



**Swansea University**  
**Prifysgol Abertawe**

**FACULTY OF SCIENCE AND  
ENGINEERING**

**STUDENT HANDBOOK**

**MSc VIRTUAL REALITY  
(FHEQ Level 7)**

**SUBJECT SPECIFIC  
(PART TWO OF TWO)**

***MODULE AND COURSE STRUCTURE***

**2023/24**

## **DISCLAIMER**

The Faculty of Science and Engineering has made all reasonable efforts to ensure that the information contained within this publication is accurate and up-to-date when published but can accept no responsibility for any errors or omissions.

The Faculty of Science and Engineering reserves the right to revise, alter or discontinue degree programmes or modules and to amend regulations and procedures at any time, but every effort will be made to notify interested parties.

It should be noted that not every module listed in this handbook may be available every year, and changes may be made to the details of the modules. You are advised to contact the Faculty of Science and Engineering directly if you require further information.

## The 23-24 academic year begins on 25 September 2023

Full term dates can be found [here](#)

### **DATES OF 23-24 TERMS**

25 September 2023 – 15 December 2023

8 January 2024 – 22 March 2024

15 April 2024 – 07 June 2024

### **SEMESTER 1**

25 September 2023 – 29 January 2024

### **SEMESTER 2**

29 January 2024 – 07 June 2024

### **SUMMER**

10 June 2024 – 20 September 2024

## **IMPORTANT**

Swansea University and the Faculty of Science of Engineering takes any form of **academic misconduct** very seriously. In order to maintain academic integrity and ensure that the quality of an Award from Swansea University is not diminished, it is important to ensure that all students are judged on their ability. No student should have an unfair advantage over another as a result of academic misconduct - whether this is in the form of **Plagiarism, Collusion** or **Commissioning**.

It is important that you are aware of the **guidelines** governing Academic Misconduct within the University/Faculty of Science and Engineering and the possible implications. The Faculty of Science and Engineering will not take intent into consideration and in relation to an allegation of academic misconduct - there can be no defence that the offence was committed unintentionally or accidentally.

Please ensure that you read the University webpages covering the topic – procedural guidance [here](#) and further information [here](#). You should also read the Faculty Part One handbook fully, in particular the pages that concern Academic Misconduct/Academic Integrity.

## **Welcome to the Faculty of Science and Engineering!**

Whether you are a new or a returning student, we could not be happier to be on this journey with you.

At Swansea University and in the Faculty of Science and Engineering, we believe in working in partnership with students. We work hard to break down barriers and value the contribution of everyone.

Our goal is an inclusive community where everyone is respected, and everyone's contributions are valued. Always feel free to talk to academic, technical and administrative staff, administrators - I'm sure you will find many friendly helping hands ready to assist you. And make the most of living and working alongside your fellow students.

During your time with us, please learn, create, collaborate, and most of all – enjoy yourself!

**Professor David Smith**  
**Pro-Vice-Chancellor and Executive Dean**  
**Faculty of Science and Engineering**



<b>Faculty of Science and Engineering</b>	
Pro-Vice-Chancellor and Executive Dean	Professor David Smith
Director of Faculty Operations	Mrs Ruth Bunting
Associate Dean – Student Learning and Experience (SLE)	Professor Laura Roberts
<b>School of Aerospace, Civil, Electrical, General and Mechanical Engineering</b>	
Head of School	Professor Antonio Gil
School Education Lead	Professor Cris Arnold
Head of Mechanical Engineering	Dr Eifion Jewell
MSc Virtual Reality Programme Director	Dr Peter Dorrington <a href="mailto:p.j.dorrington@swansea.ac.uk">p.j.dorrington@swansea.ac.uk</a>

## STUDENT SUPPORT

The Faculty of Science and Engineering has two **Reception** areas - Engineering Central (Bay Campus) and Wallace 223c (Singleton Park Campus).

Standard Reception opening hours are Monday-Friday 8.30am-4pm.

The **Student Support Team** provides dedicated and professional support to all students in the Faculty of Science and Engineering. Should you require assistance, have any questions, be unsure what to do or are experiencing difficulties with your studies or in your personal life, our team can offer direct help and advice, plus signpost you to further sources of support within the University. There are lots of ways to get information and contact the team:

**Email:** [studentsupport-scienceengineering@swansea.ac.uk](mailto:studentsupport-scienceengineering@swansea.ac.uk) (Monday–Friday, 9am–5pm)

**Call:** +44 (0) 1792 295514 (Monday-Friday, 10am–12pm, 2–4pm).

**Zoom:** By appointment. Students can email, and if appropriate we will share a link to our Zoom calendar for students to select a date/time to meet.

The current student **webpages** also contain useful information and links to other resources:

<https://myuni.swansea.ac.uk/fse/>

## READING LISTS

Reading lists for each module are available on the course Canvas page and are also accessible via <http://ifindreading.swan.ac.uk/>. We've removed reading lists from the 23-24 handbooks to ensure that you have access to the most up-to-date versions.

We do not expect you to purchase textbooks, unless it is a specified key text for the course.

## THE DIFFERENCE BETWEEN COMPULSORY AND CORE MODULES

**Compulsory modules** must be **pursued** by a student.

**Core modules** must not only be **pursued**, but also **passed** before a student can proceed to the next level of study or qualify for an award. Failures in core modules must be redeemed.

Further information can be found under “Modular Terminology” on the following link -

<https://myuni.swansea.ac.uk/academic-life/academic-regulations/taught-guidance/essential-info-taught-students/your-programme-explained/>

# MSc (FHEQ Level 7) 2023/24

## Virtual Reality

MSc Virtual Reality

Coordinator: Dr PJ Dorrington

### Compulsory Modules

Semester 1 Modules	Semester 2 Modules
<b>EG-M126</b> Development of Virtual Reality Environments 1 30 Credits Mr S Vowles/Mr EL Thomas	<b>EG-M130</b> Development of Virtual Reality Environments 2 30 Credits Mr S Vowles/Mr EL Thomas
<b>EG-M131</b> Case Study in state-of-the-art Virtual Reality 15 Credits Dr PJ Dorrington	<b>MN-M587</b> Digital Marketing 15 Credits Mr PA Davies
	<b>MSMM03</b> Mobile Technology Practice (VR) 15 Credits Dr NV Williams/Mrs NA Evans-Cook
Dissertation	
<b>EG-D13</b> MSc Dissertation - Virtual Reality 60 Credits Dr PJ Dorrington CORE	
Total 180 Credits	

### Optional Modules

Choose exactly 15 credits

Please choose 15 credits

<b>EG-M331</b>	Game Design and Programming	Mr EL Thomas/Mr S Vowles	TB1	15
<b>MSDM00</b>	The Digital Revolution (VR)	Dr RJ Jones/Dr LE Evans/Dr CA Pak/..	TB1	15

# EG-D13 MSc Dissertation - Virtual Reality

**Credits: 60 Session: 2023/24 June-September**

**Pre-requisite Modules:**

**Co-requisite Modules:**

**Lecturer(s):** Dr PJ Dorrington

**Format:** Typically 1 hour per week i.e 10-15 hrs total contact time. Each student is to be supervised in accordance with the University's Policy on Supervision, with a minimum of three meetings held. A careful record should be kept, agreed between supervisor and student, of all such formal meetings, including dates, action agreed and deadlines set.

**Delivery Method:** The module is delivered primarily as an individual research project. The student is expected to liaise with the supervisor on a regular basis, with a minimum University requirement of three formal meetings for full-time students. In the case of part-time students it is recommended that a minimum of four meetings are held. Ideally, contact should be more regular, with at least one meeting a week to discuss the development and progress of the project. Depending on the project the student would be expected to carry out this research individually and to complete the necessary risk assessments and training required to work on an industrial site or within laboratory facilities of the University.

**Module Aims:** The module aims to develop fundamental research skills. It comprises the development of supervised research work leading to a dissertation in the field of the Master's degree programme. The specific research topic will be chosen by the student following consultation with academic staff.

**Module Content:** Study for the dissertation, which may be based on practical, industrial, or literature work, or any combination of these, is primarily carried out over a period of about 12 weeks, with the dissertation being submitted at the end of September. Preparatory work on the dissertation may take place during Part One of the programme but students will only be permitted to submit their dissertation following successful completion of Part One.

In conducting the research project and dissertation the student will be exposed to all aspects of modern information retrieval processes, the organisation and resourcing of research and the organising and presentation of experimental data. The student must make inferences on conclusions, based on the evidence provided and supported by the research work. Furthermore they must assess the significance of this work in relation to the field and make suggestions about how further work could improve or clarify the research problem. The results of the project will be disseminated in a substantial dissertation demonstrating the student's ability to research a subject in depth.

The student will meet regularly with the supervisor to ensure that the project is well developed and organised.

Progress will be monitored.

**Intended Learning Outcomes:**

On completion of this module, students should have the ability to:

- Investigate a research topic in detail;
- Formulate research aims;
- Devise and plan a research strategy to fulfil the aims;
- Carry out research work - undertake a literature search, a laboratory based or computer based investigation or a combination of these;
- Gather, organize and use evidence, data and information from a variety of primary and secondary sources;
- Critically analyse information;
- Make conclusions supported by the work and identify their relevance to the broader research area;
- Resolve or refine a research problem, with reasoned suggestions about how to improve future research efforts in the field; and
- Produce a report (dissertation), with the findings presented and defended in a well organised and reasoned manner.
- Produce an application or relevant XR experience to fulfil the identified gap or research problem (i.e. practical outcome)

**Assessment:** Project (100%)



**Assessment Description:** PRESENTATION of the app or XR experience that the student has developed as part of their project will need to be completed and demonstrated to the teaching team in the VR lab on the 16th or 17th of September. At the point of demonstration the student will submit all associated files and build data. This will be a chance for the student to showcase their work to the team, and then focus on the formal written part of the project.

The DISSERTATION and video element of this project will then be submitted to Canvas on the 30th September at 16:00.

**Moderation approach to main assessment:** Universal Double Blind Marking of the whole cohort

**Assessment Feedback:** Informal feedback will be given during regular meetings with supervisors. The supervisor will also provide an assessment of the project drafting skills during the planning of the dissertation. Work will be returned according to specified deadlines and accompanied by constructive comment.

A Feedback session will be given to any student who fails their dissertation and is permitted by the Award Board to resubmit their work.

**Failure Redemption:** Candidates who fail the dissertation are given an opportunity to resubmit the dissertation within 3 months of the result of the examination if a full-time student or 6 months for part-time students. Such students will be given one formal feedback session, including written feedback on the reasons for failure, immediately following confirmation of the result by the University Postgraduate Taught Examination Board. The opportunity to resubmit will only be offered to students who submit a dissertation and are awarded a fail. Those candidates who do not submit a dissertation will not be offered a resubmission opportunity.

**Additional Notes:** Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

The Faculty of Science and Engineering has a ZERO TOLERANCE penalty policy for late submission of all coursework and continuous assessment. If an extension is deemed appropriate a Postgraduate Taught Masters 'Application for Extension to the Submission

# EG-M126 Development of Virtual Reality Environments 1

**Credits: 30 Session: 2023/24 September-January**

**Pre-requisite Modules:**

**Co-requisite Modules:**

**Lecturer(s):** Mr S Vowles, Mr EL Thomas

**Format:** 1x3 hour practical session per week.  
1x3 hour seminar, brainstorming and student-support session.

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

**Delivery Method:** All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

1x3 hour practical session per week.  
1x3 hour seminar, brainstorming and student-support session.

**Module Aims:** Students will acquire the basic skills necessary to create their own 3D Virtual Reality environments utilising basic project and software management systems.

**Module Content:** Virtual Worlds (VW) are a key part of any Virtual Reality (VR) application. This section will cover memory palaces and how to design effectively for spatial memory retention. The Unity game engine will be introduced along with 3D modelling software (e.g. Gravity Sketch, Blender, Pro Builder) to create these Virtual Worlds. VR capabilities will be introduced with the VR frameworks (XR Interaction Toolkit, SteamVR, Oculus Integration) required to explore the worlds. The finished Virtual World is made into a simple VR application and then content ported to an online VR platform (e.g. Spatial).

### Software Management

Any software project needs to consider Software Management so that the project reaches its goals. In this section, key skills and tools for the organisation and protection of the project will be introduced. Students will get taught how to critically think about VR applications via the Strength Weakness Opportunity Threats matrix (SWOT). Students will learn about various software project planning techniques (such as Waterfall, Prototyping, Minimum Viable Product, Spiral, Agile). Version control (Git, GitHub, Gitlab) and Planning tools (Planner, Trello, Kanban) and Team building tools (Teams, Slack, Discord) will be introduced to use alongside software management. The skills learnt in this section will be used for every other module going forward, in order to utilise critical thinking, self-discipline, organisation skills and team building.

### Programming

Computer programming, or coding, is a powerful skill for a VR developer to possess. Students will learn the basics of programming using C# in order to add custom functionality to their applications. This section will also teach students how to modify existing C# scripts and debug them to prevent issues from occurring. Eventually they will have the power to create editor scripts which can help automate their workflow and create their own digital tools. The VR areas of interaction will cover physics, sound, UX, databases and optimisation. The coding fundamentals will cover all the basics of such as methods, variables, loops, triggers, vectors etc.

### Lighting and Sound

Lighting and sound are key parts of creating immersive virtual worlds. Students will learn how to use lightning to enhance the sense of presence and believability in virtual environments. Proper lighting cues help users perceive depth, scale, and spatial relationships accurately. Being able to light a scene well allows developers to direct the user's gaze to highlight important elements within the VR environment. Students will also learn how different setups can evoke specific moods and enhance the overall user experience. Sound is also very important and sometimes underrated factor which contributes to the overall experience of VR. Students will learn audio best practices, and how to develop a soundscape by using spatial sounds and ambisonic recordings. As well as lighting and sound, the overall art pipeline will be explored. 3D modelling tools (e.g. Blender, Gravity Sketch) apps can allow students to integrate their own assets into their worlds. Shaders and particle systems will also be covered teaching the possibility for complex VFX effects.

### Artificial Intelligence (AI)

A fundamental part of VR is education of human interaction with applications, this is commonly done via Artificial Intelligences. This section will cover:

- Path-finding of Non-Playable Characters NPC.
- Create State machines for NPC's to react to the players' actions.
- Story branching will be taught to provide a programmable structure to the narrative choices.
- Utilise LLM AI models to increase NPC realism

We will also explore self-learning machines in the Unity environment, with both reinforced learning and unsupervised learning. In conjunction with AI, students will also learn the Mixed Reality (MR) workflow in order to bring AI driven characters into the real world.

### Hackathon

Students will engage in teams on a short hackathon project where they will use their skills to create an app on a given theme.

### Devices

Throughout the course students will learn how to use Head Mounted Displays (HMD) and Controller technology from a range of VR hardware companies including, Meta, HTC Vive, Pico, Varjo, Valve, etc. Augmented Reality (AR) through handheld devices (iPhone ARKit, Android ARcore, Vuforia) and Mixed

Reality (MR) (Quest Pro, HoloLens) through VR headsets will be used throughout the module. Additional technologies will also be covered such as eye tracking, additional trackers, light field displays, and scent modules will also be covered.

**Intended Learning Outcomes:**

- o Through the exploring of and exposure to various tools and assets, students will develop advanced VR skills enabling them to create working, organised and original applications.
- o In solo VR development, students will exploit cross-disciplinary connections between theoretical and practical concepts.
- o Students will be able to plan, present, evaluate and defend an original VR concept.
- o Students will be able to appraise and value both solo and team based VR development approaches in order to best develop and design real VR applications.

**Assessment:**

- Assignment 1 (10%)
- Assignment 2 (10%)
- Assignment 3 (20%)
- Assignment 4 (20%)
- Assignment 5 (10%)
- Group Work - Coursework (30%)

**Resit Assessment:** Coursework reassessment instrument (100%)

**Assessment Description:** Assignment 1: (Virtual Worlds)

Weighting: 10%

By working on a basic problem the student will demonstrate in class their competency in a basic set of skills to include: Know the Project View Window, Manage Scene files, Navigate the Scene View Window, Reorganize the Unity interface, Understand Tags, Understand the Hierarchy Window, Understand the Inspector Window, Understand the Project View Window, Utilize the Inspector Window.

Assignment 2: (Software Management)

Weighting: 10%

By working on a basic problem the student will demonstrate in class the basic management tools of SWOT, the GIT repository and project planning.

Assignment 3: (Scripting)

Weighting: 20%

Evidence of working with and modifying existing C# codes and use of basic physics.

Assignment 4: (Advanced Lighting)

Weighting: 20%

A VR environment will be developed demonstrating elements of advanced lighting and 3D graphics and the ability to capture video footage from within the environment.

Assignment 5: (AI)

Weighting: 10%

A VR environment will be developed demonstrating different pathfinding methods, state machine and story branching.

Group Work - Coursework (Group Assignment)

Weighting: 30%

A small group exercise where teams will use the knowledge gained so far to pitch a potential VR project. This will include management tools and an informed and realistic project plan with timings based on experience to date.

**Moderation approach to main assessment:** Moderation by sampling of the cohort

**Assessment Feedback:** All assessments will be 1-2-1 authentic, summative assessments by teaching staff according to openly available rubrics. Feedback therefore occurs during every assessment.

**Failure Redemption:** Students will be required to complete a 100% coursework resubmission.

**Additional Notes:** Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

NA

## EG-M130 Development of Virtual Reality Environments 2

**Credits: 30 Session: 2023/24 January-June**

**Pre-requisite Modules:** EG-M126

**Co-requisite Modules:**

**Lecturer(s):** Mr S Vowles, Mr EL Thomas

**Format:** 1x3 hour practical session per week.  
1x3 hour seminar, brainstorming and student-support session.

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

**Delivery Method:** All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

1x3 hour practical session per week.  
1x3 hour seminar, brainstorming and student-support session.

**Module Aims:** Practical lab sessions covering VR applications.

**Module Content: Empathy**

VR is a behaviour inducing machine. Capable of invoking stronger reactions than other techniques and technologies, VR has been utilised in a wide variety of behaviour modifications. Ranging in use from:

- Building empathy with managers and operators in highline work on cell towers.
- Telling emotive stories through the medium of VR for both disabilities, refugees or even inanimate objects.
- Helping people overcome fears such as of heights, in addition to helping manage PTSD and social interactions.
- Helping people think about ethical scenarios in self driving cars.

Students will learn about how emotions can be instilled by the technology and how scenarios can be set up to create ethical dilemmas. Students will have to learn how to tell their stories in VR such that the user can assume the role of the character they have been asked to be. Students will also have to learn how to collect data and learn the laws around data collection. Students will have to plan how to carry out social experiments to collect qualitative and quantitative data.

**Information Machines**

VR/ AR is commonly used to provide spatial overlays of information. This can be for example, seeing:

- The underlying pipes in roads.
- Network signal strength around a building.
- Overlaying data logs of plants' equipment to understand the machines' states.
- Data Analytics of user focus and emotions

Students will learn how in situ systems can be represented. Students will learn how to interface with CAD based systems and BIM based systems for getting available data on 3d geometry, materials properties and operators feedback. Students will have to learn how to cope with a variety of data types (i.e. different geo-coordinate systems, different available data in information systems) How is the Virtual World is going to be orientated to the real world using target recognition and/or location services.

**Training**

Training carried out in VR has been shown to be extremely effective and longer lasting.

Training in VR has been used in a wide range of uses such as:

- Electrical Safety in Transforms operations
- Assembly of devices
- Customer Service Staff training for emotive situations
- Doctors carrying out procedures
- Sports simulations.

VR learning is often captive and always needs to be authentic as technically feasible. It can also be a more sustainable way of training. Students will be expected to evaluate the appropriateness of using VR for any given task. Students will learn the pedagogy, communication and thoroughness to provide robust and effective instruction. Ergonomics must be considered as for example what might work for a taller user may not work for a short user. Gamification of the task has over other learning methods. By entering participants into a playful environment you can enable the ludo state which enables participants to explore, learn and understand the realms of the game as given which of course will significantly improve how they will be able to handle the trained task as the circumstances of its operation changes. Play testing of the VR apps is very important to making the app usable to the end user and this should be considered even in the captive learning environment.

**Intended Learning Outcomes:** \* Students will design and create self-contained, usable VR applications through applying existing knowledge.

\* Students will critically review their VR applications and be able to generate, analyse and evaluate data from these systems to inform further improvements and optimisations.

\* Students will create working VR applications of different types from the ground up.

\* Students will be able to assemble multidisciplinary teams and logically allocate tasks in order to design and develop real VR applications successfully.

**Assessment:**           Assignment 1 (25%)  
                                   Assignment 2 (25%)  
                                   Assignment 3 (50%)

**Assessment Description:** Assignment 1: (Empathy)

Weighting: 25%

As part of a team students will develop an immersive VR system such that a user can experience an environment outside their normal experience and be better able to empathise with others for whom this environment is normal. This will equip students to develop 'experience' type applications.

Assignment 2: (Information Machines)

Weighting: 25%

As part of a team students will develop an in-situ Information Machine that functions at a location on the Bay Campus and operates in AR. This will equip students to develop 'guided tour' type applications.

Assignment 3: (Training)

Weighting: 50%

As part of a team students will develop a training environment implementing a basic understanding of pedagogical principles to train a user in a particular area of knowledge or skill. This will equip students to develop 'training' type applications.

**Moderation approach to main assessment:** Moderation by sampling of the cohort

**Assessment Feedback:** Due to the smaller cohort size feedback is presented to students at monthly feedback sessions 1 to 1.

**Failure Redemption:** Failed group work components are removed and replaced with supplementary assessments that address the required learning outcomes.

**Additional Notes:** Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

<b>EG-M131 Case Study in state-of-the-art Virtual Reality</b>	
<b>Credits: 15 Session: 2023/24 September-January</b>	
<b>Pre-requisite Modules:</b>	
<b>Co-requisite Modules:</b>	
<b>Lecturer(s):</b> Dr PJ Dorrington	
<b>Format:</b>	No formal lectures involved. Tutorials given by individual MSc research project supervisors and MSc Coordinator (20 h) Directed private study (180 h).
<b>Delivery Method:</b>	No formal lectures involved. Tutorials given by individual MSc research project supervisors and MSc Coordinator (20 h) Directed private study (180 h).
<b>Module Aims:</b>	The aim of the module is to undertake an in-depth study into the state-of-the-art of VR related to a student and discipline-specific subject. This will be done by carrying out a detailed literature survey and examination of their chosen topic of specialisation. Additionally, students will explore interdisciplinary activities or opportunities in the chosen field.
<b>Module Content:</b>	<ul style="list-style-type: none"> <li>• Literature review on chosen research topic.</li> <li>• Familiarisation with chosen research topic.</li> <li>• Identification of interdisciplinary links relevant to the chosen topic.</li> </ul>
<b>Intended Learning Outcomes:</b>	<ul style="list-style-type: none"> <li>• Conduct an extensive literature review on the chosen research topic.</li> <li>• Identify interdisciplinary links between the chosen topic and other subject specialisms.</li> <li>• Assess how VR tools can be used to enhance the core/fundamental aspects of the research topic.</li> <li>• Explain the socioeconomic, environmental, and ethical aspects of the project.</li> <li>• Produce a report detailing the above.</li> <li>• Present the summary of the work in 15-20 min oral powerpoint presentation.</li> </ul>
<b>Assessment:</b>	Presentation (5%) Presentation (30%) Draft Paper (10%) Report (55%)
<b>Assessment Description:</b>	Presentation (5%) A short pitch to academic staff to introduce the topic of research Presentation (20%) A presentation to an open audience describing the chosen topic Report (25%) An executive summary document describing the research carried out suitable for a general non-specialist audience Report (50%) An academically rigorous report describing the topic of research suitable for an expert audience
<b>Moderation approach to main assessment:</b>	Moderation of the entire cohort as Check or Audit
<b>Assessment Feedback:</b>	Through oral examination for feedback of the report
<b>Failure Redemption:</b>	Supplementary examination period (August of the current academic year):- Resubmit the report; a 20-minute presentation of the research findings and conclusions followed by 10 minutes Q&A session.
<b>Additional Notes:</b>	Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.
Recommended texts to be defined by supervisor and/or MSc Coordinator according to the chosen research topic.	



<b>EG-M331 Game Design and Programming</b>	
<b>Credits: 15 Session: 2023/24 September-January</b>	
<b>Pre-requisite Modules:</b>	
<b>Co-requisite Modules:</b>	
<b>Lecturer(s):</b> Mr EL Thomas, Mr S Vowles	
<b>Format:</b> 22 hours (11 x 2-hour lectures)	
<b>Delivery Method:</b> On-campus/virtual lectures.	
<b>Module Aims:</b> This module introduces students to the basics of game design and programming providing a foundation on which they can then build a novel 3D game that utilises the benefits of Virtual Reality (VR). The module will begin with core programming principles for gaming, introducing students to theory at the beginning of lecture sessions which incorporate activities to test learning and provide additional support. In addition, the module will build the student awareness of existing contemporary VR games to understand what constitutes the core elements for a successful game.	
<b>Module Content:</b> <ul style="list-style-type: none"> <li>• Introduction to game design</li> <li>• Introduction to level design</li> <li>• Introduction to game programming</li> <li>• Implementation of game mechanics</li> </ul>	
<b>Intended Learning Outcomes:</b> By the end of this module, students will be able to: <ol style="list-style-type: none"> <li>1. Understand and demonstrate their ability to implement basic game mechanics</li> <li>2. The ability to take existing knowledge of contemporary VR game design and critically appraise the elements that are required for a successful game design.</li> <li>3. Develop the rationale for a novel game based on information gathering, storyboarding and development planning.</li> <li>4. Apply fundamental game design principles and techniques to design and construct engaging 3D game levels that exploit the benefits of VR.</li> </ol>	
<b>Assessment:</b>	Coursework 1 (40%) Coursework 2 (60%)
<b>Assessment Description:</b> Coursework 1 – Application. Using an existing game template and 3D design packages, students will create their own game level to fit into an existing popular VR game. Coursework 2 – Application. By using the programming skills they have developed, students will develop a novel game mechanic as part of a VR game prototype.	
<b>Moderation approach to main assessment:</b> Moderation by sampling of the cohort	
<b>Assessment Feedback:</b> Individual written feedback on coursework, and optional face-to-face meetings with the module coordinator and/or lecturers.	
<b>Failure Redemption:</b> Resit coursework(s) as appropriate.	
<b>Additional Notes:</b> This module is for the MSc VR students only.	

<b>MN-M587 Digital Marketing</b>	
<b>Credits: 15 Session: 2023/24 January-June</b>	
<b>Pre-requisite Modules:</b>	
<b>Co-requisite Modules:</b>	
<b>Lecturer(s):</b> Mr PA Davies	
<b>Format:</b> 10 x 3 hour lectures and seminars combined (2-4 held within a PC lab)	
<b>Delivery Method:</b> Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.	
<p><b>Module Aims:</b> Digital technology continues to touch and shape almost every aspect of modern marketing communications. The course aims to provide students with an in-depth understanding of the business (and business development) challenges and opportunities presented by the introduction of new technology.</p> <p>Students will learn about the key concepts that underpin creating sustainable business models within the digital environment through modern marketing techniques with the emphasis on how disruptive technology can be used to effect and evolve multi-channel marketing.</p> <p>The module is practical as well as academic in nature providing students with hands-on experience of developing not only their digital skills (including social, site design search engine and app development) but also the necessary business, research and presentational skills required to build and deploy a real life dynamic digital marketing solution.</p>	
<p><b>Module Content:</b></p> <ol style="list-style-type: none"> <li>1. Introduction: The impact of Digital</li> <li>2. New Marketing and the Digital Involvement Cycle</li> <li>3. Integrated Digital Marketing Strategy</li> <li>4. Content Marketing and Multi-Channel Marketing</li> <li>5. Developing Online Presence I (Web)</li> <li>6. Developing Online Presence II (Mobile &amp; App)</li> <li>7. Online Advertising</li> <li>8. Analytics and BIG Data</li> <li>9. Digital Alignment and The Socially Responsible DIO</li> <li>10. Review</li> </ol>	
<p><b>Intended Learning Outcomes:</b> On completion of this module students should be able to:</p> <ul style="list-style-type: none"> <li>• Apply strategies to shape the development and growth of digital marketing with the organisation.</li> <li>• Critically explain and evaluate different types of digital marketing models.</li> <li>• Formulate a practical plan for the delivery of an effective digital marketing campaign</li> <li>• Recognise and interpret the importance of multi-channel digital marketing and the influence of social media on business and consumer buying behaviour</li> <li>• Prioritise and apply the principles of effective design and implementation to online products and services including web, mobile web and mobile App channels.</li> </ul>	
<b>Assessment:</b>	Coursework 1 (100%)
<b>Resit Assessment:</b>	Coursework reassessment instrument (100%)

**Assessment Description:** 100% Individual Proposal - 3000 words (excluding tables, appendices).

Students are required to create an authentic and integrated digital marketing strategy proposal for an organisation of their choice. In addition to the written element, students are required to evidence their application of relevant and practical digital marketing techniques from teaching / labs. The coursework asks them to critically evaluate theory and market research as they present a range of strategic options supported by examples they create of suitable digital tactics. This may be for instance content planners, SEO plans and practical builds of web pages or applications. The coursework is designed as a portfolio task which students build upon iteratively each week.

Students will need to evidence practical work / output as part of their written submission, and capture and include screenshots of their work.

**Moderation approach to main assessment:** Moderation by sampling of the cohort

**Assessment Feedback:** Written feedback via Canvas plus drop-in sessions for students who would like individual feedback on their performance.

**Failure Redemption:** To redeem failure in this module students will be expected to resit the coursework component and this will be weighted at 100%.

**Reading List:** Kaufman, Ira Morton, 1947- author., Horton, Chris (Marketing consultant) author.; Soltanifar, Mariusz, author.; Kaufman, Ira Morton, 1947-, Digital marketing : integrating strategy, sustainability, and purpose., Routledge, 2024.ISBN: 9781138497283

Philip Kotler author., Hermawan Kartajaya 1947- author.; Iwan Setiawan author., Marketing 4.0 : moving from traditional to digital / Philip Kotler, Hermawan Kartajaya, Iwan Setiawan., Hoboken, New Jersey : John Wiley & Sons, Inc., 2017.ISBN: 9781119341208

Hanlon, Annmarie, author., Digital marketing : strategic planning & integration, SAGE, 2022.ISBN: 9781529742817

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Charles F. Hofacker author., Digital marketing : communicating, selling and connecting / Charles F. Hofacker., Cheltenham : Edward Elgar Publishing Limited, 2018.ISBN: 1788115341

Ryan, Damian, author., Understanding digital marketing : a complete guide to engaging customers and implementing successful digital campaigns, Kogan Page Inc, 2020.ISBN: 1789666023

Ira Morton Kaufman 1947-, Chris Horton (Marketing consultant) A. guidebook for executives, managers, and students., Digital marketing : integrating strategy and tactics with values : a guidebook for executives, managers, and students/ written by Ira Kaufman & Chris Horton., New York, NY ; London : Routledge, Taylor & Francis Group, 2015.ISBN: 9781317999751

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Annmarie Hanlon author., Digital marketing : strategic planning & integration / Annmarie Hanlon., London : SAGE Publications Ltd, 2019.ISBN: 9781526426666

Alan. Charlesworth, Digital Marketing : a Practical Approach., Taylor and Francis, 2014.ISBN: 9781135048877

Annmarie Hanlon author., Digital marketing : strategic planning & integration / Annmarie Hanlon., London : SAGE Publications Ltd, 2019.ISBN: 9781526426666

Technology Advice, Connect and Convert.

Mike Williams, Best VPS hosting providers of 2020.

Dane Wesolko, Peter Morville's User Experience Honeycomb.

Hassenzahl, Marc ; Tractinsky, Noam, User experience - a research agenda, Taylor & Francis Group, 2006-03-01.ISBN: 0144929X

Jakob Nielsen, Usability 101: Introduction to Usability.

NNgroup, Usability Heuristic 8: Aesthetic and Minimalist Design.

NNgroup, Usability Heuristic 9: Help Users Recognize, Diagnose and Recover from Errors.

Peep Laja, Great User Experience (UX) Leads to Conversions.

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AB Tasty, Shopping Cart Abandonment.

AB Tasty, A/B Testing 101.

AB Tasty, Psychology Hacks for Website Optimization.

Peter Prestipino, Make it or break it (next level marketing automation), Feb 2015.

JISC, Meeting accessibility regulations.

Wix, Wix for students.

American Society for Quality, What is the Kano model?.

Moorthy, Krishna ; Johanthan, Sonia ; Tham, Carmem ; Xuan, Khoo Xiao ; Yan, Lee Lit ; Xunda, Tan ; Sim,

Tee Cheng, Behavioural Intention to Use Mobile Apps by Gen Y in Malaysia, 2019.ISBN: Journal of Information

Liu, Huan ; Lobschat, Lara ; Verhoef, Peter C ; Zhao, Hong, App Adoption: The Effect on Purchasing of Customers Who Have Used a Mobile Website Previously, Elsevier Inc, 2019-08.ISBN: 10949968

Engine Creative, 5 reasons why augmented reality fails for brands.

The past, present, and future of FYI: How Hiten Shah turned an obsession with customers into Product Excellence.

BBC, Cathay Pacific fined £500,000 over customer data protection failure.

Responsive web design: it's a matter of process.

Native, web, hybrid, oh my! Further insight into the mobile app landscape.

Establishing your brand's online presence.

Layon, Kristofer, Digital Product Management: Design websites and mobile apps that exceed expectations, New Riders, 2013-12-04.ISBN: 9780321947970

Lyons, Nancy, Wilker, Meghan, Interactive project management pixels, people, and process, 2012-04-12.ISBN: 0321815157

Joe McGauley, 10 Absurdly Dumb 'Smart' Products Nobody Asked For, 2016.

Rasmus Houlind author., Colin Shearer author., Make it all about me : leveraging omnichannel and AI for marketing success / Rasmus Houlind, Colin Shearer., London, UK : LID Publishing Limited, 2019.ISBN: 9781912555147

Annmarie Hanlon author., Digital marketing : strategic planning & integration / Annmarie Hanlon., London : SAGE Publications Ltd, 2019.ISBN: 9781526426666

**Additional Notes:**

This is a compulsory module on the MSc Strategic Marketing

Please note - SOM Postgraduate taught modules are not available to undergraduate study abroad exchange or visiting students.

<b>MSDM00 The Digital Revolution (VR)</b>	
<b>Credits: 15 Session: 2023/24 September-January</b>	
<b>Pre-requisite Modules:</b>	
<b>Co-requisite Modules:</b>	
<b>Lecturer(s):</b> Dr RJ Jones, Dr LE Evans, Dr CA Pak	
<b>Format:</b> 22 hours (11 x 2-hour lectures, including in-class discussions of set readings)	
<b>Delivery Method:</b> Primarily on campus	
<b>Module Aims:</b> Through close analysis of digital media/new media texts, this module will examine the theoretical and practical issues of new media technologies and the implications for social, political and economic spheres.	
<b>Module Content:</b> Drawn from: foundational theories of digital media, including medium theory and cybernetics; virtual reality and the roots of the 'virtual' in computer theory; computer history and software history; the convergence of communication and computing; digital ecology and its focus on the user; the history of the internet and the web, including recent developments; information, knowledge and collaboration; networked publics and real-time 'streams'; critiques and critics of digital media; posthumanism and transhumanism.	
<b>Intended Learning Outcomes:</b> At the end of this module, students should have: <ol style="list-style-type: none"> <li>1. The ability to critically analyse the debates surrounding digital media.</li> <li>2. Developed an advanced understanding of theoretical issues and discussions within digital media.</li> <li>3. The ability to take advanced knowledge of key theorists, within their historical context, and apply that to today's contemporary digital media world.</li> <li>4. Developed an advanced knowledge and appreciation of foundational texts within the field of digital media.</li> <li>5. The ability to construct a persuasive argument around the comparisons and contrasts that emerge in the discussion of digital media/medium theory.</li> </ol>	
<b>Assessment:</b>	Coursework 1 (40%) Coursework 2 (60%)
<b>Assessment Description:</b> Coursework 1: 1500-word critical report (40%) – a critical report on the student's choice of one out of a selection of keywords from digital media history, which will have already been discussed within class.  Coursework 2: 2250-word essay (60%) – the student's choice from a predetermined selection of essay topics listed in the module handbook, though students have some freedom to choose their own essay topic, in consultation with the module coordinator, provided it is appropriately aligned to the module's learning outcomes	
<b>Moderation approach to main assessment:</b> Moderation by sampling of the cohort	
<b>Assessment Feedback:</b> Individual written feedback on coursework, and optional face-to-face meetings with the module coordinator.	
<b>Failure Redemption:</b> re-submit failed component	
<b>Additional Notes:</b> This module is for students on the MSc in Virtual Reality only.	

<b>MSMM03 Mobile Technology Practice (VR)</b>
<b>Credits: 15 Session: 2023/24 January-June</b>
<b>Pre-requisite Modules:</b>
<b>Co-requisite Modules:</b>
<b>Lecturer(s):</b> Dr NV Williams, Mrs NA Evans-Cook
<b>Format:</b> Workshop 1x3hr
<b>Delivery Method:</b> 3 hour weekly workshop in a room where group work can be facilitated.
<b>Module Aims:</b> A practical opportunity to explore the possibilities of mobile technology and social media platforms using still images, video and sound.
<b>Module Content:</b> 1. Introduction, assessment, creative possibilities of mobile technology. 2. How to work creatively: responding to a brief or creating own ideas. 3. Technical possibilities of mobile technology: sound 1 (recording, scripting, visualizing audio) 4. Technical possibilities of mobile technology: sound 2 (editing and sharing) 5. Social media platforms: the potential and the pitfalls 6. You on screen: presenting and vlogging 7. Telling a story: moving images 1 (storyboarding, scripting, permissions) 8. Telling a story: moving images 2(filming, editing, copyright, sharing) 9. Interviewing: techniques and technical requirements 10. Workshop 11. Workshop
<b>Intended Learning Outcomes:</b> At the end of this module, students should have... 1. An advanced awareness of the creative possibility of mobile technology; 2. An advanced knowledge of how individuals and companies make use of images and sound to convey desired messages; 3. A thorough understanding of how individuals and organisations maximize the potential of social media; 4. A confident technical and creative understanding of how to manipulate images and sound to convey their own messages, including their own professional online presence.
<b>Assessment:</b> Coursework 1 (65%) Coursework 2 (35%)
<b>Assessment Description:</b> Coursework 1: practical online portfolio (to include a range of short form audio and visual content of varying lengths: e.g. podcast (5.00 min) / blog (2.30 min) / video or audio interview with industry representative (4.00 min.) ) 65%  Coursework 2: report (1,000 words) (e.g. Write a critical analysis of how two contrasting organisations make use of social media within a specific time period.) 35%
<b>Moderation approach to main assessment:</b> Moderation by sampling of the cohort

**Assessment Feedback:** Feedback on Gradescope, personal meeting can be arranged if student wishes to discuss.

**Failure Redemption:** Re-submit failed component.

**Additional Notes:** This module is not available to visiting and exchange