

**Course Title:** Fundamentals of AR/VR (Base Program)

**Duration:** 4 Weeks

**Sessions:** 3 per week × 3 hours each = 36 hours

**Format:** Balanced blend of theory, demos, and hands-on labs

Week	Title	Sessions	Content	Hands-on/Build
<b>Week 1</b>	<b>AR/VR Fundamentals and WebAR Setup</b>	Session 1: AR/VR/XR Fundamentals	AR vs VR vs MR vs XR , Industry applications , WebAR vs Unity (pros/cons, use cases)	N/A
		Session 2: WebAR Setup	Tools: VS Code, Node.js, local server, GitHub Pages , Intro to A-Frame & AR.js	First 3D scene in browser
		Session 3: 3D Graphics on the Web	Shapes, materials, lighting, animations , Importing GLTF/GLB models <sup>16</sup>	Animated 3D model in browser
<b>Week 2</b>	<b>Marker-based and Markerless WebAR</b>	Session 4: Marker-based WebAR	AR.js with Hiro & custom markers	Build: AR business card (marker to 3D overlay)
		Session 5:	Plane	Hands-on: AR

		Markerless WebAR	detection basics , Object placement on real surfaces <sup>23</sup>	furniture demo
		Session 6: Interaction in WebAR	Tap to place/rotate/scale objects , Adding UI overlays	Build: AR product preview demo
<b>Week 3</b>	<b>WebVR, Advanced WebAR, and Case Studies</b>	Session 7: WebVR Basics	A-Frame for VR , 360 Degree images & videos	Hands-on: virtual tour in VR mode
		Session 8: Advanced WebAR	Location-based AR, Multi-target tracking	Example: AR tourism guide (scan site image to info overlay)
		Session 9: Case Studies in AR/VR	Retail, healthcare, tourism, education, Digital twins & AR navigation	Guest demo/discussion (optional)
<b>Week 4</b>	<b>Unity, Oculus VR, and Final Project</b>	Session 10: Unity Basics (Bridge to Native XR)	Unity interface, scenes, game objects, prefabs, Importing 3D models , Basic C# scripting, Difference between	N/A

			WebAR & Unity AR/VR	
		Session 11: VR in Unity with Oculus	Setting up Oculus SDK / XR plugin management in Unity, Connecting Oculus Quest headset	Building a simple VR scene (exploration + grabbing objects)
		Session 12: Final Project & Showcase	Students choose a project: AR business card/product demo, AR location-based info app, or VR interactive room walkthrough (Oculus)	Presentation & feedback

**Key Deliverables:**

- Final Project: Functional WebAR or Unity VR project.

**Tools & Platforms Required:**

- **Software:** VS Code , Node.js , local server, GitHub Pages, A-Frame, AR.js, Unity, Oculus SDK / XR plugin management, C# scripting.
- **Hardware (Limited Access):** Oculus headset , high-end machines, Android Phones.