

**STA 247 L0101 - Probability with Computer Applications**  
**M 3-5, F 3-4 (BA 1160) & Tutorials F 4-5**

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**Instructor:** Karen H. Wong - karen.huynhwong@utoronto.ca

**Office Hours:** Stewart Building 103C (149 College St.) - TIME TBD

**Textbook:** Scheaffer & Young: *Introduction to Probability and Its Applications*, 3rd ed., 2010

**Calculators:** Only non-programmable calculators are permitted (for more information, see [here](#)).

**Course Website:** All lecture slides, problem sets, course information will be posted on Quercus. Course materials provided on Quercus are for the use of students currently enrolled in this course only. Providing course materials to anyone outside of the course is unauthorized use.

**Course Description:** Introduction to the theory of probability, with emphasis on applications in computer science. The topics covered include random variables, discrete and continuous probability distributions, expectation and variance, independence, conditional probability, normal, exponential, binomial, and Poisson distributions, the central limit theorem, sampling distributions, estimation and testing, applications to the analysis of algorithms, and simulating systems such as queues (Note: STA247H1 does not count as a distribution requirement course).

**Prerequisites:** MAT135H1 & MAT136H1/MAT137H1/MAT157Y1; CSC108H1/CSC148H1

**Exclusions:** ECO227Y1/STA255H1/STA257H1

**Grading:** There will be multiple evaluations in form of assignments and midterms. The grade breakdown is

Syllabus Hunt	1.5%	January 23
Individual Assignments (2)	10% each	Feb. 22, Apr. 5
Tutorial Activities (9)	1.5% each	Weekly
Midterm	25%	March 8 at 3:10-5 PM, Location TBD
Final Exam	40%	TBD

**Assignments:** All assignments are individual assessments (i.e. all work is yours alone, with perhaps reference to course materials). Students are to complete assignments independently, to the best of their understanding of the questions. Only select problems on the assignments will be evaluated. **Assignments will be submitted through Crowdmark on Quercus.** Official due dates will be posted on the assignment PDF. Late assignments will receive a penalty of 5% for every hour

interval that the assignment is late. For example, if an assignment is submitted 10 minutes after the due date, there would be a penalty of 5% on the assignment grade (i.e. 90% → 85%).

**Tutorials:** Tutorials begin on **January 18** and will consist of short learning and problem solving activities that will be graded. The purpose of the activities is to help you deepen and/or extend your understanding of the concepts covered during lecture, and to develop and apply problem solving skills.

This will be an opportunity to learn how to write a clear solution that demonstrates that you understand the ideas presented and communicate them to your peers. They are meant to be slightly challenging at times but with many opportunities to do well. You will also see how your work will be evaluated to make appropriate improvements for your assignments and tests.

**Grading Policy:** Any answers on assignments, midterms, and final exam without justification and showing your work **will not receive any credit**, regardless of the “correctness” of the answer. All graded work is an opportunity for you to demonstrate, beyond a shadow of a doubt, that you have sufficiently learned and understood course concepts. This includes **defining variables/random variables, distributions, relevant parameters, providing brief explanations, etc.** as necessary.

All assignments, midterms, and final exam will be graded according to a comprehensive marking scheme. If after reviewing posted marking schemes you believe you have earned more credit than what was awarded, send me an email with a brief explanation **no later than 1 week after the assessments have been released back to you. If you require an extension for an assignment with valid reasons and documentation, please notify me prior to the due date** to have something arranged.

**Homework:** Suggested practice problems from the textbook and exercises will be provided in the lecture slides for each chapter section covered. It is strongly recommend that you attempt as many as possible with and without notes to assess your own understanding of concepts.

**Extra Help:** Regular office hours will be offered along with extra hours before the midterm and final exam. These will posted on Quercus under *course help*. If you are experiencing difficulty with course content, or have questions related to course material, please come by during the available office hours. TA office hours are located on **Level G** of Sidney Smith Hall in SS 623B. There is an additional aid centre in [New College Wetmore 68A](#)(see schedules). If you are experiencing difficulty with course content, or have questions related to course material, please attend the available office hours.

We will be using Piazza for discussion of practice problems and general course concepts. In lieu of emailing, you are encouraged to post your questions and work on Piazza. Please note that **assignments are individual assessments** and assignment questions are **not to be posted publicly** on Piazza. If you have any problems or feedback for the developers, email [team@piazza.com](mailto:team@piazza.com). Find our class page [here](#). Use of Piazza is **entirely optional** and students who choose to use it should read the Privacy Policy agreement and post only what they are comfortable sharing as stated in the agreement.

## Course Conduct:

- **Email:** Any administrative questions regarding the course should be addressed to the course instructor (karen.huynhwong@utoronto.ca). Questions regarding course material and concepts should be addressed in office hours and **NOT** via email. If those times do not work for you, separate hours can be set up by appointment.
- **Piazza:** Students are expected to follow the University's code of conduct. Posts should be respectful of everyone in the course and should only address course content.
- **During Lecture:** Practice classroom etiquette – arrive on time, devices on silent, save your conversations for later, and most of all, be respectful of your peers. If you anticipate that you will have to leave early for any reason, please seat yourself so that you may do so without disrupting your fellow peers.
- **Missed Tests:** There are no make-up tests. Any missed tests that are a result of illness requires a **U of T Student Medical Certificate** to be completed by you and your doctor within one week of the test. This can be obtained [here](#).

**Accessibility Services::** The University of Toronto provides accommodations through accessibility services to students with diverse learning styles and needs. If you have a disability or health consideration that may require accommodations, please feel free to reach out to me and/or Accessibility Services at 416-978-8060 or through email [accessibility.services@utoronto.ca](mailto:accessibility.services@utoronto.ca). You can find out more information [here](#).

## Important Dates:

First Day of Classes .....	Jan. 7
Last Day to Drop .....	Mar. 17
Reading Break .....	Feb. 18-22
Last Day of Classes .....	Apr. 5
Exam Period .....	Apr. 6-30

**Academic Integrity:** Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves. Familiarize yourself with the [University of Toronto's Code of Behaviour on Academic Matter](#). Potential offences include, but are not limited to:

## Assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes)
- Obtaining or providing unauthorized assistance on any assignment including
  - working in groups on individual assignments – this includes giving hints to help them get to the answer!

- having someone rewrite, edit, or add material to your work while editing.
- researching for inspiration, hints, or answers to any graded problem
- Lending your work to a classmate who submits it as his/her own with or without your permission

On tests and exams:

- Using or possessing any unauthorized aids, including a cell phone, smart watch, programmable calculators.
- Looking at someone else's answers or allowing someone to look at yours
- Misrepresenting your identity.
- Falsifying or altering any documentation required by the University, including doctor's notes

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. **If you have any questions about what is or is not permitted in this course, please do not hesitate to contact the instructor.** If you are experiencing personal challenges that are having an impact on your academic work, please speak to the instructor or seek the advice of your college registrar.

**Tentative Schedule:**

Week	Topics
1: Jan. 7-11	Introduction to the course, mutual expectations. Recurring definitions, Probability: Axioms, Events ( $\cup, \cap, ^c$ ), Independence vs. Mutually Exclusive
2: Jan 14-18	Counting
3: Jan. 21-25	Counting, Conditional Probability, Law of Total Probability
4: Jan. 28-Feb. 1	Discrete Random Variables and Properties of RVs
5: Feb. 4-8	Common Discrete Distributions: Bernoulli, Indicator Variables, Binomial, Poisson
6: Feb. 11-15	Continuous Random Variables, Common Continuous RV: Exponential
7: Feb. 18-22	READING WEEK
8: Feb. 25-Mar. 1	Gamma and Connection to Exponential, Normal Distribution and Properties
9: Mar. 4-8	Moment Generating Functions, <b>MIDTERM</b>
10: Mar. 11-15	Working with Bivariate Discrete Distributions
11: Mar. 18-22	Bivariate Continuous Distributions
12: Mar. 25-29	Bivariate Continuous Distributions, Transformations
13: Apr. 1-5	Transformations & Central Limit Theorem <b>Apr. 5: 2 HR LECTURE (NO TUTORIAL)</b>