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## ARTIFICIAL INTELLIGENCE

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**Paper Code**                      **CEN-802**

**Course Credits**                **4**

**Lectures / week**               **3**

**Tutorial / week**                **1**

**Course Description**        **UNIT – I**

AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, and problem formulation.

### **UNIT- II**

Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative-deepening depth first search bi-direction search - comparison. Search with partial information (Heuristic search) Greedy best first search, A\* search, Memory bounded heuristic search, Heuristic functions. Local search Algorithms: Hill climbing, simulated, annealing search, local beam search, genetic algorithms. Constraint satisfaction problems: Backtracking search for CSPs local search for constraint satisfaction problems.

### **UNIT- III**

Min-max, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search. Knowledge – Based Agents, Logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward. Chaining. First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

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#### **UNIT- IV**

Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state – space search, Forward states space search, Backward states space search, Heuristics for states space search. Planning search, planning with state space search, partial order planning Graphs.

#### **UNIT – V**

Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, learning with complex data, learning with Hidden variables – The EM Algorithm, Instance Based learning, Neural Networks.

#### **References / Text Books:**

- Introduction to Artificial Intelligence – Rajendra Akerkar, PHI.
- Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/Pearson Education.
- Artificial Intelligence, 3<sup>rd</sup> Edition, Patrick Henry Winston., Pearson Edition,
- Artificial Intelligence , 2<sup>nd</sup> Edition, E.Rich and K.Knight (TMH).
- Artificial Intelligence and Expert Systems – Patterson PHI
- Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson
- PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.

#### **Computer Usage / Software Requires:**

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