

Introduction to Neural Networks
T and TH 9:45 to 11 am at 121 EES
Department of Engineering Science and Mechanics
Course Format
ESci 456/EE 456
Spring 2004

Instructor: Dr. Mirna Urquidi-Macdonald
Office: 203 C Earth Engineering and Science Building
Phone: 863-4217
Office Hours: Tuesday 11:30am-1.00pm, and Wednesday 9:00-10:30 am.
Others: by appointment
Text: Neural Networks Design by Hogan, Demuth, and Beale.

Grading: Your final grade in this course will be based on 1) Homework (to be collected as indicated-no late collections) 30% of your grade, 2) one test (given during the semester) 30% of your grade, and 3) the final test for undergraduate students, and a project for graduate students to be defined mid-semester (40% of your grade).

The class participation will involve "hands-on" homework (MatLab, C⁺⁺, Fortran, or other languages can be used to develop the homework and projects, MatLab is recommended). The first test will be scheduled during class time as indicated on the Assignment Sheet. The final project will be assigned half way through the semester.

Homework: The homework assignment due dates are indicated in **bold** on the Assignment Sheet. Homework Assignments will be posted on ANGEL. Some assignments will be discussed during class sessions.

Final Project: Students will develop their homework and projects in the computer language of your choice: MatLab/NN toolbox, C, Fortran, or others.

Scale: 100-95 = A
95-90 = A-
90-85 = B+
85-80 = B
80-50 = C or D (lenient scale)
49-0 = F

Assignment Sheet

Date	Homework due	Subject
January 13	Read Chapter 1. Homework problems	Introduction to Neural Networks-Linear Algebra Review
January 15	Read Chapter 2. Homework problems	Neuron model and architectures
January 20	Chapter 3. Examples	Examples
January 22	Read Chapter 4. Homework problems posted in Angel	Perceptron Learning Rule
January 27	Read Chapter 5. Homework problems	Signal and Weight Vector Space
January 29	Read Chapters 6. Homework problems	Linear Transformation for Neural Networks
February 3	Read Chapter 7. Problems posted in Angel. Homework problems	Supervised Hebbian Learning
February 5	Read Chapters 8. Homework problems	Performance Surface and Optimum Points
February 10	Read Chapter 9. Problems posted in Angel. Homework problems	Performance Optimization
February 12	Read Chapter 10. Problems posted in Angel. Homework problems	Adaline
February 17	Read Chapters 11 and 12. Homework problems	Backpropagation
February 19	Problems posted in Angel	Variation of Backpropagation
February 24	Problems posted in Angel	Bacpropagation Applications
February 26		Review
March 2		TEST
March 4	Chapter 13. Homework problems	Associative Learning: Hebb rule
March 16	Problems posted in Angel.	Associative Learning: Hebb rule
March 18	Problems posted in Angel.	Associative Learning
March 23	Chapter 14: Competitive learning. Homework problems	Hamming; SOM; LVQ
March 25	Homework	Kohonen nets and applications
March 30	Homework	Kohonen nets and applications
April 1	Chapter 15. Homework posted in Angel	Grossberg Networks
April 6	Read Notes Chapter 16	Adaptive resonance Theory
April 8	Problems Chapter 16. Homework posted in Angel	Adaptive resonance Application
April 13	Notes Chapter 17. Homework problems	Stability
April 15	Chapter 18. Homework	Hopfield Network
April 20	Homework problems	Hopfield Applications
April 22	Homework problems	Hopfield Applications
April 27		Introduction to other AI subjects: Fuzzy Logic and Genetic Algorithm
April 29		Review