

**B.E. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

Choice Based Credit System (CBCS)

SEMESTER – VI

**Principles of Artificial Intelligence and its applications (3:0:0) 3**

(Effective from the academic year 2021-22)

Subject Code	21AM651	CIE Marks	50
Teaching Hours/Week (L: T:P)	3:0:0	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	3

**Course Objectives:**

This course will enable students to:

1. Identify the problems where AI is required and the different methods available
2. Compare and contrast different AI techniques available.
3. Define and apply learning algorithms

**Module – 1**

Implication and Scope of Course and its Importance in Economic growth of Nation, Impact of the course on Societal Problems/ Sustainable Solutions/ National Economy, Career Perspective, Overview of the course in current Innovations and Research trends. Introduction: AI in transforming the world, Impact of AI on international trade, National strategy for AI, Introduction to Artificial Intelligence, Philosophical Foundations of Artificial Intelligence, weak AI and strong AI, Ethics and Risk of developing AI, Applications of Artificial Intelligence, Agents and Environments, Intelligent Agents, Structure of Intelligent Agents.

(8 Hours)

**Module – 2**

**Problem Solving:** Solving problems by searching, Problem solving agents, searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimization problems, constraint satisfaction, Means End Analysis, Adversarial Search, Games, Optimal Decision in Games, Alpha - Beta pruning.

(8 Hours)

**Module – 3**

**Knowledge and Reasoning:** Knowledge based Agents, The Wumpus world, Logic, Propositional Logic: A very simple logic, Propositional theorem proving, first order logic, Representation revisited, Syntax and semantics of first order logic, using first order logic Knowledge in first order logic.

(8 Hours)

**Module – 4**

**Slot Filler Structures:** Weak slot filler structures, Semantic Nets, Frames, Strong filler structures, conceptual dependency Scripts, Frames, CYC.

(8 Hours)

**Module – 5**

**Planning, Understanding and Expert System:** Overview, Block world Problem example, components of a planning system, Goal stack planning, Nonlinear planning using constraint posting, hierarchical planning, other planning techniques, what is understanding? What makes understanding hard? Understanding as constraint satisfaction  
Representing and using domain knowledge, Expert System Shells, Explanation, Knowledge Acquisition

(8 Hours)

Recap/ Summary of the Course

**Course outcomes:**

The students will be able to:

- C01 Identification and representation of AI based problems.
- C02 Apply appropriate search techniques to solve AI problems.
- C03 Analyze various learning techniques for solving AI problems.
- C04 Design and demonstrate AI applications benefiting to real time problems.

**Textbooks:**

1. Stuart Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Pearson Education, Third Edition, 2015
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, McGraw-Hill, Third Edition, 2010

**Reference Book:**

1. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem Solving”, Pearson Education, Fourth Edition-2002.
2. E Charniak and D McDermott, “Introduction to Artificial Intelligence”, Pearson Education, 2008.
3. Dan W. Patterson, “Artificial Intelligence and Expert Systems”, Prentice Hall of India.
4. D W Rolston, "Artificial Intelligence and Expert Systems", Mc Graw hill