

Devi Ahilya University, Indore, India Institute of Engineering & Technology				IVYear B.E. (Computer Engg.) (Full Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
CER8E3	L	T	P	L	T	P	Total
Game AI	3	1	2	3	1	1	5
Duration of Theory Paper:3 Hours							

Learning Objectives:

Game AI is a very large field—far more complex than can be fully studied in a single semester. This course aims to provide a broad overview of game AI, combining study of industry standard techniques with new approaches from research.

Pre requisites:

CER7C3: Artificial Intelligence, Knowledge of algorithms and experience with object-oriented design or functional programming.

COURSE OF CONTENTS

Unit 1:

Introduction, Model of Game AI and algorithms, the kind of AI in Games, Speed and memory, The AI Engine.

Unit 2:

Movement, the basics of movement algorithms, Steering Behavior, Combining Steering behaviors, predicting physics, Jumping, Motion control. Pathfinding.

Unit 3:

Designing Game AI: The design, the shooters, driving, real time strategy, sports, turn-based strategy games.

AI-Based game Genres: Teaching characters, Flocking and herding games.

Unit 4:

Simple Soccer: A walk through of the development of a five a side soccer game from start to finish.

Raven - An Overview: a detailed overview of the Raven game architecture and the design of the AI of the agents that fight within its maps

Unit 5:

Practical Path Planning: an overview of the problems faced by today's game developers, tile based navgraphs, points of visibility navgraphs, expanded geometry navgraphs, navmeshes, hierarchical pathfinding.

Hierarchical Goal Based Agents: introduction of agents that are motivated by hierarchical goals.

Learning Outcomes

After completing this course, the students will learn how to use games, artificial intelligence (AI) to generate responsive, adaptive or intelligent behaviors primarily in non-player characters (NPCs) similar to human-like intelligence. They will also familiar with the research area of Game AI.

RECOMMENDED BOOKS:

- [1] Artificial Intelligence for Games, Millington and Funge, 2nd ed. Morgan Kaufmann Publishers Inc. San Francisco, CA, USA ©2009, ISBN:0123747317 9780123747310
- [2] Programming Game AI by Example, Mat Buckland, (Wordware Game Developers Library)

PRACTICAL EXPERIENCE/Assignments:

- [1] Implement common game AI algorithms for controlling NPCs
- [2] Implement AI techniques common in recent game AI research, including procedural content generation
- [3] Perform both game design and analysis as they intersect with artificial intelligence
- [4] Gain experience in how to read and write research papers
- [5] Identify the relationships between AI authoring and game design, and understanding the roles that each play in the game design and development process
- [6] Describe the basics of game design theory, to the extent necessary to assist in communicating with and creating tools for non-technical designers