

Course Code	Course Title	L	T	P	C
OLMCA605	Virtual and Augmented Reality	3	1	0	4
Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives					
1. To enable students to understand the concepts of Virtual and Augmented Reality 2. To educate the students on technology and underlying principles of Virtual and Augmented reality 3. To accentuate the real-world applications of Virtual and Augmented Reality					
Course Outcome					
By the end of this course, students will: 1. Understand how the design of Virtual and Augmented Reality related to human perception and cognition 2. Gain the knowledge of historical and modern overview of Virtual and Augmented Reality 3. Analyze the real-world applications of Virtual and Augmented reality 4. Understand the hardware technology and development tools used in Virtual and Augmented Reality 5. Analyze the social implications of Virtual and Augmented Reality 6. Comprehend the latest trends and technology in Virtual and Augmented Reality					
Module:1	Introduction to Virtual Reality				
Definitions – History of VR – Key VR terminologies – VR and its relations to human perception –The science and theory of human sensory and cognitive systems - Multi-sensory interactions with virtual environments – Output Devices – Input devices – Immersive and Non-immersive VR – Immersion and Presence – VR Software					
Module:2	Virtual Reality Hardware				
Glossary of VR hardware – Tracking – Rendering - Visual Displays – Head Mounted Displays (HMD) – Tethered HMDs – Mobile Phone integrated HMDs – Stand-alone HMDs - BOOM – CAVE – Sensual Technology					
Module:3	Applications of Virtual Reality				
Entertainment – Business – Education – Training – Automotive – Healthcare – Retail – Military – Architecture – Case Studies					
Module:4	Trends and Technology in Virtual Reality				
Innovative HMDs – Research outcomes – Eye tracking capabilities – Cheaper VR models – VR for the modern world – Metaverse – Remote VR capabilities – Case Studies – Future directions					
Module:5	Introduction to Augmented Reality				

Definitions – Taxonomy – Features – AR Vs VR – AR system functionality – AR Methods – Visualization Techniques – Interactivity in AR – Marker based and Marker less AR – AR development tools			
Module:6 Augmented Reality Hardware			
Mobile Phones – Motion tracking sensors – Accelerometer – Gyroscope – Camera - Smart glasses – AR Headsets – Mixed reality Headsets – AR Glasses – AR Contact Lenses – KIOSK systems			
Module:7 Applications of Augmented Reality			
Education – Medicine – Military – Architecture – Entertainment – Retail – Training – Case Studies			
	Total Lecture hours:		120 hours
Text Book			
1.	Doerner, R., Broll, W., Grimm, P., & Jung, B. (Eds.). (2022). Virtual and Augmented Reality (VR/AR). Springer International Publishing.		
Reference Books			
1.	Badotra, S., Tanwar, S., Rana, A., Sindhwani, N. & Kannan, R. (2023). <i>Handbook of Augmented and Virtual Reality</i> . Berlin, Boston: De Gruyter.		
2.	Fink, C., Fine, R. and Rosedale, P. (2018) <i>Charlie Fink's metaverse: An AR enabled guide to AR & VR</i> . United States, LA: Cool Blue Media.		
Mode of Evaluation: CAT, written assignment, Quiz, Case Study, and FAT			
Recommended by Board of Studies		01-11-2023	
Approved by Academic Council		No. 72	Date: 13-12-2023