## CS-504: ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

Teaching and Examination Scheme:

| Teaching Scheme | | | Credits | Marks | | | Duration of End Semester Examination |
|---|---|---|---|---|---|---|---|
| L | T | P/D | C | Sessional | End Semester Exams | Total | |
| 3 | 0 | 0 | 3 | 40 | 60 | 100 | 3Hrs |

**COURSE OBJECTIVE:**

The course should enable the students to understand the representation of agents & agent environment, searching techniques, and various concepts of learning and expert system.

**COURSE CONTENT:**

| UNIT | CONTENT | No. of Hrs. |
|---|---|---|
| I | **Introduction:** Introduction to artificial intelligence, background and applications, turing test and rational agent approaches, introduction to intelligent agents, their structure, behavior and environment.<br><br>**Problem Solving and Searching Techniques**: Problem characteristics, production systems, breadth first search, depth first search, heuristics search techniques, best first search, A* algorithm, hill climbing, AND/OR graph AO*, constraint satisfaction problem, means-end analysis, introduction to game playing, min max and alpha beta pruning. | 10 |
| II | **Knowledge Representation:** introduction to first order predicate logic, well-formed formulas, quantifiers, rule based system, resolution principle, unification, forward reasoning: conflict resolution, backward reasoning , structured knowledge representation.<br>AI programming language: PROLOG: Syntax, procedural and declarative meaning, PROLOG unification mechanism, converting english to PROLOG facts and rules, goals, anonymous variable, lists, use of fail, CUT, NOT | 10 |
| III | **Introduction to Neural Network:** Hopfield network, single and multilayer networks, perceptions, back-propagations learning, Boltzman machine.<br>Introduction to genetic algorithm: The genetic algorithm, genetic operators, working of genetic algorithm, problem with genetic algorithm. | 10 |
| IV | **Expert System:** introduction, skill v/s knowledge, characteristics of expert system, knowledge engineering, inferencing, forward chaining and backward chaining expert system tools, applications and future scope<br>Natural language processing: Introduction, language parsing, syntactic and semantic analysis, top down and bottom up parsing, chart parsing, knowledge representation languages, ELIZA, speech recognition | 9 |

**Text Books:**

1. Russell and Norvig, ***"Artificial Intelligence- A Modern Approach"***, Pearson Prentice Hall.



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2. D W Patterson, ***"Artificial Intelligence and Expert Systems"***, Prentice Hall of India.
3. B.Vegnanarayana, ***"Artificial neural networks"***, Prentice Halll of India P Ltd

**Reference Books:**

1. Elaine Rich, Kevin Knight, ***"Shivashankar B. Nair, Artificial Intelligence"***, Tata McGraw Hill.
2. Nils J Nilsson, ***"Artificial Intelligence A New Synthesis"***, Morgan Kaufmann