

Course Information

MA/STAT 532 Elements of Stochastic Processes

Meeting time: MWF 3:30-4:30

Location: Schleman Hall 122

Course credit hours: 3

Course web page: <https://www.math.purdue.edu/~stindel/teaching/ma532/ma532.html>

Prerequisites: MA/STAT 416 or 519 or equivalent level.

- Students should be familiar with independence, conditional probability/expectations, the law of large numbers, the central limit theorem, and common discrete and continuous probability distributions (especially Binomial, Geometric, Exponential, and Gaussian/Normal).
- Students must also have enough mathematical maturity to be comfortable following proofs in the textbook and in lectures, and must also be able to construct proofs of their own on homeworks and tests.

Information About the Instructor

Name of the instructor: Sammy Tindel

Office Location: Math building 434

Phone number: 765-496-2846

Email Address: stindel@purdue.edu

Office hours: Mondays 11:30am-1pm on Zoom.

Name of grader: Yi Chu

Email address: chu199@purdue.edu

Course Description/ Learning Outcomes

A basic course in stochastic models, including discrete and continuous time Markov chains and Brownian motion, as well as an introduction to topics such as Gaussian processes, queues, epidemic models, branching processes, renewal processes, Martingales, etc.

Learning Resources, Technology, & Texts

- References:
 - Probability and Random Processes, by Grimmett and Stirzacker
 - Essentials of Stochastic Processes (2nd Edition - beta version), by Rick Durrett
- Brightspace/webpage
 - All links to class recordings will be posted on Brightspace.
 - All lecture notes will be posted on the MA 532 Webpage.
- Gradescope
 - All homeworks will be collected, graded, and returned on gradescope.
 - Exams will be held in person, and returned on gradescope.

Course Logistics

- **Homework:** there will be a problem set every week. The problems will be posted on the course calendar and due on Friday 11:59 pm (unless otherwise specified). The homework must be turned in through **Gradescope** platform as single pdf file, before the deadline indicated in each assignment (You must have received an email from Gradescope saying that you have been added as a student for MA/STAT 532 on Gradescope). Late homework will not be accepted without an authorized excuse. Note that submission option on Gradescope will become unavailable after deadline is passed.
- Homework format: All solutions turned in must include the student name, course number, homework number and date. Please start every question on new page. Please make sure that the handwriting is legible. Homework assignment that do not follow above formatting rules might be returned without grade. Also, it is important that each problem solution details the middle steps. Homework problem solutions not understandable will be returned with zero score.
- Collaboration on homework assignments is allowed and in fact encouraged, but each student is expected to write up his/her own solution
- **Exams:** There will two exams throughout the semester:
 - Exam 1 will be held on February 28th, and Exam 2 will be held during the Finals week.
 - Both exams are designed to be solved in 60 min, closed book and closed notes.
 - **The problems for the exam will be adapted from Grimmer-Stirzacker's book.**
 - No make-up exam except in extremis. In case of extremis, you need to inform the instructor a week before, with authorized excuses.
- Cheating, plagiarism, and other forms of academic dishonesty during the exams will be penalized in accordance with the Purdue Honors Pledge (<https://www.purdue.edu/provost/teachinglearning/honor-pledge.html>)
- Questions on grades of particular problems in homework or exams might be addressed on Gradescope by submitting a regrade request.

Assignments and Points

Grades will be earned based on a weighted average as follows:

Homework	200 pts
Exam 1	150 pts
Exam 2	150 pts
Participation Bonus	20 pts

Missed or Late Work

No late homework is accepted. A missed homework assignment may not be made up. **One** worst homework assignment scores will be dropped at the end of semester.

Grading Scale

In this class grades reflect the sum of your achievement throughout the semester. You will accumulate points as described in the assignments portion above, with each assignment graded according to a rubric. At the end of the semester, final grades will be calculated by adding the total points earned and translating those numbers (out of 100) into the following letters.

- A+: 97 - 100
- A: 93 - 96.99
- A-: 90 – 92.99
- B+: 87 - 89.99
- B: 83 – 86.99
- B-: 80 – 82.99
- C+: 77 – 79.99
- C: 73 – 76.99
- C-: 70 – 72.99
- D+: 67- 69.99
- D: 63 – 66.99
- D-: 60 – 62.99
- F: 59.99 or below

Grades might also be curved according to the instructor's discretion; in this case, criteria used for the curving will be shared to the students. Students who get at least 97% of the total points in this course are guaranteed an A+, 93% guarantees an A, 90% an A-, 87% a B+, 83% a B, 80% a B-, 77% a C+, 73% a C, 70% a C-, 67% a D+, 63% a D, and 60% a D-; for each of these grades, it's possible that at the end of the semester a somewhat lower percentage will be enough to get that grade.

Course Schedule

[Academic Calendar](#) and key University dates for the Spring 2021 semester:

- Classes begin on Monday, Jan. 8, 2024
- Quiet period, April 21-27, 2024
- Classes End on Saturday, April 27, 2024
- Final Exams are April 29 - May 4, 2024
- Grades are due by 5:00 pm on Tuesday, May 7, 2024

Academic Integrity

As previously stated, cheating and plagiarisms and other forms of academic dishonesty will be pursued following University policy. Students might expect the class instructors to cross check the student work and use commercial websites or tools such as iThenticate, Course Hero or Quizlet to verify the student assignments.

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either [emailing](#) or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

The [Purdue Honor Pledge](#) "As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue"

Use of commercial websites Course materials (including lecture notes, lecture videos, homework problem sets and solutions) are considered to be derivative works of the instructor's presentations and materials, and they are thus subject to the instructor's copyright in such presentations and materials. As such, they cannot be sold or bartered without the instructor's express written permission.

Attendance Policy during COVID-19

Students should stay home and contact the Protect Purdue Health Center (496-INFO) if they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus. In the current context of COVID-19, in-person attendance will not be a factor in the final grades, but the student still needs to inform the instructor of any conflict that can be anticipated and will affect the submission of an assignment or the ability to take an exam. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace, or by phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link on Attendance and Grief Absence policies under the University Policies menu

Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. More details are available on our course Brightspace table of contents, under University Policies.

Students with Disabilities

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone at 765-494-1247.

If you have been certified by the Disability Resource Center (DRC) as eligible for accommodations, you should contact your instructor to discuss your accommodations as soon as possible. Here are instructions for sending your Course Accessibility Letter to your instructor: <https://www.purdue.edu/drc/students/course-accessibility-letter.php>

Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

A link to Purdue's Information on [Emergency Preparation and Planning](#) is located on our Brightspace under "University Policies and Statements." This website covers topics such as Severe Weather

Guidance, Emergency Plans, and a place to sign up for the Emergency Warning Notification System. I encourage you to download and review the *Emergency Preparedness for Classrooms document* ([PDF](#)) or ([Word](#)).

The first day of class, I will review the **Emergency Preparedness plan for our specific classroom**, following Purdue's required [Emergency Preparedness Briefing](#). Please make note of items like:

- The location to where we will proceed after evacuating the building if we hear a fire alarm.
- The location of our Shelter in Place in the event of a tornado warning.
- The location of our Shelter in Place in the event of an active threat such as a shooting.

Mental Health Statement

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [Therapy Assistance Online \(TAO\)](#), a new web and app-based mental health resource available courtesy of Purdue Counseling and Psychological Services (CAPS). TAO is available to students, faculty, and staff at any time.

If you need support and information about options and resources, please contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8 a.m.- 5 p.m.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc., sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours.

Diversity and Inclusion Statement

In our discussions, structured and unstructured, we will explore a variety of challenging issues, which can help us enhance our understanding of different experiences and perspectives. This can be challenging, but in overcoming these challenges we find the greatest rewards. While we will design guidelines as a group, everyone should remember the following points:

- We are all in the process of learning about others and their experiences. Please speak with me, anonymously if needed, if something has made you uncomfortable.
- Intention and impact are not always aligned, and we should respect the impact something may have on someone even if it was not the speaker's intention.
- We all come to the class with a variety of experiences and a range of expertise, we should respect these in others while critically examining them in ourselves.

Course Evaluation

During the last two weeks of the course, you will be provided with an opportunity to evaluate this course and your instructor. Purdue uses an online course evaluation system. You will receive an official email from evaluation administrators with a link to the online evaluation site. You will have up to two weeks to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

Disclaimer

This syllabus is subject to change.

Changes might involve all elements of the class logistics, class schedule and deadlines.

All the important information will be announced on Brightspace and via email. Also, an updated version of the syllabus will be maintained on Purdue Brightspace.