Marwadi University
Faculty of Diploma Studies
Information and Communication Technology

Subject Code: Game Development

Subject Name: Game Development

Diploma Year – III (Semester V)

Objective: After completion of this course, student will be able to understand the concepts of Game design and development. They will learn the processes, mechanics and issues in Game Design. They will be exposed to the Core architectures of Game Programming.they will Know about Game programming platforms, frame works and engines which requires to develop games.

Credits Earned: 04 Credits

Course Outcomes: After completion of this course, student will be able to:

1. Discuss the concepts of Game design and development.
2. Design the processes, and use mechanics for game development.
3. Explain the Core architectures of Game Programming.
4. Use Game programming platforms, frame works and engines.
5. Create interactive Games.

Pre-requisite of course: Basic programming and oops concept

Teaching and Examination Scheme:

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial / Practical Marks		Total Marks
				E	I		V	T	
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term Work	
3	0	2	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	**Introduction to Unity & Game Development:** Engine Concepts, Development Tools, Introducing Unity, Installing Unity Software, IDE Basics, Unity Concepts, Sprites	04
2	**Introduction to Scripting:** C# Language Concepts, C# Coding Fundamentals, Game Loops and Functions	05
3	**Simple Movement & Input:** Simple Movement, Simple Rotation and Scaling, Easy Input Handling in Unity, 2D Physics Concepts, Rigidbody Components, Unity Colliders, Physics Materials, Scripting Collision Events	05
4	**Primitive Data and Math:** Data Types and Variables, Mathematical Operations, Variable Scope and Access, Displaying Data, **Decisions and Flow Control:** Logical Expressions, “if/else” Statements, "switch" Statements	04
5	**Organizing Game Objects:** Parent-Child Objects, Sorting Layers, Tagging Game, Objects, Collision Layers, Object-Oriented Concepts, Class, functions, Constructor, Property Function, Object Management, it’s lifespan with Invoke.	06
6	**Exceptions and Debugging:** Runtime Exception, Errors, Debugger, **Loops and Array:** Array, for() and foreach(), while loop()	05
7	**Game Design Strategies:** Game Requirements, Game Mechanics, Storytelling and Progression, Design Documents. **Virtual Worlds:** Moving Cameras, Setting Boundaries, Building a Tile World, Mini-Maps	05
8	**Scrolling Games:** Wrapping Background, Scrolling Game Mechanics, Parallax Effects **Animation:** Simple Unity Animation, Animator States, Scripting Animations, Animations and Colliders **Sound Effects:** Sound Files, Adding Sounds to Game Objects, Scripting Sounds	08
	Total Hours	42

Suggested Text books / Reference books:

1. Sams Teach Yourself Unity Game Development in 24 Hours
2. Unity in Action: Multiplatform Game Development in C# with Unity 5 by Joseph Hocking
3. Introduction to Game Design, Prototyping, and Development, Jeremy Gibson
4. Learning C# by Developing Games with Unity 5.x, Gerg Lukosek.
5. Unity 5.x By Example, Alan Thorn.

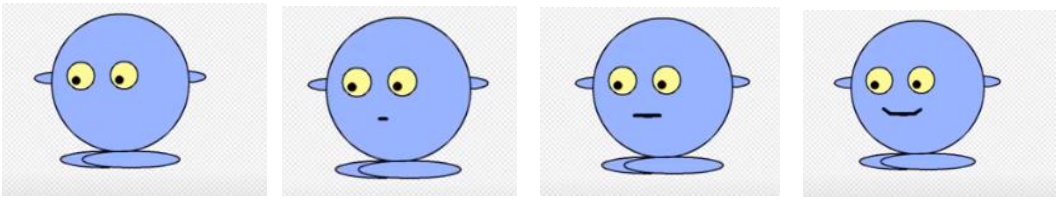
Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
40%	40%	10%	10%	-	-

Suggested List of Experiments:

1. Installation to Unity Software.
2. Introduction to Operating of IDE and basic program.
3. Create first Sprite using Scratch as following images.



4. Write a C# Sharp program to accept two integers and check whether they are equal or not.
5. Write a C# Sharp program to accept a coordinate point in an XY coordinate system and determine in which quadrant the coordinate point lies.
6. Write a C# Sharp program to check whether an alphabet is a vowel or consonant.
7. Create a program to demonstrate Alien Dance Squad.
8. Create Simple Pin Ball game.
9. Add Scoring feature in Practical-8.
10. Write a program to develop Thunder Road.
11. Write a program to develop Mower Dodgeball.
12. Write a program to develop Bug Hunt.
13. Write a program that will demonstrate sounds with movement of any Sprite.
14. Write a program to develop RoboDash with animation effects.

Open Ended Projects:

Student will develop a game like Crossy Road, Super Mario Run etc, by using concepts of Unity and C#.

Student Activity:

Complete online course and get certificate of "Android development" under Online Programming Certification.

Instructional Method:

a) The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, also need to use Digital media for programming.
b) The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room..
c) Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

References

1. https://learn.unity.com/
2. https://www.tutorialspoint.com/unity/index.htm
3. https://www.raywenderlich.com/unity/paths/learn