# STA261H1 S LEC0101
# Probability and Statistics II
## Winter 2023

**Instructor:** Ziteng Cheng

**Email:** sta261@utoronto.ca

**Lecture Hours:** Monday 15:00-17:00, MS 2158 and Wednesday 15:00-16:00, PB B250

**Tutorial Hours:** Wednesday 16:00-17:00, MS 2172, MS 3278 and MS 4171

**Office Hours:** See Quercus

**Prerequisite:** Please refer to the academic calendar of the course available at here. The prerequisite is strictly enforced by the Department of Statistical Sciences. Students who have deferred assessments/exams in prerequisite course(s) or have an equivalent course as a transfer credit should contact the Statistics Undergraduate Office at ug.statistics@utoronto.ca to request to be kept in the course.

**Quercus Discussion Board:** We will be using the Quercus Discussion Board as an online discussion forum. All questions related to the content of the course should be posted here or asked during lecture/office hours. I will monitor the board and answer questions. Students are encouraged to answer posts and help their fellow classmates.

**Course Outline:** A rigorous introduction to the theory of statistical inference and to statistical practice. Statistical models, parameters, and samples. Estimators for parameters, sampling distributions for estimators, and the properties of consistency, bias, and variance. The likelihood function and the maximum likelihood estimator. Hypothesis tests and confidence regions. Examples illustrating statistical theory and its limitations. Introduction to the use of a computer environment for statistical analysis.

**Course Materials:** We will use handwritten lecture notes throughout the course. The lecture notes will be uploaded after class. The lecture notes are mainly based on the two textbooks below:

1. George Casella and Roger L. Berger. *Statistical Inference.* Brooks/Cole Cengage, 2nd ed., 2002. (Link)

2. Michael J. Evans and Jeffrey S. Rosenthal. *Probability and Statistics: the Science of Uncertainty.* Freeman, 2nd ed., 2010. (Link)

A small portion of the lecture will be spent on practicing basic data analysis using Python. Google Colaboratory is recommended. More resources for statistical theory and data analysis will be mentioned along the line.

**Grading Scheme:** See Table 1 for the allocation of points. The maximum points possible is 105.

We will follow marks distribution guidelines in the academic handbook available at here. Exercises will be assigned, but will not be graded. I strongly recommend you to work on the exercises to prepare for midterms and final. Late submissions of computer programs and midterms will not be accepted. If you missed or plan to miss the midterm, please file an abscence declaration following the guideline here, and inform me via the course email with title "Absence midterm #, LEC #" as soon as possible. The weight of a missed midterm will be shifted to the final. If you want to request for a deferred final, please follow the petition guideline here.

|  |  |
|---|---|
| (Jan. 9, classes begin) | |
| Computer Programs 1 (due Feb. 3) | 5 points |
| Crowdmark Midterm 1 (Feb. 10, 1.5 hours) | 20 points |
| Computer Programs 2 (due March. 3) | 5 points |
| Crowdmark Midterm 2 (March 10, 1.5 hours) | 20 points |
| Computer Programs 3 (due April 7) | 5 points |
| (April 6, classes end) | |
| Comprehensive Final (April 11-28, 3 hours, schedule TBA) | 50 points |

**Table 1:** *Allocation of points.*

**Regrading Policy:** To request a regrade, you must send an email to sta261@utoronto.ca:

- more that 24 hours, no more than 5 days after receiving your grade,

- with title "Regrade request computer programs #, LEC #" or "Regrade request midterm #, LEC #",

- including your full name and student number in the body of the email,

- specifying a clear and concise reason for each request, referring to a possible error or omission by the grader; regrade requests without a specific reason will not be accepted.

Regrade and point increase are not guaranteed. Requests to increase partial points on incorrect solutions will not be treated favorably.

**Accessibility Needs:** The University of Toronto offers academic accommodations for students with disabilities. If you require accommodations, or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services as soon as possible: accessibility.services@utoronto.ca. More information available at here.

**Academic Integrity:** Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the University of Toronto 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 Matters available at here.