ME 674 Soft Computing in Engineering (3-0-0-6)

Offered to: UG & PG

Introduction to soft computing, hard computing, Need for soft computing; Neurons and neural networks; Basic models of artificial neural networks – single-layer perceptron, multilayer perceptron; Radial basis function networks; SOM; Recurrent neural networks; Training of neural network; Applications of neural networks in mechanical engineering; Introduction to fuzzy sets, Fuzzy reasoning and clustering; Optimization tools – traditional and non-traditional, genetic algorithms, simulated annealing etc.; Combined techniques – Genetic Algorithms–Fuzzy Logic, Genetic Algorithms–Neural Networks, Neural Networks–Fuzzy Logic.

Textbooks:

[1] D. K. Pratihar, Soft Computing, Narosa Publishing House, 2008.

[2] S. Haykin, Neural Networks: A Comprehensive Foundation, 2nd Ed, Pearson Education, 1999.

[3] G. Chen and T. T. Pham, Introduction to Fuzzy Sets, Fuzzy Logic, and Fuzzy Control Systems, CRC Press, 2001.

References:

[1] P. M. Dixit, U. S. Dixit, Modeling of metal forming and machining processes: by finite element and soft computing methods, 1st Ed, Springer-Verlag, 2008.

[2] K. Deb, Optimization for Engineering Design: Algorithms and Examples, Prentice Hall, 2006.

[3] R. A. Aliev, R. R. Aliev, Soft Computing and its Applications, World Scientific Publishing Co. Pte. Ltd., 2001.