



B. P. Poddar Institute of Management & Technology
Department of Electronics & Communication Engineering



Academic Year: 2024-25

Lesson Plan

Course Name: Artificial Intelligence

Course Code: OE-EC 804A

Lecture/tutorial. No.	Topics to be Covered	Text/References	Teaching Pedagogy*
L1	Overview of Artificial Intelligence, Definition and scope of AI, Applications of AI in real-world systems	T1, T3	C&T.CD,Q, PS
L2	Foundations of AI, Philosophy, Mathematics, Economics, Neuroscience, Psychology, Computer Engineering & Control Theory	T1, T3	C&T.CD,Q, PS
L3	History of AI, Evolution of AI systems, Current State-of-the-Art AI technologies	T1, T3	C&T.CD,Q, PS
L4	Agents and Environments, Types of agents, PEAS description	T1, T2, T3	C&T.CD,Q, PS
L5	Rationality, Rational agent design, Performance measures	T1, T3	C&T.CD,Q, PS
L6	Nature of Environments, Observable vs Partially observable, Deterministic vs Stochastic, Episodic vs Sequential, Structure of Agents, Simple reflex, Model-based, Goal-based, Utility-based agents	T1, T3	C&T.CD,Q, PS
L7	Problem-solving agents, Well-defined problems and solution formulation	T1, T3	C&T.CD,Q, PS

L8	Problem formulation, State space representation, Search trees and graphs	T1, T3	C&T.CD,Q, PS
L9	Uninformed Search Strategies, Breadth-First Search (BFS)	T1, T3	C&T.CD,Q, PS
L10	Depth-First Search (DFS), Depth-Limited Search (DLS)	T1, T3	C&T.CD,Q, PS
L11	Iterative Deepening DFS (IDDFS), Bidirectional Search	T1, T3	C&T.CD,Q, PS
L12	Comparative analysis of uninformed search strategies, Time and space complexity	T1, T3	C&T.CD,Q, PS
L13	Introduction to Informed Search, Heuristic functions, Properties of heuristics (Admissibility, Consistency)	T1, T3	C&T.CD,Q, PS
L14	Greedy Best-First Search A* Search Algorithm, Performance comparison	T1, T3	C&T.CD,Q, PS
L15	Advanced heuristic techniques, Designing heuristic functions	T1, T3	C&T.CD,Q, PS
L16	Local search algorithms, Hill climbing, Simulated annealing	T1, T3	C&T.CD,Q, PS
L17	Online search agents, Exploration in unknown environments	T1, T3	C&T.CD,Q, PS
L18	Introduction to CSP, Variables, domains, constraints, Examples (Map coloring, Sudoku)	T1, T3	C&T.CD,Q, PS

L19	Backtracking search for CSPs, Forward checking, Constraint propagation	T1, T3	C&T,CD,Q, PS
L20	Local search for CSPs, Min-conflicts heuristic, Performance analysis	T1, T3	C&T,CD,Q, PS
L21	Games in AI, Game trees, Optimal decisions in games	T1, T3	C&T,CD,Q, PS
L22	Minimax Algorithm, Evaluation functions	T1, T3	C&T,CD,Q, PS
L23	Alpha-Beta pruning, Complexity analysis, Practical game AI examples	T1, T3	C&T,CD,Q, PS
L24	Knowledge-based agents, Knowledge representation, Inference mechanisms	T1, T3	C&T,CD,Q, PS
L25	The Wumpus World, Logical representation of Wumpus environment, Inference in Wumpus world	T1, T3	C&T,CD,Q, PS
L26	Propositional Logic, Syntax and semantics, Logical reasoning patterns	T1, T3	C&T,CD,Q, PS
L27	Syntax and semantics of First-Order Logic (FOL) Quantifiers and predicates	T1, T3	C&T,CD,Q, PS
L28	Knowledge representation using FOL, Inference in First-Order Logic	T1, T3	C&T,CD,Q, PS
L29	Applications of First-Order Logic, Comparison: Propositional vs First-Order Logic, Course summary and revision	T1, T3	C&T,CD,Q, PS
L30	Discussions on model questions		C&T, Q, CD, PS

Textbooks:

1. Artificial Intelligence: A Modern Approach – Stuart Russel, Peter Norvig, 3rd Edition, Pearson Education,

Reference Books:

1. Artificial Intelligence - Elaine Rich, Kevin Knight and Shivashankar B Nair, 3rd Edition, Tata McGraw Hill, 2008.

2. Artificial Intelligence: A new Synthesis – Nils J. Nilsson, 1st Edition, Elsevier, 1997.

3. Introduction to Artificial Intelligence and Expert Systems- Dan W. Patterson 2nd Edition, PHI, 2009.

Web Resources (WR):

1. <https://ocw.mit.edu/courses/6-034-artificial-intelligence/>
2. <https://www.geeksforgeeks.org/artificial-intelligence/>
3. <https://www.kaggle.com/>
4. <https://www.technologyreview.com/topic/artificial-intelligence/>

***Teaching Pedagogy:**

S. No.	Abbreviation	Full Form
1.	C&T	Chalk & Talk
2.	CD	Classroom Discussions
3.	Q	Quiz
4.	PS	Problem Solving