

COURSE OUTLINE

INSTITUTION

University of Management & Technology, Lahore

A. Course Description

The purpose of this course is to teach students about the overall process of game development. Computer games can be played today on a number of platforms. The course will equip students with the latest techniques using Unity and accompanying tools to develop quality games for PC, Mobile and Console platforms.

Course Title	Game Development using Unity 3D
Course Start Date	Aug 21, 2023
Course End Date	Oct 11, 2023
Class Schedule	Monday, Wednesday: 2:00 pm to 5:30 pm
Number of Weeks	8
Textbook	Unity Game Development Cookbook Essentials for Every Game by O'Reilly
Reference Material	Developing 2D Games with Unity by Jared Halpern Beginning 3D Game Development with Unity by Sue Blackman
Course Goals	The Goals of the course are to To enhance student organizational and computer skills that will develop a foundation for living and working in the environment of the 21st Century. To provide a challenge for students to design computer games from scratch to launch, that will entertain and instruct without violence or inappropriate language.

Topics Covered in the Course	Sr. No	Topics	Assessments	Lab tasks
	1	<p>Introduction to the game development life-cycle, the game loop, a brief history of how games have been developed. Basic components of a game</p> <p>Installation of Unity Hub and Unity Game engine with VS 19. How to create a project in Unity? Discussion about Unity layout and assets with use.</p>		Unity hub and Installation
	2	<p>Scripts as Behaviour Components, Variables, and Functions, Syntax, C# vs. JS, If Statements, Loops, Scope, and Access Modifiers, Awake and Start, Update and Fixed Update, Vector Maths, Enabling and Disabling Components, Activating Game Objects & Translate and rotating.</p>	Assignment#1	Unity Basics
	3	<p>Linear Interpolation, Destroy, Get Button and Get Key and Get Axis.</p> <p>OnMouseDown, Get Component, Delta Time & Data Types.</p> <p>Classes, Instantiate, Arrays, Invoke, Enumerations & Switch Statements.</p>	Assignment#2	C# basics
	4	<p>What is User Interface?</p> <p>Text, Button (On click & Events), Image, Slider</p>	Assignment#3	UI
	5	<p>Player Preference and Sounds</p> <p>Store Game Data in Local Mobile Storage.</p> <p>Handling Sounds in the Game.</p>		Handling Sounds in Game
	6	<p>Physics</p> <ul style="list-style-type: none"> • Colliders & Triggers. • Collisions. • Rigid bodies & Joints. • Materials. • Ray casting. 	Assignment#4	Physics in Game
	7	Animation	Assignment#5	

		<ul style="list-style-type: none"> • Animation View • Properties. • Curves and Events. • Asset API. • Animator. 		Animation
	8	<p>Rolling Ball</p> <ul style="list-style-type: none"> • Concept. • Environment. • Player. • Camera. • Play Area. • Pickups. • Displaying. 	Project	Rolling Ball Project
	9	<p>Android Development</p> <p>Third Person Shooter</p> <ul style="list-style-type: none"> • Concept. • Environment. • Player. • Camera. • Play Area. • Weapon Pick and Drop. • Displaying. 		Game setup of Third Person Shooter
	10	<p>How to add an enemy and make the enemy move?</p> <p>How to turn an enemy into a patrolling zombie and AI based zombie?</p>		Enemy AI
	11	<p>Object Collision, Environments and Drawing the world, Particle Systems.</p> <p>Killing enemies using bullets with blood splash.</p> <p>Instantiate method and its use in Unity.</p> <p>Respawning multiple enemies.</p> <p>Random method and its use in Unity.</p> <p>Invoke method and its use in Unity.</p>	Assignment#6	Respawning enemies
	12	Game Optimization		Optimization