Riphah International Colleges
A Project of Riphah International University
Course Outline

Course Code	CS2713
Course Title	**Game Programming**
Credit Hours	3(2+1)
Prerequisites	N/a
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	Quizzes + Assignments: 10 Project+ Presentation 10 Lab : 15 Mid Term 25 Final Exam: 40
Course Description	The ultimate goal of game programming is to deliver an entertaining, visually appealing, and well-performing game that captivates players and provides an enjoyable and memorable experience. This involves a combination of technical skills, creativity, and collaboration within a game development team
Textbook	**"Game Programming Patterns"** – Robert Nystrom **"Introduction to Game Design, Prototyping, and Development"** – Jeremy Gibson Bond
Reference Material	Lecture Slides, notes, **"The Art of Game Design: A Book of Lenses"** – Jesse Schell
Course Goals/Objectives	**Goal:** • Creating Engaging Gameplay • Implementing Game Mechanics • Optimizing Performance • Graphics and Visual Effects • Audio Integration • Network Programming (for Online Multiplayer Games)

Topics Covered in the Course, with Number of Lectures on Each Topic

Topics	Hours
Introduction to Game programming	3
Game engine	12
Game Level Design,	14
Game world	6
Game Technology	3

Game Documentation	4
Business for gaming	6

Weekly Lecture Plan

Week	Lecture	Topic
1	1	Introduction to Game programming
		Game Design and Development 1: 2D Shooter
		The game process
		How are game made
	2	Game designer role
		The game Development team
		Costs and limitation
2	3	Game engine overview
		Solar system project overview
		Download and install Unity platform
	4	Unity setup
		Create unity project
		Download project assists
		import Assists
		Unity editor
3	5	Game engine overview
		Solar system project overview
		Download and install Unity platform
	6	Unity setup
		Create unity project
		Download project assists
		Materials, Lights, Behaviors and Cameras
		Audio, Prefabs, Build and test
		Finishing up Solar system simulation
		Setting up the project
		Level Design
		Game system
4	7	Level Design
		Game system
		taking screenshot
		Additional Resources
	8	Create new unity project
5	9	Get new input system
		Player setup visual
		Player setup control
		Player setup health damage
	10	Player setup fighting backup
6	11	Cameras Framing the Action
		Level Setup Environment Sprites

		Game Loop Setup 1 Management and UI
		Game Loop setup 3 In Game UI and main Menu
		Audio and Music
		Adding More levels
	12	Code Basics
		Unity Programming_ Introduction
		Unity Programming_Object Oriented Thinking
	13	Unity Programming_Anatomy of C# Script
		C# Variables
		Conditionals and Loops
		Functions and Classes
		C# within Unity
7	14	Programming in Unit
		Tilemaps_Tile Palette and Tiles
		Tilemaps_Rules Tiles
	15	Animated Tiles
		Combining Rules and Animation
		Player setup Physics
		Player setup input System
		Canvases and user interface
8	16	Level Setup
		MID TERM EXAM
		Introduction
		Game word Components
	17	Designing the game world
		World Building
		Story telling Introduction
		character and Documentary
		Character Design
9	18	Setting and Plot
		Game play introduction
		Decomposing Gameplay
	19	The secret of Mario's jump(and other versatile verbs)
		forms of fun
		Game Genres
		user experience
		inputs
		outputs
		The mechanics of Movement
10	20	Designing with UX
		Game technology Introduction
		Brief History
		Game technology Hardware
	21	Game technology Software
		Game technology Environment
11	22	A brief history of video game
		3D Shooter Game Project setup
12	23	Project Overview

		Creating A New Unity Project
		Getting The New Input System
		Main Menu Setup 1 - Creating Menu
		Main Menu Setup 2 - About page
		Main Menu Setup 3 - Dynamic elements
		Main Menu Setup 4 - Unity terrain
		Creating First Level
		Player setup
		Writing The Player Controller Script 1, 2, 3
		Enemy AI Setup 1
		Boss Fight
		Game Graphics
		Game Graphics Concepts - Part 1 of 3
		Game Audio
	24	Game Audio Concepts
		Programming Best Practices - Part 1: Introduction
		Programming Best Practices - Part 2: Easy-to-Read
		Game Balancing
		Game Balancing player vs player
		Player vs Game Play
	25	Game Play vs Game play
		Game designing challenges
13	26	Prototyping and Playtesting
		Game Play prototyping
		Other early prototyping
	27	Mid to late Prototypes
14	28	Playtesting
		Level Whiteboxing with ProBuilder 1
		Level Whiteboxing with ProBuilder 2
		Level Whiteboxing with ProBuilder 3
		The Art Pass 1
		The Art Pass 2
		Adding The Player And Animations
	29	Using the Provided Prefabs 1
		Creating a Special Effect
		Ideation - Part 1: Introduction
		Changing the Way You Look at the World
		Ideation - Part 2: Brainstorming Warm Up
		Ideation - Part 3: Structured Brainstorming
15	30	Design Documentation
		Business for Gaming
		Game Studio Budget Calculator
		Business for Gaming - Part 2: How are games funded?
		Business for Gaming - Part 3: Where are games sold?
	31	Business for Gaming - Part 4: How is money made on games?
		Social Issues
		Building your Game Design Library
16	32	What Game Development Role Interests You Most?

17	33	Project/Presentation
	34	Project/Presentation
		FINAL TERM EXAM