

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
MCAE35 B	Artificial Intelligence	3	--	--	3	--	--	3
		Examination Scheme						
		ISE		MSE		ESE		
		10	30	100 (60% Weightage)				

Pre-requisite Course Codes	--		
Course Outcomes	CO1	Develop a basic understanding of AI building blocks presented in intelligent agents.	
	CO2	Choose an appropriate problem solving method and knowledge representation technique.	
	CO3	Analyze models for reasoning with uncertainty as well as the expert system	
	CO4	Design the AI applications in real world scenario.	

Module	Unit No.	Topics	Ref.	Hrs.
<b>1</b>		<b>Introduction to AI</b>	<b>1</b>	<b>6</b>
	1.1	Artificial Intelligence : Role of AI in engineering, AI in daily life		
	1.2	Intelligence and Artificial Intelligence		
	1.3	Different task domains of AI		
	1.4	Programming methods, Limitations of AI		
	1.5	<b>Intelligent Agent:</b> Agent, Performance Evaluation		
	1.6	Task environment of agent		
	1.7	Agent classification		
	1.8	Agent architecture		
<b>2</b>		<b>Problem Solving</b>	<b>1,2</b>	<b>11</b>
	2.1	Problems, problem spaces and search: Define the problem as a state space search, Production systems		
	2.2	Problem characteristics, Production system characteristic		
	2.3	Issues in design of search program		
	2.4	<b>Uninformed Search Methods:</b> Breadth First Search (BFS), Depth First Search (DFS) , Depth Limited Search, Depth First Iterative Deepening(DFID),		
	2.5	<b>Informed Search Methods:</b> Greedy best first Search , A* Search , Memory bounded heuristic Search.		
	2.6	<b>Local Search Algorithms and Optimization Problems:</b> Hill climbing search Simulated annealing, Local beam search, Genetic algorithms.		
	2.7	<b>Adversarial Search:</b> Games, Optimal strategies, The minimax algorithm, Alpha-Beta Pruning.		

<b>3</b>		<b>Knowledge Representation</b>	<b>1,3</b>	<b>9</b>
	<b>3.1</b>	Knowledge Representation: Need to represent knowledge		
	<b>3.2</b>	Knowledge representation with mapping scheme		
	<b>3.3</b>	Properties of good knowledge-based system		
	<b>3.4</b>	Knowledge representation issues		
	<b>3.5</b>	AND-OR graph		
	<b>3.6</b>	Types of knowledge		
	<b>3.7</b>	The Wumpus World, The Propositional logic,		
	<b>3.8</b>	First Order Logic: Syntax and Semantic, Inference in FOL,		
	<b>3.9</b>	Forward chaining, backward Chaining.		
<b>4</b>		<b>Uncertain Knowledge and Reasoning</b>	<b>1,3</b>	<b>3</b>
	<b>4.1</b>	Uncertainty, Representing knowledge in an uncertain domain,		
	<b>4.2</b>	The semantics of belief network,		
	<b>4.3</b>	Inference in belief network.		
<b>5</b>		<b>Planning and Learning</b>	<b>1,2</b>	<b>8</b>
	<b>5.1</b>	The planning problem, Planning with state space search		
	<b>5.2</b>	Partial order planning, Hierarchical planning, Conditional Planning.		
	<b>5.3</b>	Learning: Forms of Learning, Inductive Learning, Learning Decision Tree.		
	<b>5.4</b>	Expert System: Introduction, Phases in building Expert Systems, ES Architecture		
	<b>5.5</b>	ES vs Traditional System.		
<b>6</b>		<b>Applications</b>	<b>2,4</b>	<b>5</b>
	<b>6.1</b>	Natural Language Processing(NLP)		
	<b>6.2</b>	Expert Systems		
	<b>6.3</b>	Neural Network.		
			<b>Total</b>	<b>42</b>

### References:

- [1] Artificial Intelligence, 3rd Edition, Elaine Rich, Kevin Knight, S.B. Nair, Tata McGraw Hill.
- [2] Stuart J. Russell and Peter Norvig, "Artificial Intelligence A Modern Approach "Second Edition" Pearson Education
- [3] Patrick Henry Winston , "Artificial Intelligence", Addison-Wesley, Third Edition.
- [4] N.P.Padhy, "Artificial Intelligence and Intelligent Systems", Oxford University Press.