

UNIVERSITI TEKNOLOGI MARA

CSC573: VIRTUAL REALITY

| | OUT OF THE TEALUT | | | | |
|--|---|--|--|--|--|
| Course Name (English) | VIRTUAL REALITY APPROVED | | | | |
| Course Code | CSC573 | | | | |
| MQF Credit | 3 | | | | |
| Course Description | This course will introduce the essential topics in virtual reality principles and its application. It will also incorporate the development ecosystem such as the technology of multimodal interface and real-time simulation of Virtual Reality. Virtual Reality toolkits editor will also be emphasized, as it will help to jump start on building Virtual Reality applications as required in the coursework. Beside that, the implications of the technology of Virtual Reality towards the users and society will also be discussed. | | | | |
| Transferable Skills | Explain the fundamental concept of virtual reality application. Display technical skills in virtual reality application. Formulates an autonomous learning in virtual reality application. | | | | |
| Teaching Methodologies | Lectures, Lab Work | | | | |
| CLO | CLO1 Explain the fundamental concept of virtual reality application. CLO2 Display technical skills in virtual reality application CLO3 Formulates an autonomous learning in virtual reality application | | | | |
| Pre-Requisite Courses | No course recommendations | | | | |
| Topics | | | | | |
| 1. Introduction 1.1) Definition 1.2) Interaction, Imme | 1. Introduction | | | | |
| 2. History of VR 2.1) The 1800s 2.2) The 1900s 2.3) The 2000s 2.4) VR Becomes An Industry | | | | | |
| 3. The Overview of Various Realities 3.1) Form of Realities 3.2) The Five Classic Components of a VR System | | | | | |
| 4. Input Devices: Trackers, Navigation, and Gesture 4.1) Three- Dimensional Position Trackers 4.2) Navigation and Manipulation Interfaces 4.3) Gesture Interfaces | | | | | |
| 5. Interaction Pattern and Techniques 5.1) Selection Patterns 5.2) Manipulation Patterns 5.3) Viewpoint Control Patterns 5.4) Indirect Control Patterns 5.5) Compound Patterns | | | | | |
| 6. Output Devices: Graphics, Three-Dimensional Sound and Haptics 6.1) Graphics Displays 6.2) Sound Displays 6.3) Haptic Feedback | | | | | |

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7. Computing Architectures For VR 7.1) The Rendering Pipeline 7.2) PC Graphics Architectures 7.3) Workstation-Based Architectures

- 7.4) Distributed VR Architectures

8. Geometric Modeling

- 8.1) Virtual Object Shape 8.2) Object Visual Appearance

- 9. VR Programming
 9.1) Toolkits and Scene Graphs
 9.2) WorldToolKit
 9.3) Java 3D

10. Adverse Health Effects

- 10.1) Motion Sickness 10.2) Eye Strain, Seizures, and Aftereffects 10.3) Hardware Challenges

- 10.4) Latency 10.5) Measuring Sickness 10.6) Summary Factors That Contribute to Adverse Effect 10.7) VR and Society

- **11. Emerging Applications of VR**11.1) VR Applications in Manufacturing
 11.2) Application of VR in Robotics
- 11.3) Information Visualization

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| Assessment Breakdown | % |
|-----------------------|--------|
| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

| Details of | | | | |
|--------------------------|--------------------|--|--------------------|------|
| Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
| | Group Project | Efficiently create workable virtual reality application in a team. | 25% | CLO3 |
| | Individual Project | Skills in using 3D software and virtual reality toolkits. | 15% | CLO2 |
| | Test | Test 1 | 10% | CLO1 |
| | Test | Test 2 | 10% | CLO1 |

| Reading List | Reference Book Resources | Tony Parisi 2016, Learning Virtual Reality, 1 Ed., O'Reilly Media USA [ISBN: 9781491922835] Ann Latham Cudworth 2014, Virtual World Design, 4, 5, 6, CRC Press [ISBN: 1466579617] Jason Jerald 2014, The VR Book: Human-Centered Design for Virtual Reality, 1 Ed., ACM, Morgan and Claypool USA [ISBN: 978-1-97000-1] Jonathan Linowes 2015, Unity Virtual Reality Projects, Packt Publishing [ISBN: 9781783988] Steve Aukstakalnis 2016, Practical Augmented Reality: A Guide to the Technologies, Applications, and Human Factors for AR and VR (Usability), Addison-Wesley [ISBN: 9780134094] | |
|--------------------|---|---|--|
| Article/Paper List | This Course does not have any article/paper resources | | |
| Other References | This Course does not have any other resources | | |

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