

Course Code	21CSC206T	Course Name	ARTIFICIAL INTELLIGENCE	Course Category	C	PROFESSIONAL CORE	L	T	P	C
							2	1	0	3

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	School of Computing	Data Book / Codes / Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Program Outcomes (PO)												Program Specific Outcomes		
CLR-1:	infer knowledge in problem formulation with AI	1	2	3	4	5	6	7	8	9	10	11	12	PSO-1	PSO-2	PSO-3
CLR-2:	exemplify the uninformed and informed search technique procedures for real world problems	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning			
CLR-3:	understand the adversarial search methods, constraint satisfaction problems and intelligent agents															
CLR-4:	demonstrate various knowledge representation techniques															
CLR-5:	infer knowledge about expert systems															

Course Outcomes (CO):	At the end of this course, learners will be able to:	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
CO-1:	formulate a problem as a state space search method and its solution using various AI techniques	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO-2:	apply appropriate searching techniques to solve a real-world problem	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
CO-3:	develop various game playing strategies to solve real world adversarial search problems	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO-4:	represent various knowledge representation techniques to solve complex AI problems	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO-5:	design an expert system to implement advance techniques in Artificial Intelligence	3	2	3	-	-	-	-	-	2	-	-	-	-	-	-

Unit-1- Introduction to AI	9 Hour
AI techniques, Problem solving with AI, AI Models, Data acquisition and learning aspects in AI, Problem solving- Problem solving process, formulating problems, Problem types and characteristics, Problem space and search, Toy Problems – Tic-tac-toe problems, Missionaries and Cannibals Problem, Real World Problem – Travelling Salesman Problem	
Unit-2- Basic Introduction to Data Structure and Search Algorithms	9 Hour
Basic introduction to stacks, queues, trees and graphs - General Search Algorithms – Searching for solutions – Problem-solving agents – Control Strategies – Uninformed Search Methods – Breadth First Search – Uniform Cost Search - Depth First Search -Depth Limited Search – Informed search - Generate and test - Best First search - A* Algorithm	
Unit-3 - Adversarial Search Problems and Intelligent Agent	9 Hour
Adversarial Search Methods (Game Theory) - Mini max algorithm - Alpha beta pruning - Constraint satisfactory problems – Constraints – Crypt Arithmetic Puzzles – Constraint Domain – CSP as a search problem (Room colouring). Intelligent Agent – Rationality and Rational Agent – Performance Measures – Rationality and Performance – Flexibility and Intelligent Agents – Task environment and its properties – Types of agents.	
Unit-4 - Knowledge Representation	9 Hour
Knowledge Representation -Knowledge based agents – The Wumpus world – Propositional Logic - syntax, semantics and knowledge base building - inferences – reasoning patterns in propositional logic – predicate logic – representing facts in logic: Syntax and semantics – Unification – Unification Algorithm - Knowledge representation using rules - Knowledge representation using semantic nets - Knowledge representation using frames inferences - Uncertain Knowledge and reasoning Methods.	
Unit-5 - Planning and Expert System	9 Hour
Planning – planning problem – Simple planning agent – Blocks world problem – Mean Ends analysis Learning - Machine learning - Learning concepts, methods and models Introduction to expert system – architecture of expert systems.	

Learning Resources	1. Deepak Kemhani, <i>First course in Artificial Intelligence</i> , McGraw Hill Pvt Ltd, 2013	3. Parag Kulkarni, Prachi Joshi, <i>Artificial Intelligence –Building Intelligent Systems</i> , 1st ed., PHI learning, 2015
	2. Stuart Russel and Peter Norvig, <i>Artificial Intelligence: A Modern Approach</i> , Fourth Edition, Pearson Education, 2020.	4. <i>Data Structures Schaum's Outlines Series</i> , Seymour, Lipschutz, 2014.

Learning Assessment							
	Bloom's Level of Thinking	Continuous Learning Assessment (CLA)				Summative Final Examination (40% weightage)	
		Formative CLA-1 Average of unit test (50%)		Life-Long Learning CLA-2 (10%)			
		Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	-	20%	-	20%	-
Level 2	Understand	15%	-	15%	-	15%	-
Level 3	Apply	20%	-	20%	-	20%	-
Level 4	Analyze	25%	-	25%	-	25%	-
Level 5	Evaluate	20%	-	20%	-	20%	-
Level 6	Create	-	-	-	-	-	-
	Total	100 %		100 %		100 %	

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Mr. Tejas Gowda, Co-Founder & Chief Data Scientist, tenzai	1. Dr. T. Senthilkumar, Associate Professor, Amrita School of Engineering, Amrita Vishwa Vidyapeetham	1. Dr. A. Alice Nithya, SRMIST
		2. Dr. K. Senthil Kumar, SRMIST