

**San Jose State University
College of Engineering
Electrical Engineering Department**

EE250 (Section 01) Probability, Random Variables, and Stochastic Processes Spring 2020

Course and Contact Information

Instructor: Nader F. Mir

Office Location: Department of Electrical Engineering, College of Engineering, E251

Telephone: (408) 924-3986

E-mail Address: nader.mir@sjsu.edu (preferred contact method: in person - office hours)

Office Hours: Mon/Wed, 12:00n-1:00pm

Instructor's Web-site: <http://www.sjsu.edu/people/nader.mir/>

Class Days/Time: Mon/Wed, 1:30pm-2:45pm

Classroom: E341

Prerequisites: (Graduate Standing)

Course Description and Outcomes

Course Description: Random variables, random processes, power spectral density, optimum linear systems, queuing theory. **Credit Hours:** 3

Course Learning Outcomes (CLOs). Upon successful completion of this course, students will be able to:

1. An ability to analyze fundamentals of probability and set theories.
2. An ability to analyze fundamentals of probability axioms, conditional probability, and independence.
3. An ability to analyze sequential experiments, counting methods, and independent trials.
4. An ability to analyze discrete and continuous random variables, and PMF, PDF, and CDF.
5. An ability to analyze useful discrete and continuous random variables such as Gaussian and Poisson.
6. An ability to analyze functions of a random variables, and transfer functions.
7. An ability to analyze multiple discrete and continuous random variables.
8. An ability to analyze correlation and covariance of multiple random variables.
9. An ability to analyze joint and marginal PMF, PDF, and CDF, functions of multiple random variables.
10. An ability to analyze random (stochastic) processes.
11. An ability to analyze stationary and wide-sense stationary random processes.
12. An ability to analyze auto-correlation and auto-covariance of random processes.
13. An ability to analyze random signal processing.
14. An ability to analyze Markovian processes and Markov chains.

Textbook/References

Required Textbook

“Probability and Random Processes for Electrical Engineering,” By: A. Leon-Garcia. 3rd edition, Pearson Prentice Hall, ISBN: 0131471228.

Other References

1. “Probability and Random Processes,” By: Henry Stark and John Woods.

Course Requirements and Assignments

Class Participation: The class attendance is required and is an important factor to achieve the learning objectives of this course.

Homework Assignments: Normally bi-weekly. The hardcopies of assignments are required to be turned in class. Working on assignments is an important factor to achieve the learning objectives of this course. Answers to homework will be given in class before each exam.

Exams:

- Midterm Exam: Monday, March, 23rd, (location: TBA).
- Final Exam: Monday, May 18th, 12:15pm (location: TBA).

Evaluation and Grading Information

Assignments: 10%

Midterm Exam: 40%

Final Exam: 50%

Standard Grading Percentage Breakdown (after possible normalizations):

<i>Grade</i>	<i>Points</i>	<i>Percentage</i>
<i>A plus</i>	<i>960 to 1000</i>	<i>96 to 100%</i>
<i>A</i>	<i>930 to 959</i>	<i>93 to 95%</i>
<i>A minus</i>	<i>900 to 929</i>	<i>90 to 92%</i>
<i>B plus</i>	<i>860 to 899</i>	<i>86 to 89 %</i>
<i>B</i>	<i>830 to 829</i>	<i>83 to 85%</i>
<i>B minus</i>	<i>800 to 829</i>	<i>80 to 82%</i>
<i>C plus</i>	<i>760 to 799</i>	<i>76 to 79%</i>
<i>C</i>	<i>730 to 759</i>	<i>73 to 75%</i>
<i>C minus</i>	<i>700 to 729</i>	<i>70 to 72%</i>
<i>D plus</i>	<i>660 to 699</i>	<i>66 to 69%</i>
<i>D</i>	<i>630 to 659</i>	<i>63 to 65%</i>
<i>D minus</i>	<i>600 to 629</i>	<i>60 to 62%</i>

Tentative Course Schedule

1. Fundamentals of Set Theory and Probabilities, Chapter 2, (Weeks 1 and 2)
2. Sequential, Bernoulli, and Binomial Laws, Chapter 2, (Weeks 2 and 3)
3. Discrete Random Variables, Chapter 3, (Weeks 4, and 5)
4. Continuous Random Variables, and Transfer Methods, Chapter 4, (Weeks 5, 6, and 7)

Quick Review and Midterm Exam (Week 8)

5. Multiple Random Variables, Chapter 5, (Weeks 8 and 9)
6. Stochastic Processes, Chapter 7, (Weeks 10, 11, and 12)
7. Application of Stochastic Processes in Random Signal Processing, Chapter 8, (Week 13)
8. Markovian Processes, Chapter 9, (Weeks 14 and 15)

Quick Review, and Final Exam (Week 16)

University Policies

Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at <http://www.sjsu.edu/gup/syllabusinfo/>. Make sure to visit this page, review and be familiar with these university policies and resources.

EE Department 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.