STA 247 - Probability with Computer Applications L0101
Mon 3-5, Fri 3-4 ES 1050

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

Office Hours: M 12-1 PM and F 11AM - 12PM , or by appointment in:

SS6026 (**until end of September**)
SS6008 (**after September**)

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.

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 or MAT136H1/MAT137H1/MAT157Y1; CSC108H1/CSC148H1
Exclusions: ECO227Y1/STA257H1

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

Assignments	30%	Oct 3, Oct 28, Nov 28
Midterms	30%	Oct 14, Nov 18
Final Exam	40%	TBD

Assignments: Due to available TA resources, only select problems on the assignments will be evaluated. **For this term, assignments will be submitted through Crowdmark on Blackboard.** Assignments are due at the beginning of class. Late assignments will not be accepted.

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, etc.** as necessary.

All assignments, midterms, and final exam will be graded according to a strict marking scheme. If you believe have earned more credit than what was graded, or that marks were added, please submit your test/assignment **no later than 2 weeks after** with a brief explanation. Assignments

and midterms written in pencil or erasable pen will **not be eligible for regrading**. Late assignments will not be accepted. 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: TAs will be holding regular weekly office hours in the Stats Aid Centre, **SS1091** as well as in the additional aid centre in New College Wetmore 68A(see schedules). If you are experiencing difficulty with course content, have questions related to course material, please attend the available office hours.

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email 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 can be addressed by me via email. Questions regarding course material and concepts should be addressed in office hours and **NOT** via email. If those times do not work for you, please arrange an appointment to see me.
- **During Lecture:** Please practice classroom etiquette – arrive on time, put your devices on silent, hold 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 as 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 accessibility.utoronto.ca.

Important Dates:

First Day of Classes	Sept. 12
Last Day to Add	Sept. 25
Thanksgiving (University closed)	Oct. 10
First Midterm	Oct. 14
Last Day to Drop	Nov. 7
Fall Break	Nov. 7
Second Midterm	Nov. 18
Monday Make-Up	Dec. 7
Exam Period	Dec. 9 - 20

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 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
  - having someone rewrite or add material to your work while editing.
- 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.
- Submitting an altered test for re-grading.
- 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 have questions about appropriate research and citation methods, seek out additional information from the instructor, or from other available campus resources like the U of T Writing Website. 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:

Week	Topics
Sept 12 - 16	Probability: Axioms, Events, Counting Methods
Sept 19 - 23	Counting, Conditional Probability, Law of Total Probability
Sept 26 - 30	Discrete Random Variables, Bernoulli, Indicator Random Variables
Oct 3 - 7	Discrete RV: Binomial, Geometric, Negative Binomial, Hypergeometric
Oct 10 - 14	Thanksgiving! and Midterm 1
Oct 17 - 21	Discrete RV: Poisson - Continuous Random Variables: Uniform, Exponential
Oct 24 - 28	Continuous RV: Gamma, Normal, Approximation to Binomial
Oct 31 - Nov 4	Continuous RV, Moment Generating Functions
Nov 7 - 11	Multivariate and Joint Disributionst
Nove 14 - 18	Multivariate and Joint Dist, Midterm 2
Nov 21 - 25	Transformations, Central Limit Theorem
Nov 28 - Dec 2	Transformations, Central Limit Theorem, Markov Processes
Dec 5	Monday Make-Up Lecture