

## Syllabus (as of January 22, 2021)

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### STA447/2006S: Stochastic Processes Winter 2021

**Instructor:** Jun Young Park, PhD

**E-mail:** junjy.park@utoronto.ca

**Lectures:** Thursdays 6-9 PM, Eastern time; lectures will be delivered online via Zoom. Please check Quercus website for a link.

**Teaching Assistants:**

- Arvind Shrivats (arvind.shrivats@mail.utoronto.ca)
- Yuxin Fan (fionayuxin.fan@mail.utoronto.ca)
- Luke Cui (luke.cui@mail.utoronto.ca)

**Office hours:** (In eastern time)

- Jun Young Park: Friday 12-2PM
- Arvind Shrivats: Wednesday 3-5PM
- Yuxin Fan: Monday 9-11PM
- Luke Cui: Tuesday 9-11PM

**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
- *Introduction to Probability Models* by Ross

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

**Evaluation:** Midterm 1 (30%, scheduled Feb 11), Midterm 2 (30%, scheduled March 18), and a Final exam (40%). Even though there is no homework required for this course, it is highly recommended to try all problems listed in the textbook.

**Missing an Examination:** If a student misses an exam without any issues reported to the instructor, the student will receive a 0. Student who are ineligible to take the exams with valid reasons must report to the instructor at least 12 hours before the exam and receive the instructor's approval. In these cases, the proportion of the grade will be combined with the final exam grade.

**Late penalty policy:** If online midterm or final exams are submitted late, student will 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 to the instructor.

**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 student's 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.

**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>].

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