Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
ITC703	Intelligent System	4	-	-	4	-	-	4
		Examination Scheme						
		ISE	MSE		ESE			
		10	30		100 (60%Weightage)			

Pre-requisite Course Codes		
After successful completion of the course, student will be able to:		
Course Outcomes	CO1	Describe the building blocks of AI as presented in terms of intelligent agents.
	CO2	Choose an appropriate problem solving method and knowledge representation scheme for a given problem.
	CO3	Analyze and formalize the problem and select the appropriate search method.
	CO4	Develop simple intelligent system or classical toy problems using different AI techniques.

Module No.	Topics	Ref.	Hrs.
1	**Introduction** Introduction to AI, AI Problems and AI techniques, Solving problems by searching, Problem Formulation.	1	04
2	**Intelligent Agents** Structure of Intelligent agents, Types of Agents, Agent Environments PEAS representation for an Agent.	1	03
3	**Uninformed Search Techniques** DFS, BFS, Uniform cost search, Depth Limited Search, Iterative Deepening, Bidirectional search, Comparing Different Techniques.	1	04
4	**Informed Search Methods** Heuristic functions, Hill Climbing, Simulated Annealing, Best First Search, A*, IDA*, SMA*, Crypto Arithmetic Problem, Backtracking for CSP, Performance Evaluation.	1	08
5	**Adversarial Search** Game Playing, Min-Max Search, Alpha Beta Pruning.	1	03
6	**Knowledge and Reasoning** A Knowledge Based Agent, WUMPUS WORLD Environment, Propositional Logic, First Order Predicate Logic, Forward and Backward Chaining, Resolution. , Introduction to PROLOG	1	08

7	**Planning** Introduction to Planning, Planning with State Space Search, Partial Ordered planning, Hierarchical Planning, Conditional Planning, Planning with Operators.	1, 2	04
8	**Uncertain Knowledge and Reasoning** Uncertainly, Representing Knowledge in an Uncertain Domain, Conditional Probability, Joint Probability, Bays theorem, Belief Networks, Simple Inference in Belief Networks.	1, 2	06
9	**Learning** Learning from Observation, General Model of Learning Agents, Inductive Learning, Learning Decision Trees, Rote Learning, Learning by Advice, Learning in Problem Solving, Explanation based Learning.	2, 3	05
10	**Expert Systems** Representing and using Domain Knowledge, Expert System-shell, Explanation, and Knowledge Acquisition.	2, 3	03
Total hours of instructions			48

References:

1. Stuart Russell and Peter Norvig," *Artificial Intelligence: A Modern Approach*", 2nd Edition, Pearson Education.
2. Elaine Rich, Kevin Knight, Shivshankar B Nair, "*Artificial Intelligence*", 3rd Edition, McGraw Hill.
3. Elaine Rich, Kevin Knight, "*Artificial Intelligence*", 2nd Edition ,Tata McGraw Hill,.
4. George Lugar, .AI-Structures and Strategies for Complex Problem Solving., 4/e, 2002, Pearson Education.
5. Nils J. Nilsson, Principles of Artificial Intelligence, Narosa Publication.
6. Patrick H. Winston, Artificial Intelligence, 3rd edition, Pearson Education.
7. Deepak Khemani, A First Course in Artificial Intelligence, McGraw Hill Publication