ECE 330:541, Stochastic Signals and Systems
Information Sheet and Syllabus
Fall 2003

- **The Why:** Randomness underlies many physical processes, and therefore understanding techniques to characterize and model the stochastic nature of the world around us is critical for successful engineering. ECE 330:541 Stochastic Signals and Systems serves as an introductory graduate course that provides the fundamental material needed for modeling the uncertainties of nature, and thereby tools that are necessary to do research in a variety of disciplines, such as Communications, Networking, Control, Signal Processing, Information Theory, and Security.

- **Course Specifics:**

  - Place and Time: MW 4:30-5:50, at SEC-211.
  - Instructor: Wade Trappe. Phone: x50611 . Office: CORE 523.
    Email: trappe@winlab.rutgers.edu. Office Hours are MW 10:00-11:30 am. If you desire to speak with me outside of these times, please email me to arrange an appointment.
  - TA: None.

- **Handouts and Materials:** All course related materials will be available at the course website www.winlab.rutgers.edu/~trappe/StochF03.html. Homework assignments will be posted on this website and announced in class.

- **Prerequisites:** It is expected that students have had an undergraduate level class in probability. Additionally, students should have a background in multivariable calculus, linear algebra, and linear systems. A quick barometer: Do you know what convolution is? Can you calculate double integrals? Can you invert matrices? You should be able to answer yes to all three of these questions.

- **Texts:** Probability and Random Processes with Applications to Signal Processing, by J. Woods and H. Starks. Prentice Hall, 2001. Optional Book: Probability and Measure, by P. Billingsley.

- **Grading:** There will be two computer projects that will each require a report, and there will be 3 exams (two midterms and one final).

  - Homework: (0%) There will be homework assignments. However, they will not be graded. Solutions to the assigned problems will be provided. Students are encouraged to do the problems and practice... practice... practice.
  - Computer Projects: (2 projects at 10% each) The purpose of the two projects is to give students hands on experience with the concepts taught in the class. Students will report their findings in a short writeup that will be graded. The writeups will be graded based upon the technical content and the clarity of the exposition.
  - Midterms: (2 midterms at 25% each) Two midterms will be given during the course of the semester. At least one week notice will be given in class to allow students to prepare. The exams are closed book. I don't believe in *cheat sheets* and such gimmicks that trick students into thinking they are prepared for an exam. So, no note sheets are allowed and I reiterate the importance of doing the homework problems. I will try to keep a mix of applied and theoretical problems in the midterms. I reserve the right to be *mean* and ask hard questions... I also reserve the right to be *nice* and ask some easy questions. Think of me as a random variable!
  - Final: (30 %) The final exam is comprehensive and then some. Any material covered in class is fair game. However, I will examine your ability to go beyond the basic course material and will expect you to be able to apply your knowledge to challenging problems.

  There is no set policy regarding the distribution of grades. However, since this class is considered a *core* class, the grading will be highly competitive. Not all students will be getting a B or better– grades of C and C+ will be given. After the first midterm, I will provide feedback so that students can gauge their performance.