सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
DEVELOPMENT COMMISSIONER
MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES
MSME TECHNOLOGY CENTRE

MODEL CURRICULUM

Qualification Name:
Associate Developer AR VR

Qualification Code:

Version: 1.0

NSQF Level: 4.5

Model Curriculum Version: 1.0

Submitted By:

MSME TECHNOLOGY CENTRE
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NOS / MODULE TEMPLATE

NOS /Module: Understand and Create Computer Graphics

NOS /Module Code: MSME/ARVR/01

Outcomes:

Job Roles:

1. Beginner Level:
    - Graphic Design Intern
    - Junior Graphic Designer
    - Production Assistant
2. Intermediate Level:
    - Graphic Designer
    - Digital Illustrator
    - Visual Content Creator
3. Advanced Level:
    - Senior Graphic Designer
    - Art Director
    - UI/UX Designer
4. Expert Level:
    - Creative Director
    - 3D Modeler/Animator
    - Design Consultant

Theory Hours : 60 **Practical Hours: 60** **Theory Marks: - 50** **Practical Marks: 50**

Unit No	Unit Name	Unit Outcome	Content (Chapter/Topics)	PR Hours	TH Hours	PR Marks	TH Marks
1	Introduction to Computer Graphics	• Basics of Computer Graphics: • Understand the fundamentals of computer graphics, including 2D and 3D concepts. • Grasp key terms like pixels, resolution, color spaces, and rendering principles. • Learn about the significance of computer	• Basics of Computer Graphics • Software's Installation	5	5	5	5

		graphics in various industries. ● Software Installation: ● Learn to choose and install graphics software like Adobe Photoshop or Blender. ● Understand system requirements and resolve installation issues. ● Familiarize yourself with basic software features and tools.					
2	Quick-Start Exercise	● Workspace Basics: ● Learn how to navigate the software's interface and customize it to your needs. ● Document Creation: ● Create new documents with various settings and artboards. ● Platform Differences: ● Understand distinctions in software usage between Mac and Windows systems. ● Tool and Panel Management: ● Customize toolbars and panels for	● The Start Workspace ● Creating New Docum ● Mac and Windows D ● Art boards ● Working with Panels ● Customize Panels ● Customize the Toolb ● Keyboard Shortcuts a Commands ● Using Workspaces ● Interface Shading Op ● Screen Modes ● Working with Multip ● Tab Preferences ● Document Navigatio ● Preferences Dialog B	15	15	5	5

		efficient workflow. ● Navigation and Preferences: ● Master document navigation and configure preferences for a personalized experience. ● Multi-Document Handling: ● Manage multiple open documents and workspaces effectively.					
3	Digital Imaging Concepts	● File Types: ● Gain insight into different image file formats and their uses. ● RAW Formats: ● Learn about RAW image formats and their benefits for post-processing. ● Bitmaps vs. Vectors: ● Understand the distinction between bitmap (raster) and vector graphics. ● Resolution: ● Grasp the importance of resolution in image quality and printing. ● Resize vs. Resample Images: ● Differentiate between resizing and resampling images and when to use each.	● Understanding File T ● Reviewing RAW Forn ● Bitmaps vs. Vectors ● Understanding Resol ● Resize vs. Resample ● Print Size ● Color Modes	10	10	5	5

		● Print Size and Color Modes: ● Explore considerations for print size and various color modes for different design and printing needs.					
4	Making Selections and Basic Compositing	● Utilize various selection tools for precise image selections. ● Apply feathering for softer, blended selections. ● Copy, paste, and scale selected portions of images. ● Refine and modify selections as needed. ● Use quick selection, magic wand, and color range tools for efficient selections. ● Explore advanced selection refinement with the select and mask workspace, quick mask mode, and saving selections for future use.	● Selection Tool Overv ● Practical Marquee Se ● Feather a Selection ● Copy and Paste ● Scaling the Image ● Modifying Selections ● Quick Selection and Tools ● Select Subject ● Select and Mask Wo ● Quick Mask Mode ● Color Range Comma ● Saving Selections	15	15	5	5
5	Layers and Masks	● Learn undo/redo for editing reversals. ● Understand background layers. ● Open images as separate layers.	● Undo and Redo ● Background Layer ● Opening Images to L ● Layer Basics ● Selecting Layers ● Layer Panel Options ● Locking Layers ● Distribute and Align ● Layer Groups	20	20	5	5

		• Master basic layer functions. • Select and manage layers effectively. • Apply layer styles for enhanced visuals.	• Layer Opacity Options • Understanding Blend Modes • Layer Mask Basics • Gradient Layer Masks • Layer Styles • Flatten Layers				
6	Crops, Transformations, and Warps	• Utilize the crop tool for image framing. • Implement non-destructive cropping techniques. • Expand canvas size using cropping. • Learn about the canvas size dialog box. • Straighten images using the perspective crop tool. • Apply transformations, including scaling and warping for image manipulation.	• Using the Crop Tool • Non-destructive Crop • Crop to Add Canvas • Canvas Size Dialog B • Perspective Crop Too • Straighten an Image • Transform • Content-aware Scale • Puppet Warp • Perspective Warp	15	15	5	5
7	Adjustments	• Analyze and interpret histograms for image evaluation. • Utilize adjustment layers for non-destructive editing. • Apply levels adjustments for modifying image contrast. • Use adjustment layer masks for precise edits.	• Reviewing the Histog • Adjustment Layers • Levels Adjustment • Adjustment Layer M • Clipping to the Adjus • Curves Adjustment • Hue/Saturation Adju • Vibrance Adjustmen • Photo Filter Adjustm • Remove a Color Cast • Black and White Adju	15	15	5	5

		• Clip adjustments to specific layers for targeted effects. • Adjust image curves for fine-tuning brightness and contrast.					
8	Localized Adjustments and Photo Retouching	• Utilize toning tools for enhancing image tones. • Apply spot healing brush and healing brush for removing imperfections. • Use the patch tool for more advanced object removal. • Employ content-aware fill and move for seamless content manipulation. • Utilize eraser tools for precise pixel-level adjustments. • Sharpen images to enhance details and clarity.	• Toning Tools • Spot Healing Brush • Healing Brush • Patch Tool • Content-aware Fill • Content-aware Move • Eraser Tools • Sharpening an Image	10	10	5	5
9	Type, Guides, and Grids	• Use the type tool for adding text to your designs. • Employ the area type tool for text within defined areas. • Display rulers to measure and align elements. • Utilize guides for precise layout alignment.	• Type Tool • Area Type Tool • Displaying Rulers • Using Guides • Add a Guide Layout • Smart Guides • Showing the Grid • Grid Preferences	10	10	5	5

		• Add a guide layout for consistent positioning. • Enable smart guides to assist with alignment. • Show the grid and adjust grid preferences for layout precision.					
10	Libraries, Output, and Updates	• Utilize creative libraries for asset organization and reuse. • Share libraries for collaborative work and consistency. • Save files to preserve your work. • Use quick export for efficient file output.	• Creative Libraries • Shared Libraries • Saving Files • Quick Export	5	10	5	5

NOS / MODULE TEMPLATE

NOS /Module: Acquire Knowledge to Develop an VR Application

NOS /Module Code: MSME/ARVR/02

Outcomes:

Job Roles:

1. Beginner Level:
    - VR Intern
    - Junior VR Developer
    - VR Tester
2. Intermediate Level:
    - VR Developer
    - VR Designer
    - 3D Modeler for VR
3. Advanced Level:
    - Senior VR Developer
    - VR Project Manager
    - VR UX/UI Designer

4. Expert Level:
    - VR Architect
    - VR Research Scientist
    - VR Consultant

Theory Hours: 60 **Practical Hours: 150** **Theory Marks: NA** **Practical Marks: 100**

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR Hours	TH Hours	PR Marks	TH Hours
1	Getting Started with VR	• Understand the differences between VR and traditional media. • Address the issue of motion sickness in VR experiences. • Explore locomotion methods used in VR for movement. • Manage the high-performance requirements of VR applications. • Differentiate between using geometry and normal maps in VR graphics. • Plan and design VR museum experiences for immersive learning and exploration.	• VR vs Traditional Media • VR and Motion Sickness • Locomotion in VR • Dealing with the High-Performance Needs of VR • Geometry vs Normal Maps in VR • VR Museum Experience Planning	30	20	25	-
2	Creating a VR Camera and Game Mode	• Learn how to set up a custom VR game mode for your project. • Create a custom VR character to suit your game's requirements. • Integrate the VR character into your game level. • Understand the concept of character possession in VR. • Attach objects to your VR camera for	• How to Setup a Custom VR Game Mode • How to Create a Custom VR Character • How to Use a VR Character in Your Level • How to Use Character Possession • How to Attach Objects to Your VR Camera	30	20	25	-

		immersive interactions.					
3	Using Blueprints to Trigger Objects by Looking at Them	• Build Gaze Overlap Blueprints for VR character interaction. • Create and use collision volumes for interactions and obstacles. • Establish communication between the pawn and level Blueprints. • Implement teleportation mechanics for character movement. • Configure specific button controls to activate teleportation. • Design visual indicators for teleportation pads. • Toggle indicator lights based on the user's gaze. • Incorporate puzzle box animations into Matinee. • Activate Matinee sequences through the level Blueprint. • Create fade effects using Matinee for transitions. • Control teleportation using Matinee event tracks for immersive experiences.	• How to Build Gaze Overlap Blueprints for Our VR Character • How to Make and use Collision Volumes • How to Communicate Between Our Pawn and Level Blueprints • How to Teleport a Character from One Location to Another • How to Activate Teleport with Specific Button Controls • How Create a Visual Indicator for Our Teleport Pads • How to Toggle an Indicator Light with a Glance • How to Bring Our Puzzle Box Animation into Matinee • How to Activate a Matinee in the Level Blueprint • How to Create a Fade Effect with Matinee • How to Control Our Teleport with a Matinee Event Track	90	20	50	-

NOS / MODULE TEMPLATE

NOS /Module: Aquire Knowledge to Develop an AR Application

NOS /Module Code: MSME/ARVR/03

Outcomes:

Job Roles:

1. Beginner Level:
    - AR Development Intern
    - Junior Game Developer
2. Intermediate Level:
    - AR Developer
    - Game Designer

3. Advanced Level:
    - Senior AR Developer
    - AR Project Manager
4. Expert Level:
    - AR Architect
    - AR/VR Specialist
    - Game Development Consultant

THEORY HOURS: 60 PRACTICAL HOURS: 150 THEORY MARKS: NA PRACTICAL MARKS: 100

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR hours	TH Hours	PR Marks	TH Marks
1	Getting Started with AR	• Get introduced to the AR. • Learn the basics of video game development. • Understand the concept of augmented reality (AR). • Explore the Dartboard Game as an example. • Access additional resources and useful links. • Download and install the necessary AR software for development and testing.	• Introduction • How to Make a Video Game • Introduction to Augmented Reality • What is Dartboard Game • Resources and Links • Download and Install AR Software	20	5	10	-
2	Creating 1st AR Scene	• Start a new project for AR development. • Test your AR project on various devices using different methods. • Get familiar with the development environment. • Identify devices compatible with AR. • Set up your project to support AR features. • Create your first AR scene. • Incorporate 3D objects into the AR environment. • Enhance visuals by aligning them with detected surfaces. • Customize surface detection for specific orientations. • Modify scanning visuals for user feedback. • Implement a placement indicator for precise object positioning in AR scenes.	• Create New Unity Project • Different Ways of Testing Unity Project on Device • Basic Understanding of Unity Editor • Augmented Reality Supported Devices • Setting up Project with AR Foundation • Create First AR Scene • Adding a 3D Cube in AR • Adding Visuals to detected Surface • Restrict Surface Detection only to Vertical Area • Change the Scanning Visuals	20	5	30	-

			• Create a Placement Indicator				
3	AR App Design & Developing	• Place a dartboard on a physical wall in the AR environment. • Restrict the placement of only a single dartboard. • Create an event system to broadcast actions within the game. • Disable surface detection once the dartboard is placed. • Instantiate darts for throwing. • Implement the ability to throw darts in the AR scene. • Manage dart throwing and load the next dart. • Ensure that darts stick to the dartboard. • Utilize Mesh Colliders on the dartboard for collision detection. • Optimize performance for a smooth AR experience. • Display real-time distance between the dart and the dartboard. • Integrate sound effects into the dart-throwing experience. • Manage the direction of the placement indicator for accurate positioning.	• Place a Dartboard on the Wall • Restrict to Place a Single Dartboard • Create an Event to Broadcast an Action • Disable Surface Detection on Placement • Instantiate a Dart • Throw a Dart • Throw Dart and Load Next Dart • Dart Stick to Dartboard • Using Mesh Collider on Dartboard • Performance Tips • Show er Distance from Dartboard in Real-time • Sound Integration • Placement Indicator Direction	60	20	50	-
4	Publish the AR App on Google Play Store and Apple App Store	• Generate an Android production build for your AR app. • Publish your app on the Google Play Store for Android users. • Understand the process of app publishing for the Apple App Store. • Learn essential steps for switching the platform to iOS in an AR project. • Follow the step-by-step process for iOS development and creating a production build for your AR app on iOS.	• Create Android Production Build • Publishing App on Google Store • App Publishing Overview on Apple AppStore • Important Steps for Switching Platform to iOS in an Augmented Reality Project • iOS Development and Production Build Process Step by Step	50	30	10	-

NOS / MODULE TEMPLATE

NOS /Module: Employability Skills

NOS /Module Code: MSME/ES/02

THEORY HOURS: 60 PRACTICAL HOURS: - THEORY MARKS: 100 PRACTICAL MARKS: -

Refer Standard Curriculum developed by NCVET. (60-hours-MC-Employability-Skills_v4-DGT (1).pdf)