THE GLASGOW SCHOOL OF ART	**Course Specification**

Course Code:	**Session:**
PSGV201	2017/18

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

2. Date of production / revision:
9/03/2017

3. Level:
SCQF 11

4. Credits:
15

5. Lead School/Board of Studies:
School of Simulation and Visualisation

6. Course Contact:
Dr Matthieu Poyade

7. Course Aims:

- Introduce and review recent applications of motion tracking, haptic interaction and 3D display technologies in virtual reality and video games 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 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.

8. Intended Learning Outcomes of Course:

On successful completion of the course the student will be able to:

1. critically evaluate the theoretical and practical aspects and workflow involved in in the

development of interactive and immersive simulations and games
2. critically assess the usefulness of different form of motion tracking and haptic data and investigate the associated problems which are inherent with the data
3. appraise methods for combining data from different sources 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
5. provide solutions to particular problems of using motion tracking and/or haptic devices in interactive and immersive 3D applications

9. Indicative Content:

This course will cover issues including

- Investigate appropriate computer hardware for motion tracking and haptic technologies, eg. electromagnetic, optical, mechanical linkages, game console controllers
- Realtime motion tracking as an alternative input device for interactive applications
- Head and eye tracking, hand tracking and haptics
- Gesture and posture in Human-Computer Interaction
- Applications of motion tracking and haptic technologies, VR/AR in serious games (e.g. exergames and other genres of health games)
- User interface concerns in designing interactive applications with motion/haptic control

10. Description of Summative Assessment:

For this course, students are assessed through coursework. Coursework weighting: 100%

No.	Assessment Method	Description of Assessment Method	Weight %	Submission week (assignments) or length (exam)
1	Essay	2000 word essay	50	8 (indicative)
2	Coursework	Individual project	50	12 (indicative)

10.1 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.

The learning outcomes 3-5 will be assessed through an individual project 50%.

11. Formative Assessment:

Formative lab exercises

11.1 Please describe the Formative Assessment arrangements:

A number of formative lab exercises provide students with opportunity to practise with a range of technologies through the course, and obtain early feedback on concepts and implementation.

12. Collaborative:	
Yes ☐	**No** ☒
12.1 Teaching Institutions:	
4T	

13. Requirements of Entry:
None

14. Co-requisites:
None

15. Associated Programmes:
MSc Visualisation (Serious Games and Virtual Reality)

16. When Taught:
Spring semester

17. Timetable:
Timetable will be available in the induction week.

18. Available to Visiting Students:	
Yes ☒	**No** ☐

19. Distance Learning:	
Yes ☐	**No** ☒

20. Placement:	
Yes ☐	**No** ☒

21. Learning and Teaching Methods:		
Method	**Formal Contact Hours**	**Notional Learning Hours** (Including formal contact hours)

Lecture	10	10
Studio		
Seminar/Presentation		
Tutorial		
Workshop		
Laboratory work	20	20
Project work		50
Professional Practice		
E-Learning / Distance Learning		
Placement		
Examination		
Essay		20
Private Study	Not Applicable	50
Other (please specify below)		
TOTAL	**30**	**150**

22. Description of "Other" Teaching and Learning Methods:
4T

23. Additional Relevant Information:
4T

24. Indicative Bibliography:

Allbeck, Jan & Faloutsos, Petros (Eds.) (2011) *Proceedings from Motion in Games: 4th International Conference*, Edinburgh, United Kingdom, November 13-15, 2011, Springer, ISBN 9783642250897

Bullock, J., Michailidis, T. and Poyade, M., Towards a Live Interface for Direct Manipulation of Spatial Audio.

Cranmer, E., Jung, T. and Miller, A., 2016. Implementing Augmented Reality to Increase Tourist Attraction Sustainability.

Fox, J., Arena, D. and Bailenson, J.N., 2009. Virtual reality: A survival guide for the social scientist. *Journal of Media Psychology*, *21*(3), pp.95-113. Available at https://pdfs.semanticscholar.org/1475/9c2226d24d3926b91b375d6fcd85cf403813.pdf

Kallmann, Marcelo and Bekris, Kostas (Eds.) (2012) *Proceedings from Motion in Games: 5th International Conference,* Rennes, France, November 15-17, 2012, Springer, ISBN-13: 978-3642347092

Lohse, K.R., Hilderman, C.G., Cheung, K.L., Tatla, S. and Van der Loos, H.M., 2014. Virtual reality therapy for adults post-stroke: a systematic review and meta-analysis exploring virtual environments and commercial games in therapy. *PloS one*, *9*(3), p.e93318.

LaValle, Steven, (2017) *Virtual Reality*, http://msl.cs.uiuc.edu/vr/vrbooka4.pdf

Microsoft (2013) *Kinect Human Interface Guidelines*. Available from http://www.microsoft.com/en-us/kinectforwindows/develop/

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

Poyade, M., Clunie, L., McGeough, B., Lysakowski, A., Rea, P. and Anderson, P., 2015. Toward the development of an accurate 3D human body model implemented in a real-time, interactive application to enhance anatomy teaching. *FASEB J*, *29*(1 Supplement), pp.692-713.

Poyade, M., Reyes-Lecuona, A. and Viciana-Abad, R., 2009. Influence of binocular disparity in depth perception mechanisms in virtual environments. In *New Trends on Human–Computer Interaction* (pp. 13-22). Springer London.

Tscheu, F. and Buhalis, D., 2016. Augmented reality at cultural heritage sites. In *Information and Communication Technologies in Tourism 2016* (pp. 607-619). Springer International Publishing.

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