COURSE CODE: **1153EE101**	COURSE TITLE: **NEURAL NETWORK AND FUZZY LOGIC CONTROL**	L	T	P	C
		3	**0**	**0**	**3**

COURSE CATEGORY:

Allied Elective

PREAMBLE :

This course Fuzzy Logic and Neural network require understand the concept of fuzziness involved in various systems and fuzzy set theory and neural network.

PREREQUISITE COURSES:

- Control System

RELATED COURSES:

http://en.wikipedia.org/wiki/Neural_network
http://en.wikipedia.org/wiki/Fuzzy_logic

COURSE EDUCATIONAL OBJECTIVES:

The objectives of the course are to make the students,

- To cater the knowledge of Fuzzy Logic and Neural Networks in real time systems

COURSE OUTCOMES :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
C01	Illustrate the concepts of feed forward neural networks	K2
C02	Explain the importance of feedback networks and specify the applications of neuro controller for various applications	K2
C03	Analyze and compare fuzzy set theory with conventional set theory	K3
C04	Explain fuzzy systems and the structure of fuzzy logic controller.	K2
C05	Identify various applications of fuzzy logic control to real time systems.	K2

CORRELATION OF COs AND POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	M		L							
CO2	M	H	M		L							
CO3	M	H	M		L							
CO4	M	H	L		L							
CO5	M	H	L		L							

H-High M-Medium L-Low

COURSE CONTENT:

UNIT I	**INTRODUCTION TO NEURAL NETWORKS**	**9**
Introduction – Biological neuron – Artificial neuron – Neuron modeling – Learning rules – Single layer – Multi layer feed forward network – Back propagation – Learning factors.		
UNIT II	**NEURAL NETWORKS FOR CONTROL**	**9**
Feedback networks – Hop field networks – Associative memories and Adaptive Resonance Theory – Applications of artificial neural network - Process identification – Neuro controller – Application to inverted pendulum problem.		
UNIT III	**FUZZY SYSTEMS**	**9**
Classical sets vs Fuzzy sets – Operation in fuzzy sets– NOT, AND and OR operators - Fuzzy relations – Fuzzification – Defuzzification – Fuzzy rules		
UNIT IV	**FUZZY LOGIC CONTROL**	**9**
Elements of Fuzzy logic Control - Membership function – Knowledge base – Decision-making logic – Adaptive fuzzy system - Introduction to neuro fuzzy controller		
UNIT V	**APPLICATION OF FLC**	**9**
Fuzzy logic control – Washing Machine - Inverted pendulum – Image processing – Home heating system – Blood pressure during anesthesia		
		TOTAL: 45 PERIODS

TEXT BOOKS:

1. Jacek M. Zurada, 'Introduction to Artificial Neural Systems', Jaico Publishing Home, 2002.

2. Timothy J. Ross, 'Fuzzy Logic with Engineering Applications', Tata McGraw Hill, 1997.

REFERENCE BOOKS:

1. Laurance Fausett, Englewood cliffs, N.J., 'Fundamentals of Neural Networks', Pearson Education, 1992.

2. H.J. Zimmermann, 'Fuzzy Set Theory & its Applications', Allied Publication Ltd., 1996.

3. Simon Haykin, 'Neural Networks', Pearson Education, 2003.

4. John Yen & Reza Langari, 'Fuzzy Logic – Intelligence Control & Information', Pearson Education, New Delhi, 2003.