PVP20

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
KANURU, VIJAYAWADA
II B.Tech – I Sem CSE (AI&ML)
FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

Course Code	20ES1307	**Year**	II	**Semester**	I
Course Category	Engineering Sciences	**Branch**	CSE (AI & ML)	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Discrete Mathematical Structures, Probability and Statistics
Continuous Internal Evaluation:	30	**Semester End Examination:**	70	**Total Marks**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Understand the basic concepts of Artificial Intelligence.	**L2**
CO2	Apply the principles of AI in solutions that require problem solving and knowledge representation.	**L3**
CO3	Apply Planning and Learning for solving AI problems.	**L3**
CO4	Analyze the different AI Techniques for solving a given problem.	**L4**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	1													
CO2	3													
CO3	3													
CO4		3	1						1	1		1		

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Introduction**: Definition of AI, History of AI, Foundations of AI, Applications of AI. **Intelligent agents:** Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, Structure of agents.	**CO1**
II	**Problem Solving Techniques:** **Solving Problems by Searching:** Problem-Solving Agents: Well-defined problems and solutions, formulating problems, Searching for Solutions: Infrastructure for search algorithms, Measuring problem-solving performance. **Uninformed Search Strategies**: Breadth first search, depth first Search **Informed (Heuristic) Search Strategies**: Hill climbing, A* Algorithm, Alpha-Beta Pruning.	**CO1,CO2,CO4**
III	**Knowledge Representation:** **Logical Agents:** Knowledge Based Agents, Logic, Propositional logic: Syntax, Semantics, A simple knowledge base, A simple inference procedure**,** first order logic: Syntax and Semantics in First order Logic, Using first order logic. **Inference in first order logic**: propositional vs. First order inference, Unification and Lifting, Forward chaining, Backward chaining, Resolution	**CO1, CO2, CO4**
IV	**Planning:** Definition of classical planning, planning with state space search: Forward (progression) state-space search, backward (regression) relevant-states search, Heuristics for planning, planning graphs, Analysis of planning approaches, Hierarchical planning, and Multi Agent Planning.	**CO1,CO3, CO4**
V	**Learning:** Learning from Examples: Forms of Learning, Supervised Learning, Learning Decision Trees, Evaluating and choosing best hypothesis, The theory of learning, Regression and Classification with Linear models. **Artificial Neural Networks**: Neural network structures, Single-layer feed-forward neural networks (perceptron's), Multilayer feed-forward neural networks, Learning in multilayer networks, Learning neural network structures.	**CO1,CO3, CO4**
Learning Resources		
Text Books		
1**.** Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, Third Edition, Prentice Hall.		
References		
1. A Classical Approach to Artificial Intelligence, M.C. Trivedi, 2019, Khanna Book Publishing. 2. Artificial Intelligence, Elaine Rich and Kevin Knight, Tata McGraw Hill. 3. Artificial Intelligence Saroj Kaushik, Cengage Learning India, 2011.		
e-Resources & other digital material		
1. https://nptel.ac.in/courses/106105077 2. https://nptel.ac.in/courses/106105078 3. https://nptel.ac.in/courses/106106126 4. https://www.coursera.org/learn/introduction-to-ai		