GUJARAT TECHNOLOGICAL UNIVERSITY

Design Innovation Centre (DIC)

MHRD funded Project - Hub & Spoke Model

Certificate Program in

Augmented Reality (AR) & Virtual Reality (VR)

Avail 30% Scholarship from GTU

Course Abstract

Course Name: ***Augmented Reality (AR) & Virtual Reality (VR) (Offline)***

Beneficiaries: ***Students, Faculty Members, Researchers, Industry Personnel, Innovators/Start-ups or any aspirants who wish to learn about AR/VR***

Apply Now

Duration: ***Four (4) months***

Timing: ***3 hrs. / Session (Saturday only, Flexible timings for professionals)***

*Tuition Fees: ***Rs. 15,000/- (Including GST, Study/reference materials)***

(After 30% scholarship, it costs Rs. 10,500)

(Partial Payment is accepted: **EMI 1: Rs. 5500, EMI 2: Rs. 5000)**

Evaluation Pattern: ***Continuous evaluation based on Practical learning, MCQ, Final evaluation for Capstone Project at the end of course***

Prerequisites: ***Optimistic & Un-learning mind-set, Enthusiasm of learning new things***

The course is in association with Innovation & Research Foundation (IRF).

Objective: Understanding the basics of AR VR Technology

The course aims to expose learners to the basic of AR/VR technology and devices, understanding of various elements and components used in AR/VR Hardware and Software, industrial application of AR/VR technology with hands on experience through more informative and practical exploration. Students will be working on real life projects using AR/VR technology

and if they wish to create a Start-up then further their idea will be supported by GTU Incubation and DIC program in terms of funding, mentoring, fabrication lab support, company formation & legal structure, IPR etc.

About the Course

VIRTUAL REALITY (VR)

Virtual Reality is the use of computer technology to create a simulated environment. Placing the user inside an experience so they can interact with 3D worlds by simulating as many senses as possible. The only limits to VR experiences are the availability of content and cheap computing power.

AUGUMENTED REALITY (AR)

Augmented Reality brings elements of the virtual world into the real world enhancing the things we see, hear, and feel. Augmented reality lies in the middle of the mixed reality spectrum between the real world and the virtual world.

MIXED REALITY (MR)

Mixed reality is the result of blending the physical world with the digital world. Mixed reality is the next evolution in human, computer, and environment interaction. It is made possible by advancements in computer vision, graphical processing power, display technology, and input systems. The application of mixed reality goes beyond displays and includes environmental input, spatial sound, and location.

AR/VR TECHNOLOGY

VR/AR's most immediately recognizable component is the head-mounted display (HMD). Display technology is the biggest difference between immersive Virtual Reality systems and traditional user interfaces. With a multiplicity of emerging hardware and software options, the future of wearable's is unfolding. The simplicity of buying a helmet-sized device that can work in a living-room, office, or factory floor has made HMDs center stage when it comes to Virtual Reality technologies.

AR AND VR COULD BE USED IN EDUCATION

Virtual reality is well publicized in the world of gaming. Some schools are trialling VR as a way of offering new and engaging ways of teaching and learning. Augmented reality has been used successfully in museums and is being adopted in education. The mixed reality headset, the

HoloLens is used in architecture, construction, and in teaching medical students. Lenovo research finds VR will be commonplace in schools in the next five years.

Course Outline

- **Virtual Experience:** Exploring Android based VR & AR apps, Difference between AR,MR & VR, Introduction to Mixed reality, Requirements in mobile to run AR/VR contents, Setting up Mobile based VR headset, Connecting Controllers with Mobile
- **VR/AR CONTENT:** VR & AR Content analysis, Difference between 3D, 360 & 180 view, Principles of Content development for VR & AR
- **TRACKING SYSTEMS:** 3DOF vs 6DOF Co-ordinate system, Camera tracking techniques (object & Camera Tracking examples)
- **INTRO TO HMD:** Types of HMD & There difference, Possibilities & Limitation in VR & AR
- **TYPES OF AR & VR TECHNOLOGY:** Mobile, Stand alone, PC & Console based, PC configuration to run VR contents, Platforms & software for VR content development, Existing Brands for VR
- **AR/VR HARDWARES & ACCESSORIES:** Breakdown of PC based VR headset, VR Thread Mills, VR Suits, Types of VR/AR Controllers, Add-on technology
- **VR/AR Application:** Assignment, Case study of existing VR/AR Applications
- **INTRO TO PS, AI, UI design in PS & AI,**
- **INTRO TO MAYA/MAX:** Software Modelling, Texturing & Shading, Basic Animation, Building Scene for VR/AR Part_01, Part_02, Baking Techniques & Optimizing
- **INTRO TO UNITY/UNREAL ENGIN**E: For Android & IOS integrating AR/VR platforms in to unity/unreal engine, Scene Development, Materials & lightings, Special FX, Publishing for Android & IOS
- **WORKSHOP BASED LEARNING:** Building APP/Games without coding For VR AND AR

FINAL PROJECT: Building one AR/VR based App/Game

Teaching / Learning Methodology:

I. The Design Thinking course will be **offline,** practical based involves Hands-on exercises, Face to face counselling and experiential program.

II. The course content will be available in form of study material, presentations, video and case studies. During the course, student may also request for the interaction with concerned faculty and industry experts for resolving their doubts and learning difficulties as per availability of experts.

III. Weekly Assignments/Tutorials and tasks will be given for their projects which requires involvements of 5-6 hours a week.

IV. At the end of the course, learner will be equipped with the knowledge of integrating hardware, software, tools for AR/VR technology. Also ready with their idea/product to start their own start-up if they wish and further supports will be provided by GTU Incubation and DIC program in terms of funding, mentoring, fabrication lab support, company formation & legal structure, IPR etc.

Three steps Registration Process:

(1) Enroll Now: https://forms.gle/7En1fKCT4DXNug5A7

After registration through above link, kindly make payment through below link and Refer Step-by-step guide (https://go.aws/2wbFfeA) for payment process for your reference.

(2) Payment link: https://www.onlinesbi.com/sbicollect/icollecthome.htm

After payment, download the payment receipt and upload the receipt through the link given in the payment guidelines, for successfully enrolment into the course.

(3) DIC Course Payment receipt upload: https://forms.gle/dt9njJbbtwGsCWPN6

Note: GTU – DIC committee deserves all right to admit, cancel and alter the course content without any prior notice. The jurisdiction for any discrepancy will be Ahmedabad.

For any query related to the course, kindly contact:

Mr. Karmjitsinh Bihola, Course Coordinator, GTU.
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