# 20CS32O4 - ARTIFICIAL INTELLIGENCE

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| Course Category: | Open Elective | Credits: | 3 |
| Course Type: | Theory | Lecture-Tutorial-Practical: | 3-0-0 |
| Prerequisite: | Fundamentals of Networking, Analytical capabilities and logic orientations. | 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, identify and define the computing requirements appropriate to its solution. * To design, implement, and evaluate a computer-based system, process, component, or program. | | |

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| Course Outcomes | Upon 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 | Gain knowledge in Adversarial Search Methods |
| CO5 | Draw the Inferences based on logical reasoning |
| CO6 | Apply different Learning techniques for future implementation |
| Course Content | UNIT-I  **Introduction**: What is Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents.  UNIT-II  **Search:** Introduction to Search, 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.  **Problem Solving:** Formulating problems, problem types, Solving Problems by Searching, heuristic search techniques, constraint satisfaction problems, stochastic search methods.  UNIT-V  **Knowledge and reasoning**: Inference, Propositional Logic, Predicate Logic (first order logic), Logical Reasoning, Forward &Backward Chaining, Resolution.  UNIT-VI  **Learning:** Overview of different forms of learning, decision trees, rule-based learning, neural networks, reinforcement learning.  **Game playing:** Perfect decision game, imperfect decision game, evaluation function, minimax, alpha-beta pruning. | |
| Text Books &  References  Books | **TEXT BOOKS:**   1. Artificial Intelligence- A Modern Approach, Stuart Russell, Peter Norvig (Person Education), Third 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. E Charniak and D McDermott, “Introduction to Artificial Intelligence”, Pearson. 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> | |