EEE 443/543
Fall 2013-2014

An Introduction to Neural Networks

Tentative Course Schedule

Instructor : Ömer Morgül
Office/Phone/e-mail : EE408/1529/morgul@ee.bilkent.edu.tr
Office Hours : Thu. 13:30-15:30.
TA's : A. A. Akyol, H. Tuna, Ç. Yeşil.

Class Time : Tue. 15:40-17:30 (EE 05)
Fri. 13:40-15:30 (EE 05)

This is an introductory course on Artificial Neural Networks for senior undergraduate and graduate students. Prerequisites are linear algebra, ordinary differential equations and computer programming. There will be 3 term projects, 1 Midterm and 1 Final.

Midterm will be held at **Nov. 18**, 17:30-19:30 (place to be specified).

FZ Policy : The students who satisfy **all** of the following will be admitted to the final :
i : At least 20/100 from the Midterm
ii : All of the project reports will be delivered.
iii : All of the project demos will be performed.
Students who fail in **any** of the conditions given above will obtain an FZ grade.

Grading : Project1-2 : 15+15%, Project 3: 20%, Midterm : 20%, Final : 30 %

Course Policy :
1 : Students are required to check the course web site frequently for course related announcements. For course web page, see :www.ee.bilkent.edu.tr/~eee443/
2 : All assignments must be prepared individually. Disciplinary action may be taken for those who do not adhere to academic conduct.

Topics :
1- Introduction.
2- Neuron model, neural network structures.
3- Learning rules and tasks.
4- Perceptron, single layer feedforward networks.
5- Multilayer feedforward networks, least mean square algorithm, error back-propagation.
6- Recurrent (Hopfield) networks.
7- Self-organizing networks.
8- Support Vector Machines.
9- Radial basis functions.
10- Simulated Annealing, Spin-Glass Theory.
11- Associative memory, analysis and design

The following book is suitable and is recommended for the undergraduate students :

J. M. Zurada, *Introduction to Artificial Neural Systems,* West Pub. Co., S. Paul, 1992.

The following book is suitable and is recommended for the graduate students :

S. Haykin, *Neural Networks, A Comprehensive Foundation*, 2nd ed. Macmillan, New York, 1999.

Supplementary Books :

N. K. Bose, P. Liang *Neural Network Fundamentals..* McGraw-Hill, 1996.
E. Davalo, D. Naim, *Neural Networks,* Macmillan, 1991 (textbook).
A. Cichocki, R. Unbehauen, *Neural Networks for Optimization and Signal Processing,* J. Wiley, 1993.
T. Khanna, *Foundations of Neural Networks,* Addison Wesley, 1990 (textbook).
D. P. Morgan, C. L. Scofield, *Neural Networks and Speech Processing,* Kluwer, 1991.
Y. Kamp, M. Hasler, *Recursive Neural Networks for Associative Memory,* J. Wiley, 1990.