**CST-364 Artificial Intelligence 3L:0T:0P 3 Credits**

**Course outcomes:** After completion of course, students would be able to:

**CO 1**. Understand the basics of the theory and practice of Artificial Intelligence as a discipline and about intelligent agents capable of problem formulation.

**CO 2**. Evaluation of different uninformed search algorithms on well formulate problems along with stating valid conclusions that the evaluation supports.

**CO 3**. Design and Analysis of informed search algorithms on well formulated problems.

**CO 4.** Formulate and solve given problem using Propositional and First order logic.

**CO 5**. Explain Expert System and implementation.

**Mapping of course outcomes with program outcomes**

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|  | **Po1** | **Po2** | **Po3** | **Po4** | **P05** | **Po6** | **Po7** | **Po8** | **Po9** | **Po10** | **Po11** | **Po12** | **Pso1** | **Pso2** | **Pso3** | **Pso 4** |
| **CO1** | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 3 | 3 | 2 | 2 |
| **CO2** | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 3 |
| **CO3** | 1 | 3 | 3 | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 3 |
| **CO4** | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 3 |
| **CO5** | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 |

**Detailed Contents:**

**UNIT 1**: Introduction Artificial Intelligence and its applications, Artificial Intelligence Techniques, Intelligent Agents, Nature of Agents, Learning Agents., advantages, and limitations of AI, Application of AI.

Problem solving techniques State space search, control strategies, heuristic search, problem characteristics, production system characteristics., Generate and test, Hill climbing, best first search, A\* search, Constraint satisfaction problem.

**UNIT 2**: First order logic. Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules-based deduction systems.

Reasoning under uncertainty, review of probability, Bayes’ Logic probabilistic interferences and dempster Shafer theory.

**UNIT 3**:Game Playing & Expert systems: - Game playing Min-Max Search, Alpha-Beta Pruning, jug problem, chess problem, basic concepts, structure of expert systems, the human element in expert systems how expert systems works, problem areas addressed by expert systems, expert systems success factors, types of expert systems, expert systems.

AI application in Modern AI, decision making ,predictive analysis and adaptive analytics.

Text Books:

1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig. Prentice-Hall, 2003 (2nd Edition).
2. Elaine Riche, Kevin Knight and Shivashankar B. Nair, “Artificial Intelligence”, Third Edition, TMH Educations Pvt. Ltd., 2008

Reference Books

1. Nils J. Nilsson, “The Quest for Artificial Intelligence”, Second Edition, Cambridge University Press, 2009
2. Artificial Intelligence and Expert Systems – Dan W. Patterson, Prentice Hall of India