

San José State University
Department of Electrical Engineering
EE 250, Probability, Random Variables and Stochastic
Processes, Section 03, Fall 2017

Instructor:	Jalil Kamali, PhD
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Office Hours:	TTR 19:00-19:30
Class Days/Time:	TTR 19:30-20:45
Classroom:	ENG 345
Prerequisites:	EE102, EE112

Faculty Web Page and MYSJSU Messaging

Copies of the course materials will be posted on the following web-site and you are responsible for regularly checking the web-site.

<http://www.sjsu.edu/people/jalil.kamali/>

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, 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 Content Learning Outcomes

Upon successful completion of this course, students will be able to:

- **LO1** Define a random experiment, outcome, event, certain event, null event, and sample space
- **LO2** Find the probability of an event
- **LO3** Determine whether events are equally likely, mutually exclusive or independent

- **LO4** Define a random variable; classify random variables as discrete or continuous, compute probabilities from probability mass (density) functions and cumulative distribution functions
- **LO5** Calculate mean, variance, moments, probabilities associated with a random variance and its transformations
- **LO6** Compute probabilities (joint and conditional) of two random variables. Test independence of two random variables
- **LO7** Analyze probabilities associated with multiple random variables and with its transformations
- **LO8** Compute covariance and correlation for two random variables
- **LO9** Define a random process and classify random processes
- **LO10** Analyze and characterize random processes in terms of probability density function
- **LO11** Identify if a process is stationary (both strict-sense and wide-sense)
- **LO12** Compute the autocorrelation and the power spectral density of a stationary random process
- **LO13** Define basic properties of a Markov chain and identify if a process is Markov chain
- **LO14** Apply the concepts of probability, random variables and random processes to analyze problems

Required Texts/Readings

Textbook

Probability, Statistics, and Random Processes for Electrical Engineering by A. Leon-Garcia, Prentice Hall, (3rd Ed).

The textbook is closely followed in the class and the covered sections of each chapter are announced. Students are responsible to read those sections.

Other Readings

Probability, Random Variables, and Stochastic Processes by A. Papoulis and S.U. Pillai, Mc-Graw Hill, 4th Ed., 2002.

Other equipment / material requirements

Handouts posted on the webpage.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/provost/Academic_Calendars/) web page at http://www.sjsu.edu/provost/Academic_Calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Assignments and Grading Policy

There will be two midterms and one final examination. Exams cover the assigned reading materials and class lecture notes. Homework assignments will be given regularly. While the students are not asked to hand in the solution and it will not be part of the grading, it is an essential part of learning. Thus students are urged to try to solve these problems on their own. Solutions to these problem sets will also be distributed.

Midterm 1: Thursday October 5th (30%) class time

Midterm 2: Thursday November 9th (30%) class time

Final Exam: Thursday December 14th (40%) 19:45 – 22:00

University Policies

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University's Academic Integrity policy](http://www.sjsu.edu/senate/S07-2.htm), located at <http://www.sjsu.edu/senate/S07-2.htm>, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make 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](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Disability Resource Center](http://www.drc.sjsu.edu/) (DRC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.