C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: -Instrumentation & Control Engineering
SEMESTER: - VII
CODE: -   4TE07ITS1
NAME: Intelligent Systems

Teaching & Evaluation Scheme

Subject Code	Subject Name	Teaching Hours/Week				Credits	Evaluation Scheme/Semester						
							Theory				Practical		
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	Total Marks
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE07ITS1	Intelligent Systems	4	0	2	6	5	30	1.5	70	3	--	20	30	**150**

OBJECTIVES
- To acquaint the students with basics of Neural Networks and Artificial Intelligence.

PRE-REQUISITE
- Fundamentals of Control Engineering.

COURSE OUTLINES

Sr. No.	Course Contents	No. of Hours
1.	**Artificial Intelligence:** Introduction; Intelligent Agents	4
2.	**Problem Solving:** Solving problems by searching; informed search methods; game playing.	4
3.	**Knowledge and Reasoning:** Agents that reason logically; first-order logic; building a knowledge base; inference in first-order logic; logical reasoning systems	6
4.	**Planning:** Practical planning; planning and acting in the real world.	4
5.	**Uncertain Knowledge and Reasoning:** Uncertainty; probabilistic reasoning systems; making simple and complex decisions.	4
6.	**Learning:** Learning from observations; learning in neural and belief networks; reinforcement learning; knowledge in learning.	4
7.	**Introduction:** Motivation, Neural Networks, Rationale for Using NN in Engineering, Fuzzy Logic Control, Rationale for Using FL in Engineering, Evolutionary Computation, Hybrid Systems	8
8.	**Fundamentals Of Neural Networks:** Introduction Basic Structure of a Neuron, Model of Biological Neurons, Elements of Neural Networks.	8
9.	**Neural Network Architectures:** Introduction, NN Classifications, Feedforward and	8

	feedback networks, Supervised and Unsupervised Learning Networks, Back Propagation Algorithm, Delta Training Rule, Radial Basis Function Network (RBFN), Training of the Kohonen Network, Examples of Self-Organization, Hopfield Network (Brief overview of each of them)	
10	**Case Study: Design of Neural Network based Controller.**	2

Learning Outcomes

- Students will be able to understand the concept of Artificial Intelligence and its probable applications in the field of Control Engineering.

Books Recommended

1. Stuart Russel and Peter Norvig "Artificial Intelligence: A Modern Approach," 2nd edition, Pearson Education, 2002.
2. Intelligent Control Systems Using Soft Computing Methodologies by Ali Zilouchian and Mo Jamshidi, CRC Press.
3. Principles of Soft Computing by S.N.Sivanandam, S.N.Deepa , 2e, Wiley India Pvt.Ltd.