C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology and Engineering
DEPARTMENT OF: - Information Technology
SEMESTER: - VII
CODE: - **4TE07AIN1**
NAME: – **ARTIFICIAL INTELLIGENCE**

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
4TE07AIN1	ARTIFICIAL INTELLIGENCE	3	0	2	5	4	30	1.5	70	3.0	-	20	30	150

Objectives:

The objectives of the course are:

- To familiarize students with Artificial Intelligence techniques for building well-engineered and efficient intelligent systems.
- Pattern-directed inference systems and different types of truth maintenance systems will be discussed in length from both theoretical and applied point of view. Some Expert system applications will be discussed.
- Introduction to Artificial Intelligence Programming using PROLOG will be provided to help students with the programming part of the course.

Prerequisites:

Basics of computer science and mathematics, Discrete structures, Predicate logic, and programming languages.

Course outline:

Sr. No.	Course Contents	Total Hrs.
1	**Introduction to Artificial Intelligence:** Introduction, Problems, Problem space, Production systems, Problem characteristics	04
2	**Search Techniques:** Uninformed search techniques (Best-first search, Depth-First Search), Heuristic search techniques, Generate and test, Hill climbing, Simulated annealing, A* algorithm, Constraint satisfaction, Means-end-analysis) Adversarial Search Techniques (Game playing, MINIMAX algorithm, alpha-beta pruning)	08
3	**Knowledge Representation:** Propositional Logic, Predicate logic, Instance and relation	08

4	**Fuzzy Logic:** Definition, need, fuzzy set, fuzzy operators, fuzzy control systems, limitations	**04**
5	**Inference Techniques:** Representing knowledge using rules, procedure versus declarative knowledge, forward versus backward reasoning, Unification, Resolution.	**04**
6	**Expert Systems:** ES architectures, Representation and use of domain knowledge, knowledge acquisition.	**04**
7	**PROLOG:** Facts and predicates, data types, goal finding, backtracking, simple object, compound objects, use of cut and fail predicates, recursion, lists, simple input/output.	**08**
8	**Evolutionary Computing:** Theoretical Background of Genetic Algorithms and Applications.	**03**
9	**Connectionist Models:** Introduction to Neural Network, Activation functions, Supervised and Unsupervised Learning, Neuro Processing and Neural Network Learning, Learning, Learning rules, Single layer Perceptrons and Classification, Introduction to Multilayer Neural Networks, Neural Network Applications and recent developments.	**05**
	Total	**48**

Learning Outcomes:

At the end of this module the students will be able to do:

- Representation of world knowledge using symbolic logic. Deductive strategies employed in symbolic logic. Programming in prolog.

Books Recommended:

1. Artificial Intelligence, Elaine Rich and Kevin Knight, TMH
2. Introduction to Turbo PROLOG, Carl Townsend, BPB
3. Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, PHI
4. Artificial Intelligence and Expert Systems, D. W. Patterson, PHI
5. Introduction to Applied fuzzy logic, Ahmed Abraham, PHI