20AM611OE: Introduction to Artificial Intelligence (Open Elective-I)

B. Tech VI SEM. **L T P C**
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Course Objectives:

- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To provide a basic exposition to the goals and methods of Artificial Intelligence.
- To apply the techniques in applications which involve perception, reasoning and learning.

Course Outcomes:

Upon successful completion of the course, the student will be able to:

1. Enumerate the history and foundations of Artificial Intelligence
2. Apply the basic principles of AI in problem solving
3. Choose the appropriate representation of Knowledge
4. Solve the problems with uncertainty using probability
5. Examine the Scope of AI and its societal implications

UNIT I

Introduction: What Is AI?, The Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art, Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents.

UNIT II

Problem Solving: Problem-Solving Agents, Example Problems, Searching for Solutions, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Local Search Algorithms and Optimization Problems, Searching with Nondeterministic Actions.

UNIT III

Knowledge Representation: Knowledge-Based Agents, Logic, Propositional Logic: A Very Simple Logic, Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, The Internet Shopping World.

UNIT IV

Uncertain Knowledge and Reasoning: Acting under Uncertainty**,** Basic Probability Notation, Inference Using Full Joint Distributions, Independence, Bayes' Rule and Its Use, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks.

UNIT V

AI present and Future: Weak AI: Can Machines Act Intelligently?, Strong AI: Can Machines Really Think?, The Ethics and Risks of Developing Artificial Intelligence, Agent Components, Agent Architectures, Are We Going in the Right Direction?, What If AI Does Succeed?.

Text Books:

1) Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" , 3rd Edition, Pearson.
2) Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill

Reference Books:

1) Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India, 2011
2) David Poole and Alan Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press 2010.
3) Trivedi, M.C., “A Classical Approach to Artifical Intelligence”, Khanna Publishing House, Delhi.

Web Resources:

1) https://nptel.ac.in/courses/106105077
2) https://nptel.ac.in/courses/106106126
3) https://aima.cs.berkeley.edu
4) https://ai.berkeley,edu/project_overview.html