ARTIFICIAL INTELLIGENCE

(Professional Elective-III) / (Common to CSE & IT)

Course Code : 15CT1121

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Course Outcomes:

At the end of the Course, the Student will be able to:

CO 1 Classify searching strategies for finding solutions.

CO 2 Identify knowledge representation methods for inference

CO 3 Plan solutions through state space search.

CO 4 Explain uncertainty.

CO 5 Classify learning methods

UNIT-I **(10 Lectures)**

INTRODUCTION:

AI problems, foundation of AI and history of intelligent agents, Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

SEARCHING:

Searching for solutions, uninformed search strategies- Greedy best first search , A*search. Game Playing: Adversarial search, Games, minimax algorithm, optimal decisions in multiplayer games, Alpha Beta pruning, Evaluation functions, cutting of search.

UNIT-II **(10 Lectures)**

KNOWLEDGE REPRESENTATION:

Knowledge Based agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward and Backward chaining.

FIRST ORDER LOGIC:

Inference in first order logic, propositional vs first order inference, unification and lifts, forward chaining, backward chaining, resolution.

UNIT-III (10 Lectures)

PLANNING :

Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state-space search, Forward state space search, Backward state space search, Heuristics for state space search. Planning search, planning with state space search.

UNIT-IV (10 Lectures)

UNCERTAINTY:

Acting under uncertainty, Basic probability notation, axioms of probability, Inference using Full joint distributions, Baye's Rule and its use. Probabilistic Reasoning: Representing knowledge in an uncertain domain, the semantics of Bayesian Networks.

PROBABILISTIC REASONING OVER TIME:

Time and Uncertainty, Inference in Temporal models, Hidden Markov models, Kalman Filters, Dynamic Bayesian Networks, Speech Recognition.

UNIT-V (10 Lectures)

LEARNING:

Forms of learning, Induction learning, Learning Decision trees, statistical learning methods, learning with complex data, learning with hidden variables-the EM algorithm, instance based learning.

TEXT BOOK:

Stuart Russel, Peter Norvig ,"Artificial Intelligence-AModern Approach", 2nd Edition PHI/Pearson Education ,2003.

REFERENCES:

1. Patrick Henry Winston ,"Artificial Intelligence", 3rd Edition, Pearson Edition, 2001.

2. E.Rich and K.Knight ,"Artificial Intelligence", 3rd Edition, TMH, 2008.
3. Patterson, "Artificial Intelligence and Expert Systems", 2nd Edition, PHI, 2008.

WEB REFERENCE:

http://nptel.iitm.ac.in/video.php?subjectId=106105079