# 19CS3202 - ARTIFICIAL INTELLIGENCE

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category:** | Program Core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-1-0 |
| **Prerequisite:** | Fundamentals of Networking, Analytical capabilities and logic orientations are required | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | * To apply knowledge of computing and mathematics appropriate to the discipline.
* To analyze a problem, and identify and define the computing requirements appropriate to its solution.
* To design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
 |

|  |  |
| --- | --- |
| **Course Outcomes** | Upon the successful completion of the course, the students will be able to: |
| CO1 | Understand the basics of AI and study different types of supporting agent characteristics |
| CO2 | Know various Problem-solving agents and their behavior in real-world environment |
| CO3 | Understand and apply the fundamentals of AI search algorithms |
| CO4 | Know various knowledge representation techniques and its applicability |
| CO5 | Observe different Learning techniques for future implementation |
| CO6 | Know the concepts of Knowledge in explanation based learning and utilization |
| **Course Content** | **UNIT – I****Introduction**: Overview on A.I, History , The state of the Art, Intelligent Agents - Agents and Environments, Good behavior, The nature of Environments, the Structure of Agents.**UNIT – II****Problem Solving**: Problem solving agents, toy problems, Real-world problems, searching for solutions.**Uninformed Search strategies**: BFS, DFS, Depth-limited search.**UNIT – III****Informed Search strategies**: GBFS, A\* search, Local search algorithms: Hill-climbing.**Constraint Satisfaction Problems**: Constraint Satisfaction Problems, Backtracking Search for CSPs, Local search for CSPs.**UNIT – IV****Adversarial Search**: Games, optimal decision in games, Alpha-Beta pruning, Imperfect, Real-Time Decisions, **Knowledge and reasoning**: Logical Agents: Knowledge -based Agents, The WUMPUS world, Logic, Propositional Logic, Reasoning Patterns in Propositional logic. First-order Logic: Syntax and Semantics of First-Order Logic.**UNIT – V****Learning**: Learning from Observations- Forms of Learning, Inductive Learning, Learning Decision Trees, and Ensemble Learning.**UNIT – VI****Knowledge in Learning**: A Logical formulation of learning, knowledge in learning, Explanation-Based Learning, Learning using Relevance Information. |
| **Text Books and References** | **TEXT BOOK(S):**1. Artificial Intelligence- A Modern Approach, Stuart Russell, Peter Norvig (Person Education), 2nd edition.

**REFERENCE BOOKS:**1. Artificial Intelligence- Rich E & Knight K (TMH), 4th edition.
2. Artificial Intelligence Structures and Strategies complex problem Solving – George F. Lugar Pearson Education.
3. D.W. Patterson, “Introduction to AI and Expert Systems”, PHI, 1992...
4. R.J. Schalkoff, “Artificial Intelligence - an Engineering Approach”, McGraw Hill Int. Ed., Singapore, 1992.
 |
| **E-Resources** | 1. <https://nptel.ac.in/courses>
2. <https://freevideolectures.com/university/iitm>
 |