

Course Objectives: The objective of the course is to provide the knowledge of artificial intelligence and expert systems. To enable the understanding of the concepts, methods, and techniques of Natural Language processing, genetic algorithms, and neural networks. To prepare students to be in a position to develop a system based on artificial intelligence.

UNIT - I

Overview of A.I.: Definition of AI, The Importance of AI, previous works in the history of AI, AI and related fields, Problem spaces and Search. Knowledge: General concepts-Definition and Importance of Knowledge, Knowledge-Based Systems, Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, Acquisition of Knowledge.

UNIT - II

Natural Language Processing: Overview of Linguistics, Grammar and Language, Parsing Techniques, Semantic Analysis and Pragmatics. Multi Agent Systems: Agents and Objects, Agents and Expert Systems, Generic Structure of Multiagent Systems, Semantic Web, Agent Communication, Knowledge Sharing using Ontologies, Agent Development Tools.

UNIT - III

Genetic Algorithms (GA): Encoding Strategies, Genetic Operators, Fitness Functions and GA Cycle, Problem Solving using GA.

Artificial Neural Networks (ANN): Supervised, Unsupervised and Reinforcement Learning, Single Perceptron, Multi-Layer Perceptron, Self-Organizing Maps, Hopfield Network.

UNIT - IV

Pattern Recognition: Introduction, Recognition and Classification Process, Learning Classification Pattern, Recognizing and Understanding Speech. Expert Systems: Definition, Rule Based System Architecture, Non-Production System Architecture, Basic Components of Expert system.

Text Books:

1. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems." Prentice-Hall, India.
2. P. H. Winston, "Artificial Intelligence", Addison Wesley.

1. A. Rich and K. Knight, "Artificial Intelligence", Tate McGraw Hill.
2. E. Charniak And D. Mcdermott, "Introduction To Artificial Intelligence", Addison-Wesley Publishing Company.
3. N. J. Nilsson, "Artificial Intelligence: A New Synthesis", Morgan Kauffman.
4. T. Dean, J. Allen and Y. Aloimonos, "Artificial Intelligence: Theory and Practice", Benjamin/Cummings.

Course Outcomes:

By the end of the course, the students will be able to:

CO1: analyze different approaches for artificial intelligence.

CO2: identify and select optimal solutions for different situations and projects.

CO3: implement the knowledge through practicing AI systems.

CO4: conduct independent research in artificial intelligence and expert systems and apply that knowledge in their future research and practice.

CO5: evaluate the work of peers constructively by following proven methods of peer-review, and by using the principles of research ethics.

NOTE: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and the candidate is required to attempt one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.