

Branch Name:	Electrical Engineering
Program Code:	ET109
Course Name:	Artificial Intelligence (Professional Elective-I)
Course Code:	2ET1090508T
Pre-requisite Course:	-

Course Objectives:

1. The main objective of this course is to understand the need of artificial intelligence.
2. To Select artificial intelligence technique for applications.
3. To Implement artificial intelligence technique.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Course Contents:

Sr. No.	Topic	Total Hours	Weightage (%)
1	Introduction to Artificial Intelligence: Biological foundations to intelligent systems, Foundation of artificial intelligence, Problem solving approaches, Reasoning in logical domain, Quantification of uncertainty, Probabilistic reasoning and model, Application of bayes' rule, Decision making in the presence of uncertainty.	07	15
2	Fuzzy Logic: Introduction to Classical sets, Properties, Operations and relations, Fuzzy sets, Membership, Uncertainty, Operations, Properties, Fuzzy relations, Cardinalities, Membership functions, Fuzzification, Membership value assignment, Development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.	15	35
3	Artificial Neural Networks: Introduction to biological neural network, Artificial neural networks, Single layer perceptron, Structure and learning of perceptron, Pattern classifier, Bayes classifiers, Perceptron as a pattern Classifier, Perceptron convergence, Limitations of a perceptron, Feed forward networks, Back propagation algorithm, Recurrent networks, Radial basis function networks, Neural network as associative memory, Hopfield network.	15	30
4	Application of AI: Applications of fuzzy logic and ANN.	08	20

Text Books:

1. Simon Haykin, "Neural Networks: A Comprehensive Foundation", Pearson Education Asia, 4th edition-2014.
2. Rajase karan and G. A. V. Pai, "Neural Networks, Fuzzy Logic & Genetic Algorithms", PHI.

Reference Books:

1. Satish Kumar, "Neural Networks: A classroom approach", Tata McGraw Hill, 5th edition- 2017.
2. Robert J. Schalkoff, "Artificial Neural Networks", McGraw-Hill International, 2nd edition- 2013.
3. H. J. Zimmermann, "Fuzzy Set Theory and Its Applications", Kluwer Academic Publishers.
4. M.Ganesh, "A Introduction to fuzzy sets and fuzzy logic", Prentice Hall India, 5th edition- 2018.

ICT/MOOCs Reference:

1. <https://nptel.ac.in/courses/106/106/106106140/>
2. <https://nptel.ac.in/courses/106/105/106105077/>
3. <https://nptel.ac.in/courses/117/105/117105084/>
4. <https://nptel.ac.in/courses/108/104/108104157/>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understanding the need of artificial intelligence.	2 Understanding
CLO2	Explain the basics of fuzzy logic and ANN.	2 Understanding
CLO3	Select artificial intelligence technique for applications.	4 Analyzing
CLO4	Implement artificial intelligence technique.	3 Applying

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	H	M	H	M	L	L			M			M	L	L	L	L
CLO2	H	M	H	M	H	L			M			M	L	L		L
CLO3	H	H	H	H	H	L	L		M		M	H	H	H	M	
CLO4	H	H	H	H	H	H	M	L	M		M	H	H	H		H

H: High, M: Medium, L: Low