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

2. Date of Production/Revision:
22 November 2017

3. Level: Please identify the level at which this course is taught.
SCQF11

4. Credits: Please enter the number of credits allocated to this course.
20

5. Lead School/Board of Studies: Please enter the School to which the course belongs therefore the Board of Studies which has the responsibility for quality assurance of the course. If more than one School is involved in the delivery of the course, then please record only the lead School. Please contact Academic Services if you require help.
School of Simulation and Visualisation

6. Course Contact: Please enter the name of the course coordinator.
Dr. Matthieu Poyade

7. Course Aims: Please specify the aims of the course.

- 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.

8. Intended Learning Outcomes of Course: Please specify the ILOs of the 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 form of motion tracking and haptic interface data and investigate the associated problems which are inherent with each methods
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

9. Indicative Content: Please enter a short description of the course 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.

10. Description of Summative Assessment: Describe the assessment. Where multiple methods are used and separately weighted, indicate the relative weighting of each in percentage terms.

<table>
<thead>
<tr>
<th>No.</th>
<th>Assessment Method</th>
<th>Description of Assessment Method</th>
<th>Weight %</th>
<th>Submission week (assignments) or length (exam)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Essay</td>
<td>2000 word essay</td>
<td>50</td>
<td>Week 8</td>
</tr>
<tr>
<td>2</td>
<td>Coursework</td>
<td>Individual Project</td>
<td>50</td>
<td>Week 13</td>
</tr>
</tbody>
</table>
### 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, 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.

### 11. Formative Assessment: Please briefly describe the assessment methods used to provide feedback to the student but not contributing towards the final grade/classification. If none, enter “None”.

Individual feedback is available during tutorials to provide verbal formative assessment on a weekly basis.

### 11.1 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.

### 12. Collaborative: Is this course collaborative with any other institutions?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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### 12.1 Teaching Institutions: If yes, then please enter the names of the other teaching institutions.

School of Simulation and Visualisation

### 13. Requirements of Entry: Please enter the pre-requisites for this course, both mandatory and optional. If none, enter “None”.

None

### 14. Co-requisites: Please enter the courses which must be taken in conjunction with this course.

None

### 15. Associated Programmes: Please enter the main degree programme(s) for which this is a compulsory course. If none, enter “None”.

MSc Visualisation, MDes Sound for the Moving Image
16. When Taught: Please indicate the proportion of the session when the course is taught e.g. Term 1
Semester 2

17. Timetable: Please enter times and days (if known) and length and frequency of teaching sessions (weekly, fortnightly etc). If none, please enter “None”.
Timetable will be made available before the end of Semester 1

18. Available to Visiting Students: Can this course be taken by visiting students? Please tick either yes or no.
Yes ☒ No ☐

19. Distance Learning: Are all the students on the course taught wholly by distance learning? Please tick either yes or no.
Yes ☐ No ☒

20. Placement: Does this course represent a work placement or a year of study abroad? Please tick either yes or no.
Yes ☐ No ☒

21. Learning and Teaching Methods: Please indicate the number of formal contact hours for each learning and teaching method listed below as well as the estimated notional learning hours associated with each method. Note that 100 notional learning hours correspond to 10 credits (an average student should devote approximately 100 hours in total to a 10-credit course).

<table>
<thead>
<tr>
<th>Method</th>
<th>Formal Contact Hours</th>
<th>Notional Learning Hours (Including formal contact hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Studio</td>
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<tr>
<td>Seminar/Presentation</td>
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<td>Tutorial</td>
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<tr>
<td>Workshop</td>
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<tr>
<td>Laboratory work</td>
<td>30 (formerly 20)</td>
<td>30 (formerly 20)</td>
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<tr>
<td>Project work</td>
<td></td>
<td>60 (formerly 50)</td>
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<tr>
<td>Professional Practice</td>
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<tr>
<td>E-Learning / Distance Learning</td>
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<tr>
<td>Placement</td>
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<tr>
<td>Examination</td>
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<tr>
<td>Essay</td>
<td>20</td>
<td>20</td>
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<tr>
<td>Private Study</td>
<td>Not Applicable</td>
<td>80 (formerly 50)</td>
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<tr>
<td>Other (please specify below)</td>
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<tr>
<td>TOTAL</td>
<td>40</td>
<td>200</td>
</tr>
</tbody>
</table>
22. Description of “Other” Teaching and Learning Methods:

N/A

23. Additional Relevant Information: Please record any further explanatory information relevant to the course.

N/A

24. Bibliography: Please ensure that this aligns with the Harvard Referencing System


application to enhance anatomy teaching. *FASEB J*, 29(1 Supplement), pp.692-713.


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