Subject Code	Subject Name	Category	L	T	P	C
AI19P52	AI FOR GAME PROGRAMMING	PE	2	0	2	3

Objectives:	
●	To learn the fundamentals of Game programming.
●	To understand the 3D Graphics, vertex and pixel shader.scenes.
●	To learn the various PyGame Development process and its design attributes.
●	To interpret working knowledge in various game platforms.
●	To familiarize various games using reinforcement learning.

UNIT-I	**INTRODUCTION**	**6**
Elements of Game-Game Architecture-Application Layer-Game Logic-Game View for the Human Player-Game View for AI agents-Networked Game Architecture-Remote Game View-Remote Game Logic.(Text Book 1: Chapter 2)		
UNIT-II	**3D GRAPHICS**	**6**
3D Graphics Basics- Pipeline-3D MATH 101-Vector Classes-Matrix Mathematics-Quaternion Mathematics. 3D Vertex and Pixel Shader : Vertex Shader Syntax-Compiling the vertex shader-The pixel shader-Rendering the shader Helper Classes. 3D Scenes: Graph Basics-Special Scene Graph Nodes.(Text Book 1: Chapter 14,15,16)		
UNIT-III	**PYGAME AND 3D AND PYPLATFORMERS**	**6**
Installing Packages-Getting started with OpenGL-Adding the Pygame Library-Drawing the openGL-Basic Collision Detection Game-An introduction to Game Design-Introducing Pymunk-Building a Game Framework-Developing Pyplatformers.(Text Book 2 : Chapter 5 & 6)		
UNIT-IV	**AUGMENTING A BOARD GAME WITH COMPUTER VISION**	**6**
Planning the checker application-setting up OpenCV and Other dependencies-Supporting multiple version of Open CV-Configuring Cameras-Working With Colors-Building the analyser-Converting OpenCV images for wxPython-Building the GUI Application-Troubleshooting the projects.(Text Book 2 : Chapter 7)		
UNIT-V	**REINFORCEMENT LEARNING AND GAMES**	**6**
Intelligence and Games- Reinforcement Learning - Heuristic Planning - Adaptive Sampling-Deep Supervised Learning-Deep Reinforcement Learning.(Text Book 3:Chapter 2, 3,4, 5 and 6)		
	Contact Hours : 30	

List of Experiments (can be implemented using any tools: Play Canvas, jMonkey Engine, Direct 3D 11, Scratch , Python or Unity.**)**			
1.	Texture the Triangle using Direct 3D 11.		
2.	Programmable Diffuse Lightning using Direct3D 11.		
3.	To Implement Make Bouncing Ball Game.		
4.	To Implement " virtual pet" game.		
5.	To Implement " treasure hunt " game.		
6.	To Implement Shooting games.		
7.	To Implement Tynker games.		
8.	Introduction about PyGame, Unity software.		
9.	Learning 2D Game Development with Unity.		
	Contact Hours	**:**	**30**
	Total Contact Hours	**:**	**60**

Course Outcomes: On completion of the course, the students will be able to	
●	Explain the need for Game programming.
●	Integrate various concepts and techniques of 3D Game design.
●	Design and model interactive game.
●	Explain the need for advanced game development platforms.
●	Design and develop games using reinforcement learning.

Text Books:	
1	Mike “MrMike” McShaffry and David “Rez” Graham, “Game Coding Complete,Fourth Edition”, Course Technology PTR, A part of Cengage Learning.
2	Alejandro Rodas de Paz,Joseph Howse, “Python Game Programming By Example”, Packt Publishing,2015.
3	Learning to Play (Springer),Reinforcement Learning and Games by Aske Plaat,2020.

Reference Books:	
1	Jeremy Gibson, “Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#”, Addison-Wesley Professional, 2 nd edition, 2016.
2	John Horton, “Learning Java by Building Android Games”, Packt Publishing Limited, 1st edition, 2015.
3	Jorge Palacios, “Unity 5.x Game AI Programming Cookbook”, Packt Publishing Limited, 1st edition, 2016.

Web link:

1. https://docplayer.net/62131747-Python-game-programming-by-example.html

2. https://www.3dgep.com/introduction-opengl/

3. https://link.springer.com/chapter/10.1007/978-3-642-27645-3_17

CO - PO – PSO matrices of course

PO/PSO CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
AI19P52 .1	1	2	2	2	2	-	-	-	-	-	-	-	1	1	-
AI19P52 .2	2	2	3	2	2	-	-	-	-	-	-	-	2	2	-
AI19P52.3	2	2	3	3	3	-	-	-	-	-	2	-	3	3	-
AI19P52.4	2	2	3	3	3	-	-	-	-	-	2	-	3	3	2
AI19P52.5	2	2	3	3	3	-	-	-	-	-	2	-	3	3	2
Average	1.8	2	2.8	2.6	2.6	-	-	-	-	-	1.2	-	2.4	2.4	0.8

Correlation levels 1, 2 or 3 are as defined below:
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
No correlation: “-”