

Carleton University
School of Mathematics and Statistics
STAT 2507 E – *Introduction to Statistical Modeling I* – Winter 2020

Instructor: Dr. Wayne Horn, wayne.horn@carleton.ca, 4352 Herzberg Laboratories

Lectures: Monday and Wednesday from 6:05pm – 7:25pm in Azrieli Theatre 102.

Office Hours: Tuesday 2:30pm – 3:30pm, Wednesday 4:30pm – 5:30pm, or by appointment.

Textbook: *Introduction to Probability and Statistics*, 4th Canadian Edition, by Mendenhall et al.

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

Grading Scheme:	Assignments	10%
	Test #1	20%
	Test #2	20%
	Final Exam	50%

Assignments: 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.

Tests: Test #1 will take place on Friday, February 7, 6:00pm – 7:30pm. Test #2 will take place on Friday, March 13, 6:00pm – 7:30pm. The locations of the tests will be posted on cuLearn.

Final Exam: There will be a cumulative 3-hour final exam scheduled by the university. The final exam period runs from April 13 – 25.

Calculators: During the midterm and final exams, only non-programmable calculators will be permitted.

Academic Integrity: Students are required to be familiar with the Academic Integrity Policy at Carleton University. The complete policy is available at: <http://carleton.ca/senate/wp-content/uploads/Academic-Integrity-Policy1.pdf>. Students who violate the standards of academic integrity relating to any coursework will be required to meet with the Associate Dean of Science.

Class Conduct: In order to foster a positive and productive learning environment, disruptive behaviour will not be tolerated during lectures. Disruptive behaviour is defined as any action, as determined at the sole discretion of the instructor, that distracts any student or the instructor from focusing on the lecture. Examples of disruptive behaviour include, but are not limited to: (i) students socializing during class; and (ii) students using electronic devices for reasons unrelated to the lecture. Students who engage in disruptive behaviour may be given a verbal warning or, if disruptive behaviour has become more prevalent, be asked to leave the classroom for the remainder of the lecture. A student who continually exhibits disruptive behaviour will be referred to the Dean's Office for committing an instructional offence.

Withdrawal: The last day for withdrawal from winter term courses with full fee adjustment is January 31. Withdrawals after this date will result in a permanent notation of WDN on the official transcript. The last day for academic withdrawal is April 7.

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor 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: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

Please contact your instructor 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: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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.

<https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

ADDITIONAL COURSE POLICIES:

- 1.** Concerns about grading on assignments or tests must be brought to my attention within one business day of these items being available for review. Assignments and tests not collected prior to the end of the semester will be destroyed.
- 2.** Students who need to miss a test for a valid reason must inform me prior to the test and provide the original hardcopy (not an email) of the appropriate supporting documentation within one business day of the test. Students who correctly follow this procedure will have the weight of the missed test added to the weight of the final exam. Failure to follow this procedure will result in a grade of 0% on the missed test.
- 3.** Any student wishing to review their final exam must make an appointment within a two week period following the submission of the final grades. These appointments are solely for educational purposes and are **not** to be treated as an opportunity to debate your grade.
- 4. 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.
- 5.** In assigning course letter grades, final numerical grades are viewed as continuous and grades are not automatically rounded up. A student must earn at least the lower numerical limit of a letter grade category to receive that letter grade.
- 6.** You must use your Carleton email account for all email communications. I am unable to respond to non-Carleton emails due to FIPPA (Freedom of Information and Protection of Privacy Act).

TENTATIVE LECTURE SCHEDULE

WEEK	DATES	SECTIONS	TOPICS
1	Jan 6, 8	Introduction, 1.1 – 1.5	Population and sample. Variables and data. Types of variables. Graphs for categorical data and quantitative data.
2	Jan 13, 15	2.1 – 2.7	Measures of centre and variability. Tchebysheff's Theorem, Empirical Rule. Percentiles, quartiles. Box plots.
3	Jan 20, 22	3.1 – 3.4, 4.1 – 4.3	Bivariate data. Graphs for bivariate data. Correlation coefficient. Regression line. Probability. Sample spaces, events.
4	Jan 27, 29	4.4 – 4.7	Counting rules. Event relations. Additional rule. Subtraction rule. Conditional probability, independence. Multiplication rule. Bayes' rule.
5	Feb 3, 5	4.8, 5.1 – 5.4	Probability distributions, expected values, and variances for discrete random variables. Binomial distribution. Hypergeometric distribution. Poisson distribution.
6	Feb 10, 12	6.1 – 6.4	Probability distributions for continuous random variables. Normal distribution. Normal approximation to the binomial distribution.
N/A	Feb 17 – 21	WINTER BREAK	
7	Feb 24, 26	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.
8	Mar 2, 4	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.
9	Mar 9, 11	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.
10	Mar 16, 18	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.
11	Mar 23, 25	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.
12	Mar 30, Apr 1	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.