V SEMESTER

Course Code	:	**CSPE51**
Course Title	:	**Augmented and Virtual Reality**
Number of Credits	:	**3-0-0-3**
Pre-requisites (Course Code)	:	**-**
Course Type	:	**PE**

Course Objectives

- To know basic concepts of virtual reality
- To understand visual computation in computer graphics
- To understand interaction between system and computer
- To know application of VR in Digital Entertainment
- To know basic concepts of augmented reality

Course Contents

UNIT I
Introduction of Virtual Reality: Fundamental Concept and Components of Virtual Reality - Primary Features and Present Development on Virtual Reality - Multiple Models of Input and Output Interface in Virtual Reality: Input - Tracker - Sensor - Digital Glove - Movement Capture - Video-based Input - 3D Menus & 3DScanner – Output - Visual /Auditory / Haptic Devices.

UNIT II
Visual Computation in Virtual Reality: Fundamentals of Computer Graphics - Software and Hardware Technology on Stereoscopic Display - Advanced Techniques in CG: Management of Large Scale Environments & Real Time Rendering.

UNIT III
Interactive Techniques in Virtual Reality: Body Track - Hand Gesture - 3D Manus - Object Grasp.
Development Tools and Frameworks in Virtual Reality: Frameworks of Software Development Tools in VR. X3D Standard; Vega - MultiGen - Virtools.

UNIT IV
Application of VR in Digital Entertainment: VR Technology in Film & TV Production - VR Technology in Physical Exercises and Games - Demonstration of Digital Entertainment by VR.

UNIT V
Augmented and Mixed Reality: Taxonomy - technology and features of augmented reality - difference between AR and VR - Challenges with AR - AR systems and functionality - Augmented reality methods - visualization techniques for augmented reality - wireless displays in educational augmented reality applications - mobile projection interfaces - marker-less tracking for augmented reality - enhancing interactivity in AR environments - evaluating AR systems.

Course Outcomes

Upon completion of this course, the students will be able to:

- Provide opportunity to explore the research issues in Augmented Reality and Virtual Reality (AR & VR)
- Know the basic concept and framework of virtual reality
- Know the computer-human interaction

Text Books

1. Burdea, G. C., P. Coffet., “Virtual Reality Technology”, Second Edition, Wiley-IEEE Press, 2003/2006.