

23CP307T					Artificial Intelligence					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	-	-	100

COURSE OBJECTIVES

- To identify the problems where AI is required and the different methods available.
- To compare and contrast different AI techniques available.
- To define and explain learning algorithms and identify problems in game playing.
- To learn Neural Networks and Expert systems.

UNIT 1 INTRODUCTION TO AI AND SEARCHING**10 Hrs.**

AI Problems, Intelligent Agents, Problem Formulation, Basic Problem Solving Methods. Search strategies: Uniformed Search Strategies, State-Space Search, Bi-Directional Search, BFS, DFS, Heuristic Search Strategies, Local Search Algorithms, Hill Climbing, Greedy Best First Search, A* Search, Adversarial Search and Games Constraint Satisfaction Problems, Simulated Annealing, Measure of performance and analysis search algorithms.

UNIT 2 KNOWLEDGE REPRESENTATION AND INFERENCE**10 Hrs.**

Game playing, MiniMax, Alpha-Beta Cut-off, Refinements, Iterative deepening, Blocks World Problem, Components of Planning System, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic, Structured representation of knowledge, Production based system, Frame based system, First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution, Automated Planning, Quantifying Uncertainty, Probabilistic Reasoning, Multiagent Decision Making.

UNIT 3 NEURAL NETWORKS**12 Hrs.**

Characteristics of Neural Networks, Historical Development of Neural Networks Principles. Artificial Neural Networks: Terminology, Models of Neurons, Topology, Basic Learning Laws, Pattern Recognition Problem, Basic Functional Units, Multi-layer feed-forward network, mathematics behind the updation rule, Deep neural network, loss function, optimization function, Convolution layer, Pooling layer, activation functions, back propagation, Pattern Recognition Tasks by the Functional Units.

UNIT 4 EXPERT SYSTEMS**7 Hrs.**

Introduction to Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition –Meta knowledge, Heuristics. Example of expert systems - MYCIN, DART, XOON, Expert systems shells, Introduction to Planning.

Max. 39 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

CO1- Explain the basic of AI.

CO2- Apply uniform search, state-space search, bi-directional search, heuristic search and local search techniques.

CO3- Apply knowledge representation techniques using predicate logic and proposition logic.

CO4- Design Neural Networks for classification and regression task.

CO5- Understand expert systems and Game playing techniques.

CO6- Solve real-world problems using AI.

TEXT/REFERENCE BOOKS

1. Russell, S.J. and Norvig, P., Artificial Intelligence: A Modern Approach, Pearson Education.
2. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", McGraw Hill.
3. Dan W. Patterson, "Introduction to AI and ES", Pearson Education.
4. G.Luger, W.A. Stubblefield, "Artificial Intelligence", Addison-Wesley Longman.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs**

Part A: 10 Questions of 2 marks each-No choice

20 Marks

Part B: 2 Questions from each unit with internal choice, each carrying 20 marks

80 Marks