# 19CS3202 - ARTIFICIAL INTELLIGENCE

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| **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:** | 40  60  100 |
| **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. | | |

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| **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> | |