RAMAKRISHNA MISSION VIDYAMANDIRA

NEP Syllabus B.Sc. Computer Science Major

Semester-VI

Course Code: 6CMSMJC1
Course Type: Major Course

Course Outcome:

i) Able to understand real life scenarios in terms of agents and environments.
ii) Able to formulate computational problems as search problems.
iii) Be able to understand informed, uninformed search and heuristics, multi agent search.
iv) Be able to develop and express problems in FOPL and understand inference rules.
v) Developing concepts of Metaheuristics.
vi) Introduction to modern AI trends.

6CMSMJC1: Artificial Intelligence

Credit: 3 **Marks: 50**

Introduction: Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment. [4 L]

Problem Solving and Searching Techniques: Problem Characteristics, Production Systems, Uninformed Search; Heuristic Search Techniques: Best First Search, A* algorithm, Hill climbing and its Variations; Adversarial Search: Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms; Constraint Satisfaction Problem. [20 L]

Knowledge Representation and Knowledge Based System: Overview of Propositional Logic; Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs, Expert Systems.
Programming in Logic (PROLOG). [10 L]

Metaheuristics: Simulated Annealing, Evolutionary Computation, Ant Colony Optimization, Particle Swarm Optimization; Multi Objective Optimization. [7 L]

AI Trends and Applications: Agentic AI, LLMs, Explainable AI, AI Law and Policies. [4 L]

6CMSMJC1 (Practical): AI Laboratory

Credit: 1 **Marks: 25**

- Programming in Logic using PROLOG.
- Application of AI based algorithms in Python.
- Applications of Metaheuristic algorithms.
- Introduction to open source Agentic AI tools (LangChain/ CrewAI).

[30 L]

Recommended Books:

1. Artificial Intelligence by Russel, Norvig; 3rd Edition; Pearson.
2. Introduction to Artificial Intelligence by Dan W Patterson; 1st Edition; Pearson.
3. Artificial Intelligence by Knight, Rich; 3rd Edition; TMH.
4. Computational Intelligence: An Introduction; 2nd Edition; Andries P. Engelbrecht.
5. Genetic Algorithms in Search, Optimization, and Machine Learning; David E. Goldberg, Addison Wesley.