

MATH 478 - Introduction to Stochastic Processes

TTh 1:40 - 3:00 PM, Room: SEC 205

[Course website](#)

Instructor: Triet Pham, Office: Hill 508, Email: tmp140@math.rutgers.edu

Office Hours: MW 10:00 - 11:30 am and by appointment.

Grader: Yujia Fan Email: yf198@scarletmail.rutgers.edu

Textbook: Ross: Introduction to Probability Models - 10th Edition

Course Objectives: In this course we will study the basic probability models (stochastic processes) in discrete and continuous time settings. Topics that we will go over include Markov chains for discrete-time models, Poisson processes, Markov chains for continuous-time models, queuing theory, renewal processes.

Course Outline:

Please note that this is a tentative outline. As the course progresses, we may adjust the pace and / or the material if necessary.

WEEK 1: Probability review, random variables. Text : Chapters 1 and 2

WEEK 2: Random variables, conditional probability and expectation. Text: Chapters 2 and 3.

WEEK 3: Conditional probability and expectation, Markov chains. Text: Chapters 3 and 4

WEEK 4 and 5 : Markov chains. Text: Chapter 4

WEEK 6 and 7 : Poisson processes. Text : Chapter 5

WEEK 8: Continuous time Markov chains. Text : Chapter 6

WEEK 9: Renewal Theory. Text : Chapter 7

WEEK 10 and 11 : Queuing Theory, Reliability Theory. Text : Chapter 8 and 9

WEEK 12 and 13: Brownian motion and Stationary Processes. Text : Chapter 10

WEEK 14 : Simulation. Text : Chapter 11

Grade Breakdown:

Homework: 15 %

Midterm 1: 25 %

Midterm 2: 25 %

Final: 35 %

Cell phone policy: No cell phone use shall be permitted in class. Violation of this policy may result in the user being asked to leave the class room.

Missing exams policy: Absence from an exam must be discussed prior to the actual exam date with the instructor and with valid reason. If an emergency happens on the exam date, the student must show proof of the emergency to the instructor. In this case, the final exam result shall be used in place of the missed exam. Unexcused absence from an exam will result in a zero in that exam.

Academic Honesty: As a Rutgers University student, you have agreed to abide by the University's academic honesty policy, as stated in <http://academicintegrity.rutgers.edu>. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

Extra help: All students are strongly encouraged to come to my office hours to discuss homework problems or any aspect of the course. I am also available by appointments if the office hours do not fit into your schedule. Sending me emails regarding your questions is also an excellent way to get a prompt response.

University Attendance Policy: Students are expected to attend classes regularly, according to what is stated in <http://sasundergrad.rutgers.edu/academics/courses/registration-and-course-policies/attendance-and-cancellation-of-class>

Important Dates:

- First midterm Feb 21, 2019
 - Second midterm Apr 4, 2019
 - Final Exam 8 - 11 am, May 10, 2019
- You can also check the final exam schedule [here](#)

Student-Wellness Services:

Just In Case Web App
<http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to

students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>.

If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.