STA447/2006S: Stochastic Processes
Winter 2022

Instructor: Jun Young Park, PhD

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Lectures: Thursdays 6-9 PM, Eastern time.
- Following the university policy, lectures will be delivered online until January 31. Please check the Quercus website for a link.
  Zoom link: https://utoronto.zoom.us/j/82740503882 (Passcode: sta4472006)
- Lectures will not be recorded.

Teaching Assistants:
- Michaël Lalancette (lalancette@utstat.utoronto.ca)
- Ziang Zhang (aguero.zhang@mail.utoronto.ca)

Office hours: (In eastern time)
- Jun Young Park: Friday 1-3PM (Use the Zoom link above)
- Michaël Lalancette: Monday 3-5PM (click this link)
- Ziang Zhang: TBD: Tuesday 8-10PM (click this link, passcode: sta447)

Tentative Topics: Review of conditional probability, discrete-time Markov Chain, Poisson process, continuous-time Markov chain, martingales, Brownian motion and Gaussian process, additional topics including MCMC and stock options (if time permits)

Prerequisites: This course strictly requires completion of **STA347: Probability** to undergraduate students. For graduate students, this course requires a solid understanding of calculus-based probability at the knowledge of:

- *Fundamentals of Probability: With Stochastic Processes* by Ghahramani, up to Chapter 10
- *A First Course in Probability* by Ross, up to Chapter 7
- *Probability and Statistics - The Science of Uncertainty* by Evans and Rosentla, up to Chapter 4 [link to a free copy]

Some knowledge of Linear Algebra and Real Analysis will be helpful, but *not* required.

Textbooks: This course *requires* a textbook:
- *A First Look at Stochastic Processes* by Rosenthal, 1st edition: This is a textbook written by Professor Jeffrey Rosenthal, a professor at the Department of Statistical Sciences who also taught this course in the past more than 10 years.

The course will use some materials from the following (optional) textbooks to help understanding:
- *Introduction to Stochastic Processes with R* by Dobrow
- *Essentials of Stochastic Processes* by Durrett
- *Introduction to Probability Models* by Ross

Copyright: Reproduction of lecture notes or exams is **not allowed**. Such behavior will affect the final grade.

Evaluation: Two midterm exams (35% each, scheduled Feb 17, Mar 24) and a final exam (30%).
- Even though there is no homework required for this course, it is highly recommended to try all problems listed in the textbook.
- Previous year's midterm exam problems will be uploaded to the Quercus prior to the exam.

Missing an examination: Students are required to take the midterm exams on the scheduled dates to qualify for grades. In case of (medical or family-related) emergencies, students must declare the absence and send a proof to the instructor *at least 2 hours before the exam*. A late notification will result in penalties. A make-up exam or reweighing will be discussed or scheduled by the instructor.

Accommodations for disability policy: If you have a disability or health consideration that may require accommodations, please feel free to approach me or Accessibility Services at [(416) 978-8060 or `https://studentlife.utoronto.ca/as`]. A copy of the letter of accommodation needs to be sent to the instructor 7 days before the exam date.

Late penalty policy: If exams are held online and a student submits the response late, the stuent will be be penalized 30% of the grade for every 10 minutes.

Remarking policy: If you believe an exam has been incorrectly graded, there is the opportunity for re-marking. To initiate this process, you must submit a brief written statement (in a pdf form) outlining why you deserve a higher mark. All inquiries should be sent directly to the instructor. Note that the regraded marks may be lower than the original marks.

Academic integrity: Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each students individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (`link`) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:
On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Challenges: For any other challenges during your study, please visit Health and Wellness Centre or the Graduate Wellness Services.