Carleton University
School of Mathematics and Statistics
BIT2009 A – *Statistics for Technology* – Winter 2022

Instructor: **Name:** Ahmed Almaskut
E-mail: aalmasku@math.carleton.ca
Office: 4348HP

Lectures: Tuesdays and Thursdays from 10:05 am – 11:25 am, Hyflex.

Attendance: Attendance will be mandatory. You will either attend in-person or through ZOOM. If you have a valid reason for not attending, you will need to discuss it with me before classes start.

Tutorials:

- In-person: A1, A2, A3, and A5
- Online: AT

Note: A schedule for the tutorials will be available on Brightspace before the start of tutorials

Office Hours: Tuesdays and Thursdays 12:00 pm – 1:00 pm in 4351HP
Tuesdays and Thursdays 4:00 pm – 5:00 pm through ZOOM

Textbook: Introduction to Probability and Statistics (4th Canadian Edition by Mendenhall, Beaver, Beaver, and Ahmed).

Note: The textbook is required for practice problems. Any edition of the textbook is acceptable.

Course description: This course covers statistical data analysis with an emphasis on hypothesis testing including parametric tests (e.g., t-tests, ANOVA) and non-parametric tests (e.g., Kruskal-Wallis, Friedman, chi-square), correlation and linear regression. Provides an introduction to probability theory and distributions (e.g. binomial, normal). SPSS will be the statistical software package used.

Prerequisites: Restricted to students in the BIT degree program.

Evaluation: Your final grade will be calculated as:

- Term Mark (60%)
    - Tests (40%)
    - Assignments (20%)
- Final Examination Mark (40%)

Assignments
There will be 5 assignments, each counting equally toward the term mark. Assignments due dates and times will be posted on Brightspace. No late assignments will be accepted.

Tentative Assignments Schedule

Assignment	Available	Due
Assignment 1	Sunday, January 16th	Sunday, January 30th
Assignment 2	Sunday, January 30th	Sunday, February 13th
Assignment 3	Sunday, February 13th	Monday, February 28th
Assignment 4	Sunday, March 6th	Sunday, March 20th
Assignment 5	Sunday, March 20th	Sunday, April 3rd

Tests
There will be two tests worth 20% each on **Saturday, March 5th, 9am to 10:30am** and **Saturday, March 26, 9:00am to 10:30am**. Students who need to miss a test submission for a valid reason must complete the **self-declaration form** and the weight of their missed assessment will be added to their final exam.

Final Exam: The final exam will be scheduled by the university. The exam period runs from **April 14-28**. It is the responsibility of each student to be available during the exam period. In particular, no travel plans should be made until the examination schedule is released.

Please note, your tests and final exam will be proctored using e-proctoring. Failure to join e-proctoring and set properly will result in a zero on a test/final exam.

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.

Calculators: Only non-programmable, non-graphing calculators are allowed on the tests and the final.

Intellectual property notice
Classroom teaching and learning activities, including lectures, discussions, presentations, tests, exams, by instructors, guest presenters, and students, are copy protected and remain the intellectual property of the instructor or respective author(s). All course materials, including PowerPoint/pdf presentations, outlines, and other materials, are also protected by copyright and remain the intellectual property of their respective author(s).
Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s). A student who publicly posts or sells an instructor's work, without the instructor's express consent, may be charged with misconduct under Carleton's Academic Integrity Policy and/or Code of Conduct, and may also face adverse legal consequences for infringement of intellectual property rights.

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 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

Academic Integrity: Students are required to be familiar with the Academic Integrity Policy at Carleton University. The complete policy is available at: Academic-Integrity-Policy-2021.pdf (carleton.ca). Students who violate the standards of academic integrity relating to any coursework will be required to meet with the Associate Dean of Science.

Important Dates

- First day of classes: January 10
- Last for registration: January 24
- Last day to withdraw from fall term and fall/winter courses with a full fee adjustment. Withdrawals after this date will result in a permanent notation of WDN on the official transcript: January 31
- Statutory Holiday: February 21
- Winter Break (no classes): February 22 - 25
- April 12: Last day of classes, last day for academic withdrawal
- Final Exam period: April 14 -28

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.

2. Students who need to miss a test for a valid reason must inform me prior to the test and 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 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 40% on the term mark and 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.

TENTATIVE LECTURE SCHEDULE

WEEK	DATES	SECTIONS	TOPICS
1	Jan 11, 13	Introduction, 1.1 – 1.5	Population and sample. Variables and data. Types of variables. Graphs for categorical data and quantitative data.
2	Jan 18, 20	2.1 – 2.3, 2.6, 2.7	Measures of centre and variability. Percentiles, quartiles. Box plots.
3	Jane 25, 27	5.1 – 5.2,6.1 – 6.4	The Binomial and Normal distributions.
4	Feb 1, 3	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.
5	Feb 8, 10	8.1 – 8.4	Point estimation. Interval estimation. Large sample confidence intervals for a population mean.
6	Feb 15, 17	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.
7	Feb 21 – 25	**Winter BREAK**	
8	Mar 1, 3	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.
9	Mar 8, 10	9.1 – 9.3, 9.5, 10.3	Testing hypotheses about population parameters. Statistical tests of hypothesis. Type I and Type II errors, power of the test. Large-sample test about a population mean. Small-sample test about a population mean. Large-sample test about a population (binomial) proportion.
10	Mar 15, 17	9.4, 9.6, 9.7, 10.4, 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). 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).
11	Mar 22, 24	11.1-11.3, 11.9	The analysis of Variance: The completely Randomized Design: One-Way Classification.
12	Mar 29, 31	12.1-12.3	Linear Regression and Correlation.
13	Apr 5, 7	12.4-12.5	Linear Regression and Correlation Continued
14	Apr 12	14.1-14.3	Analysis of Categorical Data: Chi square Goodness of fit.

This outline is subject to change depending on the progress of the course. All necessary changes will be announced in class and on Brightspace. It is the responsibility of the student to keep up to date with any such modifications.