of the other teaching institutions:

N/A

21. Additional Relevant Information:

N/A

22. Indicative Bibliography:

This course may be taught using any suitable programming language (e.g. Python, C#)
For C#, an indicative bibliography would include:
Anon 2015. *C# Fundamentals: Development for Absolute Beginners (Channel 9)*. [online] Channel 9. Available at: <<https://channel9.msdn.com/Series/C-Sharp-Fundamentals-Development-for-Absolute-Beginners>> [Accessed 6 Jul. 2015].
Miles, R., n.d. *The C# Programming Yellow Book*.
Stephens, R., 2014. *C# 5.0 Programmer's Reference*. 1 edition ed. Indianapolis, IN: John Wiley & Sons.
Felicia, P., 2016. *Unity 5 from Zero to Proficiency (Foundations): A step-by-step guide to creating your first game*. CreateSpace Independent Publishing Platform.

The course will also utilise a current game engine, and physical computing with a low-cost hardware platform such as Raspberry Pi or Arduino. Possible books and resources would include:

Richardson, M. and Wallace, S., 2014. *Make: Getting Started with Raspberry Pi: Electronic Projects with the Low-Cost Pocket-Sized Computer*. 2nd ed. Maker Media, Inc.

McEwen, A. and Cassimally, H., 2013. *Designing the Internet of Things*. John Wiley & Sons.

For 3D Modelling, links to web based resources will be provided, e.g.:

Autodesk, n.d., *Autodesk Knowledge Network*, <https://knowledge.autodesk.com/>

Lynda, n.d., *Lynda.com*, <http://lynda.com>