



**GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY,
EAST DELHI CAMPUS,
SURAJMAL VIHAR-110092**

Paper code : ARD 203	L	T/P	C
Subject : Introduction to Artificial Intelligence	4	0	4

Marking Scheme

1. Teachers Continuous Evaluation: 25 Marks
2. End Term Theory Examination: 75 Marks

INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks : 75

1. There should be 9 questions in the end term examination question paper
2. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 15 marks.
3. Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit. Each question should be 15 marks.
4. The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/level of the questions to be asked should be at the level of the prescribed textbooks.
5. The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required

Course Outcomes:

CO1: Ability of students to understand the basic concept of Artificial Intelligence

CO2: Ability of students to understand the concept of agents and planning

CO3: Ability of students to understand the probabilistic reasoning and making decision

CO4: Ability of students to understand the concept of Fuzzy Logic.

Course Outcomes (CO) to Programme Outcomes (PO) Mapping (Scale 1: Low, 2: Medium, 3: High)

CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	3	3	3	3	1	-	-	-	-	-	1	2
CO2	3	3	2	3	1	1	-	-	-	-	1	2
CO3	3	3	2	3	1	2	-	-	-	-	2	3
CO4	3	3	3	3	1	2	-	-	-	-	2	3

Unit I

[10]

Introduction to Artificial Intelligence : Basic Concepts: Foundations of Artificial Intelligence – the four approaches to AI. Intelligent Agents – Agents and Environments, Rationality, Nature of Environments, Structure of Agents. **Solving Problems by Searching:** Problem-Solving Agents, Searching for Solutions, Uninformed Search Strategies, Heuristic Search Strategies, Heuristic Functions. **Beyond Classical Search:** Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces, Searching with Nondeterministic Actions. Introduction to Adversarial Search.

Unit II

[6]

Logical Agents: Knowledge-Based Agents, Logic, Propositional Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic.

Classical Planning: Definitions of Classical Planning. Algorithms for Planning as State-Space Search. Planning Graphs. Other Classical Planning Approaches. Analysis of Planning Approaches. Planning and Acting in the Real World: Time, Schedule and Resources, Hierarchical Planning, Planning and Acting in Nondeterministic Domains, Multi-agent Planning.

Knowledge Representation: Ontological Engineering, Categories and Objects, Events, Mental

Approved by BoS of USAR : 1/08/22,

Applicable from Batch Admitted in Academic Session 2021-22 Onwards

Approved by AC sub-committee 29/08/22

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Page 17



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Events and Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information.

Unit III

[13]

Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, Semantics of Bayesian Networks, Efficient Representation of Conditional Distribution, Exact Inference and Approximate Inference in Bayesian Networks. Relational and First-order, Probability Models.

Probabilistic Reasoning over Time: Time and Uncertainty, Inference in Temporal Models, Hidden Markov Models, Kalman Filters, Dynamic Bayesian Networks, Keeping Track of Many Objects.

Making Decisions: Making Simple Decisions – Combining Beliefs and Desires, Utility Theory, Utility Functions, Multi-attribute Utility Functions, Decision Networks, Decision-Theoretic Expert Systems. Sequential Decision Problems. Value Iteration, Policy Iteration. Partially Observable MDPs. Decisions with Multiple Agents

Unit IV

[6]

Fuzzy Logic: Crisp Sets V/s Fuzzy Sets, Fuzzy Functions, Fuzzy Logic and Fuzzy Inference Systems, Type-2 Fuzzy Sets, Intuitionistic Fuzzy Sets based sentiment Analysis

Text Books

1. E. Rich and K. Knight. *Artificial Intelligence*. TMH, 2nd Ed., 1992.
2. N. J. Nilsson. *Principles of AI*. Narosa Publ. House, 1990

Reference Books

1. P. H. Winston. *Artificial Intelligence*. Pearson Education, 3rd Edition, 2000
2. Ross, T. J. (2005). *Fuzzy logic with engineering applications*. John Wiley & Sons.
3. Sivanandam, S. N., & Deepa, S. N. (2007). *Principles of soft computing*. John Wiley & Sons.

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