PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY

# LESSON PLAN

**SUBJECT CODE & NAME** : **20CS4501D / ARTIFICIAL INTELLIGENCE**
**ACADEMIC YEAR & PROGRAMME** : **2022-23/ B.TECH**
**YEAR/BRANCH/SEMESTER** : **III/CSE /SEM- I**
**SECTION** : **G1**
**FACULTY NAME** : **Dr. P.Naga Srinivasu**

| CO | COURSE OUTCOMES | LEVEL |
|---|---|---|
| CO1 | Understand the basic concepts of Artificial Intelligence. | L2 |
| CO2 | Apply the principles of AI in solutions that require problem solving, knowledge representation. | L3 |
| CO3 | Apply Planning and Learning for solving AI problems. | L3 |
| CO4 | Analyze a given problem and apply AI Techniques. | L4 |

| Unit No. | Topic of syllabus to be covered | Learning out comes | Lecture/Tutorial (L/T) | | Total no.of Hours (Cumulative ) | Teaching Mode(Online) (WB/PPT) | Expected date of completion (for each unit) | Review/ Remarks (By HOD) |
|---|---|---|---|---|---|---|---|---|
| | | | L | T | | | | |
| I | Course Objective and Introduction | Understand the main objective of the course and its outcomes(CO1-L2) | 1 | | 1 | PPT | | |
| I | **UNIT I:** Introduction to Artificial Intelligence | Understand Fundamentals of AI(CO1-L2) | 1 | | 2 | PPT | | |
| I | Definition of AI | Understand the definition of AI and scope of AI (CO1-L2) | 1 | | 3 | WB/PPT | | |
| I | Foundations of AI | Understand the basic fundamentals, and types of AI techniques (CO1-L2) | 1 | | 4 | WB/PPT | | |
| I | Applications of AI | Analyzing various applications of AI (CO2-L3) | 1 | | 5 | WB/PPT | | |
| I | Intelligent agents | Understanding various agents in AI(CO1-L2) | 1 | | 6 | WB/PPT | | |

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| **I** | Agents and Environments | Understanding the various types of Agents and Environments in AI (CO1-L2) | 1 | | 7 | PPT | | |
| **I** | Structure of agents | Analyze the structure of agents(CO2-L3) | 1 | | 8 | PPT | | |
| **I** | Structure of agents | Analyze the structure of agents(CO2-L3) | 1 | | 9 | PPT | | |
| **II** | **UNIT II: Problem Solving Techniques:** | solve these problems by using general-purpose search algorithms. (CO3-L3) | 1 | | 10 | WB/PPT | | |
| **II** | Solving Problems by Searching | solve these problems by using general-purpose search algorithms. (CO3-L3) | 1 | | 11 | WB/PPT | | |
| **II** | Problem Solving Agents | Apply goal based agents(CO3-L3) | 1 | | 12 | WB/PPT | | |
| **II** | Searching for Solutions | Apply various searches for problems to obtain solutions. (CO3-L3) | 1 | | 13 | WB/PPT | | |
| **II** | ***Uninformed Search Strategies*** | Understand blind search. (CO1-L2) | 1 | | 14 | **Flip Class** | | |
| **II** | Breadth first search | Apply breadth first search(CO3-L3) | 2 | | 16 | WB/PPT | | |
| **II** | Depth first Search | Apply depth first search(CO3-L3) | 1 | | 17 | WB/PPT | | |
| **II** | ***Informed (Heuristic) Search Strategies*** | Understand informed search. (CO3-L3) | 1 | | 18 | WB/PPT | | |
| **II** | Hill climbing | Apply hill climbing search(CO3-L3) | 1 | | 19 | WB/PPT | | |
| **II** | A* Algorithm | Apply A* Algorithm(CO3-L3) | 1 | | 20 | WB/PPT | | |
| **II** | Alpha-Beta Pruning | Apply Alpha-Beta pruning(CO3-L3) | 1 | | 21 | WB/PPT | | |
| **II** | Constraint Satisfaction Problem | Solve constraint satisfaction problem(CO3-L3) | 1 | | 22 | WB/PPT | | |
| **III** | **Unit-III Knowledge Representation** | Understand Knowledge Representation(CO2-L2) | 1 | | 23 | WB/PPT | | |
| **III** | ***Logical Agents*** | build logical agents that can represent information and draw conclusions(CO2-L3) | 1 | | 24 | WB/PPT | | |
| **III** | Knowledge Based Agents | define a logic with which such agents(CO2-L3) | 1 | | 25 | WB/PPT | | |

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| **III** | Logic: Propositional logic | handle propositions that are known true, known false, or completely unknown(CO2-L3) | 2 | | 27 | WB/PPT | | |
| **III** | First order logic | sufficiently expressive to represent a good deal of our commonsense knowledge. (CO2-L3) | 1 | | 28 | WB/PPT | | |
| | | **Industry Institute Interaction, QUIZ** | | | | | | |
| **III** | Syntax and Semantics in First order Logic | deal with objects and the relations among them(CO2-L3) | 1 | | 29 | WB/PPT | | |
| **III** | ***Inference in first order logic:*** propositional vs. First order inference | Apply inference rules to sentences with quantifiers to obtain sentences without quantifiers. (CO2-L3) | 1 | | 30 | | | |
| **III** | Unification and lifting | Apply unification and lifting(CO3-L3) | 1 | | 31 | WB/PPT | | |
| **III** | Forward chaining and Backward chaining | Apply efficient updates with very large rule sets(CO3-L3) | 1 | | 32 | WB/PPT | | |
| **III** | Resolution | provides a complete proof system for first order logic. (CO3-L3) | 1 | | 33 | WB/PPT | | |
| **IV** | **UNIT-IV Planning:** The Planning problem | Understand the planning problem. (CO3-L2) | 1 | | 34 | WB/PPT | | |
| **IV** | Planning with state space search | Apply various state space searches. (CO3-L2) | 1 | | 35 | WB/PPT | | |
| **IV** | Planning graphs | Give better heuristic estimates(CO3-L2) | 1 | | 36 | WB/PPT | | |
| **IV** | Planning with propositional logic | solve planning problems that are expressed in propositional logic (CO3-L2) | 1 | | 37 | WB/PPT | | |
| **IV** | Analysis of planning approaches | Analyze various planning approaches (CO4-L4) | 1 | | 38 | WB/PPT | | |

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| **IV** | Hierarchical planning | create the very large plans required by many real-world applications. (CO3-L3) | 1 | | 39 | WB/PPT | | |
| **IV** | Conditional planning | Apply conditional planning (CO3-L3) | | | | | | |
| **IV** | Continuous and Multi Agent planning | Apply continuous and multi agent planning (CO3-L3) | 1 | | 40 | WB/PPT | | |
| **V** | **UNIT-IV Planning: Learning** | Understand Learning (CO3-L2) | 1 | | 41 | WB/PPT | | |
| **V** | Learning from Examples | Analyze improving agent behavior through diligent study of their own experiences. (CO4-L4) | 1 | | 42 | WB/PPT | | |
| **V** | Knowledge in Learning | finds inductive hypotheses (CO3-L3) | 1 | | 43 | WB/PPT | | |
| **V** | Learning probabilistic Models | Learn their probabilistic theories of the world from experience(CO4-L3) | 1 | | 44 | WB/PPT | | |
| **V** | Reinforcement Learning | agents learn what to do in the absence of labeled examples of what to do. (CO3-L3) | 1 | | 45 | WB/PPT | | |

**Legend**: Teaching Mode

WB: White Board / PPT: Power Point Presentation, Flip Class, Quiz

**Signature of the Faculty** **Signature of the HOD**

**Date:**