MULTIDISCIPLINARY

FUZZY LOGIC AND NEURAL NETWORKS

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TYPE OF COURSE : New| Core| UG/PG
INTENDED AUDIENCE : Engineering, Researchers and practicing Engineers
COURSE DURATION : 8 weeks (25 Feb'19 - 19 Apr'19)
EXAM DATE : 28 April 2019

INDUSTRIES APPLICABLE TO : RDCIS, Ranchi CMERI, Durgapur Reliance Industries, Mumbai C-DAC.

COURSE OUTLINE :

This course will start with a brief introduction to fuzzy sets. The differences between fuzzy sets and crisp sets will be identified. Various terms used in the fuzzy sets and the grammar of fuzzy sets will be discussed, in detail, with the help of some numerical examples. The working principles of two most popular applications of fuzzy sets, namely fuzzy reasoning and fuzzy clustering will be explained, and numerical examples will be solved. Fundamentals of neural networks and various learning methods will then be discussed. The principles of multi-layer feed forward neural network, radial basis function network, self- organizing map, counter-propagation neural network, recurrent neural network, deep learning neural network will be explained with appropriate numerical examples.

ABOUT INSTRUCTOR :

Prof. Pratihar received BE (Hons.) and M. Tech. from REC (NIT) Durgapur, India, in 1988 and 1994, respectively and Ph.D. from IIT Kanpur, India in 2000. He completed his post-doctoral studies in Japan and then, in Germany under the Alexander von Humboldt Fellowship Programme. He is now a Professor at IIT Kharagpur, India. His research areas include robotics, soft computing and manufacturing science. He has guided 18 Ph.D.s. and is in editorial board of 14 International Journals. He has been elected as FIE, MASME and SMIEEE.

COURSE PLAN :

Week 01 : Introduction to Fuzzy Sets
Week 02 : Introduction to Fuzzy Sets (contd.); Fuzzy reasoning
Week 03 : Fuzzy reasoning (contd.); Fuzzy clustering
Week 04 : Fuzzy clustering (contd.); Fundamentals of Neural Networks
Week 05 : Multi-layer Feed-Forward Neural Network; Radial Basis Function Network
Week 06 : Self-Organizing Map; Counter-Propagation Neural Network; Recurrent Neural Networks; Deep Learning Neural Network
Week 07 : Genetic-Fuzzy system; Genetic-Neural System
Week 08 : Neuro-Fuzzy System; Concepts of Soft Computing and Computational Intelligence; Summary of the Course