



COMSATS University Islamabad

Department of Computer Science

Course Description Form (CDF)

Course Information

Course Code: **CSC495**

Course Title: **Game Development**

Credit Hours: **4 (3,1)**

Lecture Hours/Week: **3**

Lab Hours/Week: **3**

Pre-Requisites: **CSC241-Object Oriented Programming**

Catalogue Description:

This course will cover the following topics: Game Development Overview; Game Characters; Gameplay; HUD; Difficulty Balance; Game Development Engine Overview (Unity); Scenes and Game Objects; Graphics & Sound Material and Effects with URP & Shader Graph; Lighting Using the Universal Render Pipeline; Full Screen Effects with Post Processing; Sound & Music Integration; User Interface Design; Creating a UI using Toolkit; Creating Animation with Animator; Cinemachine & Timeline; C# & Visual Scripting; Movement & Spawning; Win & Lose Condition; AI for Game Development; and Releasing the Game.

Unit wise Major Topics:

Unit	Topic	No of teaching hours
1.	Game Development Overview; Game Characters; Gameplay: Layout, Starting & Ending Condition, Point System, HUD; Difficulty Balance: Questions, Implementation Plan & Documentation; and Game Development Engine Overview (Unity).	4.5
2.	Scenes & Game Objects: Manipulating Scenes, GameObjects & Components, Object Hierarchies, Prefabs, Creating a Landscape with Terrain , Creating Shapes with ProBuilder, Importing, Integrating, and Configuring Assets.	7.5
3.	Graphics & Sound Material; Effects with URP & Shader Graph; Visual Effects with Particle Systems; Lighting using Universal Render Pipeline; Fullscreen Effects with Post Processing; Sound & Music Integration; User Interface Design; Creating a UI with the UI Toolkit; Creating Animation with Animator, and Cinemachine & Timeline.	12
4.	C# and Visual Scripting: Creating Scripts & Using events and Instructions; Movement & Spawning: Physics Collisions & Health System, Configuring Physics, Detecting Collisions, Moving with Physics; Win & Lose Condition: Scripting the UI, and Sounds & Graphics.	12
5.	Implementing Game AI for Building Enemies: Gathering Information with Sensors, Making Decisions with FSM's, Executing FSM actions; Scene Performance Optimization: Graphics, Processing, and Memory.	4.5
6.	Releasing The Game: Building the Project, Testing & Feedback; and	4.5

	Augmented Reality in Unity.					
Total Contact Hours					45	
Mapping of CLOs and SOs						
Sr.#	Unit #	Course Learning Outcomes	Blooms Taxonomy Learning Level	SO		
CLO's for Theory						
CLO-1	1	Characterize the fundamental concepts of game development.	Understanding	1		
CLO-2	2	Create different assets and scenes for a game scenario.	Creating	3,4		
CLO-3	3	Create animations for a game scenario.	Creating	3,4		
CLO-4	4-6	Illustrate the concept of visual scripting and AI for gaming.	Applying	2,4		
CLO's for Lab						
CLO-5	1-6	Implement the components of game development using modern languages and tool.	Applying	2-4		
CLO-6	4-6	Develop a complete game using the modern concepts of game development in a team environment.	Creating	3-5,9		
CLO Assessment Mechanism						
Assessment Tools	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5	CLO-6
Quizzes	Quiz 1	Quiz 2	Quiz 3	Quiz 4	-	-
Assignments	-	Assignment 1&2	Assignment 3	Assignment 4	LAB Assignments	LAB Assignments
Mid Term Exam	Mid Term Exam	Mid Term Exam	Mid Term Exam	-	-	-
Final Term Exam	Final Term Exam				-	-
Project	-	-	-	-	-	Lab Project
Text and Reference Books						
Text Books:						
1. Hands-On Unity 2021 Game Development: Create, customize, and optimize your own professional games from scratch with Unity 2021, Borromeo, N. A., Packt Publishing, 2021.						
2. Agile Game Development with Scrum, Keith, C., Addison-Wesley, 2020.						
Reference Books:						
1. The Art of Game Design: A Book of Lenses, Schell, J., Morgan Kaufmann, 2019.						
2. Fundamentals of Game Design, Adams, E., New Riders, 2013.						

