GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Bachelor of Technology					Branch/Spec.	Computer Science & Engineering (BDA/CBA/CSE)		
Semester	VI					Version	1.0.0.2		
Effective from Academic Year			2024-25			Effective for the batch Admitted in			June 2022
Subject code	2CSE60E14		Subject Name			Artificial Intelligence			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	**3**	**0**	**1**	**0**	4	Theory	40	60	100
Hours	**3**	**0**	**2**	**0**	5	Practical	30	20	50
Pre-requisites:									
Data structures, Algorithm design and analysis, Basic programming logic									
Learning Outcome:									
Upon Completion of the course, the students will be able to • Learn the key components of the artificial intelligence (AI) field. • Understand the key aspects of search strategies, planning and reasoning algorithms. • Understand and apply the key aspects of statistical approach to solve computational problems. • Apply artificial intelligence techniques and algorithms to various use cases.									
Theory syllabus									

Unit	Content	Hrs
1	**Basics of Artificial Intelligence** What is intelligence? Foundations of artificial intelligence (AI). History of AI; Problem Solving- Formulating problems, problem types, states and operators, state space, search strategies	**5**
2	**Informed Search Strategies** Best first search, A* algorithm, heuristic functions, Iterative deepening A*(IDA), small memory A*(SMA)	**5**

3	**Reasoning** Representation, Inference, Propositional Logic, predicate logic (first order logic), logical reasoning, forward chaining, backward chaining; AI languages and tools **-** Lisp, Prolog, CLIPS	**7**
4	**Planning** Basic representation of plans, partial order planning, planning in the blocks world, hierarchical planning, conditional planning, representation of resource constraints, measures, temporal constraints	**6**
5	**Statistical Reasoning** Probability And Bayes' Theorem, Certainty Factors And Rule-Base Systems, Bayesian Networks, DempsterShafer Theory, Fuzzy Logic.	**7**
6	**Game Playing:** Overview, And Example Domain : Overview, MiniMax, Alpha-Beta Cut-off, Refinements, Iterative deepening	**3**
7	**Hidden Markov Models-** Markov Chains, The Hidden Markov Model, Likelihood Computation: The Forward Algorithm, Decoding: The Viterbi Algorithm, HMM Training: The Forward-Backward Algorithm	**4**
8	**Learning** Inductive learning, decision trees, logical approaches, computational learning theory, reinforcement learning, natural language understanding and its Applications.	**8**

Practical content
Practicals will be based on developing intelligent agents through uninformed search strategy, informed sea strategy, first order logic using prolog, Byesian network, automation for 2-Player game, Hidden Markov Cha reinforcement learning, Natural language understanding.

Text Books	
1	Stuart Russell and Peter Norvig. Artificial Intelligence – A Modern Approach, Pearson Education Press.
2	Kevin Knight, Elaine Rich, B. Nair, Artificial Intelligence, McGraw Hill.
3	Daniel Jurafsky, James H. Martin, Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition

Reference Books	
1	George F. Luger, Artificial Intelligence, Pearson Education.
2	Nils J. Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kauffman.

Course Outcomes:	
Cos	Description

CO1	Learn the key components of the artificial intelligence (AI) field.
CO2	Understand the key aspects of search strategies, planning and reasoning algorithms.
CO3	Understand and apply the key aspects of statistical approach to solve computational problems.
CO4	Apply artificial intelligence techniques and algorithms to various use cases.

Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	3	2	1	0	2	2	3	3
CO2	2	2	2	3	3	0	3	1	0	2	2	2
CO3	3	2	3	1	2	1	3	2	2	2	1	3
CO4	3	2	2	3	3	2	2	3	1	2	3	3