---

**Glasgow School of Art Course Specification**

**Course Title:** Human Computer Interaction, Virtual & Augmented Reality

*Course Specifications for 2020/21 have not been altered in response to the COVID-19 pandemic. Please refer to the 2020/21 Programme Specification, the relevant Canvas pages and handbook for the most up-to-date information regarding any changes to a course.*

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>HECOS Code:</th>
<th>Academic Session:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSGV201</td>
<td></td>
<td>2020-21</td>
</tr>
</tbody>
</table>

1. **Course Title:**
Human Computer Interaction, Virtual & Augmented Reality

2. **Date of Approval:**
PACAAG April 2020

3. **Lead School:**
School of Simulation and Visualisation

4. **Other Schools:**
N/A

5. **Credits:**
20

6. **SCQF Level:**
11

7. **Course Leader:**
Dr. Matthieu Poyade

8. **Associated Programmes:**
- MSc Visualisation (Serious Games & Virtual Reality)
- SimVis elective option for MDes Sound for the Moving Image, MSc Visualisation (Heritage Visualisation)

9. **When Taught:**
Semester 2

10. **Course Aims:**
- Introduce and review recent applications of motion tracking, haptic interaction and 3D display technologies in virtual reality to attain an understanding of HCI in VR/AR production pipelines.
- Provide students with practical skills on VR/AR implementation using advanced interaction interfaces.
- Learn about stereoscopic visualisation, motion tracking and haptic interfaces 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 motion tracking, haptic interaction, gesture-based technologies and stereoscopic visualization in immersive simulations and Augmented Reality.

11. **Intended Learning Outcomes of Course:**
By the end of this course students will be able to:
1. Critically evaluate the theoretical and practical aspects and workflow involved in the development of interactive and immersive and augmented simulations.
2. Critically assess the usefulness of different forms of motion tracking and haptic interface data and investigate the associated problems which are inherent with each method.
3. Appraise methods for combining methods to produce coherent simulated outputs.
4. Handle and manipulate interaction data and interfaces to produce a final output in line with and comparable to industry practices provide solutions to particular problems of using motion tracking and/or haptic devices in interactive and immersive or augmented 3D applications.

12. Indicative Content:
This course will cover issues including:
- Virtual and Augmented Reality
- Stereoscopic visualisation (HTC Vive, Oculus Rift, Google VR SDK)
- 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, VR/AR 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 expose to the VR/AR technologies through a set of practical activities and be given introduction about its functioning.

13. Description of Summative Assessment Methods:

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>Description of Assessment Method</th>
<th>Weight</th>
<th>Submission week (assignments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essay</td>
<td>2000 word essay</td>
<td>50</td>
<td>Week 8</td>
</tr>
<tr>
<td>Coursework</td>
<td>Individual Project</td>
<td>50</td>
<td>Week 13</td>
</tr>
</tbody>
</table>

13.1 Please describe the Summative Assessment arrangements:

The learning outcomes 1-2 will be assessed through a 2000-word written essay 50% (this could include examples of visual work, where appropriate, and a bibliography) in the areas of Human Computer Interfaces and Augmented or Virtual Reality or related areas, 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 – 50% - to be submitted on week 13.

14. Description of Formative Assessment Methods:
Engagement with formative assessment is a mandatory requirement. Individual feedback is available during tutorials to provide verbal formative assessment on a weekly basis.

14.1 Please describe the Formative Assessment arrangements:
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.

15. Learning and Teaching Methods:

<table>
<thead>
<tr>
<th>Formal Contact Hours</th>
<th>Notional Learning Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>200</td>
</tr>
</tbody>
</table>

15.1 Description of Teaching and Learning Methods:
Timetable: Timetable will be made available before the end of Semester 1
Classes are taught in digital studios, with a mixture of lectures and practical hands-on lab sessions with a range of user interaction, VR and AR technologies.

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:


Poyade, M., 2013. MOTOR SKILL TRAINING USING VIRTUAL REALITY AND HAPTIC INTERACTION-A CASE STUDY IN INDUSTRIAL MAINTENANCE (Doctoral dissertation, University of Malaga).


Relevant papers published on journal/conference proceedings will be available on the VLE.