

Course Name: Artificial Intelligence

Course Type: Core

Course Credits: 3+1 credits

Objectives:

The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence.

Learning Outcomes

After successful completion of the course, the students should be able to:

- 1) Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- 2) Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- 3) Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- 4) Demonstrate proficiency in applying scientific method to models of machine learning.
- 5) Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

Unit 1:

Introduction to AI And Production Systems : Introduction to AI-Problem formulation, Problem Definition -

Searching state-spaces :Use of states and transitions to model problems , Breadth-first, depth-first and related types of search , A* search algorithm ,Heuristic Search Techniques.

Unit 2:

Knowledge Representation: Logic, Semantic Networks, Frames, Rules, Scripts, Conceptual Dependency and Ontologies; Expert Systems, Handling Uncertainty in Knowledge.

Unit 3 :

Fuzzy Sets: Notion of Fuzziness, Membership Functions, Fuzzification and Defuzzification; Operations on Fuzzy Sets, Fuzzy Functions and Linguistic Variables; Fuzzy Relations, Fuzzy Rules and Fuzzy Inference; Fuzzy Control System and Fuzzy Rule Based Systems.

Unit 4 :

Artificial Neural Networks (ANN): Supervised, Unsupervised and Reinforcement Learning; Single Perceptron and their limitations,

Multi Layer Perceptron: The sigmoid output function , Hidden units and feature detectors , Training by error backpropagation , The error surface and local minima , Generalization.
Applications of AI in Information technology

TEXTBOOKS/ SUGGESTED READINGS:

1. Artificial Intelligence – Russell, "A Modern Approach"; 2/e ;Pearson Education
2. Patterson , " Introduction to Artificial intelligence and expert systems" , Pearson Education
3. Neural Computing: An Introduction; R Beale and T Jackson; Institute of Physics Publishing.