Syllabus for
EEL 6825 Pattern Recognition

Spring 2009   Tue: period 4 (10:40 am – 11:30 am)   Location: NEB 201
Thr: periods 4-5 (10:40 am – 12:35 pm)

Instructor:  K. Clint Slatton, Assistant Professor
University of Florida
Dept. of Electrical and Computer Engineering
Engineering Building, Rm 459; Gainesville, FL  32611
Tel: 352.392.0634; E-mail: slatton@ece.ufl.edu ; Web: http://www.slatton.ece.ufl.edu
Office hours: held in NEB 459 after class.  Tue: periods 5-6 (11:45 am – 1:40 pm), Thr: period 6 (12:50 pm – 1:40 pm)

Objectives and Description:
The objective of this course is to impart a working knowledge of several important and widely used pattern recognition topics to the students through a mixture of motivational applications and theory. Topics covered will include
• Bayesian decision theory
• Parametric estimation and supervised learning
• Nonparametric methods
• Linear discriminant functions
• Unsupervised learning and clustering
• Feature extraction and feature selection
• Applications (multiple-model, multiscale, hydro-geologic)

Both traditional (pencil and paper) and computer-based homework assignments will be used to illustrate key concepts and develop problem-solving skills. Selected journal paper readings will also be assigned. A significant fraction of the grade will be determined by an in-class exam, which will draw from lecture, the textbook, and the journal paper readings.

This class is relevant to students in several different departments, including Civil and Coastal Engineering, Electrical and Computer Engineering, Geology, Agricultural and Biological Engineering, and Environmental Engineering. Grades will be determined in part by a semester project in which the students will form teams and learn how to solve real-world pattern classification problems. Interdisciplinary teaming on these projects is strongly encouraged. Data sets can be provided for the projects by the instructor.

Prerequisites:
• EEL 5544-Noise in Linear Systems, undergraduate-level probability theory/stochastic processes, or instructor permission
• Some exposure to mathematical software, e.g. MATLAB or Mathematica

Textbook (required):
Course Grading:
Grades will be assigned based upon

- Homework/ mini projects: 20% : mix of analytical, computer, and literature reviews
- Quizzes: 10%: some may be unannounced ("pop")
- Midterm exam: 30% : in class (date to be announced)
- Class project: 40% : in teams

Comments:
We have a class in the ECE Department dedicated to the topic of neural networks (EEL 6814—Neural Networks for Signal Processing). Thus, I will not cover neural networks in detail.

Class e-mail:
Many class announcements, clarifications and answers to student questions will be distributed primarily via e-mail. To get on the class e-mail list, you should send an e-mail to slatton@ece.ufl.edu with the subject of the e-mail being “EEL6825 email list”. Be sure to include your (1) full name, (2) home department, (3) the “…@…ufl.edu” email address I can use to contact you, and (4) number of years in graduate school in the body of the e-mail. *Note* I will only send email to “…@…ufl.edu” addresses since many other accounts, such as hotmail or yahoo, commonly bounce emails. Do this as soon as possible.

Mathematical software:
Some homework assignments and the project will require the use of a mathematical software package, such as Mathematica, MATLAB, MathCad or Maple, or a computer language compiler, such as IDL or C/C++. All are available at either student prices or free of charge. Which software package or language you choose is entirely up to you. MATLAB will be used almost exclusively for demonstrations and examples, as it is the most comprehensive algorithm development package for numerical mathematics and data visualization. Matlab is also freely available on most UF College of Engineering machines through a UF site-license.

Students with Disabilities:
For information on classroom accommodation and requirements for instructor notification, please see (http://www.dso.ufl.edu/drp/faqs.htm).

Attendance:
Perfect class attendance is not required, but regular attendance is expected. It is the student's responsibility to independently obtain any missed material (including handouts) from lecture. *Note* that missed quizzes can not generally be made up (special circumstances, such as medical problems, can be exceptions). Quizzes will be emailed to EDGE students.
Late Assignments:
Grade reduction of 10% per day after the due date if received before the solutions are posted. Grade of zero once solutions are posted. Deadlines for EDGE students are generally delayed 1 week from the posted deadlines. Further allowances can be made for EDGE student deadlines, particularly for those students serving in the Armed Forces, on a case-by-case basis.

Academic Honesty:
All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a student at the University of Florida, and to be honest in all work submitted and exams taken in this class and all others. For more information, please see the academic honor code and http://www.dso.ufl.edu/judicial/academic.php. *Note*, I find that graduate students often place too much emphasis on their grades, which can create a motivation for academic dishonesty. I would like to remind you that what you learn is more important than what grade you get. Future employers may ask what courses you took, but rarely do they ask MS and PhD students about what grades they received.