

III B. Tech I Semester (CSE)

23CS31T1 - ARTIFICIAL INTELLIGENCE

Course Category:	Professional core	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisite:	<ul style="list-style-type: none"> Knowledge in artificial intelligence 	Sessional Evaluation: 30 Univ. Exam Evaluation: 70 Total Marks: 100	
Course Objectives:	Students undergoing this course are expected: <ul style="list-style-type: none"> The student should be made to study the concepts of Artificial Intelligence. The student should be made to learn the methods of solving problems using Artificial Intelligence. The student should be made to introduce the concepts of Expert Systems. To understand the applications of AI, namely game playing, theorem proving, and machine learning. To learn different knowledge representation techniques 		

Course Outcomes:	Upon successful completion of the course, the students will be able to:	
	CO1	Describe AI foundations, agent architectures, and environment types.
	CO2	Apply search strategies to solve classical and complex problems.
	CO3	Represent knowledge using logic and implement basic inference and planning.
	CO4	Understand reinforcement learning and natural language applications
	CO5	Explain the principles of robotics and vision, and discuss AI ethics.
Course Content:	<u>UNIT-I</u> Introduction: AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation	
	<u>UNIT-II</u> Searching- Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A*, AO* Algorithms, Problem reduction, Game Playing-Adversial search, Games, mini-max algorithm, optimal decisions in multiplayer games, Problem in Game playing, Alpha-Beta pruning, Evaluation functions <u>UNIT-III</u> Representation of Knowledge: Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems. Reasoning under uncertainty, review of probability, Bayes' probabilistic interferences and dempstershafer theory.	

	<p style="text-align: center;"><u>UNIT-IV</u></p> <p>Logic concepts: First order logic. Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Learning from observation Inductive learning, Decision trees, Explanation based learning, Statistical Learning methods, Reinforcement Learning.</p> <p style="text-align: center;"><u>UNIT-V</u></p> <p>Expert Systems: Architecture of expert systems, Roles of expert systems – Knowledge Acquisition Meta knowledge Heuristics. Typical expert systems – MYCIN, DART, XCON: Expert systems shells.</p>
Text Books & References Books:	<p>TEXTBOOKS:</p> <ol style="list-style-type: none"> 1. S. Russel and P. Norvig, —Artificial Intelligence – A Modern Approach, Second Edition, Pearson Education. 2. Kevin Night and Elaine Rich, Nair B., —Artificial Intelligence (SIE), Mc Graw Hill <p>REFERENCE BOOKS:</p> <ol style="list-style-type: none"> 1. David Poole, Alan Mack worth, Randy Goebel, Computational Intelligence: a logical approach, Oxford University Press. 2. G. Luger, —Artificial Intelligence: Structures and Strategies for complex problemsolving, Fourth Edition, Pearson Education. 3. J. Nilsson, —Artificial Intelligence: A new Synthesis, Elsevier Publishers. 4. Artificial Intelligence, SarojKaushik, CENGAGE Learning
E-Resources:	<ol style="list-style-type: none"> 1. https://ai.google/ 2. https://swayam.gov.in/nd1_noc19_me71/preview