Professional Certificate in Game Designing

DURATION: 450 Hours

TOTAL CREDITS: 15

COURSE SYLLABUS

Objective

Professional Certificate in Game Design is an intensive program designed to equip students with the essential skills and knowledge required for a successful career in the game design industry. The course covers a wide range of topics, including traditional drawing, digital painting, 3D modeling, animation, sculpting, texturing, and game development using industry-standard tools. Students will develop a comprehensive understanding of the game design pipeline, from initial concept art to the final game production, using software such as Photoshop, Blender, Maya, ZBrush, Substance Painter, and Unreal Engine.

Exit Profile

- Create high-quality concept art and digital paintings.
- Develop detailed 3D models and animations using Blender and Maya.
- Sculpt complex, high-detail models in ZBrush.
- Apply realistic textures and materials using Substance Painter.
- Design and develop game levels and mechanics using Unreal Engine.
- Understand the complete game design and development pipeline.
- Work effectively in a game design team and contribute to professional game projects.

Career Path

- Game Designer
- 3D Modeler
- Texture Artist
- Level Designer
- Animator
- Technical Artist

Course Outline

Course Name:	Professional Certificate in Game Designing	Duration:	450 H
Module	Topic	Duration	Total Duration
Module -I	Game Design Overview & Pipeline	3H	50H
	History of Arts	3H	
	Artistic Analysis	4H	
	Traditional Drawing	4H	
	Perspective Drawing	4H	
	Observation drawing	4H	
	Volumes and lights	4H	
	Paint	4H	
	Still life	5H	
	Anatomy	5H	
	Composition	5H	
	Storyboards	5H	
Module-2	Photoshop For Digital Painting, Texturing, & Concept Art	25H	25H
Module-3	Illustrator	25H	25H
Module-4	Blender	50H	50H
Module-5	Autodesk Maya	50H	50H
Module-6	ZBrush	50H	50H
Module-7	Substance Painter	50H	50H
Module-8	Unreal Engine	60H	60H
Module-9	Final Project	90H	90H

Course In Detail

MODULE – I

INTRODUCTION TO GAME DESIGN & CONCEPT ART

- Game Design Overview & Pipeline
- History of Arts
- Artistic Analysis
- Traditional Drawing
- Perspective Drawing
- Observation drawing
- Volumes and lights
- Paint
- Still life
- Anatomy
- Composition
- Colors and contrast
- Storyboards

MODULE – II

PHOTOSHOP FOR DIGITAL PAINTING, TEXTURING, & CONCEPT ART

PHOTOHOP

OVERVIEW OF PHOTOSHOP INTERFACE

- Essential tools for digital painting
- brush tool
- layers
- color picker
- Customizing the workspace

BASIC BRUSH TECHNIQUES AND CUSTOMIZATION

- Using default brushes
- Creating and customizing brushes

- Brush settings and dynamics

UNDERSTANDING COLOR THEORY

- Basics of color theory (hue, saturation, value)
- Color harmonies and color schemes
- Applying color theory to digital painting

WORKING WITH LAYERS

- Understanding layers and layer types
- Layer blending modes
- Using layer masks

BASIC SHADING AND LIGHTING

- Techniques for shading and creating depth
- Understanding light sources and shadows
- Applying shading and lighting in a digital painting

TEXTURING AND DETAIL WORK

- Adding textures to digital paintings
- Techniques for creating detailed elements
- Finalizing and polishing digital artwork

CREATING A SIMPLE DIGITAL PAINTING

- Planning a composition
- Sketching and outlining
- Applying learned techniques to create a simple digital painting

CHARACTER CONCEPT ART CREATION

- Designing and sketching characters
- Developing character concepts and iterations
- Finalizing and detailing character concept art
- Environment and Prop Concept Art Creation
- Techniques for creating environment concepts
- Designing and detailing props
- Integrating characters, environments, and props into cohesive scenes

FINAL CONCEPT ART PROJECT
- Planning and developing a concept art piece
- Applying advanced techniques to create a professional-level artwork

- Presenting and critiquing final concept art

MODULE – III

Illustrator

INTRODUCTION TO ADOBE ILLUSTRATOR
- Overview of the Illustrator interface
- Understanding vector vs. raster graphics
- Setting up a new document
- Basic tools and panels (selection tools, shapes, lines, etc.)

WORKING WITH SHAPES AND COLORS
- Creating and manipulating basic shapes
- Color theory basics
- Using the Color Picker and Swatches
- Applying gradients and patterns

PEN TOOL AND PATHS
- Introduction to the Pen Tool
- Drawing and editing paths
- Working with the Direct Selection Tool
- Creating complex shapes using the Pathfinder panel

BRUSHES AND STROKE TECHNIQUES
- Overview of different brush types
- Customizing brushes
- Using the Brush Tool and Blob Brush Tool
- Creating and editing strokes

LAYERS AND MASKS
- Understanding the Layers panel
- Organizing artwork using layers
- Clipping masks and layer masks
- Opacity and blending modes

DRAWING AND PAINTING TECHNIQUES
- Using the Pencil Tool and Paintbrush Tool
- Freehand drawing and painting

- Applying strokes and fills
- Creating texture and depth

TEXT AND TYPOGRAPHY
- Adding and formatting text
- Type on a path
- Using text as a design element
- Creating custom typography effects

PATTERNS AND TEXTURES
- Creating and editing patterns
- Applying textures to artwork
- Using the Appearance panel for complex effects
- Using pattern libraries

ADVANCED BRUSH TECHNIQUES
- Creating custom brushes
- Using scatter, art, and pattern brushes
- Applying brush strokes to artwork
- Experimenting with different brush settings

GRADIENT MESH AND BLENDING TECHNIQUES
- Introduction to Gradient Mesh
- Creating smooth color transitions
- Using the Blend Tool
- Advanced blending techniques

EFFECTS AND FILTERS
- Applying and editing effects
- Using the Appearance panel for multiple effects
- Understanding and using filters
- Creating depth and dimension with effects

MODULE – IV
BLENDER

INTRODUCTION TO BLENDER INTERFACE AND BASIC NAVIGATION
- Overview of Blender interface and tools
- Customizing the workspace

- Basic navigation and manipulation of objects

BASIC 3D MODELING TECHNIQUES
- Understanding 3D geometry (vertices, edges, faces)
- Creating and manipulating basic shapes
- Introduction to extruding, scaling, and rotating objects

INTERMEDIATE 3D MODELING TECHNIQUES
- Advanced modeling tools and modifiers (subdivision surface, mirror, array)
- Creating complex models by combining basic shapes
- Using reference images for accurate modeling

SCULPTING BASICS
- Introduction to sculpting tools in Blender
- Basic sculpting techniques for adding details
- Using dynamic topology for detailed sculpting

UV MAPPING AND UNWRAPPING
- Understanding UV mapping and its importance
- Basic UV unwrapping techniques
- Organizing UV layouts for efficient texturing

TEXTURING AND MATERIAL CREATION
- Introduction to Blender's shader editor
- Creating and applying materials to models
- Basic texturing techniques using image textures

INTRODUCTION TO RIGGING
- Understanding the basics of rigging and armatures
- Creating and setting up a basic armature
- Skinning (weight painting) the model to the armature

BASIC ANIMATION TECHNIQUES
- Introduction to Blender's animation tools
- Keyframing and the basics of animating objects
- Creating simple animations (e.g., bouncing ball, moving objects)

INTERMEDIATE ANIMATION TECHNIQUES
- Animating with armatures (character rigging)
- Understanding animation principles (timing, spacing, squash and stretch)
- Creating walk cycles and simple character animations

ADVANCED MODELING AND ANIMATION TECHNIQUES
- Using shape keys for facial animations
- Advanced rigging techniques (IK/FK switching, custom bone shapes)
- Combining multiple animation techniques for complex animations

LIGHTING AND RENDERING
- Basic lighting techniques in Blender
- Setting up scenes for rendering
- Understanding render settings and output formats

EXPORTING MODELS AND ANIMATIONS
- Preparing models and animations for export
- Exporting to different formats (FBX, OBJ) for game engines
- Best practices for exporting and importing in Unreal Engine

PROJECT PLANNING AND EXECUTION
- Planning a final project: from concept to execution
- Creating detailed project schedules and milestones
- Iterating on models and animations based on feedback

FINAL PROJECT DEVELOPMENT
- Developing a 3D model with textures and animations
- Integrating all learned techniques

FINAL PROJECT PRESENTATION AND CRITIQUE
- Presenting the final 3D model and animation
- Receiving and providing constructive feedback

MODULE – V

MAYA

INTRODUCTION TO MAYA INTERFACE AND BASIC NAVIGATION

- Overview of Maya interface and tools
- Customizing the workspace
- Basic navigation (viewports, selection tools, move, rotate, scale)

- Understanding the Outliner and Attribute Editor

BASIC 3D MODELING TECHNIQUES
- Creating and manipulating primitive shapes (cube, sphere, cylinder, etc.)
- Introduction to polygon modeling tools (extrude, bevel, bridge)
- Using the Modeling Toolkit for efficient modeling
- Basic modeling project: Creating a simple object (e.g., a chair or a table)

INTERMEDIATE 3D MODELING TECHNIQUES
- Advanced modeling tools and techniques (multi-cut, edge loop, mirror)
- Creating more complex models by combining and refining shapes
- Using reference images and blueprints for accurate modeling
- Intermediate modeling project: Creating a detailed object (e.g., a vehicle or a character bust)

MODULE – VI

ZBRUSH

INTRODUCTION TO ZBRUSH INTERFACE AND BASIC TOOLS
- Overview of ZBrush interface and navigation
- Understanding ZBrush's unique workflow and toolset
- Basic sculpting tools and brushes
- Customizing the ZBrush workspace

BASIC SCULPTING TECHNIQUES
- Introduction to digital sculpting concepts
- Using the standard brush and move tool
- Basic shaping and detailing techniques
- Working with different levels of subdivision for detail management

SCULPTING WITH DYNAMESH AND ZREMESHER
- Introduction to Dynamesh for freeform sculpting
- Using ZRemesher for topology optimization
- Combining Dynamesh and ZRemesher workflows
- Sculpting a basic object using Dynamesh

ADVANCED BRUSH TECHNIQUES AND CUSTOMIZATION
- Using advanced brushes (clay, trim, hPolish, etc.)
- Creating and customizing brushes
- Understanding and utilizing alphas for detailing

- Sculpting practice with advanced brushes and alphas

DETAILING TECHNIQUES
- Adding fine details using high subdivision levels
- Using noise and surface detailing tools
- Sculpting skin textures, wrinkles, and pores
- Detailing project: Sculpting a detailed character bust

SCULPTING CHARACTERS
- Anatomy basics for character sculpting
- Blocking out character proportions and shapes
- Sculpting facial features, muscles, and clothing
- Character sculpting project: Creating a detailed character model

SCULPTING ENVIRONMENTS AND PROPS
- Techniques for sculpting environmental assets (rocks, trees, etc.)
- Creating detailed props (weapons, furniture, etc.)
- Using reference images for environmental and prop sculpting
- Environment and prop sculpting project: Creating a detailed scene

POLYPAINTING AND TEXTURING
- Introduction to polypainting for texturing within ZBrush
- Techniques for painting directly on the model
- Combining polypaint with sculpted details
- Texturing project: Polypainting a sculpted model

CREATING AND USING ZBRUSH MATERIALS
- Introduction to ZBrush's material system
- Applying and customizing materials
- Combining materials and textures for realistic effects
- Material project: Applying materials to a detailed model

RENDERING IN ZBRUSH
- Introduction to ZBrush's rendering tools
- Setting up lights and cameras
- Rendering techniques for showcasing models
- Rendering project: Rendering a final sculpted and textured model

EXPORTING MODELS FOR OTHER SOFTWARE
- Preparing models for export (decimation, retopology)
- Exporting models to other formats (OBJ, FBX)
- Best practices for exporting and importing in Blender, Maya, and game engines

- Exporting project: Preparing a model for use in another software

FINAL PROJECT PLANNING AND EXECUTION
- Planning a final project: from concept to execution
- Creating detailed project schedules and milestones
- Iterating on models and textures based on feedback

FINAL PROJECT DEVELOPMENT
- Developing a detailed 3D sculpture with textures
- Integrating all learned techniques
- Preparing for final presentation and critique

MODULE – VII

Substance Painter

INTRODUCTION TO SUBSTANCE PAINTER INTERFACE AND BASIC TOOLS
- Overview of Substance Painter interface and navigation
- Understanding the 3D viewport and 2D view
- Basic tools: brush, eraser, fill, and selection tools
- Setting up a new project and importing 3D models

UNDERSTANDING MATERIALS AND TEXTURES
- Introduction to PBR (Physically Based Rendering) workflow
- Understanding materials: base color, metallic, roughness, normal maps
- Exploring default materials and smart materials
- Applying and customizing basic materials

BASIC TEXTURING TECHNIQUES
- Using brushes for painting textures directly on the model
- Utilizing alphas and stencils for detailed textures
- Working with layers and layer blending modes
- Basic texturing project: Texturing a simple 3D object

ADVANCED TEXTURING TECHNIQUES
- Using masks and generators for procedural texturing
- Applying smart materials and masks for complex textures
- Working with particles and effects for realistic details
- Advanced texturing project: Texturing a detailed 3D model

CREATING CUSTOM MATERIALS
- Introduction to the material creation process
- Using the Substance Painter material editor
- Creating and saving custom materials
- Custom material project: Creating unique materials for a 3D model

DETAILING AND ADDING REALISM
- Techniques for adding wear and tear, dirt, and scratches
- Using normal maps for adding depth and detail
- Creating and applying height maps for surface details
- Detailing project: Adding realistic details to a textured model

WORKING WITH SMART MASKS AND GENERATORS
- Understanding and applying smart masks
- Using generators for procedural effects (e.g., edge wear, ambient occlusion)
- Customizing and creating smart masks for specific needs
- Smart mask project: Enhancing a 3D model with procedural effects

BAKING MAPS AND OPTIMIZING TEXTURES
- Introduction to baking in Substance Painter
- Baking ambient occlusion, curvature, and other maps
- Optimizing textures for performance and quality
- Baking project: Preparing and baking maps for a complex model

EXPORTING TEXTURES AND INTEGRATION
- Preparing textures for export
- Export settings and formats for various software (Unreal Engine, Unity, etc.)
- Best practices for importing textures into game engines
- Exporting project: Exporting and integrating textures into a game engine

RENDERING IN SUBSTANCE PAINTER
- Setting up lights and cameras in the 3D viewport
- Using the Iray renderer for high-quality previews
- Rendering techniques for showcasing textured models
- Rendering project: Rendering a final textured mode

FINAL PROJECT PLANNING AND EXECUTION
- Planning a final project: from concept to execution
- Creating detailed project schedules and milestones
- Iterating on textures and materials based on feedback

FINAL PROJECT DEVELOPMENT
- Developing a detailed 3D model with advanced textures
- Integrating all learned techniques
- Preparing for final presentation and critique

MODULE – VIII

UNREAL ENGINE

INTRODUCTION TO UNREAL ENGINE INTERFACE AND NAVIGATION
- Overview of Unreal Engine interface and tools
- Customizing the workspace
- Basic navigation (viewports, panels, content browser)
- Creating and managing projects

LEVEL DESIGN BASICS
- Introduction to level design concepts
- Using geometry tools to create basic level structures
- Working with assets from the content browser
- Basic level design project: Creating a simple game level

ADVANCED LEVEL DESIGN TECHNIQUES
- Using landscape tools for terrain creation
- Applying foliage and environmental assets
- Techniques for designing complex environments
- Advanced level design project: Creating a detailed outdoor environment

INTRODUCTION TO BLUEPRINT SCRIPTING
- Overview of blueprints and visual scripting
- Creating and managing blueprint classes
- Basic blueprint scripting concepts (variables, functions, events)
- Blueprint scripting project: Implementing basic game logic

ADVANCED BLUEPRINT SCRIPTING
- Using advanced blueprint nodes and functions
- Implementing game mechanics (triggers, pickups, health systems)
- Creating and managing blueprints for characters and objects
- Advanced blueprint project: Creating interactive game elements

MATERIALS AND TEXTURING
- Introduction to Unreal Engine's material editor
- Creating and applying basic materials
- Using textures and UV mapping in Unreal Engine
- Materials project: Creating realistic materials for game assets

ADVANCED MATERIALS AND SHADERS
- Using material instances and parameters
- Creating complex materials with nodes and functions
- Techniques for optimizing materials for performance

- Advanced materials project: Developing detailed and optimized materials

LIGHTING AND SHADOWS
- Introduction to lighting concepts in Unreal Engine
- Setting up and adjusting different types of lights (directional, point, spot)
- Understanding and using light baking and dynamic lighting
- Lighting project: Creating a well-lit game environment

POST-PROCESSING AND VISUAL EFFECTS
- Introduction to post-processing volumes and effects
- Applying effects such as bloom, depth of field, and color grading
- Using particle systems for visual effects (fire, smoke, explosions)
- Visual effects project: Enhancing a game environment with post-processing and particles

CHARACTER ANIMATION AND RIGGING
- Importing and setting up character models
- Applying and adjusting animations in Unreal Engine
- Using animation blueprints for character movement
- Animation project: Creating a fully animated character

IMPLEMENTING GAME MECHANICS
- Designing and implementing player controls
- Creating game mechanics such as scoring, health, and inventory systems
- Using blueprints to manage game states and events
- Game mechanics' project: Implementing core game mechanics in a project

USER INTERFACE DESIGN
- Introduction to Unreal Engine's UMG (Unreal Motion Graphics) UI Designer
- Creating and designing UI elements (menus, HUDs, buttons)
- Implementing UI functionality with blueprints
- UI design project: Developing a user interface for a game

SOUND AND MUSIC INTEGRATION
- Importing and using sound assets
- Applying sound effects and background music in levels
- Using sound cues and blueprints for interactive audio
- Sound integration project: Enhancing a game with sound and music

OPTIMIZATION AND PERFORMANCE TUNING
- Techniques for optimizing game performance
- Using profiling tools to identify and fix performance issues
- Best practices for optimizing assets, lighting, and materials
- Optimization project: Improving the performance of a game level

PACKAGING AND DEPLOYMENT
- Preparing a game for deployment

- Packaging projects for different platforms (Windows, Mac, Android, iOS)
- Testing and debugging final builds
- Deployment project: Packaging and deploying a completed game

FINAL PROJECT PLANNING AND EXECUTION

- Planning a final game project: from concept to execution
- Creating detailed project schedules and milestones
- Iterating on game design based on feedback

FINAL PROJECT DEVELOPMENT

- Developing a comprehensive game with all learned techniques
- Integrating all elements (levels, mechanics, UI, audio, etc.)
- Preparing for final presentation and critique

MODULE – IX

FINAL PROJECT

- Project Planning and Concept Development
- Asset Creation and Integration
- Game Level Design and Scripting
- Polishing and Playtesting
- Final Project Presentation and Critique