

Artificial Intelligence  
Code: PEC-IT501B  
Contacts: 3L

### **1. 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.

### **2. 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 [5]**

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.

### **3 Knowledge & reasoning [3]**

Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation.

### **4 Using predicate logic [2]**

Representing simple facts in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.

#### **Probabilistic reasoning [4]**

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

### **5 Natural Language processing [2]**

Introduction, Syntactic processing, semantic analysis, discourse & pragmatic processing.

#### **Learning [2]**

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.