III Year II Semester

L T P C

Code: 20AI6662 4 0 0 4

GAME PROGRAMMING (Honors)

Course Objectives:

The student should be made to:

- 1. Understand the concepts of Game design and development.
- 2. Learn the processes, mechanics and issues in Game Design.
- 3. Be exposed to the Core architectures of Game Programming.
- 4. Know about Game programming platforms, frame works and engines.
- 5. Learn to develop games.

Course Outcomes:

Upon completion of the course, students will be able to

- 1. Distinguish the concepts of Game design and development.
- 2. Understand the Design processes, and use mechanism for game development.
- 3. Understand Core architectures of Game Programming.
- 4. Use Game programming platforms, frame works and engines and Create interactive Games
- 5. Apply the different techniques to game develop.

UNIT-I

3D GRAPHICS FOR GAME PROGRAMMING: Transformations, Quaternions, 3D Modeling and Rendering, Ray Tracing, Shader Models, Lighting, Color, Texturing, Camera and Projections, Culling and Clipping, Character Animation, Physics-based Simulation, Scene Graphs.

UNIT-II

GAME ENGINE DESIGN :Game engine architecture, Engine support systems, Resources and File systems, Game loop and real-time simulation, Human Interface devices, Collision and rigid body dynamics, Game profiling.

UNIT-III

GAME PROGRAMMING: Application layer, Game logic, Game views, managing memory, controlling the main loop, loading and caching game data, User Interface management, Game event management.

UNIT-IV

GAMING PLATFORMS AND FRAMEWORKS: 2D and 3D Game development using Flash, DirectX, Java, Python, Game engines - Unity. DX Studio.

UNIT-V

GAME DEVELOPMENT: Developing 2D and 3D interactive games using DirectX or Python – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

Text Books:

- 1. Mike McShaffrfy and David Graham, "Game Coding Complete", Fourth Edition, Cengage Learning, PTR, 2012.
- 2. Jason Gregory, "Game Engine Architecture", CRC Press / A K Peters, 2009.
- 3. David H. Eberly, "3D Game Engine Design, Second Edition: A Practical Approach to Real-Time Computer Graphics" 2nd Editions, Morgan Kaufmann, 2006.

Reference Books:

- 1. Ernest Adams and Andrew Rollings, "Fundamentals of Game Design", 2nd Edition Prentice Hall / New Riders, 2009.
- 2. Eric Lengyel, "Mathematics for 3D Game Programming and Computer Graphics", 3rd Edition, Course Technology PTR, 2011.
- 3. Jesse Schell, The Art of Game Design: A book of lenses, 1st Edition, CRC Press, 2008.