



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-5 (Diploma)

Subject: Artificial Intelligence-DETCE15213

Type of course: Major (Core)

Prerequisite: Basic knowledge of Computer Programming.

Rationale:

The course will enable students to understand the different issues involved in the design and implementation of artificial intelligence systems. Students will understand essential AI concepts like problem-solving, search strategies, reasoning, and knowledge representation. These subjects cover principles, architectures, and technologies necessary for intelligent decision-making, probabilistic reasoning, game-playing strategies, and logic-based problem-solving. Proficiency in AI is essential for developing smart applications, vital in robotics, data science, automation, and various real-world AI-driven industries.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

Legends: CI-ClassRoom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Sr. No	Course Content	Hrs.	% Weightage
1	Introduction of AI: The AI Problems, The Underlying Assumption, what is an AI Techniques, The Level of The Model, Criteria for Success, Some General References, Application of AI.	06	10%



2	State Space Search and Heuristic Technique: Search strategies are divided into two basic types: informed search: - strategies and uninformed search strategies. Informed research includes: - The best-first search strategy, A* algorithm, AO* algorithm, generate-and-test strategy, Hill Climbing, and mean and analysis. Uninformed search: - include Heuristic function, breadth-first search, uniform cost search, depth-first search and bidirectional search. Breadth-first search.	15	25%
3	Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distribution, Exact Inference in Bayesian Networks, Approximate Inference in Bayesian Networks.	12	20%
4	Order Logic and Fuzzy Logic: First Order Logic, Logic programming, The Wumpus world Logic, Characteristics of fuzzy logic, architecture of a fuzzy logic system, applications of fuzzy logic, advantages, disadvantages of fuzzy logic, operations.	12	20%
5	Game Playing: Overview, Planning and Example Domain: Overview, The Blocks World, Components of a Planning System, Goal Stack Planning, Hierarchical Planning, Bounded Look-Ahead Strategy, Mini-Max algorithm, Alpha-Beta Pruning, N-queen Problem, 8 puzzle problem.	15	25%

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Smart Assistant Suggestions Students here must individually interact with a virtual assistant (Google Assistant, Siri, or Alexa) by asking at least five different types of questions (factual, conversational, command-based, opinion-based, or contextual). They must record the AI responses and explain how AI processes them using NLP and machine learning. Submit a Word/PDF document with questions, responses, and explanations, and upload it on the GMIU Web Portal.	10
2	AI in Image Recognition Students must perform this individually by collecting 5-10 images of objects and analyzing how an AI-based image recognition system identifies them. They must record the results, note any errors, and explain how AI processes images using deep learning. Submit a Word/PDF document with images, AI results, and explanations, and upload it on the GMIU Portal.	10



3	Basic Chatbot Creation Students must perform this in group of 2 by building a rule-based chatbot using if-else conditions on a selected topic. The chatbot should respond based on user input. Submit a Python (.py) file with chatbot code and a Word/PDF document with example interactions. Upload both files on the GMIU Portal.	10
Total		30

Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	20%	30%	25%	15%	05%	05%

Course Outcome:

After learning the course, the students should be able to:	
CO1	Describe AI techniques and their applications in solving complex problems.
CO2	Differentiate between informed and uninformed search strategies and their applications in AI.
CO3	Apply exact inference techniques in Bayesian Networks for structured decision processes.
CO4	Explore applications of fuzzy logic in various domains.
CO5	Explain components of a planning system and their roles.



List of Practical

Sr. No	Description	Unit No	Hrs.
1	Write a program to implement Tic-Tac-Toe game problem.	02	02
2	Write a program to implement BFS (for 8 puzzle problems or Water Jug problem or any AI search problem).	02	02
3	Write a program to implement DFS (for 8 puzzle problem or Water Jug problems or any AI search problem).	02	02
4	Write a program to implement Single Player Game (Using Heuristic Function).	02	04
5	Write a program to Implement A* Algorithm.	02	02
6	Write a program to solve the Tower of Hanoi problem.	06	02
7	Write a program to solve the N-Queens problem.	06	04
8	Write a program to solve 8 puzzle problems.	06	04
9	Write a program to count even and odd elements from a list and count elements up to specific index in list.	06	02
10	Write a program to find factorial n numbers.	06	02
11.	Write a program to find Fibonacci series of n numbers.	06	02
Total			30

Instructional Method:

The course delivery method will depend upon the requirement of content and needs of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done based on the Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.



Reference Books:

- [1] Artificial Intelligence -By Elaine Rich and Kevin Knight (2nd Edition) Tata Mcgraw-Hill.
- [2] Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, PHI.
- [3] Nils J Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kaufmann Publications, 2000.
- [4] Introduction to Prolog Programming by Carl Townsend.
- [5] PROLOG Programming for Artificial Intelligence” -By Ivan Bratko (Addison-Wesley).
- [6] Programming with PROLOG” –By Klocksin and Mellish.

