

# Introduction to Statistical Modeling I (Stat 2507 G & BIT 2000 C, Winter 2020)

**Instructor: Dr. Gang Li**

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<https://www.carleton.ca/culearn/>

## Class Schedule

Class Times: Tuesday & Thursday 8:35am - 9:55am Azrieli Theatre 302

Office Hours: Tuesday & Thursday 10:05am - 11:05am HP 5218

OR by appointment

## Marking Scheme

Assignments 4 10% total

Tests 2 40% total

Final Exam 50%

## Textbook

*Introduction to Probability and Statistics*, by Mendenhall, Beaver, Beaver, and Ahmed, 4th Canadian edition.

## Prerequisite

Ontario Grade 12 university-preparation Mathematics or equivalent, or permission of the School of Mathematics and Statistics.

## Course Overview

A data-driven introduction to statistics. Basic descriptive statistics, introduction to probability theory, random variables, discrete and continuous distributions, contingency tables, sampling distributions, distribution of sample mean, Central Limit Theorem, interval estimation and hypothesis testing. MINITAB will be the statistical software package used.

## Course Policies

- There will be 4 assignments each worth 2.5% of your final grade. Assignments are due prior to the start of class on the assigned due date unless stated otherwise. **No late assignments will be accepted.**
- There will be **two 90-minutes, closed book** tests on ***Friday, Feb 7, and March 13, 2020, 6pm to 7:30pm.*** The locations of the tests will be posted on cuLearn.
  - ✓ Each test worth 20% of your final grade.
  - ✓ You are expected to take all the tests. ***No make up, early, or delayed tests.***
  - ✓ Students who must miss a test must inform me prior to the test and provide supporting documentation within one business day of the test date. If you provide adequate documentation (doctor's note, etc), then the weighting of that test will be placed on the final exam, otherwise a mark of 0 will be given for the test.
  - ✓ Students must bring their student card to each test and exam and place it on the desk where it is visible.
  - ✓ It is your responsibility to pick up your tests/assignments in the following two weeks after I return the marked tests/assignments in class. After that, TA's and I are not responsible for missing test/assignment papers.
- **Checking the Test/Assignment Grades:**
  - ✓ It is your responsibility to make sure that your test/assignment marks recorded correctly by visiting **cuLearn**.
  - ✓ Deadline to make any corrections on your test/assignment marks is within one week when you receive them.
- **Final Exam** will be 3-hours, closed book exam based on whole term.

- ✓ It is the responsibility of each student to be available at the time of the examination. In particular, no travel plans for the examination period in **April, 2020** should be made until the examination schedule is published.
- ✓ Students wishing to see their examination papers must make an appointment within three weeks of the examination to do this. **This examination review is for educational purposes only and NOT for negotiation of your grade. Please remember that we do not change your grade on the basis of your needs (such as scholarships, etc).**
- **Passing Conditions:** Students are required to obtain a minimum score of **50% on the final exam**. Students who fail to do so will automatically be assigned a grade of F in the course. Exceptions to this rule may be made at the discretion of the instructors.
- **Homework:** Selected exercises, mainly from the text, will be posted on **cuLearn**. These exercises are not to be handed in and will not be graded. However, to succeed in the course it is **ABSOLUTELY ESSENTIAL** that you do the exercises on a regular basis.
- **Calculators:** ONLY **non-programmable calculators** will be permitted for tests and the final exam. I reserve the right to confiscate any calculator during a test or final exam.
- **Course Information:** All course related materials (slides, assignments, solutions, grades, announcements) will be posted on **cuLearn**.
  - ✓ It is highly recommended that you print the slides and bring them in as we will be discussing all of the content presented in the slides.
  - ✓ It is your responsibility to keep up with information announced in class, on **cuLearn**, or sent to your Carleton e-mail account.
- **E-mail:** According to Carleton University policy under the Freedom of Information of Privacy Act (FIPPA), Please use your **Carleton account ONLY** for all course related email, and write your course code **MATH 1007 on the subject line**.
- **Copyright:** All course related materials (including slides, assignments, solutions, and tests) are intended for personal use only and **MAY NOT be reproduced or redistributed without prior written consent of the author(s)**.

<b>Tentative Schedule and Syllabus</b>
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Week	Textbook Sections	Topics
Week 1	Sec 1.1-1.5	Population and sample. Variables and data. Types of variables. Graphs for categorical data and quantitative data.
Week 2	Sec 2.1-2.7	Measures of centre and variability. Tchebysheff's Theorem, Empirical Rule. Percentiles, quartiles. Box plots.
Week 3	Sec 3.1-3.4, 4.1-4.3	Bivariate data. Graphs for bivariate data. Correlation coefficient. Regression line. Probability. Sample spaces, events.
Week 4	Sec 4.41-4.7	Counting rules. Event relations. Additional rule. Subtraction rule. Conditional probability, independence. Multiplication rule. Bayes' rule.
Week 5	Sec 4.8, 5.1-5.4	Probability distributions, expected values, and variances for discrete random variables. Binomial distribution. Hypergeometric distribution. Poisson distribution.
Week 6	Sec 6.1-6.4	Probability distributions for continuous random variables. Normal distribution. Normal approximation to the binomial distribution.
Week 7	Sec 7.1-7.6	Sampling plans. Sampling distributions of statistics. Central Limit Theorem. Sampling distribution of the sample mean. Sampling distribution of the sample proportion.
Week 8	Sec 8.1-8.4	Point estimation. Interval estimation. Large sample confidence intervals for a population mean. Large sample confidence intervals for a population (binomial) proportion.
Week 9	Sec 8.5-8.6, 8.8	Choosing the sample size. Large-sample confidence interval for the difference between two population means. Large-sample confidence interval for the difference between two population (binomial) proportions.
Week 10	Sec 9.1-9.3, 9.5	Testing hypotheses about population parameters. Statistical tests of hypothesis. Large-sample test about a population mean. Large-sample test about a population (binomial) proportion.
Week 11	Sec 9.4, 9.6, 9.7	Large-sample test of hypothesis for the difference between two population means. Large-sample test of hypothesis for the difference between two population (binomial) proportions. Type I and Type II errors, power of the test.
Week 12	Sec 10.1-10.5	Student's t distribution. Small-sample inference for a population mean. Small-sample inference for the difference between two populations means, independent and pair samples.

- This schedule is subject to change depending on the progress of the course.
- Please note that certain topics may be omitted or abbreviated. The order of presentation will not always be the same as in the text.

## University Policies

- **Academic Integrity:** Students are required to be familiar with [Section 10 of the Academic Regulations of Carleton University](#).
  - ✓ All tests, assignments, quizzes, and exams are to be done independently.
  - ✓ **Academic dishonesty in any form will not be tolerated..**
  - ✓ Students who violate the standards of academic integrity during a test/examination will receive a grade of zero for that test/examination, and will be required to meet with the Associate Dean of Science for further disciplinary action.
- **Students with disabilities** requiring academic accommodations in this course must contact a coordinator at the Paul Menton Centre for Students with Disabilities to complete the necessary Letters of Accommodation. After registering with the PMC, make an appointment to meet and discuss your needs with me in order to make the necessary arrangements as early in the term as possible. Please note the deadline for submitting completed forms to the Paul Mention Centre is **March 13, 2020**. For more details visit the [PMC website](#).
- **Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the [Equity Services website](#).
- **Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the [Equity Services website](#).

## Extra Help Options

- **Math Tutorial Center:** There is a mathematics and statistics help centre located at 1160HP. For information visit the website <http://www5.carleton.ca/math/handbook-2/tutorial-centre/>
- **MS-LAP:** Online support is available for this course through MS-LAP. You should automatically be registered in MS-LAP via CuLearn. You have access to online tutorial videos free of charge. For more information and tutorials on how to access MS-LAP, please see: <https://carleton.ca/math/math-learning-assistance-program/>

### Important Dates

- **Tests:**
  - ✓ Test 1 is on Friday, February 7, 6pm to 7:30pm.
  - ✓ Test 2 is on Friday, March 13, 6pm to 7:30pm.
- **Withdrawal:** The last day for academic withdrawal from the course is ***April 7, 2020***.
- **Winter Break:** February 17-21, 2020. Classes are suspended.
- For more information, please visit [Dates and Deadlines](#).

***The End***

*Last modified: Sunday 5<sup>th</sup> January, 2020, 19:31*