

EE6224

NEURAL AND FUZZY SYSTEMS

Acad Unit: 3.0
Prerequisite: NIL
Effective: Acad Year 2003-04
Last update: 5 Feb 2003

OBJECTIVE

This course provides a unified engineering perspective on neural networks and fuzzy system with emphasis both on theory and applications.

DESIRED OUTCOME

The course consists of two major sections. In the first section, students learn neural network theory and applications and should be able to use neurons as signal functions for hopfield and associative memory network. Unsupervised synaptic learning and review of probability theories are studied as the first step of in-depth study. Finally, neurons and perceptrons are combined together to allow the students have a complete picture of the thinking and learning procedure of neural networks including RBF networks. The second section requires the students to master fuzzy logic and the theory of fuzzy logic systems. This includes fuzzy relation, fuzzy proposition and approximate reasoning.

OTHER RELEVANT INFORMATION

The basic theory uses only elementary calculus, linear algebra and probability. Some applications use more advanced techniques from digital signal processing, random processes, and estimation and control theory. The text and continue assignment in the course introduce and develop these techniques.

CONTENT

Neural Dynamics and Models. Synaptic Dynamics. Single and Multi-layered Perceptrons. Radial-Basis Function Networks. Fuzzy Logic Theory. Fuzzy Systems and Applications.

ASSESSMENT SCHEME

Continuous Assessment	20 %
Final Examination	80 %

TEXTBOOKS

1. Simon Haykin, Neural Networks – a Comprehensive Study, Prentice Hall, 1999.
2. Kosko, B, Neural Network and Fuzzy Systems, Prentice Hall, 1992.

REFERENCE

1. Zurada J. M., Introduction to Artificial Neural Systems, West Publishing Company, 1992.