

GANPAT UNIVERSITY									
FACULTY OF DIPLOMA ENGINEERING									
Programme		Diploma Engineering				Branch/Spec.		Electronics and Communication Engineering	
Semester		V				Version		1.0.0.0	
Effective from Academic Year			2026-27			Effective for the Batch admitted in			July 2024
Course Code		1EC5102		Course 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									
Basic understanding of mathematics, logical reasoning, programming with python									
Course Outcomes									
On successful completion of the course, the students will be able to:									
CO1	Describe the fundamentals, applications, areas, and limitations of Artificial Intelligence.								
CO2	Apply problem-solving techniques, search algorithms, and AI agents to design intelligent solutions.								
CO3	Illustrate issues in knowledge representation and apply logical reasoning and resolution procedures for solving AI problems.								
CO4	Analyze the structure, components, development phases, and applications of Expert Systems and Knowledge-Based Systems and use modern AI tools for practical problem solving.								
Theory Syllabus									
Unit	Content								Hrs.
1	Introduction to Artificial Intelligence History and Evolution of AI, Applications of AI, Areas of AI: Machine Learning, NLP, Computer Vision, Robotics, Expert Systems, Advantages and Disadvantages of AI, Generative AI: Definition and concept, Agentive AI: Definition and concept								07
2	AI Problem-Solving and Search Techniques Introduction to AI Problem-Solving: Definition, Characteristics and steps , Rule-Based Systems: Structure: If–Then rules, Forward Chaining and Backward Chaining, Simple examples using if–else logic, Problem-Solving Approaches: Uninformed Search: BFS, DFS and Informed (Heuristic) Search: Best-First Search, AI Agents Overview: Definition and types, Components and examples, Weak AI vs. Strong AI								12
3	Knowledge Representation Techniques Introduction and Issues to Knowledge Representation: Need and role of knowledge representation in AI; data vs. information vs. knowledge, Logical Representation of Knowledge: Concept of logic, symbols, propositions, and rules, First-Order Logic (FOL): Basic syntax and semantics; objects, predicates, and quantifiers with simple examples. , Reasoning Methods Concept of inference; Forward Reasoning (Data-driven) and Backward Reasoning (Goal-driven) ,Unification and Lifting: Concept of unification in matching logic expressions ,Resolution Procedure: Simple explanation of how resolution helps in deriving conclusions.								10
4	Expert Systems and Knowledge-Based Systems Introduction to Expert Systems: Definition, need, and role of Expert Systems; how they differ from traditional programs ,Characteristics of Expert Systems ,Building Blocks of Expert Systems: Knowledge Base, Inference Engine, User Interface, Explanation Facility, and Knowledge Acquisition Module, Development Phases of an Expert System: Problem identification, knowledge acquisition, system design, implementation, testing, and maintenance, Knowledge Acquisition: Methods to gather knowledge from experts, data, or rules; challenges in acquiring expert knowledge. Applications of Expert Systems: Examples from: medical diagnosis (MYCIN), agriculture, finance, education, customer support, and								8

	manufacturing.	
5	AI Tools and Their Applications Introduction to AI Tools: Definition, classification, and importance Chat GPT: Overview, applications (Content writing and programming), limitations, ethical considerations ,Google AI Tools: Google Translate, Google Lens (overview and applications (Notebook LM, Google Assistant, Gemini), Canva AI: Overview and applications (AI Image Generator, Magic Design) ,Netflix Recommendation System: Collaborative filtering, content-based filtering, hybrid approaches, Alexa Voice Assistant: Speech recognition, NLU, response generation	8
Practical Content		
Practical assignments and tutorials are based on the above syllabus.		
Text Books		
1	Artificial Intelligence A Modern Approach By Stuart Russell and Peter Norvig, Prentice Hall.	
Reference Books		
1	Artificial Intelligence A Modern Approach By Stuart Russell and Peter Norvig, Prentice Hall.	
2	Artificial Intelligence and Expert Systems By Dan W. Patterson, Prentice Hall of India.	
ICT/MOOCs Reference		
1	https://nptel.ac.in/courses/106105077	
2	https://nptel.ac.in/courses/106105079	

Mapping of CO with PO and PSO:															
	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3
CO1	2	2	1	1	2	0	0	0	0	1	0	2	2	1	1
CO2	3	3	3	2	2	0	0	0	1	1	1	2	1	2	2
CO3	2	2	1	2	1	0	0	0	0	1	0	2	2	1	1
CO4	3	1	2	2	1	0	0	0	0	1	0	3	1	2	2