

# STA 257F: Probability and Statistics I (Fall 2022)

This [course](#) will present an introduction to mathematical probability theory, including: probability spaces, common probability distributions, discrete and continuous random variables, distribution and density functions, joint distributions, expected values, generating functions, probabilistic inequalities, convergence of random variables, laws of large numbers, the Central Limit Theorem, and the concept of statistical inference. See also the evolving [lecture notes](#).

**Course Web Page Quick link:** [probability.ca/sta257](http://probability.ca/sta257)

**Instructor:** Professor [Jeffrey S. Rosenthal](#), Department of Statistics, University of Toronto. Email [j.rosenthal@math.toronto.edu](mailto:j.rosenthal@math.toronto.edu); web <http://probability.ca/jsr>

## Lectures -- Mondays (1 hour) and Wednesdays (2 hours):

**L0101:** Mondays 11:10-12:00 in room **162** of the [Lash Miller Chemical Laboratories](#) (LM: 80 St. George Street), and Wednesdays 11:10-1:00 in room **2102** of [Sidney Smith Hall](#) (SS: 100 St. George Street).

**L0201:** Mondays 3:10-4:00 in room **6** of the [C. David Naylor Building](#) (NL: 6 Queen's Park Crescent West), and Wednesdays 3:10-5:00 in room **202** of the [McLennan Physical Laboratories](#) (MP: 255 Huron Street).

First class Sept 12. Last class Dec 7. No class Oct 10 (Thanksgiving) nor Nov 7 nor 9 (Reading Week).

Lectures will be **interactive**; please **put away your laptops and cell phones** (aside from taking class notes) and **stop talking** and **pay close attention** to the material being presented.

## Tutorials -- Mondays (1 hour):

**L0101:** Mondays 12:10-1:00 (in your assigned classroom).

**L0201:** Mondays 4:10-5:00 (in your assigned classroom).

First tutorial Sept 19. Last tutorial Dec 5. No tutorial Oct 10 (Thanksgiving) nor Nov 7 (Reading Week).

Tutorials will discuss solutions to each week's **suggested homework problems**.

TAs will also have some time for **office hours**, and to reply to **email** and **Piazza** questions.

See also the [New College Stat Aid Centre \(scroll to bottom\)](#), and a [Tues Dec 6 10:00am free student R workshop](#).

**Textbook:** We will roughly follow the book [Probability and Statistics: The Science of Uncertainty \(2nd ed\) by M.J. Evans and J.S. Rosenthal](#), available as a [free pdf file](#), including:

- [Chapter 1 \(Probability Models, pp. 1-32\)](#),
- [Chapter 2 \(Random Variables and Distributions, pp. 33-128\)](#),
- [Chapter 3 \(Expectation, pp. 129-198\)](#),
- [Chapter 4 \(Sampling Distributions and Limits, pp. 199-252\)](#)
- See also the [TOC](#) and [preface](#) and [background](#) and [answers](#) and [index](#) and [errata](#).

[The follow-up course [STA261](#) then covers much of the content of subsequent chapters, and [STA347/STA447/book](#) expand on Chapter 11.]

**Note:** Please try to save these pdf files **locally** on your computer, rather than download them every time.

**Optional extra reading:** Much of this material is also covered in Chapters 1-4 of the book [Probability with Applications in Engineering, Science and Technology \(2nd ed\) by M.A. Carlton and J.L. Devore](#) (solutions are [here](#); search for the ISBN 978-3-319-52401-6 and then see "product archive file" item #4).

**Prerequisites:** [MAT 137](#) or [157](#) (or their UTSc/UTM equivalents), plus co-requisite [MAT 237](#) or [257](#). Strictly enforced by the university!

**Instructor Office Hours:** You are welcome to talk to the instructor **after class**, or you can **email him** to ask questions or arrange a time to talk on Zoom.

**Special office hours** will be arranged before the midterms and exam, including:

- **Tues Oct 11** from 3:30 to 5:30 in room **1200** of the [Bahen Building](#) (BA: 40 St. George Street).

- **Tues Nov 22** from 3:30 to 5:30 in room **1200** of the [Bahen Building](#) (BA: 40 St. George Street).
- **Fri Dec 9** from 12:30 to 2:30 in room **1073** of [Sidney Smith Hall](#) (SS: 100 St. George Street). [Part of the [ASSU Exam Jam](#).]

**Covid Protocols:** Since Covid is still [active](#), I will try to wear a **mask** in the classroom, and request that **you wear a mask too** (though it is not required). Please let me know of any concerns. Thank you.

**Discussion Pages:** I created a STA257 "Piazza" discussion page where students can post and answer questions about the course. You can join using the link and access code provided on the course's [quercus](#) page. Feel free to post course-related messages there any time you want to. I may or may not read your posts myself, but other students and TAs will hopefully answer them. Also, feel free to create a [recognized study group](#), or join a [drop-in study space](#).

#### **Evaluation:**

- **28%** Midterm #1: **Wed Oct 12**, at **11:10 for L0101** or **3:10 for L0201**; 100 mins; in room **100** of the [Exam Center](#) (EX: 255 McCaul Street)
- **28%** Midterm #2: **Wed Nov 23**, at **11:10 for L0101** or **3:10 for L0201**; 100 mins; in room **100** of the [Exam Center](#) (EX: 255 McCaul Street)
- **44%** [Final Exam](#): **Monday Dec 12** from **9:00 AM to 12:00 noon**; surname (last name) **A - K in ES 1050**, **L - R in HA 403**, **S - X in PB B150**, **Y - Z in PB B250**.

Tests will be **closed book** (no aid sheet). Be sure to bring your **TCard**. You may bring one **non-programmable calculator** for arithmetic/exp/sqrt only.

You must take the midterm of the **section that you are enrolled in**. Write with **pen or sharp pencil** in the **space provided** (or last page).

You are required to follow the university's [Code of Behaviour](#) at all times. **Absolutely no cheating!** (For added security, photography may be used.)

Any student who cannot attend a midterm due to illness should follow the [FAS Absence Declaration procedure](#), and then email the form and details to the instructor. If the excuse is found to be valid, then the corresponding weight will be shifted to the Final Exam. If a student cannot attend **both** midterms, then a special oral-exam midterm will be given instead. If a student cannot attend the final exam, then they should [submit a petition for a deferred exam](#).

**Homework:** There will be **suggested homework** exercises assigned from the textbook each week, listed within the course notes. They will **not** be handed in or graded, but they will be discussed in tutorial. They are **strongly recommended** to learn the material well. See also the book's [selected answers](#). (Note: We will mostly skip the textbook's Challenges and Discussion Topics, but interested students are encouraged to think and ask questions about them, too.)

**Regrades:** Regrading requests should be made **within one week** of when the graded item was first available, but only for **genuine grading errors**, not for grading **judgements**, otherwise **your mark may end up going down** rather than up. For details, see the [regrading policy and instructions](#). (For the **final exam**, a different [Faculty-wide submission process](#) should be followed instead.)

**For Actuarial Science students:** see this [Actuarial accreditation information](#).

**Stressed?** If you encounter challenges during your studies, then please see [these support options](#) or [here](#) or visit [Academic Success](#) or the [Health & Wellness Centre](#) or [Navi](#) for assistance and support.

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This document is available at [probability.ca/sta257](http://probability.ca/sta257), or permanently at [probability.ca/jeff/teaching/2223/sta257/](http://probability.ca/jeff/teaching/2223/sta257/).