Course Code	21CSC206T	Course Name	ARTIFICIAL INTELLIGENCE		Course Category	C	PROFESSIONAL CORE		L	T	P	C
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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:
CLR-1:	infer knowledge in problem formulation with AI
CLR-2:	exemplify the uninformed and informed search technique procedures for real world problems
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 (1)	Problem Analysis (2)	Design/development of solutions (3)	Conduct investigations of complex problems (4)	Modern Tool Usage (5)	The engineer and society (6)	Environment & Sustainability (7)	Ethics (8)	Individual & Team Work (9)	Communication (10)	Project Mgt. & Finance (11)	Life Long Learning (12)	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, First course in Artificial Intelligence, McGraw Hill Pvt Ltd, 2013 2. Stuart Russel and Peter Norvig, "Artificial Intelligence: A Modern Approach", Fourth Edition, Pearson Education, 2020.	3. Parag Kulkarni, Prachi Joshi, Artificial Intelligence –Building Intelligent Systems, 1st ed., PHI learning, 2015 4. Data Structures Schaum's Outlines Series, 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