THE INTELLIGENT INSTITUTE OF EDUCATION

ARTIFICIAL INTELLIGENCE

Theory Schedule		
Chapter No.	**Topics Description**	**Week**
1	**Introduction to AI,** What is AI?, Acting humanly, Thinking humanly, Acting Rationally, Thinking Rationally, The Turing test approach, Neuroscience , Robotics concepts, expert system, AI becomes an industry, History of AI, Summary, Exercises	1
2	**Intelligent Agents,** The structure of Agents, Agents and Environments, PEAS - Performance, Environment, Actuators, Sensors, Types of Intelligent Agents, Simple Reflex Agents, Model Based Reflex Agents, Utility Based Agents, Goal based agents, Summary, Exercises	2
3	**Solving Problems by Searching,** Problem Solving Agents, Well defined problems and solutions, Real world problems, Toy Problems, Searching for solutions, Types of Searching, Heuristic Search Strategy, Memory bounded heuristic search, learning to search better, Heuristic function, BFS, DFS, Bidirectional Search, Summary, Exercises	3, 4
4	**Game Playing:** Introduction: Games as Search Problems , Perfect Decisions in Two-Person Games, Imperfect Decisions, Evaluation Functions, Cutting off search , Alpha-Beta, Effectiveness of alpha-beta pruning, Games That Include an Element of Chance, Position evaluation in games with chance nodes, Complexity of Expect minimax, State-of-the-Art Game Programs, Chess, Checkers or Draughts .	5, 6
5	**Knowledge and Reasoning Agents that Reason Logically,** A Knowledge-Based Agent, Representation, Reasoning, and Logic Representation, Inference Logics, Summary, Exercises	7
6	**First Order Predicate Logic,** Representation Revisited, Syntax and Semantics of First order Logic**,** Models for first-order-logic, Symbols and interpretations, Terms, Atomic sentences, Complex sentences , Equality, Summary, Exercises	8
7	**Planning,** The planning problem, The language of planning problems, Partial Order planning, Types of Planning, Continuous planning, Conditional Planning, Multi Agent planning, Summary, Exercises	9
8	**Learning,** Learning from observations, Forms of learning, Inductive learning, A Logical Formulation of Learning, knowledge in Learning, Top-down Inductive Learning Methods, Reinforcement Learning, Summary, Exercises	10

9	**Neural Networks,** Concepts of Neural Networks, Network Structures, Single Layer Feed-Forward Neural Networks, Multilayer feed-forward Neural Networks, Models-Network Functions, Learning Algorithm, Summary, Exercises	11
10	**Decision Trees,** Introduction to decision tree, Decision trees as performance elements, Inducing decision trees from examples, Assessing the performance of the learning algorithm, Noise and over fitting, Applicability of decision trees, Summary, Exercises	12
11	**Robotics,** Introduction, Robot hardware devices, Sensors, Effectors, Robotic Perception, Sensors, Planning to move, Configuration space, Moving, Robotic software architecture, Summary, Exercises	13
12	**AI – Present and Future,** Agent Components, Agent Architectures, Are We Going in the Right Direction? What if AI Does succeed?	14