4/4 B.Tech. FIRST SEMESTER

IT7T4B **ARTIFICIAL INTELLIGENCE** **Credits: 4**
(Common to IT/ECM)

Lecture: 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Objectives:

- To explain the challenges and the usefulness of Artificial Intelligence.
- To design a game playing program.
- To discuss various search algorithms.
- To explain area of inference in first-order predicate logic.
- To discuss the issues involved in knowledge bases, reasoning systems, and planning.
- To introduce the potential and current research issues in Artificial Intelligence.

Outcomes:

Students will be able to

- Know the concepts of AI.
- Built game playing programs.
- Design search algorithms.
- Get acquaintance with architecture and knowledge base of AI systems.

Syllabus:

UNIT-I
What is AI: The AI Problems, What is an AI Techniques, Criteria for Successes?
Problems and problem spaces and Search: Problem as a state space search, Production systems, Problem Characteristics, Production system characteristics.

UNIT-II
Heuristic search techniques: Generate and test, Hill climbing, Best First search, Problem reduction, Constraint satisfaction, Means ends analysis.

UNIT-III
Knowledge Representation issues: Representations and mappings.
Predicate logic: Representing simple facts in logic, Resolution.

UNIT-IV
Representing knowledge using rules: Procedural knowledge Vs Declarative knowledge, Forward Vs Backward reasoning, Matching.

UNIT-V

Symbolic reasoning under uncertainty: Introduction to Nonmonotonic reasoning, Implementation in DFS and BFS.

UNIT-VI

Weak, strong slot and filler structures: Semantic nets, Frames, Conceptual dependency, Scripts.

UNIT-VII

Game playing: The minimax search procedure, adding alpha beta cut offs.
Planning: Goal stack planning, Hierarchical planning.

UNIT-VIII

Expert Systems: Expert system shells, Knowledge acquisition.
Perception and action: Perception, action, Robot architecture.

Text Books:

1.Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).

Reference Books :

1.Artificial Intelligence and Expert Systems – Patterson PHI
2.Expert Systems Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson
3.PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.