ARTIFICIAL INTELLIGENCE

OBJECTIVES:
- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To enable Problem-solving through various searching techniques.
- To enable the student to apply these techniques in applications which involve perception, reasoning and learning.
- To apply AI techniques primarily for machine learning, vision and robotics.

UNIT I INTRODUCTION

Introduction to Artificial Intelligence – Intelligent Agents–Agents and Environments-Good behavior - The Nature of Environments - Structure of Agents - Problem Solving - Problem Solving Agents - Agent Architectures and Hierarchical Control - Agents - Agent Systems - Hierarchical Control - Embedded and Simulated Agents - Acting with Reasoning

UNIT II SEARCHING TECHNIQUES

Searching For Solutions - Uniformed Search Strategies - Avoiding Repeated States - Searching with Partial Information - Informed Search and Exploration–Informed Search Strategies– Heuristic Function–Local Search Algorithms and Optimistic Problems–Local Search in Continuous Spaces - Online Search Agents and Unknown Environments - Constraint Satisfaction Problems(CSP)– Backtracking Search and Local Search for CSPs– Structure of Problems- Adversarial Search–Games– Optimal Decisions in Games–Alpha-Beta Pruning–Imperfect Real-Time Decisions - Games that include an element of chance.

UNIT III: KNOWLEDGE AND REASONING

Proposition Logic - First Order Predicate Logic–Unification–Forward Chaining -Backward Chaining-Resolution–Knowledge Representation-Ontological Engineering- Categories and Objects–Events - Mental Events and Mental Objects - Reasoning Systems for Categories - Reasoning with Default Information-Prolog Programming.

UNIT IV: LEARNING

Probability basics - Bayes Rule and its Applications - Bayesian Networks - Exact and Approximate Inference in Bayesian Networks - Hidden Markov Models - Forms of Learning - Supervised Learning-Learning Decision Trees–Regression and Classification with Linear Models-Artificial Neural Networks–Nonparametric Models - Support Vector Machines - Statistical Learning - Learning with Complete Data - Learning with Hidden Variables- The EM Algorithm– Reinforcement Learning

UNIT V: AI PLANNING AND APPLICATIONS

AI Planning - Planning with State - Space Search - Partial-Order Planning - Planning Graphs - Planning with Propositional Logic- Hierarchical Task Network Planning - Conditional Planning - AI applications–Language Models-Information Retrieval–Information Extraction - Machine Translation - Machine Learning - Symbol- Based - Machine Learning:

Connectionist – Machine Learning - Social and Emergent -Robots

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