## Artificial Intelligence

| Course Code | 20CS4501D | Year | III | Semester | I |
|---|---|---|---|---|---|
| Course Category | PEC | Branch | CSE | Course Type | Theory |
| Credits | 3 | L-T-P | 3-0-0 | Prerequisites | Basic Mathematics |
| Continuous Evaluation : | 30 | Semester End Evaluation: | 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, knowledge representation. | L3 |
| CO3 | Apply Planning and Learning for solving AI problems. | L3 |
| CO4 | Analyze a given problem and apply AI Techniques. | L4 |

| | | Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | √ | | | | | | | | | | | | | |
| CO2 | √ | | | | | | | | √ | √ | | | | |
| CO3 | | | | | | | | | | | | | √ | |
| CO4 | | √ | | | | √ | | | √ | √ | | √ | | |

| Syllabus | | Mapped CO |
|---|---|---|
| **Unit No.** | **Contents** | |
| **UNIT-1** | **Introduction**: Definition of AI, Foundations of AI, Applications of AI.<br>**Intelligent agents:** Agents and Environments, Structure of agents. | **CO1,CO4** |
| **UNIT-2** | **Problem Solving Techniques:**<br>**Solving Problems by Searching:** Problem Solving Agents, Searching for Solutions.<br>**Uninformed Search Strategies**- Breadth first search, depth first Search<br>**Informed (Heuristic) Search Strategies**- Hill climbing, A* Algorithm, Alpha-Beta Pruning, Constraint Satisfaction Problem. | **CO1,CO2, CO4** |
| **UNIT-3** | **Knowledge Representation**<br>**Logical Agents:** Knowledge Based Agents, Logic, Propositional logic, First order logic, Syntax and Semantics in First order Logic.<br>**Inference in first order logic**: propositional vs. First order inference, Unification and Lifting, Forward chaining, Backward chaining, Resolution | **CO1,CO2, CO4** |
| **UNIT-4** | **Planning :** The Planning problem, planning with state space search, planning graphs, planning with propositional logic, Analysis of planning approaches, Hierarchical planning, conditional planning, Continuous and Multi Agent planning. | **CO1, CO3, CO4** |
| **UNIT-5** | **Learning:** Learning from Examples, Knowledge in Learning, Learning probabilistic Models, Reinforcement Learning. | **CO1, CO3, CO4** |

| Learning Resources |
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| **Text Books** |
| 1. Stuart Russell and Peter Norvig, ‒Artificial Intelligence: A Modern Approach‖ , 3rd Edition, Prentice Hall. |
| **References** |
| 1. A Classical Approach to Artificial Intelligence, M.C. Trivedi, Khanna Book Publishing, 2019.<br>2. Elaine Rich and Kevin Knight, ―Artificial Intelligence‖, Tata McGraw Hill<br>3.  Saroj Kaushik, ‒Artificial Intelligence‖, Cengage Learning India, 2011 |
| **e-Resources & other digital material** |
| 1.      **https://www.udemy.com/course/artificial-intelligence-az/**<br>2.      **https://nptel.ac.in/courses/106105078**<br>3.      **https://www.coursera.org/learn/introduction-to-ai** |