

**IV/IV B. TECH. SECOND SEMESTER
VIRTUAL REALITY (Elective- IV)**

Course Code: CS8T3C**Credits: 3****Lecture: 3 periods/ week****Internal assessment: 30 Marks****Tutorial: 1period/week****Semester end examination: 70 Marks**

Prerequisite: Data Structures

Course Objectives :

1. Virtual reality in different object & applications.
2. Virtualization of image having big data.
3. High performance of computing with virtual reality.

Course Outcomes:

At the end of this course student will:

CO1) Understand the components of the virtual reality system

CO2) Describe various input and output devices used for virtual reality

CO3) Apply the different modelling concepts to visual virtualization

CO4) Analyze the performance of given simple applications related to virtual reality

CO5) Implement 3D technology with virtual programming concepts

Syllabus**UNIT-I**

Introduction : The three I's of virtual reality, commercial VR technology and the five classic components of a VR system. (1.1, 1.3 and 1.5 of Text Book (1))

UNIT – II

Input Devices : (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces. (2.1, 2.2 and 2.3 of Text Book (1)).

Output Devices: Graphics displays, sound displays & haptic feedback. (3.1,3.2 & 3.3 of Text Book (1))

UNIT – III

Modeling : Geometric modeling, kinematics modeling, physical modeling, behaviour modeling, model management. (5.1, 5.2 and 5.3, 5.4 and 5.5 of Text Book (1)).

UNIT – IV

Human Factors: Methodology and terminology, user performance studies, VR health and safety issues. (7.1, 7.2 and 7.3 of Text Book (1)).

Applications: Medical applications, military applications, robotics applications. (8.1, 8.3 and 9.2 of Text Book (1)).

UNIT – V

VR Programming-I : Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes. (Chapters 14, 16 and 17 of Text Book (2)) **VR Programming-II :** 3D Sprites, animated 3D sprites, particle systems. (Chapters 18, 19 and 21 of Text Book (2))

Learning Resources

TEXT BOOKS :

1. Virtual Reality Technology, Second Edition, Gregory C. Burdea & Philippe Coiffet, John Wiley & Sons, Inc.,
2. Killer Game Programming in Java, Andrew Davison, O'Reilly-SPD, 2005.

REFERENCES :

1. Understanding Virtual Reality, interface, Application and Design, William R.Sherman, Alan Craig, Elsevier(Morgan Kaufmann).
2. 3D Modeling and surfacing, Bill Fleming, Elsevier(Morgan Kauffman).
3. 3D Game Engine Design, David H.Eberly, Elsevier.
4. Virtual Reality Systems, John Vince, Pearson Education.
5. What is Virtual Reality?, <http://vr.isdale.com/WhatIsVR/frames/WhatIsVR4.1.html>.
6. Augmented and Mixed Reality, <http://www.mic.atr.co.jp/~poup/research/ar/>.