San José State University
Department of Mathematics and Statistics
Math 263 Stochastic Processes, Spring 2021

Course and Contact Information

Instructor:	Dr. Guangliang Chen
Email:	guangliang.chen@sjsu.edu
Class Days/Time:	TR 10:30-11:45am
Meeting mode:	Online, synchronous (Zoom ID: 851 5141 0181, registration required)
Office Hours:	TWR 3-4pm (Zoom ID: 851 6038 0197), and by appointment
Prerequisites:	Math 39 and Math 163 (each with a grade of B or better)

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, lecture slides, and reading material can be found on the course page at http://www.sjsu.edu/faculty/guangliang.chen/Math263.html. Assignments and grades will be posted on Canvas Leaning Management System course login website at http://sjsu.instructure.com.

Piazza

The course will use Piazza at piazza.com/sjsu/spring2021/math263 as a venue for communication and discussions outside of the class meetings. Please post all course-related questions on piazza for fastest response and broadest benefit.

Course Description

Introductory course in stochastic processes and their applications. The course will cover discrete time Markov chains, the Poisson process, continuous time Markov processes, renewal theory, and Brownian motion.

Course Learning Outcomes (CLO)

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

1. Clearly state a number of discrete and continuous stochastic process models.
2. Derive the theoretical properties of each model and carry out corresponding calculations
3. Differentiate between the different models and choose the correct model for a given application.

Required Texts/Readings

Introduction to Probability Models, Sheldon M. Ross, Academic Press, 12th edition (March 9, 2019). Older editions of the book are fine for reading, but homework will be assigned based on the 12th ed.

Technology and Equipment Requirements

Students are required to have an electronic device (laptop or desktop) with a camera and built-in microphone in order to attend the Zoom-based classes and the Proctorio-based test. Additionally, they should have access to a scanner (physical or cell phone app) in order to scan and submit their work.

Students are responsible for ensuring that they have access to reliable Wi-Fi during tests. If students are unable to have reliable Wi-Fi, they must inform the instructor, as soon as possible or at the latest one week before the test date to determine an alternative. See the [Learn Anywhere website](https://www.sjsu.edu/learnanywhere/equipment/index.php) at https://www.sjsu.edu/learnanywhere/equipment/index.php for current Wi-Fi options on campus.

Any student that needs accommodations or assistive technology due to a disability should work with the Accessible Education Center (AEC), and notify the instructor at the earliest possible time.

Zoom Classroom Etiquette

Please arrive at each Zoom meeting on time. If you have to miss a class occasionally, please find out from the instructor or your classmates regarding what's said/done in that class and act accordingly.

Students are encouraged to turn on their cameras (when without privacy concerns) during each Zoom meeting. If using a virtual background, it should be appropriate and professional and should NOT suggest or include content that is objectively offensive or demeaning.

Please raise your hand to get the instructor's permission before you speak up in class. Alternatively, you can type your question or answer (when responding to the instructor's question) in the chat window.

To help keep background noise to a minimum, make sure you mute your microphone when not speaking.

Recording Policy

All lectures will be recorded and shared with the whole class; however, you should still make every effort to attend all classes. The recordings will be deleted at the end of the semester. If you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible alternatives.

Students are not allowed to record without instructor permission: Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. The university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law.

Course Requirements and Assignments

Course requirements include weekly homework assignments, two midterm exams, and a final exam.

You are expected to attend all classes and actively participate in classroom discussions which often lead to a deeper understanding of the concepts and are also strongly associated with course grade.

The homework assignments will be mostly theory and calculation questions. Detailed instructions about homework will be provided in class.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/ studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Final Examination or Evaluation

The course will end with a comprehensive final exam. Detailed information will be given later in the semester.

Grading Information

The students may collaborate on homework but must write independent solutions according to their own understanding. Copying and other forms of cheating will not be tolerated and may result in a failing grade for the course, possibly combined with other disciplinary actions from the university.

You must submit homework on time to receive full credit. Late submissions within 24 hours of the due time can still be accepted but will receive a penalty of 10% of the total number of points. Submissions that are late for more than one day (24 hours) will not be accepted for any reason.

No make-up exam will be given if you miss a midterm exam (unless you have a legitimate excuse such as illness or other personal emergencies and can provide documented evidence).

You must show all your work for both homework and tests. Note that it is your work (in terms of correctness, completeness, and clarity), not just your answer, that is graded. Thus, correct answers with no or poorly written supporting steps may receive very little credit.

The weights in determining the semester average are:
- Homework (weekly):   20%
- Midterm 1 (March 11, Thursday):   25%
- Midterm 2 (April 22, Thursday):   25%
- Final exam (May 19, Wednesday):   30%

The following cutoffs will be used for assigning students' course grades (however, the instructor reserves the right to slightly adjust these percentages in order to better reflect the actual distribution of the class in the end):

A+: 95% to 100%	B+: 85% to 87%	C+: 72% to 74%	D+: 63% to 64%	F: 0% to 57%
A: 91% to 94%	B: 78% to 84%	C: 68% to 71%	D: 60% to 62%	
A-: 88% to 90%	B-: 75% to 77%	C-: 65% to 67%	D-: 58% to 59%	

University Policies

Per University Policy S16-9 *(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/".

Disclaimer: *The instructor reserves the final right to interpret, and make changes to, all the policies that are stated in this course syllabus.*

Math 263 Stochastic Processes, Spring 2021, Course Schedule

This schedule is subject to change with fair notice in class and also through Canvas messaging system.

Week	Date	Topics, Readings, Assignments, Deadlines	Textbook sections
1	January 28	Introduction	
2	February 2	Probability review	Sections 3.2-3.5, 5.2
2	4	Probability review	
3	9	Discrete Markov Chains	Chapter 4 (4.1 – 4.8)
3	11	Discrete Markov Chains	
4	16	Discrete Markov Chains	
4	18	Discrete Markov Chains	
5	23	Discrete Markov Chains	
5	25	Poisson process	Chapter 5 (5.1 – 5.4)
6	March 2	Poisson process	
6	4	Poisson process	
7	9	Review	
7	11	Midterm 1	
8	16	Continuous Time Markov Chains	Chapter 6 (6.1 – 6.5)
8	18	Continuous Time Markov Chains	
9	23	Continuous Time Markov Chains	
9	25	Continuous Time Markov Chains	
March 29 – April 2		Spring break	
10	April 6	Renewal theory and its applications	Chapter 7 (7.1 – 7.4)
10	8	Renewal theory and its applications	
11	13	Renewal theory and its applications	
11	15	Renewal theory and its applications	
12	20	Review	
12	22	Midterm 2	
13	27	Brownian motion	Chapter 10 (10.1 – 10.3, 10.7)
13	29	Brownian motion	
14	May 4	Brownian motion	
14	6	Gaussian process regression	
15	11	Gaussian process regression	
15	13	Review	
	19	Final exam (Wednesday, 9:45am-12pm)	