Artificial Intelligence
CS703C
Contracts: 3L
Credits- 3

Introduction [2]
Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem.

Intelligent Agents [2]
Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents.

Problem Solving [2]
Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.

Search techniques [5]
Solving problems by searching :problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies.

Heuristic search strategies [4]
Greedy best-first search, A* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search, genetic algorithms; constraint satisfaction problems, local search for constraint satisfaction problems.

Adversarial search [3]
Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.

Knowledge & reasoning [3]
Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation.

Using predicate logic [2]
Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.

Representing knowledge using rules [3]
Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge.

Probabilistic reasoning [3]
Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster-Shafer theory, Fuzzy sets & fuzzy logics.

Planning [2]
Overview, components of a planning system, Goal stack planning, Hierarchical planning, other planning techniques.

Natural Language processing [2]
Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing.

Learning [3]
Forms of learning, inductive learning, learning decision trees, explanation based learning, learning using relevance information, neural net learning & genetic learning.

Expert Systems [2]
Representing and using domain knowledge, expert system shells, knowledge acquisition.

Basic knowledge of programming language like Prolog & Lisp. **[3]**

Books:
1. Artificial Intelligence, Ritch & Knight, TMH
2. Artificial Intelligence A Modern Approach, Stuart Russel Peter Norvig Pearson
3. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI
4. Poole, Computational Intelligence, OUP
5. Logic & Prolog Programming, Saroj Kaushik, New Age International
6. Expert Systems, Giarranto, VIKAS
7. Artificial Intelligence, Russel, Pearson