

Carleton University
School of Mathematics and Statistics
STAT 2509 A - Computational Statistics (Statistical Modeling II)

Term: Summer 2025

Instructor: Agnes Benhin

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Office Hours: Mondays: 4:45pm to 5:45pm (HP 5230)

Prerequisites: (i) STAT 2507 (or STAT 2606 or STAT 3502)
(ii) or permission of the School.

(If you are not sure about your prerequisites, please see me or the Undergraduate Advisor Mr. Gary Bazdel in 4302C HP).

Text: "Introduction to Probability & Statistics", 12th edition (or 4th Canadian ed.), by William Mendenhall, Robert J. Beaver and Barbara Beaver. Copies of this book should be available at the MacOdrum Library. Students are not required to buy this book, but the suggested exercises will come from it. Costs to rent or purchase the book can be found at [Introduction to Probability and Statistics, 4th Edition - 9780176857042 - Cengage](#) or [Carleton University New, Used, Rental and Digital Textbooks](#) or Bookstore.

- statistical software used: SPSS. The use of any other applications including Excel is not permitted.
link to SPSS: [IBM SPSS Statistics & AMOS - Information Technology Services](#)

Lectures: Mondays and Wednesdays: 18:05 – 19:25, Azrieli Pavilion (AP) 132

Lab: A1 – Wednesdays, 5:05pm – 5:55pm, HP 4385
A2 – Wednesdays, 7:35pm – 8:25pm, HP 4385

Grades: The course will be made up of 2 parts: Term Work (50%) and Final Examination (50%).

- Term Work: 2 tests..... 15% each
5 assignments..... 4% each

Midterms will be held on **June 16th** and **July 14th** (both days are Mondays at 6:00pm)

- Final Examination: Consists of a three-hour closed book examination of the whole course covered during the term. In the case of the Deferred Final Examination, the final exam will be written in the Fall term of 2025 and it replaces only the final examination mark of the course grade.

Calculators: You may use any non-programmable and non-graphing calculator for the tests and final exam.

Review of Final Exams: If you wish to review your exam please email the instructor to set up a convenient time to review the exam. If the instructor is unavailable, contact the associate director to set up an appointment to review your exam. Exams are only available for 3 weeks after the exam has been written. If you wish to review your exam after the three weeks, you must formally request to view your exam from the Registrar office. For more information of this process go to <http://www.carleton.ca/registrar/>

Academic Accommodations: Should you need special arrangements during the term in order to meet your academic obligations due to disability, pregnancy or religious obligations, please let me know in writing within the first two weeks of class. You may visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://carleton.ca/equity/accommodation>

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 where 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: <https://carleton.ca/equity/sexual-assault-support-services>

Course Outline:

- Simple Linear Regression: Method of Least Squares, Inference, Analysis of Variance (ANOVA), Correlation, Test for Lack of Fit and Residual Analysis, Data Transformation.
- Multiple Linear Regression: Least Squares, Inference, ANOVA, Residual Analysis, Dummy Variables, Multicollinearity, Variable Selection Procedures.
- Experimental Design: Completely Randomized Design (CRD), Randomized Block Design (RBD), Multiple Comparisons, Non-parametric Tests, Two-Way ANOVA.
- Categorical Data: Pearson's Chi-square Statistic; the Chi-square Test of Independence and Homogeneity.

Important Notes:

1. If your final exam mark is less than 40% you will receive an F, regardless of your term mark. (Exceptions to this rule may be made at the discretion of the instructors)
2. Students who need to miss a test for a valid reason must inform me prior to the test and must email me completed self-declaration form (posted on BrightSpace) 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.

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.

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.

Summer Break: **June 18th – July 1st (inclusive).**

- Last day to withdraw from the course is **August 1st**.
- Students with a disability who require academic accommodations, please feel free to discuss it with me. Students must also contact the Paul Menton Centre to complete the required forms by **August 1st**.

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation.

Mathematics and Statistics Learning Assistance Program (MS-LAP): Math & Stats Learning Assistance Program (MS-LAP) supports first year mathematics and statistics courses. This free of charge program helps students in achieving their goals. It provides learning support and solutions to homework questions through assistance videos. These services are available on BrightSpace. MS-LAP gives students tools to succeed while explaining step-by-step particular problem strategies and associated theory. The program is for anyone who wants to deepen their understanding at their own pace, and in the comfort and privacy of their home.

The following is the tentative schedule for the assignments.

Assignment	Available	Due
Assignment#1	Monday, May 5th	Thursday, May 15th
Assignment#2	Wednesday, May 14th	Thursday, May 29th
Assignment#3	Wednesday, May 28th	Thursday, June 12th
Assignment#4	Wednesday, June 11th	Thursday, July 17th
Assignment#5	Wednesday, July 16th	Thursday, August 7th

NOTE:

- **assignments will be handed in online in Brightspace at 10:00am on a due date.**
- **tests/final exam are written in-person at Carleton University.** No online/distance proctoring of tests or the final exam will be permitted under any circumstance.