

# SAN JOSE STATE UNIVERSITY

## Electrical Engineering Department

### EE 250 Probability, Random Variables and Stochastic Processes SPRING 2008

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#### Course Description:

This course is a graduate-level course on probability theory, random processes and their applications in electrical engineering. Topics covered include review of probability, random variables, transform techniques, random processes, filtering of random signals and Markov chains. The course covers random processes in detail: discusses autocorrelation, power spectral density, ergodicity, stationarity, effect of filtering and estimation of random signals. We will also discuss applications of random processes in signal processing, communications and queueing theory.

#### Course Information:

- **Instructor:** Birsen Sirkeci, Room: ENG 359, Phone: 4-3913, Email: bsirkeci@email.sjsu.edu
- **Time and Location:** TTh 16:30 - 17:45, ENGR 403
- **Homepage:** <http://www.sjsu.edu/faculty/birsen.sirkeci/EE250Spring2008.htm>
- **Prerequisites:**  
EE112 (Linear Systems), EE102 (Probability and Statistical Analysis)
- **Office hours:** Wed 13:30-18:30
- **Reading Material:**
  - **Required Text:**  
*Probability and Random Processes for Electrical Engineering* by A. Leon-Garcia, Prentice Hall, (3rd or 2nd Ed).
  - **Supplemental Texts:**
    - \* *Probability, Random Variables, and Stochastic Processes* by A. Papoulis and S.U. Pillai, Mc-Graw Hill, 4th Ed., 2002.
    - \* *Introduction to Probability* by D.P. Bertsekas and J.N. Tsitsiklis, Athena Scientific, 2nd Ed., 2002.
    - \* *Intuitive Probability and Random Processes using MATLAB* by S. Kay, Springer, 2006.
  - **Other Reading Material:** Handouts posted on the webpage.

- **Grading Policy:**

Homework sets will be assigned on Thursdays and they will be due in a week. Homework solutions will be provided after the due date. **Late homework will not be accepted.**

There will be two midterm exams and a final exam. The exams are open books and notes.

Homework	Assigned on Thursdays and due in a week	25 %
Midterm 1	<b>February 28, 2008, Thursday, 16:30 - 17:45</b>	25 %
Midterm 2	<b>April 1, 2008, Tuesday, 16:30 - 17:45</b>	25 %
Final	<b>May 16, Friday, 14:45-17:00</b>	25 %
<b>Total</b>		<b>100 %</b>

## **Tentative Schedule:**

- 1) Introduction and Probability Models (1 Lecture)
- 2) Basic Concepts of Probability (2-3 Lectures)
- 3) Discrete Random Variables (2-3 Lectures)
- 4) Continuous/Mixed Random Variables (3-4 Lectures)

### **MIDTERM 1**

- 5) Multiple Random Variables (4-5 Lectures)
- 6) Random Processes, Stationarity (6-7 Lectures)

### **MIDTERM 2**

- 7) Analysis and Processing of Random Signals (3-4 Lectures)
- 8) Markov Chains (3-4 lectures)
- 9) Sums of Random Variables and Long-Term Averages (if time permits)

## **Notes:**

- You are responsible for understanding the policies and procedures about add/drops, academic renewal, withdrawal, etc.
- You are responsible for reading and understanding the university/college/department policies.
- Attendance to all of the lectures are critical for learning the material.
- Classroom behavior: Come to the class on time and leave at the end of the lecture. Turn off your cell phone during the lectures. Do not eat and drink in the classroom.
- Additional office hours are possible by appointments only.

## UNIVERSITY/COLLEGE/DEPARTMENT POLICY INFORMATION:

- A. **Academic Integrity Statement:** "Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University's Integrity Policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Judicial Affairs. The policy on academic integrity can be found at: [http://sa.sjsu.edu/judicial\\_affairs/index.html](http://sa.sjsu.edu/judicial_affairs/index.html)
- B. **Campus policy in compliance with the Americans with Disabilities Act:** "If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with the DRC to establish a record of their disability."
- C. **EE Honor Code:** The Electrical Engineering Department will enforce the following Honor Code that must be read and accepted by all students. "I have read the Honor Code and agree with its provisions. My continued enrollment in this course constitutes full acceptance of this code. I will NOT:
- Take an exam in place of someone else, or have someone take an exam in my place
  - Give information or receive information from another person during an exam
  - Use more reference material during an exam than is allowed by the instructor
  - Obtain a copy of an exam prior to the time it is given
  - Alter an exam after it has been graded and then return it to the instructor for re-grading
  - Leave the exam room without returning the exam to the instructor."

### Measures Dealing with Occurrences of Cheating:

- Department policy mandates that the student or students involved in cheating will receive an "F" on that evaluation instrument (paper, exam, project, homework, etc.) and will be reported to the Department and the University.
- A student's second offense in any course will result in a Department recommendation of suspension from the University.