

ECE 856: PATTERN RECOGNITION  
Spring 2010  
Course Syllabus

**Format:**

Section 001, 2:00-3:15 TTH, 227 RIGGS.

**Instructor:**

Dr. R.J. Schalkoff, 334 EIB, [rjschal@clemson.edu](mailto:rjschal@clemson.edu), (864)-656-5913.

**Text:**

Schalkoff, *Pattern Recognition: Statistical, Syntactic and Neural Approaches*, John Wiley and Sons, NY, 1992, ISBN 0-471-52974-5.

**Attendance:**

Not required; probably necessary.

**Web Use:**

We will use Blackboard. Be sure you can access the course page.

## Office Hours:

M,T,W,Th 11:00AM-12:00PM. Others by appointment.

## COURSE OUTLINE<sup>1</sup>

### I. PART 1: INTRODUCTION AND GENERAL PATTERN RECOGNITION CONCERNS

- A. What is Pattern Recognition (PR)?
- B. Pattern Recognition Approaches
- C. Examples of PR Applications
- D. Pattern Recognition Extensions

### II. PART 2: STATISTICAL PATTERN RECOGNITION (StatPR)

- A. Introduction to StatPR
- B. Supervised, Parametric Approaches
- C. Unsupervised Approaches

### III. PART 3: SYNTACTIC (STRUCTURAL) PATTERN RECOGNITION (SyntPR)

- A. Introduction to SyntPR
- B. Structural Analysis Using Constraint Satisfaction and Structural Matching
- C. The Formal Language-based Approach to SyntPR
- D. Learning/Training in the Language-based Approach (Grammatical Inference)

### IV. PART 4: NEURAL PATTERN RECOGNITION (NeurPR)

- A. Feedforward Networks for Classification
- B. Other Related Neural Approaches and Extensions

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<sup>1</sup>See the text Table of Contents for more detail.

## Grading:

Tests(3): 100 %. Each test may have a 'Simulation' component. *Simulations and quizzes are individual efforts.*

## Relevant Topics

Each time this course is offered, I emphasize certain topics which I feel are both timely and of significant interest to the audience. Spring 2010 possibilities include, but are not restricted to:

- Support Vector Machines (SVM).
- Algorithms and architectures for unsupervised learning and related computational concerns leading to parallel implementation.

## Additional Remarks:

The *Clemson Announcements* contains additional information and guidelines on a number of important and related topics, including attendance, special needs and **academic integrity**. These guidelines are incorporated into ECE 856 by reference.

My teaching philosophy may be summarized in these remarks:

- The class (you) and I are 'in this together' for the session. **However, your progress is up to you.** Sometimes we can have fun with the material; sometimes work is required. Not everything can be made simple or fun.
- Academic integrity is a serious issue.
- All our interactions should be conducted within a framework of mutual respect.