

# MATH180B Introduction to Stochastic Processes I, Winter 2019

**Instructor:** Tianyi Zheng (tzheng2@math.ucsd.edu)

**Course Webpage:** <http://www.math.ucsd.edu/~tiz161/180b.html>

**Overview of the course:** Stochastic processes are used to model systems that evolve over time in some way that involves randomness. Stochastic processes have become important in fields such as Biology, Engineering, and Economics. This course, together with Math 180C, provides an introduction to stochastic processes for students who have taken a beginning course in probability theory. We will spend approximately three weeks on conditional distributions, five weeks on Markov chains, and two weeks on Poisson processes.

**Textbook:** Although not mandatory, it is highly recommended to have the following two textbooks to consult besides lecture notes.

- *An Introduction to Stochastic Modeling* by Mark Pinsky and Samuel Karlin.
- *Essentials of Stochastic Processes* by Rick Durrett (which is written at a slightly more advanced level but is available online through the UCSD library web site).

**Exams:** There will be two midterm exams and a final exam. The midterm exams will be held in class on Wednesday January 30, and Wednesday February 27. The final exam will be at 3PM-6PM on Wednesday March 20. Please bring your student ID to the exams.

**Homework:** Homework will be due each week on Thursdays at 6PM. The first homework is due Thursday January 17. To submit your homework, please upload your work in .pdf format to Gradescope on the due date. You should write your homework solutions neatly and carefully and provide full justification for your answers. Answers alone are insufficient and will receive zero credit. Homework solutions will become available in TritonEd shortly after the assignment is due.

**Grading:** Homework will count for 20 percent of the final grade. The lowest homework score will be dropped. Each midterm will count for 20 percent, and the final exam will count for 40 percent; alternatively you may drop one lower midterm and the final exam will count for 60 percent.

**Regrade Requests:** Regrade requests will be handled through Gradescope. For homework you should submit any regrade request within three days of the time when the graded work is made available to you; and for exams within seven days. Please understand that while we will correct errors in the grading, we will not modify the grading rubric or negotiate over partial credit after graded papers are returned to students.

**Lateness policy:** To make allowances for technical difficulties with Gradescope, homework assignments will be accepted up to 30 minutes late for a one-point penalty. Otherwise,

late homework will not be accepted. Other accommodations will be made only under unusual circumstances that are beyond the student's control, such as serious illness or a family emergency. Likewise, make-up exams will be given only under unusual circumstances that are beyond the student's control. In such cases, you must notify the instructor as soon as possible. Please understand that accepting late work in less extreme cases is unfair to other students. No make-up midterm exams will be given.

**Office Hours:** The instructor and TAs will hold regular office hours, time and locations are posted on the course webpage. You are encouraged to attend office hours if you have questions about the course material. You may ask questions about homework problems during office hours, in which case the instructor or TA will try to determine the source of your difficulties and guide you on the right path. However, because the purpose of homework is to provide you with practice at solving problems yourself, please do not expect the instructor or TA to provide answers or solutions to homework problems during office hours.

**Time commitment:** According to the policy of the Academic Senate of the University of California (see <http://www.universityofcalifornia.edu/senate/manual/rpart3.html>), "The value of a course in units shall be reckoned at the rate of one unit for three hours' work per week per term on the part of a student." Math 180B is a four-unit course, so you should expect to spend about 12 hours per week on the course.

**Academic integrity:** It is essential that all students adhere to the UCSD Policy on Integrity of Scholarship. Cases of academic dishonesty will be reported to the Academic Integrity Coordinator, and students found to be responsible for a policy violation will be subject to academic and administrative sanctions. Students are expected to obey the following rules:

- **Exams:** You will be allowed to use one  $8\frac{1}{2} \times 11$  page of notes on exams, and you may write 2 on both sides of the page if you wish. You are also allowed to use a calculator, but you may not share a calculator with other students during the exam. All devices that could be used for communication or internet access, such as cell phones, must be put away and out of view during the exam. You must stop working immediately when time is called, and refrain from speaking with other students until your exams are turned in.
- **Homework Assignments:** You may consult with other students in the class, the instructor, or the TA while working on these problems. However, the following rules apply: 1. You must write your final homework solutions independently. You may not show another student your solution to a problem, or use another student's solution as the basis for your own. You may not copy or paraphrase the work of another student. 2. You must not consult anyone other than the instructor, TA, or other students in the class. For example, you may not discuss homework problems with tutors in the Calculus Lab or students who completed Math 180B in previous years. Also, you may not make use of web sites that help students with homework problems. 3. If you consult any written sources other than your class notes and the textbook, or if you discuss homework problems with other students in the class, then you must acknowledge this help on your homework and indicate on which problems you received help.