KAMARAJ COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Industry Certified Value Added Course

on

"Exploring AR/VR Development"

22-07-2024 to 26-07-2024

45 HOURS

Objectives

- To understand the concept of Augment or enhance real-world environments by overlaying digital information, graphics, or objects.
- To make use of unity software in AR can be used for 3D models, VR can be used for virtual meetings, remote teamwork,.
- To acquire knowledge about the utilization of unity software for models and image, object tracking techniques in real time.
- To provide students with knowledge in Augmented Reality & Virtual Reality.

UNIT 1: Introduction to AR/VR Development with Unity (9 Hours)

Overview of AR/VR-Definition and differences between Augmented Reality (AR) and Virtual Reality (VR)-Applications and trends in AR/VR-Overview of hardware and software requirements-Getting Started with AR/VR Development-Introduction to development platforms (Unity, Unreal Engine, etc.)-Overview of AR/VR SDKs and tools (ARKit, ARCore, Oculus SDK, etc.)-Setting up your development environment- - Project creation and basic settings-Scene setup and navigation-Importing necessary packages and assets.

UNIT 2: Computer Graphics and Geometric Modeling (9 Hours)

The Virtual world space- positioning the virtual observer-the perspective projection- human vision, stereo perspective projection- Color theory-Conversion From 2D to 3D-3D space curves- 3D boundary representation- Simple 3D modeling- 3D clipping- Illumination models- Reflectionmodels- Shading algorithms- Geometrical Transformations: Introduction, Frames of reference- Modelling transformations-Instances- Picking- Flying- Scaling the VE- Collision detection-importing the outsourced models-Animation Controls-User Interface-Button Fuctions-using Audio, Video in Game Development.

UNIT 3: Game Development Tools and Frameworks (9 Hours)

Human factors: Introduction- the eye, the ear, the somatic senses Hardware: Introduction, sensor hardware, Head-coupled displays, Acoustic hardware- Integrated VR systems Software: Introduction Modeling virtual world-project setup-environmentsetup-charactercontrolling with animation-restartwhenhit-

score points.

UNIT 4: Augmented Reality (9 Hours)

Taxonomy-Technology and Features of Augmented Reality- AR Vs. VR- Challenges with AR, AR systems and functionality- Augmented Reality Methods- Visualization Techniques for Augmented Reality- Enhancing interactivity in AR Environments- Evaluating AR systems-Image Based augmented Reality- Multi Target Augmented Reality- Surface Based Augmented Reality-Space Based Augmented Reality.

UNIT 5: Introduction to Virtual Reality (9 Hours)

Virtual Reality and Virtual Environment,-Computer graphics- Real time computer graphics- Flight Simulation- Virtual environment requirement-benefits of virtual reality- Historical development of VR- Project setup, VR integration-Environment setup for Virtual Reality-Exploring,

COURSE OUTCOMES

On successful completion of this course, the student should be able to:

- **CO1:** Identify, examine, and develop software that reflects fundamental techniques for the design and deployment of VR and AR experiences
- **CO2:** Implement various UNITY Software tools for creating basics game designs.
- **CO3:** Make use of C# Scripts for live timer and score calculation
- **CO4:** Learnt about Augmented Reality (AR) and developed a basic application.
- **CO5:** Learnt the concept of Virtual Reality (VR) and integrated it with the application

(Course Coordinators)

Mrs. K. Leelarani

Mrs. E. Vijayalakshmi