**EE 500: NEURAL AND FUZZY SYSTEMS**

**Spring 2010**

6:30 – 9:20 Wednesday

Professor Kosko  
Hours: Wed 4:00 - 5:00  
Office: EEB 438  
Fri 5:00 - 6:00

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voicemail: (213) 740 - 6242

**Summary.** The course presents modern neural networks and fuzzy systems. Lectures focus on the formal structure of fuzzy and neural systems. Project required that applies these techniques to financial engineering or to some other approved area.

Required:  
- Kosko, B., *Neural Networks and Fuzzy Systems*, Prentice Hall, 1992  
  
Note: Above two texts are available as a bound copy in the bookstore  

Recommended:  

**COURSE OUTLINE**

**JAN 13:** Introduction to neural and fuzzy systems.

**JAN 20:** BAM stability. Uncertainty types. Multivalued logic.

**JAN 27:** Uncertain inference. Rational asset pricing.

**FEB 3:** Two-stage RAP. Multivalued set theory.

**FEB 10:** IP overview. Subsethood and partial equality.

**FEB 17:** MIDTERM I. Pareto optimality. Market equilibrium.


**MAR 3:** Knowledge combination. SAM supervised learning.

**MAR 10:** Rule structure and approximation. *Project proposals due.*

**MAR 17:** No class: Spring Break.

**MAR 24:** Pricing derivatives. Black-Scholes equilibrium model.

**MAR 31:** MIDTERM II. Unsupervised and competitive learning.

**APR 7:** Adaptive clustering. Neural vector quantization.

**APR 14:** Gradient systems. Training multilayer perceptrons. Feedback SAMs.

**APR 21:** Project presentations. Mandatory attendance.

**APR 28:** Project presentations. Mandatory attendance.
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GRADING PROCEDURE

1. **Midterms.** Two midterms. Each worth 25 points.

2. **Homework.** Checked and recorded. Not graded. A perfect set of worked homework problems can earn 10 points. Lesser homework sets earn fewer points. Grade stays as is if only some homework turned in. How much homework counts for how many points lies at the discretion of the instructor and teaching assistant. Students may discuss the homework problems among themselves but each student must work his or her own problems. Cheating warrants a course grade of F.

3. **Project.** Well prepared and presented project worth 50 points. Exceptional projects can earn an automatic course grade of A. Hence: *Project excellence trumps all else.* Projects must have the instructor’s written approval. Failure to present a project on schedule results in automatic course grade of F. Project evaluation at discretion of instructor and teaching assistant. View project as the final exam.

4. **Course Grade.** 100 points possible in course.
   
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5. **Cheating.** Not tolerated. Common errors in homework and exams can count as written evidence of cheating. Penalty ranges from F on exam to F in course to recommended expulsion.