# 20CS3204 - 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: | 4060100 |
| 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 &ReferencesBooks | **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.

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| E-Resources | 1. <https://nptel.ac.in/courses>
2. <https://freevideolectures.com/university/iitm>
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| **Contribution of Course Outcomes towards achievement of Program Outcomes** |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | - | - |
| CO2 | 3 | 3 | 1 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | - | - |
| CO3 | 3 | 3 | 2 | 2 |  - | 3 |  - |  - | 2 |  - | 3 |  2 | - | - |
| CO4 | 3 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | - | - |
| CO5 | 3 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | - | - |
| CO6 | 3 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | - | - |