



SNS COLLEGE OF TECHNOLOGY



Coimbatore-35.

An Autonomous Institution

**Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A++’ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai**

INTRODUCTION TO ARVR

I YEAR/ II SEMESTER

UNIT – II

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- **1. Introduction to AR World Authoring & Playback**
- AR world authoring involves creating, designing, and structuring interactive AR environments.
- Playback refers to rendering and displaying AR content to users in real time.
- **2. AR World Authoring Tools & Platforms**
- **Game Engines:** Unity, Unreal Engine
- **SDKs:** ARKit (Apple), ARCore (Google), Vuforia, 8thWall
- **3D Modeling Tools:** Blender, Maya, 3ds Max
- **Cloud-Based AR:** Niantic Lightship, WebAR (8thWall, ZapWorks)

- **3. Key Components of AR Authoring**
- **3D Object Creation:** Designing AR models, textures, animations
- **Scene Building:** Placing objects in an AR environment
- **Physics & Interactions:** Collision detection, haptics, AI-based interactions
- **Real-World Anchoring:** Marker-based, markerless, spatial anchors
- **Scripting & Logic:** C# (Unity), Blueprints (Unreal), JavaScript (WebAR)
- **4. AR Playback Methods**
- **Device-Based AR:** Smartphones, tablets (camera-based AR)
- **Head-Mounted Displays (HMDs):** HoloLens, Magic Leap, Meta Quest
- **Projection-Based AR:** AR projectors mapping onto surfaces
- **Wearable AR:** Smart glasses (Snap Spectacles, Ray-Ban Meta)

- **. Rendering & Performance Optimization**
- **Real-Time Rendering:** Optimized shaders, LOD (Level of Detail)
- **Occlusion & Lighting:** Realistic shadows, environment mapping
- **Cloud Rendering:** Edge computing, AR streaming for high-quality assets
- **Battery & CPU Efficiency:** Reducing computational load for mobile device

- **AR World Persistence & Multiplayer AR**
- **Cloud Anchors:** Shared AR spaces across devices (Google Cloud Anchors, Azure Spatial Anchors)
- **Persistent AR:** Users can leave virtual objects in real-world locations
- **Multiplayer AR Experiences:** Shared AR gaming, collaborative AR design (Niantic Lightship, WebXR)
- **7. Real-World Applications**
- **Gaming:** Pokémon GO, AR escape rooms
- **Education & Training:** Medical simulations, interactive history lessons
- **Retail & Marketing:** Virtual try-ons, interactive ads
- **Architecture & Engineering:** AR blueprints, construction site visualization
- **Healthcare:** AR-assisted surgeries, rehabilitation

Future Trends in AR Authoring & Playback

- **AI-Generated AR Worlds:** Using AI to generate procedural AR content
- **5G & Edge Computing:** Faster, real-time AR experiences
- **AR Cloud & Spatial Computing:** Persistent, shared AR environments
- **Neural Interfaces:** Brain-computer AR interactions