23RAI111	FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE	L-T-P-C: 3-0-0-3

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

CO/PO Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	3	2		2				2	2	2	2
CO2	2	2	2	2	3							2	2	2	2
CO3	2	2	2	2	3							2	2	2	2
CO4	3	2	2	2	3						2	2	2	2	2

Syllabus

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.