Carleton University
School of Mathematics and Statistics
STAT 2607 A,B – *Introduction to Statistical Modeling* II – Winter 2022

Instructor: Dr. Mohamedou Haye. mohamedouhaye@cunet.carleton.ca

Lectures: Asynchronous. Lecture slides and videos will be posted on Brightspace.

Tutorials: Tutorials will be delivered via BigBlueButton or Zoom on Brightspace.

Office Hours: TBA

Textbooks:
1. Business Statistics and Analystics in Practice, Bowerman. 9th edition.
2. Categorical data analysis. 3rd edition. A. Agresti. Wiley series in probability and Statistics.
3. Forecasting: Principles and Practice, Third Edition, Hyndman and Athanasopoulos.

Prerequisite: STAT 2606

Grading Scheme: Assignments 20%, Midterm Exam 30%, Final Exam 50%

Assignments: There will be four assignments each worth 5% of your term grade. All assignments are due before 11:59pm according to the following tentative assignment schedule.

Assignment	Available On	Due Date	Covers
Assignment 1	Friday, January 28	Friday, February 11	Weeks 1-3
Assignment 2	Friday, February 11	Friday, March 11	Weeks 4-6
Assignment 3	Friday, March 11	Friday, March 25	Weeks 7-9
Assignment 4	Friday, March 25	Friday, April 8	Weeks 10-12

Midterm Exam: The midterm exam will cover the material from Weeks 1 – 7 and be held on **Sunday, March 13** from **2pm – 4pm**. You will then have from 2pm-4:30pm to scan and upload your work.

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 14 – 28. 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 (Undergraduate Affairs).

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.

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

COURSE POLICIES:

1. Concerns about grading on assignments or the midterm exam must be brought to the instructor's attention within three business day of these grades being available for review. We will not regrade individual assignment or exam questions, but you may request a complete regrade of your entire assignment or test. Please note a regrade may result in an increase, decrease, or no change in your grade.

2. Students who need to miss the midterm exam for a valid reason must complete the self-declaration form within 3 business days of the test and email it to the instructor. Students who correctly follow this procedure will have the weight of the midterm exam added to the weight of the final exam. Failure to follow this procedure will result in a grade of 0% on midterm exam.

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 may be assigned a grade of **F** in the course at the discretion of the instructor.

5. All dates and times stated within the context of this course are local Ottawa 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.

7. 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).|

8. All assignments and exams in the course will be submitted online. A document entitled *Submission Instructions* will be posted on the course page in Brightspace. Any submissions not following the *Submission Instructions* will not be accepted for credit.

TENTATIVE LECTURE SCHEDULE

WEEK	DATES	SECTIONS	TOPICS
1	January 10 – 14	12.1, 12.2	Experimental Design, One-Way Analysis of Variance
2	January 17 – 21	12.3, 12.4	The Randomized Block Design, Two-Way ANOVA
3	January 24 – 28	15.8 – 15.10	Review of Regression Analysis, The Quadratic Regression Model, Interaction, Dummy Variables, The Partial *F* Test
4	January 31 –Feb 4	15.10 – 15.11	Multicollinearity, Model Building, Outliers and Influential Observations. Residual Analysis, Transformations
5	February 7 – 11	4.3 (from 2nd reference: Categorical data book)	Modelling Count Data, Poisson Regression, Overdispersion. Models for matched data
6	February 14 – 18	5.1-5.2 (from Categorical data book)	Logistic Regression Part 1: Connection to linear regression, logit models, mmodeling Binary Data, One Independent Variable, Interpretation of Slope Parameter, Wald Confidence Interval and Test for Slope Parameter.
N/A	February 21 – 25	N/A	**WINTER BREAK**
7	February 28 – March 4	5.3-5.5 and 4.1.5, 6.6 (from Categorical data book)	Logistic Regression Part 2: Odds Ratio, Confidence Intervals for Odds Ratios and Probabilities, Likelihood Ratio Test for Model Usefulness, Deviance, Grouped Responses, Model Building, Probit Models
8	March 7 – 11	Ch.3,8 (from 3rd reference: Forecasting)	Time Series Part 1: Basic Models, Multiplicative Decomposition, Simple Exponential Smoothing, Forecast Errors
9	March 14 – 18	Ch 4,.7 (from Forecasting)	Time Series Part 2: Regression Approach, Autocorrelation and Partial Autocorrelation Functions, Autoregressive Error Terms, Durbin Watson Test, Ljung-Box Test, Cochrane-Orcutt (Hildreth-Lu) Method
10	March 21 – 25	Ch.9.1-9.5 (from Forecasting)	Time Series Part 3: Stationarity, Differencing, Backshift Operator, Nonseasonal ARIMA Models
11	March 28 – April 1	Ch.9.8-9.9 (from Forecasting)	Time Series Part 4: Seasonal ARIMA Models
12	April 4 – 8	Other sources	Monte Carlo Simulation: Introduction, Geometric Brownian Motion Model, Examples from Finance including Portfolio Valuation
13	April 11 – 12	N/A	Final Exam Review