CA5T3E **AGENT TECHNOLOGIES** **Credits : 4**

Lecture Hours : 4 periods / week Internal assessment : 30 Marks

Semester and Examination: 70 Marks

Course Description:

The objective of this course is to provide an overview of the agent technologies and its work products and its principle of Model driven architecture. The course introduces a viewpoint framework within which to view multi agent systems. It supports the modeling of a given problem domain at three abstraction layers – analysis, design and platform specific design and from three balanced and interrelated viewpoint aspects.

Course Objective:

- To present necessary concepts for Agent Environment.
- Understanding the approaches of multi agent modeling.
- Understanding the Hybrid and Reactive agents.
- Studetnt has to Study Reaching Agreements Mechanism & Design Auctions
- Understanding the concepts of Methodologies Agent-Oriented Analysis and Design Techniques.
- Student has to realize the Pitfalls of Agent mobile technologies.

UNIT I

Intelligent Agents : Introduction to Intelligent Agent Environments, Intelligent agents- Agents and Objects, Agents and Expert Systems, Agents as Intentional Systems, Abstract Architectures for Intelligent Agents How to tell an agent what to do Synthesizing Agents

UNIT II

Deductive Reasoning Agents: Agents as Theorem Provers, Agent Oriented Programming, Concurrent MetateM, **Practical Reasoning Agents** Proactical Reasoning Equals Deliberation Plus Means-Ends Reasoning, Means-Ends Reasoning, Implementing a Practical Reasoning Agent, Homer: an agent that plans, The Procedural Reasoning System

UNIT III

Reactive and Hybrid Agents: Brooks and the Subsumption Architecture, The Limitations of Reactive Agents, Hybrid Agents

UNIT IV

Multiagent Interactions : Utilities and Preferences, Multiagent Encounters, Dominant Strategies and Nash Equilibria, Competitive and Zero-Sum Interactions.

UNIT V

The Prisoners Dilemma: The Prisoners Dilemma Other Symmetric 2 x 2 Interactions, Dependence Relations in Multiagent Systems.

UNIT VI

Reaching Agreements : Mechanism Design, Auctions, Negotiation, Argumentation, Communication Speech, Acts Agent Communication Languages, Ontologies for Agent Communication, Coordination Languages.

UNIT VII

Working Together: Cooperative Distributed Problem Solving, Task Sharing and Result sharing, Combining

Task and Result Sharing, Handling Inconsistency, Coordination, Multiagent planning and Synchronization.

UNIT VIII

Methodologies: Agent-Oriented Analysis and Design Techniques, Pitfalls of Agent Development, Mobile Agents, Applications of Agents.

<u>**Learning Resources :**</u>

Text Books:

1. Michael Wooldridge, An Introduction to Multiagent Systems, John Wiley & Sons Ltd.2002.

Reference Books:

1. Gerhard Weiss, Multi-agent Systems A Modern Approach to Distributed Artificial Intelligence, MIT Press,1999.
2. Walter Brenner et al, Intelligent Software agents-Foundation and application, Springer Verlag,1998.
3. Nicholas R. Jennings, Michael Wooldridge, Agent Technology: Foundations, Applications and markets, Springer Verlag Publishing, 2002