H8MR: Mixed Reality

Module Code:	H8MR
Long Title	Mixed Reality APPROVED
Title	Mixed Reality
Module Level:	LEVEL 8
EQF Level:	6
EHEA Level:	First Cycle
Credits:	5
Module Coordinator:	
Module Author:	Alex Courtney
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	MSc degree in Computer Science. Experience Lecturing, work experience or projects in the specific domain

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
LO1	Demonstrate understanding of mixed reality concepts by differentiate between Virtual, Mixed and Augmented Reality platforms and the creative possibilities these technologies offer.
LO2	Critically review recent applications using 3D virtual or augmented environment by identifying the possibilities and difficulties in creating and using virtual and augmented reality.
LO3	Apply appropriate design methodologies for immersive technology to design your mixed reality game or application.
LO4	Develop a game or application in 3D environment with virtual and augmented reality using advanced interaction interfaces.

Dependencies
Module Recommendations
No recommendations listed
Co-requisite Modules
No Co-requisite modules listed

Entry requirements	Learners should have attained the knowledge, skills and competence gained from stage 3 of the BSc (Hons) in Computing.

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Module Content & Assessment

Indicative Content
Fundamentals and concepts of virtual reality Types of VR displays – desktop and mobile, how does virtual reality works, types of VR experiences
Creating and exporting VR content VR toolkits, VR support, device specific toolkits, application toolkits, 3D worlds, enabling virtual reality for various platforms – setting up SDK and installing device toolkits
VR Build with controls and intractable Building for SteamVR, Oculus Rift, Gear VR, Google VR, etc. Gaze-based controls such as Ethan, go where I am looking, if looks could kill, etc.. Handy intractable such as setting up the scene, basic button input, scriptable objects for input, intractable items
World Space UI and Locomotion VR design principles, in-game dashboard, wrist-based menu palette. Glide motion, adding comfort, teleportation techniques and toolkits, VR motion sickness
Animation and VR Storytelling Composing stories, timelines and audio track, recording an animation track, animation controllers, clips, and editor, making the story interactive
Fundamentals and concepts of augmented reality AR fundamentals, packages and toolkits
GIS, Sensor Data and Plugins GIS techniques and technologies, Statistics used with GIS, GIS and augmented reality, Applications of GIS, Gaming and GIS. Leveraging sensors and plugins
Open CV, HoloLens and beyond Setting up mapbox, building OpenCV, Urban hunt, XR applications in media, XR with HoloLens, playing with mixed reality, projects with HoloLens, Do the robot, building and deploying from Visual Studio.

Assessment Breakdown	%
Coursework	100.00%

Assessments

Full Time

Coursework

Assessment Type:	Formative Assessment	**% of total:**	Non-Marked
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4
Non-Marked:	Yes		

Assessment Description:
Formative assessment will be provided on the in-class individual or group activities.

Assessment Type:	Proposal	**% of total:**	30
Assessment Date:	n/a	**Outcome addressed:**	1,2
Non-Marked:	No		

Assessment Description:
The students will learn how to use VR and AR equipment and apply immersive methodologies to design their games.

Assessment Type:	Project	**% of total:**	70
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4
Non-Marked:	No		

Assessment Description:
Develop or enhance the previously developed game to provide an immersive experience to the users. The game or application should be developed in 3D environment with virtual and / or augmented reality using advanced interaction interfaces.

No End of Module Assessment

No Workplace Assessment

Reassessment Requirement

Repeat examination
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

Reassessment Description
Coursework Only This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination. Repeat project Reassessment of this module will consist of a repeat project.

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Module Workload

Module Target Workload Hours 0 Hours

Workload: Full Time

Workload Type	*Workload Description*	*Hours*	*Frequency*	*Average Weekly Learner Workload*
Lecture	Classroom & Demonstrations (hours)	24	Per Semester	2.00
Tutorial	Other hours (Practical/Tutorial)	24	Per Semester	2.00
Independent Learning	Independent learning (hours)	77	Per Semester	6.42
			Total Weekly Contact Hours	4.00

Module Resources

Recommended Book Resources

Steve Aukstakalnis ,. (2016), ,Practical Augmented Reality: A Guide to the Technologies, Applications and Human Factors for Ar and Vr (Usability).

Jesse Glover (Author), Jonathan Linowes (Author) ,. (2019), ,Complete Virtual Reality and Augmented Reality Development with Unity: Leverage the power of Unity and become a pro at creating mixed reality applications.

Erin Pangilinan (Author), Steve Lukas (Author), Vasanth Mohan (Author) ,. (2019), ,Creating Augmented and Virtual Realities: Theory & Practice for Next-Generation Spatial Computing.

Supplementary Book Resources

Paul Mealy ,. (2018), ,Virtual & Augmented Reality for Dummies (For Dummies (Computer/Tech)) Paperback.

Dawid Borycki ,. (2018), ,Programming for Mixed Reality with Windows 10, Unity, Vuforia, and UrhoSharp (Developer Reference).

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note:	