5Th Semester

Fundamentals of Artificial Intelligence

Course Objectives

- To introduce classical AI and rational intelligent agents.
- To introduce techniques for problem solving by search and adversarial games.
- To introduce constraints, logic, and inference techniques
- To introduce planning, acting, and multi-agent systems.
- To introduce knowledge-representation and reasoning.

Course Outcomes

After completing this course, students will be able to

CO1: Analyse different elements of an AI system.

CO2: Apply elementary principles of AI for problem solving and search

CO3: Apply constraints and logic for intelligent systems

CO4: Apply knowledge representation and reasoning for defining intelligent systems

Unit 1

History and Foundations of AI, Rational Intelligent Agents, Agents and Environments, Nature of Environments,

Structure of Agents.

Unit 2

Problem Solving by Search: Uninformed and Informed Search Strategies, Heuristic Functions; Adversarial

Search: Games, Optimal Decisions in Games, Alpha-Beta Pruning

Unit 3

Constraint Satisfaction Problems, Inference in CSPs, Backtracking Search; Knowledge-Based Agents,

Propositional and First-Order Logic, Resolution Theorem Proving, Unification Forward and Backward Chaining

Unit 4

Classical Planning: Algorithms for Planning, Planning Graphs, Hierarchical Planning, Planning and Acting in

Nondeterministic Domain, Multi-Agent Planning; Knowledge Representation: Ontological Engineering,

Categories and Objects, Events, Reasoning with Default Information.

Textbooks/ References:

Russell, Stuart Jonathan, Norvig, Peter, Davis, Ernest. Artificial Intelligence: A Modern Approach. United

Kingdom: Pearson, 2010.

Deepak Khemani. A First Course in Artificial Intelligence. McGraw Hill Education (India), 2013.

Denis Rothman. Artificial Intelligence by Example. Packt, 2018.