

BCSE306L	Artificial Intelligence	L	T	P	C
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Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives					
<div>1. To impart artificial intelligence principles, techniques and its history.</div> <div>2. To assess the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving engineering problems</div> <div>3. To develop intelligent systems by assembling solutions to concrete computational problems</div>					
Course Outcomes					
On completion of this course, student should be able to:					
<div>1. Evaluate Artificial Intelligence (AI) methods and describe their foundations.</div> <div>2. Apply basic principles of AI in solutions that require problem-solving, inference, perception, knowledge representation and learning.</div> <div>3. Demonstrate knowledge of reasoning, uncertainty, and knowledge representation for solving real-world problems</div> <div>4. Analyse and illustrate how search algorithms play a vital role in problem-solving</div>					
Module:1	Introduction	6 hours			
Introduction- Evolution of AI, State of Art -Different Types of Artificial Intelligence- Applications of AI-Subfields of AI-Intelligent Agents- Structure of Intelligent Agents- Environments					
Module:2	Problem Solving based on Searching	6 hours			
Introduction to Problem Solving by searching Methods-State Space search, Uninformed Search Methods – Uniform Cost Search, Breadth First Search- Depth First Search-Depth-limited search, Iterative deepening depth-first, Informed Search Methods- Best First Search, A* Search					
Module 3	Local Search and Adversarial Search	5 hours			
Local Search algorithms – Hill-climbing search, Simulated annealing, Genetic Algorithm, Adversarial Search: Game Trees and Minimax Evaluation, Elementary two-players games: tic-tac-toe, Minimax with Alpha-Beta Pruning.					
Module:4	Logic and Reasoning	8 hours			
Introduction to Logic and Reasoning -Propositional Logic-First Order Logic-Inference in First Order Logic- Unification, Forward Chaining, Backward Chaining, Resolution.					
Module:5	Uncertain Knowledge and Reasoning	5 hours			
Quantifying Uncertainty- Bayes Rule -Bayesian Belief Network- Approximate Inference in Bayesian networks					
Module:6	Planning	7 hours			
Classical planning, Planning as State-space search, Forward search, backward search, Planning graphs, Hierarchical Planning, Planning and acting in Nondeterministic domains – Sensor-less Planning, Multiagent planning					
Module:7	Communicating, Perceiving and Acting	6 hours			
Communication-Fundamentals of Language -Probabilistic Language Processing -Information Retrieval- Information Extraction-Perception-Image Formation- Object Recognition.					
Module:8	Contemporary Issues	2 hours			
Total Lecture hours: 45 hours					
Text Book					
1.	Russell, S. and Norvig, P. 2015. Artificial Intelligence - A Modern Approach, 3 <sup>rd</sup> Edition, Prentice Hall.				

Reference Books			
1.	K. R. Chowdhary, Fundamentals of Artificial Intelligence, Springer, 2020.		
2	Alpaydin, E. 2010. Introduction to Machine Learning. 2 <sup>nd</sup> Edition, MIT Press.		
Mode of Evaluation: CAT, Assignment, Quiz, FAT			
Recommended by Board of Studies		04-03-2022	
Approved by Academic Council		No. 65	Date 17-03-2022