

**Cal State San Marcos**  
**Math 571, Probability and Random Processes**  
**Fall 2007 Course Information**

**Instructor:** Prof. Puha; Sci2-325; (760)750-4201; apuha@csusm.edu;  
<http://www.csusm.edu/puha>.

**Lecture Time:** Mondays and Wednesdays 5:30pm-7pm, Sci2-308.

**Instructor Office Hours:** Mondays 4:15pm-5:15pm, and Tuesdays 1pm-2pm.

**Virtual Office Hours:** Questions sent via email will be responded to during office hours, if time permits. Students physically present have priority.

**Description:** Framework for probability theory: probability spaces as measure spaces, random variables, expectation and conditional probability. Major results such as limit theorems for sums of random variables, zero-one laws, and ergodic theorems.

**Main Objective:** The primary aim of the course is to introduce students to stochastic modeling.

**Student Learning Objectives:** give examples of probability spaces and nonmeasurable events; work with random variables and compute expected values; distinguish between different modes of convergence; understand and apply the dominated convergence and ergodic theorems; understand, apply, and distinguish between the three fundamental limit theorems; apply coupling techniques and Stein's method; compute conditional expected values; master properties of martingales; bound probabilities and expected values using Jensen's inequality, the importance sampling identity, and Chernoff bounds.

**Email Policies:** To avoid having your message routed into the instructor's spam folder, please send messages from your UCSD student email account. You are responsible for reading all messages sent to your student email address. If you prefer to read email at another address, go to the CSUSM Webmail page and set your CSUSM account up to forward to that address.

**Course Web Page:** <http://courses.csusm.edu/math571ap/>.

**Required Textbook:** Pekoz and Ross. *A Second Course in Probability*. ProbabilityBookstore.com, Boston, MA, 2007. Available at <http://www.ProbabilityBookstore.com>.

**Additional References:**

1. Rick Durrett. *Probability: Theory and Examples*, Second Edition. Duxbury Press, 2004.
2. William Feller. *An Introduction to Probability Theory and its Applications*, Volume I, 3rd Edition. Wiley Series in Probability and Mathematical Statistics. John Wiley & Sons, 1950.

3. Jim Pitman. *Probability*. Springer-Verlag, New York, 1993. (or your Math 440 Textbook).
4. Sidney Resnick. *A Probability Path*. Birkhauser, Boston, 1998.
5. Your Math 360 or Math 430 Textbook.

**Prerequisites:** Completion of each of the following courses with a grade of C or better:

1. Math 360 or Math 430, Foundations of Analysis;
2. Math 440, Introduction to Probability and Mathematical Statistics.

**Preparing for Class:** Please read over the section in the text to be covered to prepare for lecture. This will be posted on the course homepage.

**Missed Lectures:** It is your responsibility to get the lecture notes from one of your fellow classmates in the event that you are able to attend a lecture.

**Homework:** Homework assignments will be assigned via the course webpage and due at the BEGINNING of lecture on the due date. Clear, complete, fully justified solutions are required for full credit. Graduate students must submit their homework in  $\text{\LaTeX}$ . Presentation also counts. Papers must be stapled and answers must be legible and well organized. NO LATE HOMEWORK will be accepted. Questions are welcome in office hours. Students are expected to make an earnest effort to solve a problem and to clarify their questions before seeking help.

**Obtaining  $\text{\LaTeX}$  for your computer:** For MAC, visit <http://www.uoregon.edu/~koch/texshop/texshop.html>, click the Obtaining tab and follow the instructions. For PC, install three packages in this order: MikTeX; Ghostscript and Ghostview; WinShell (borrow CD from instructor). Move the file Homework1.tex to your desktop from your email attachments. Click on the file icon to open it in  $\text{\LaTeX}$ . You will see a regular text file containing a bunch of LaTeX commands intermingled with straight text. Then click the typeset or compile button in the top of the window. A new window should open showing a pretty file.

**$\text{\LaTeX}$  Manual:** There are tons of them out there. The one that I use is the following: Leslie Lamport.  $\text{\LaTeX}$ : A Document Preparation System User's Guide and Manual, 2nd Edition. Addison-Wesley, 1994.

I like it because it isn't lengthy and seems to have most things that I have needed. There might be newer versions by now.

**Exams:** Two midterm exams and one final exam will be given. To prepare, students should review the homework problems and the lecture notes. Calculators, cell phones, and all other electronic devices are not allowed. Such devices should be turned off and stowed securely

in your backpack, i.e., not in your pocket or other easily accessible location. NO MAKEUP EXAMS. Plan accordingly.

Students must bring any grading/scoring concerns to the attention of the professor the same day that the exam is returned. If you unable to discuss this with the professor in person, write a note and attach it to the front of the exam. Either ask Vanessa Andrin in Sci2-337 to place this on the professor's desk or slide it under the professor's office door.

**Midterm Exam Dates:**

Exam One: Wednesday, October 10, 2007.

Exam Two: Wednesday, November 21, 2007.

**Final Exam:** The exam is comprehensive. Please bring a self addressed, stamped postcard (available at the CSUSM Bookstore) if you would like your grade mailed to you.

**Final Exam Date:** Wednesday, December 12, 2007, 4pm-6pm.

**Grades:** Your grade will be calculated from the best of the following options:

Homework	Exam One	Exam Two	Final Exam	Total
20%	20%	20%	40%	100%
20%	0%	20%	60%	100%
20%	20%	0%	60%	100%

**Academic Honesty:** Academic dishonesty will NOT be tolerated. Violations will be reported to the Dean of Students.

**Academic Honesty and Homework:** The instructor recognize that students benefit from discussing approaches to the assigned homework with their classmates. This practice is encouraged. However, it is expected that each student will make an independent attempt to solve any given homework problem and prepare questions before discussing it with his/her classmates. It is also expected that each student will submit an independent final write up of his/her solution. To achieve this, the final write up should be completed without referring to a book or notes and without asking others for assistance. The student should continue to study and ask questions until a final independent write up can be achieved.

**Cell Phones:** TURN THEM OFF during class.