4/4 B.Tech - SECOND SEMESTER

IT8T3A **ARTIFICIAL INTELLIGENCE** **Credits:3**

Lecture: 3 Periods/week **Internal assessment: 30 marks**

Practice/Interaction: 1Period/week **Semester end examination: 70 marks**

Objectives:

- To explore the challenges and the usefulness of Artificial Intelligence.
- To get familiar with heuristics search algorithms.
- To carry out knowledge representation issues.
- To focus on Symbolic reasoning under uncertainty.
- To introduce basic concepts of game playing and expert systems.

Outcomes:

Students will be able to

- Know the challenges and concepts of AI.
- Solve problems using heuristics search algorithms
- Transform knowledge into rules.
- Demonstrate Symbolic reasoning under uncertainty
- Acquainted with expert 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 technique: Generate and test, Hill climbing, Best First search, Problem reduction, Constraint satisfaction, Meansends analysis.

UNIT-III

Knowledge Representation issues: Representations and mappings.

Predicate logic: Representing simple facts in logic, Resolution.

Representing knowledge using rules : Procedural knowledge Vs Declarative knowledge, Forward Vs Backward reasoning, matching.

UNIT-IV

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

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

UNIT-V

Game playing: The min-max search procedure, adding alpha-beta cutoffs.

Planning: Goal stack planning, Hierarchical planning.

Expert Systems: Expert system shells, Knowledge acquisition.

Perception and action: Perception, action, Robot architecture.

Text Book:

1. Artificial Intelligence, 2nd Edition, E.RichandK. 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.

e-Learning Resources:

1. http://www.jntuk-coeerd.in/
2. http://nptel.ac.in/video.php?subjectId=106105079
3. http://nptel.iitk.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New_index1.html