

Artificial Intelligence

B.E. Sem. VII [INFT]

(Elective – I)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	25

Prerequisite : programming language like JAVA or Python

Objective : This course will introduce the basic ideas and techniques underlying the design of intelligent computer systems. Students will develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents. This course will attempt to help students understand the main approaches to artificial intelligence such as heuristic search, game search, logical inference, decision theory, planning, machine learning, neural networks and natural language processing. Students will be able to recognize problems that may be solved using artificial intelligence and implement artificial intelligence algorithms for hands-on experience

SYLLABUS

1. Artificial Intelligence

Introduction to AI, History of AI, Emergence Of Intelligent Agents

2. Intelligent Agents

PEAS Representation for an Agent, Agent Environments, Concept of Rational Agent, Structure of Intelligent agents, Types of Agents.

3. Problem Solving

Solving problems by searching, Problem Formulation, Uninformed Search Techniques- DFS, BFS, Iterative Deepening, Comparing Different Techniques, Informed search methods – heuristic Functions, Hill Climbing, Simulated Annealing, A*, Performance Evaluation.

4. Constrained Satisfaction Problems

Constraint Satisfaction Problems like, map Coloring, Crypt Arithmetic, Backtracking for CSP, Local Search.

5. Adversarial Search

Games, Minimax Algorithm, Alpha Beta pruning.

6. Knowledge and Reasoning

A knowledge Based Agent, Introduction To Logic, Propositional Logic, Reasoning in Propositional logic, First Order Logic: Syntax and Semantics, Extensions and Notational Variation, Inference in First Order Logic, Unification, Forward and backward chaining, Resolution.

7. Knowledge Engineering

Ontology, Categories and Objects, Mental Events and Objects.

8. Planning

Planning problem, Planning with State Space Search, Partial Order Planning, Hierarchical Planning, Conditional Planning.

9. Uncertain Knowledge and Reasoning

Uncertainty, Representing knowledge in an Uncertain Domain, Overview of Probability Concepts, Belief Networks, Simple Inference in Belief Networks

10. Learning

Learning from Observations, General Model of Learning Agents, Inductive learning, learning Decision Trees, Introduction to neural networks, Perceptrons, Multilayer feed forward network, Application of ANN, Reinforcement learning: Passive & Active Reinforcement learning.

11. Agent Communication

Communication as action, Types of communicating agents, A formal grammar for a subset of English

Reference :

1. Artificial Intelligence: A Modern Approach (*Stuart Russell and Peter Norvig*) 2nd Edition, Pearson Publication.
2. AI-Structures and Strategies for Complex Problem Solving (*George Luger*) 4th edition, 2002, Pearson Educations
3. Artificial Intelligence: an Engineering approach (*Robert J. Schalkolf*) McGraw Hill, 1990.
4. Artificial Intelligence (*Patrick H. Winston*) 3rd edition, Pearson.
5. Principles of Artificial Intelligence (*Nils J. Nilsson*) Narosa Publication.
6. Introduction to Artificial Intelligence and Expert System (*Dan W. Patterson*) PHI.
7. Decision Support Systems and Intelligent Systems (*Efraim Turban Jay E.Aronson*) PHI.
8. Artificial Intelligence – A System Approach (*M. Tim Jones*) Infinity Science Press -Firewall Media.
9. Artificial Intelligence – Strategies, Applications, and Models through Search (*Christopher Thornton and Benedict du Boulay*) 2nd Edition, New Age International Publications.
10. Artificial Intelligence (*Elaine Rich, Kevin Knight*) Tata McGraw Hill, 1999.
11. Principles of Artificial Intelligence and Expert System Development (*David W. Rolston*) McGraw Hill, 1988.

