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

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

Lectures: Lectures will be delivered online. Lecture slides and videos will be uploaded weekly on cuLearn.

Office Hours: Available 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	25%	(5 assignments at 5% each)
	Test #1	20%	
	Test #2	20%	
	Final Exam	35%	

Assignments: Assignments are due on **July 15**, **July 22**, **July 29**, **August 5**, and **August 12**. No late assignments will be accepted. Specific assignment instructions will be posted on cuLearn.

Test #1: Test #1 will take place on **Thursday**, **July 23** from 7:30pm – 9:00pm. **Test #2:** Test #2 will take place on **Thursday**, **August 6** from 7:30pm – 9:00pm.

Final Exam: There will be a cumulative 3-hour final exam scheduled by the University during the period August 17 – 23.

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.

Copyrighted Material: 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 any assignment or test must be brought to my attention within one business day of the completion of grading.

2. Students who need to miss a test or assignment submission for a valid reason must complete the self-declaration form. Students who correctly follow this procedure will have the weight of the missed assessment added to the weight of the relevant test or the final exam, whichever the instructor deems more appropriate under the circumstances.

3. Students will be randomly selected to participate in video interviews with the instructor to discuss their submitted work on assignments, tests, and the final exam in order to verify knowledge and ensure the academic integrity of these course assessments. Any student suspected of violating Carleton University's Academic Integrity Policy will be referred to the Office of the Dean of Science for investigation.

4. 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.

5. 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).

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 is 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	July 6 – 10	Introduction, 1.1 – 1.5, 2.1 – 2.7	Population and sample. Variables and data. Types of variables. Graphs for categorical data and quantitative data. Measures of centre and variability. Tchebysheff's Theorem, Empirical Rule. Percentiles, quartiles. Box plots.
2	July 13 – 17	3.1 – 3.4, 4.1 – 4.7	Bivariate data. Graphs for bivariate data. Correlation coefficient. Regression line. Probability. Sample spaces, events. Counting rules. Event relations. Additional rule. Subtraction rule. Conditional probability, independence. Multiplication rule. Bayes' rule.
3	July 20 – 24	4.8, 5.1 – 5.4, 6.1 – 6.4	Probability distributions, expected values, and variances for discrete random variables. Binomial distribution. Hypergeometric distribution. Poisson distribution. Probability distributions for continuous random variables. Normal distribution. Normal approximation to the binomial distribution.
4	July 27 – 31	7.1 – 7.6, 8.1 – 8.4	Sampling plans. Sampling distributions of statistics. Central Limit Theorem. Sampling distribution of the sample mean. Sampling distribution of the sample proportion. Point estimation. Interval estimation. Large sample confidence intervals for a population mean. Large sample confidence intervals for a population (binomial) proportion.
5	August 3 – 7	8.5 – 8.6, 8.8, 9.1 – 9.3, 9.5	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. Testing hypotheses about population parameters. Statistical tests of hypothesis. Large-sample test about a population mean. Large-sample test about a population (binomial) proportion.
6	August 10 – 14	9.4, 9.6, 9.7, 10.1 – 10.5	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. Student's *t* distribution. Small-sample inference for a population mean. Small-sample inference for the difference between two population means, independent and pair samples.