

Carleton University
School of Mathematics and Statistics
STAT 2507 F – *Introduction to Statistical Modeling I* – Winter 2021

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

Lectures: Lecture slides and pre-recorded videos will be posted on cuLearn.

Tutorials: Tutorials will be delivered via BigBlueButton on cuLearn.

Office Hours: Wednesday 4:05pm – 5:25pm, Thursday 8:35am – 9:55am, or by appointment, via BigBlueButton on cuLearn.

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 20%, Tests 30%, Final Exam 50%

Assignments: There will be four assignments each worth 5% of your term grade. Assignment due dates and times will be stated on the assignment and announced on cuLearn. The tentative due dates for the assignments are **February 7**, **February 22**, **March 14**, and **April 4**. These due dates are subject to change.

Test #1: There will be two tests each worth 15% of your term grade. Test #1 will take place on **Saturday, February 27** from 10:00am – 11:30am EST. Test #2 will take place on **Saturday, March 20** from 10:00am – 11:30am EST.

Final Exam: There will be a cumulative final exam worth 50% of your term grade. The exam will be scheduled by the University during the exam period from April 16 – 27. It is the responsibility of each student to be available during the exam period.

E-Proctoring: Please note that tests and examinations in this course will use a remote proctoring service provided by Scheduling and Examination Services. You can find more information at <https://carleton.ca/ses/e-proctoring/>. The minimum computing requirements for this service are as follows:

Hardware: Desktop, or Laptop

OS: Windows 10, Mac OS 10.14, Linux Ubuntu 18.04

Internet Browser: Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge

Internet Connection (High-Speed Internet Connection Recommended)

Webcam (HD resolution recommended)

Note: Tablets, Chromebooks and Smartphones are not supported at this time. Windows-based tablets are not supported at this time.

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.

Intellectual Property: All course materials are protected by copyright and remain the intellectual property of the instructor. Students registered in the course may only use course materials for their own educational use. Students are not permitted to reproduce or distribute lecture notes or other course material publicly for commercial or non-commercial purposes without express written consent from the instructor.

ADDITIONAL COURSE POLICIES:

- 1.** Concerns about grading on assignments or tests must be brought to my attention within three business days of these items being available for review.
- 2.** Students who need to miss a test or an assignment submission for a valid reason must complete self-declaration form within 3 business days of the test. Students who correctly follow this procedure will have the weight of the missed assessment added to the weight of the final exam. Failure to follow this procedure will result in a grade of 0% on the missed assessment.
- 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 40% 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.** All dates and times are in Eastern Daylight Zone ETD (Time zone in Ottawa). This includes, but not limited to, lecture times, tutorial times, office hours times, assignment due dates and times, test dates and times, and final exam date and time.
- 6.** In assigning course letter grades, final numerical grades are viewed as continuous and grades are not automatically rounded up. A student must definitively earn the lower numerical limit of a letter grade category to receive that letter grade.

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 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>

TENTATIVE LECTURE SCHEDULE

WEEK	DATES	SECTIONS	TOPICS
1	January 11 – 15	Introduction, 1.1 – 1.5	Population and sample. Variables and data. Types of variables. Graphs for categorical data and quantitative data.
2	January 18 – 22	2.1 – 2.7	Measures of centre and variability. Tchebysheff's Theorem, Empirical Rule. Percentiles, quartiles. Box plots.
3	January 25 – 29	3.1 – 3.4, 4.1 – 4.3	Bivariate data. Graphs for bivariate data. Correlation coefficient. Regression line. Probability. Sample spaces, events.
4	February 1 – 5	4.4 – 4.7	Counting rules. Event relations. Additional rule. Subtraction rule. Conditional probability, independence. Multiplication rule. Bayes' rule.
5	February 8 – 12	4.8, 5.1 – 5.4	Probability distributions, expected values, and variances for discrete random variables. Binomial distribution. Hypergeometric distribution. Poisson distribution.
6	February 15 – 19	NA	WINTER BREAK
7	February 22 – 26	6.1 – 6.4	Probability distributions for continuous random variables. Normal distribution. Normal approximation to the binomial distribution.
8	March 1 – 5	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.
9	March 8 – 12	8.1 – 8.4	Point estimation. Interval estimation. Large sample confidence intervals for a population mean.
10	March 15 – 19	10.1 – 10.3, 8.4, 8.8	Student's t distribution. Small sample confidence intervals for a population mean. Large sample confidence intervals for a population (binomial) proportion. Choosing the sample size.
11	March 22 – 26	8.5 – 8.6, 10.4	Large-sample confidence interval for the difference between two population means. Small-sample confidence interval for the difference between two population means (independent samples). Large-sample confidence interval for the difference between two population (binomial) proportions.
12	March 29 – April 2	9.1 – 9.3, 9.5, 10.3	Testing hypotheses about population parameters. Statistical tests of hypothesis. Large-sample test about a population mean. Small-sample test about a population mean. Large-sample test about a population (binomial) proportion.
13	April 5 – 9	9.4, 9.6, 9.7, 10.4	Large-sample test of hypothesis for the difference between two population means. Sample-sample test of hypothesis for the difference between two population means (independent samples). Type I and Type II errors, power of the test.
14	April 12 – 14	9.6, 10.5	Large-sample test of hypothesis for the difference between two population (binomial) proportions. Small-sample inference for the difference between two populations means (paired samples).