DAIHC-1-02T: Fundamentals of Artificial Intelligence

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 4

Detaied Contents:

Module	**Module Name**	**Module Contents**	**Lectures /Tutorials Hours**
Module-1	Foundations and Evolution of Artificial Intelligence	Definition and goals of Artificial Intelligence Historical timeline and evolution of AI Key domains: Problem-solving, reasoning, planning, learning, and Perception Agents and environments: Rationality, PEAS description, types of agents State space search and problem fonnulation Introduction to knowledge representation and inference	15
Module-II	Search Strategies and Classical AI Algorithms	Uninformed (Blind) Search:Breadth-first, depth-first, depth-limited, iterative deepening Informed (Heuristic) Search:Greedy search, A* algorithm, hillclimbingAdversarial search: Minimax algorithm, alpha-beta pruningInh·oduction to logic-based reasoning: Propositional logic, inference rules Rule-based systems and expert systems	15
Module-III . .	AI Reasoning, Decision Making & Applications	AI paradigms: Symbolic vs. sub-symbolic AI Knowledge representation: Semantic networks, frames, ontologies Decision-making under uncertainty: Bayesian networks (intro only) Machine learning as a subset of AI: Overview and applications Case studies: AI in healthcare, robotics, games, NLP	15

Module-IV	Practical AI with Python	Introduction to AI libraries in Python: NumPy, networkx, scikit-leam Implementing basic search algorithms: DFS, BFS, A* Building decision trees using ID3 (basic) Knowledge inference with simple rule engines Performance evaluation: Time, space complexity, and quality of results	15

Books

- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Luger, G. F. (2005). *Artificial intelligence: Structures and strategies for comple.,: problem solving* (6th ed.). Pearson Education.
- Nilsson, N. J. (1998). *Artificial intelligence: A new synthesis*. Morgan Kaufmann.
- Poole, D., & Mackworth, A. (2017). *Artificial intelligence: Foundations of computational agents* (2nd ed.). Cambridge University Press.