

**STA 247 - Probability with Computer Applications L5101**  
**T 7-10 PM, R 7-10 PM, SS 2118**

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

**Office Hours:** TBD

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

**Course Website:** All lecture slides, problem sets, course information will be posted on Blackboard and Quercus. Course materials provided on Blackboard 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. (Note: STA247H1 does not count as a distribution requirement course).

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

**Exclusions:** ECO227Y1/STA257H1

**Grading:** All assignments/tests/exams are meant to assess **your** (not your friends', not some internet stranger's) knowledge and proficiency with course content. As such, it is your job to submit work that is *entirely your own*. Only **non-programmable** calculators are permitted during the test and final exam. The grade breakdown is displayed below:

|                           |          |  |
|---------------------------|----------|--|
| Online Syllabus Hunt      | 1%       | May 15                                       |
| Individual Assignments    | 10% each | May 24, June 12                              |
| Weekly In-Class Pair Work | 2% each  | Weekly beginning May 15                      |
| Midterm                   | 29%      | May 29, During Class, Location TBD           |
| Final Exam                | 40%      | Scheduled by the Faculty of Arts and Science |

**Assignments:** Due to available TA resources, only select problems on the assignments will be evaluated. **For this term, assignments will be submitted through Crowdmark.** Official due dates will be posted on the assignment PDF. Late assignments will be penalized. A penalty of 10% for every hour interval that the assignment is late. For example, if the assignment was submitted 10 minutes after the due date, there would be a penalty of 10%.

**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. It is the responsibility of the student to demonstrate and show that they have learned the course concepts sufficiently. This includes **defining variables/random variables, distributions, relevant parameters, interpreting calculations, etc.** as necessary.

Evaluations will be graded according to a comprehensive marking scheme. If after reviewing posted marking schemes you believe you have earned more credit than was awarded, please send me an email with a brief explanation **within 1 week following the release of solutions**. **If you require an extension for an assignment with valid reasons and documentation, please notify the instructor 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. I strongly recommend that you attempt as many as possible with and without notes to assess your own understanding of concepts.

**Extra Help:** I will be holding regular office hours, with extra hours before the midterm and final exam. If you are experiencing difficulty with course content, or have questions related to course material, please come by during the available office hours.

This term we will be using Piazza for class discussion. The system is highly tailored to getting you help quickly and efficiently from your fellow classmates, TAs, and myself. Rather than emailing questions to the teaching team, I encourage you to post your questions on Piazza and any work or steps you have attempted for detailed feedback!

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 or regrade requests can be addressed to me. Questions regarding course material and concepts should be asked during office hours or on Piazza only. If those times do not work for you, please arrange an appointment to see me.
- **During Lecture:** Please 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.
- **Programming Languages:** In this course, we will occasionally be using [R statistical software](#) which is available for free download. Any code required for assignments will be provided either in lecture or easily found using a search engine. **You will not be tested on coding** however you will be expected to read and understand R output during midterms and/or the final exam.
- **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 from your college registrar, the Office of the

Faculty Registrar (SS1006), the Statistics Department office, or the Koffler health service. The weight of the missed term test will be shifted to the final exam. A missed test without proper documentation will receive a mark of zero.

**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 ..... | May 7      |
| Last Day to Add .....      | May 13     |
| Last Day to Drop .....     | June 5     |
| Exam Period .....          | June 20-26 |

**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](#). It is the rule book for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

Assignments:

- Using external resources (such as Google) to search for any part or all of any solution to assignment problems. **This includes finding hints and help on starting a problem.**
- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes)
- Submitting your own work in more than one course without the permission of the instructor.
- 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, notes.
- 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. Note that because of crowding in the classroom, multiple versions of the quizzes and midterm exam may be administered. The differences between versions will be slight and should not affect the difficulty of particular problems.

**Tentative Schedule:**

| Class       | Topics   |
|-------------|--|
| 1: May 8    | Introduction to the course, mutual expectations, definitions & foundations<br>Probability: Axioms, Events ( $\cup, \cap, ^c$ ) |
| 2: May 10   | Independence vs. Mutually Exclusive Events, Counting   |
| 3: May 15   | Counting, Conditional Probability, Law of Total Probability  |
| 4: May 17   | Discrete Random Variables,<br>Common Discrete Distributions: Bernoulli/Indicator Variables                                     |
| 5: May 22   | Binomial Distributions, Common Discrete Distributions: Learning Activity   |
| 6: May 24   | Common Discrete RV: Poisson, Continuous RV   |
| 7: May 29   | MIDTERM<br>Common Continuous RV: Uniform, Exponential  |
| 8: May 31   | Common Continuous RV: Gamma and Connection to Exponential<br>Normal Distribution and Properties                                |
| 9: June 5   | Moment Generating Functions, Discrete Joint RV   |
| 10: June 7  | Continuous Joint Random Variables  |
| 11: June 12 | Transformations (Univariate, bivariate time permitting)  |
| 13: June 14 | Central Limit Theorem <b>**Super important stuff**</b>   |