McGILL UNIVERSITY
DEPARTMENT OF ECONOMICS

ECON 227D2-002

ECONOMIC STATISTICS[1]

WINTER 2024

Instructor:	**Kazi Ahmed**
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Lecture Location (Hours):	**MDHAR G-10 (MW 08:35 – 09:55)**
Office Location (Hours):	**LEA 438 (W 10:00 – 11:00)**

Course Overview:
ECON 227D covers distributions, averages, dispersions, sampling, testing, estimation, correlation, regression, index numbers, trends and seasonals.

Course Restrictions:

- No credit is given for this course unless both…
  - ECON 227D1 is completed successfully in Fall 2022 and
  - ECON 227D2 is completed successfully in Winter 2023.
- ECON 227D1 and ECON 227D2 together are equivalent to ECON 227 and to ECON 227D.
- You may not be able to receive credit for this course and other statistics courses. Check here for more details.

Number of Credits:
6 credits for ECON 227D1 and ECON 227D2, upon successful completion of ECON 227D2.

Required Textbook and Materials:

- Newbold et al. *Statistics for Business and Economics, 8th Edition.* Pearson, 2012.
  - The e-text and MyLab can be purchased, using the instructor code ahmed17018, at https://mlm.pearson.com/northamerica.
  - A copy of this textbook is on reserve at the Humanities and Social Sciences Library.

Correspondence:
All correspondence in this class will be directed through McGill email addresses only. Any email coming from any other address will be directed to spam immediately and will neither be read nor answered. If you have not activated your account already, please follow the instructions here.

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[1] Every effort has been made to ensure the accuracy of the information contained in this course outline. In the event of extraordinary circumstances beyond the University's and/or instructor's control, the University and/or instructor may modify the delivery, content, structure, forum, location and/or evaluation scheme. In such an event, students will be informed.

Course Assessment:

COMPONENT	WEIGHT	DESCRIPTION
Labs (6)	20 percent	Due Sundays before 11:59pm starting January 21
Midterm 1	20 percent	Chapters 9 – 10 (Wednesday, February 7, 8:35 – 9:55)
Midterm 2	20 percent	Chapters 11 – 12 (Wednesday, March 13, 8:35 – 9:55)
April Exam	40 percent	Chapters 9 – 13, 16 (Date and Time TBA)

ECON 227D1 and ECON 227D2 are each worth 50 percent of the overall grade, except in the situation described below (see Honours to Major Transfers). The weights listed in this table are only for the ECON 227D2 portion of the course.

Honours to Major Transfers

- Honours to Major transfers are routine and are permitted only during one of two windows.
  - Up to the end of the 7th week of the Fall semester (Friday, October 13).
  - The January add/drop period in the Winter semester.
- Your performance in ECON 227D determines your grade in ECON 227D (ie, your grades from ECON 257D are disregarded entirely) and your ECON 227D instructor(s) will determine the appropriate weighting scheme of the various ECON 227D components.
- The coverage of ECON 227D and ECON 257D is not identical. You are to ensure familiarity with all aspects of ECON 227D before you transfer, a particular challenge for those transferring in January.
- If you decide to transfer, please speak with advisors in the economics department to ensure that it is done correctly and seamlessly.

Grade Criterion:

Letter	Points	Percent	Letter	Points	Percent	Letter	Points	Percent
A	4.0	85 - 100	B	3.0	70 – 74	C	2.0	55 – 59
A-	3.7	80 – 84	B-	2.7	65 – 69	D	1.0	50 – 54
B+	3.3	75 - 79	C+	2.3	60 - 64	F	0.0	00 – 49

- The official grade in this course is the letter grade. Where appropriate, a class average appears on transcripts expressed as the letter grade most representative of the class performance.
- Consult your department for the minimum grade necessary to fulfill your programme requirements.
- The grade distribution for ECON227D will be approximately normal, centred around 70 percent.
- At the end of ECON227D2, if the distribution differs significantly, the instructor(s) may exercise discretion and adjust the grade thresholds. This will not serve as grounds for grade appeals.

Lectures:

- Lectures take place in person. Attendance is not required, but lectures are not recorded so you are responsible for any material covered in class (see *Tentative Lecture Schedule and Assigned Readings* on page 5).
- While the lectures focus overwhelmingly on what is in the textbook, you are ultimately responsible for familiarity with the content covered in the textbook but not in the lectures and the content covered in the lectures but not in the textbook.
- Because of the current state of health and safety protocols and concerns, you may not approach the instructor before and/or after class, regardless of your vaccination and/or masked status. Quick transitions in and out of the classroom are needed to minimise contact and interaction.

Office Hours:

- Office hours are not recorded.
- You are received on a first-come, first-served basis and not by appointment.
- If you use the opportunity, you are expected to "arrive" prepared (ie, with their questions ready) and to be efficient so that the maximum number of students can make use of the available time.
- If you cannot attend because of scheduling conflicts, you may email questions with attached audio, video and/or photos. The more precise your question, the faster and more precise the response.

Labs:

- There are six (6) MyLab labs, one for each chapter and each worth 3 1/3 percent. These labs are very similar to more traditional, hardcopy assignments that students would submit to instructors. The purposes of the labs are to: (1) reinforce material covered in class; (2) teach material for which there is insufficient time in class; (3) keep students on track with course learning objectives; and (4) provide students with immediate evaluation and feedback.
- Labs are always accessible (except during exams) at mlm.pearson.com/northamerica after purchasing the access code (see *Required Textbook and Materials* on page 1).
- The grade on your FIRST attempt for each question (if it is before the deadline) is the one that is recorded. After the deadline, a copy of each lab is available for you to practice as much as you like. Grades from those attempts do not count.
- Labs are due Sundays at 11:59pm Eastern (see *Tentative Lecture Schedule and Assigned Readings* on page 5). The time is based on MyLab's clock. The best way to avoid missing deadlines is to do the labs ahead of time, not just prior to the deadline.
- You may ask for a 48-hour extension for any ONE of the six labs. No documentation and no reason are required, but you should use the extension opportunity judiciously and not use it without legitimate reason because a second extension will not be provided.
- If Pearson makes MyLab unavailable for an unscheduled reason (eg, a technical error on its part) and *the instructor* determines that this makes it impossible for you to complete your lab by the assigned deadline, then you may request an extension, without penalty, equal to the time that MyLab was unavailable. Note that this does not apply when you experience technical difficulties on your part.

- Each lab consists of some multiple-choice, graphical, numerical and conceptual questions. Evaluation and feedback is provided immediately.
- Some MyLab questions are based on computer algorithms. This means that every time a lab is attempted, some parameters (eg, numbers, wording) of the questions may differ.
- Labs do not have a preset amount of time to finish, but inactivity for extended periods could result in MyLab automatically logging you out.
- Address technical problems and questions directly to Pearson (https://support.pearson.com/getsupport).

Exams:

- There are two 90-minute midterms written outside of class time (the dates are to be announced) that cover the first- and second-thirds of the course, respectively, and a cumulative 2.5-hour exam written during the final exam period. (See *Course Assessment* on page 2 and *Tentative Lecture Schedule and Assigned Readings* on page 5 for more details about the contents and weights.)
- All exams are closed-book, multiple-choice exams that are written in person.
- You are ultimately responsible for knowing the date, time and location of the April exam (see www.mcgill.ca/exams).
- The weight of a midterm, if missed for any reason (eg, illness, technical, religious, work obligation, exam scheduling conflict, etc.), is shifted automatically to the April exam. There are NO MAKEUP, ALTERNATE OR DEFERRED MIDTERMS under any circumstances, nor may they be written early.
- If you miss, or cannot write, the April exam, you must request a deferred exam according to the process described here. April exam accommodations are almost never approved for reasons relating to personal vacation/travel or family events.
- You may use a non-programmable calculator and scrap paper to assist you, but you may NOT use any other additional materials, including but not limited to notes, slides, online or offline materials, external websites, formula sheets, previous exams, dictionaries, your phone/tablet or any other electronic device or anything else that would normally fall within the GENERALLY-ACCEPTED definition of cheating. Statistical tables, where appropriate, will be provided to you with the exam.
- Academic misconduct is pursued vigorously in accordance with McGill's Code of Student Conduct and Disciplinary Procedures. If you are aware of somebody else committing academic misconduct and do not report them, then you are committing academic misconduct. If you are unsure if what you are doing is acceptable, ask first.
- Do NOT underestimate the difficulty of the exams. The style of the exams is to ensure timely feedback; you should not interpret that the exam is easy because it is multiple choice.
- Questions involve algebra, definitions, interpretations and multi-part questions where the answer to one multiple-choice question may lead to another.
- If you require university-approved special accommodations (eg, 30 min/hr extra writing time), you must secure the necessary approval from McGill's Student Accessibility and Achievement (SAA) and notify me at least one week prior to the exam to receive it.
- You may review your exam (rather than take notes or copy the exam contents) during TA office hours. Intellectual property laws protect the contents of the exam.

Tentative Lecture Schedule and Assigned Readings:

DATE	EVENT	COVERAGE
January 8	Introduction	
January 10	Hypothesis Testing: Single Population	Chapter 9
January 15	Hypothesis Testing: Single Population	Chapter 9
January 17	Hypothesis Testing: Single Population	Chapter 9
January 21	Lab 1 Due	Chapter 9
January 22	Hypothesis Testing: Additional Topics	Chapter 10
January 24	Hypothesis Testing: Additional Topics	Chapter 10
January 29	Hypothesis Testing: Additional Topics	Chapter 10
January 31	Simple Regression	Chapter 11
February 4	Lab 2 Due	Chapter 10
February 5	Simple Regression	Chapter 11
February 7	Midterm 1	Chapters 9 - 10
February 12	Simple Regression	Chapter 11
February 14	Simple Regression	Chapter 11
February 18	Lab 3 Due	Chapter 11
February 19	Multiple Regression	Chapter 12
February 21	Multiple Regression	Chapter 12
February 26	Multiple Regression	Chapter 12
February 28	Multiple Regression	Chapter 12
March 4	Winter Break	
March 6	Winter Break	
March 10	Lab 4 Due	Chapter 12
March 11	Review	Chapter 11 - 12
March 13	Midterm 2	Chapter 11 - 12
March 18	Additional Topics in Regression Analysis	Chapter 13
March 20	Additional Topics in Regression Analysis	Chapter 13
March 25	Additional Topics in Regression Analysis	Chapter 13
March 27	Additional Topics in Regression Analysis	Chapter 13
April 1	Easter Monday	
April 3	Time-Series Analysis	Chapter 16
April 7	Lab 5 Due	Chapter 13
April 8	Time-Series Analysis	Chapter 16
April 10	Time-Series Analysis	Chapter 16
April 11 (Wed Schedule)	Time-Series Analysis	Chapter 16
April 14	Lab 6 Due	Chapter 16
TBA	Final	Chapters 9 – 13, 16

Course Objectives / Learning Outcomes:

Chapter 9

- Formulate null and alternative hypotheses for applications involving...
  - A single population mean from a normal distribution
  - A single population proportion (large samples)
  - The variance of a normal distribution
- Formulate a decision rule for testing a hypothesis
- Know how to use the critical value and *p*-value approaches to test the null hypothesis (for both mean and proportion problems)
- Define Type I and Type II errors and assess the power of a test
- Use the chi-square distribution for tests of the variance of a normal distribution

Chapter 10

- Test hypotheses for the difference between two population means involving...
  - Dependent population (matched pairs)
  - Independent populations (population variances known)
  - Independent populations (population variances unknown but equal)
- Test hypotheses for the difference between two population proportions (large samples)
- Use the F table to find critical F values
- Complete an F test for the equality of two variances

Chapter 11

- Explain the simple linear regression model
- Obtain and interpret the simple linear regression equation from a set of data
- Describe R^2 as a measure of explanatory power of the regression model
- Understand the assumptions behind regression analysis
- Explain measures of variation and determine whether the independent variable is significant
- Calculate and interpret confidence intervals for the regression coefficients
- Use a regression equation for prediction
- Form forecast intervals around an estimated *y* value for a given *x*
- Use graphical analysis to recognise potential problems in regression analysis
- Explain the correlation coefficient and perform a hypothesis test for zero population correlation

Chapter 12

- Apply multiple regression analysis to business decision-making situations
- Analyse and interpret computer output for a multiple regression model
- Perform a hypothesis test for all regression coefficients or for a subset of coefficients
- Fit and interpret nonlinear regression models
- Incorporate qualitative variables into the regression model by using dummy variables
- Discuss model specification and analyze residuals

Chapter 13

- Explain regression model-building methodology
- Apply dummy variables for categorical variables with more than two categories
- Explain how dummy variables can be used in experimental design models
- Incorporate lagged values of the dependent variable as regressors
- Describe specification bias and multicollinearity
- Examine residuals for heteroscedasticity and autocorrelation

Chapter 16

- Identify the trend, seasonality, cyclical and irregular components in a time series
- Use smoothing-based forecasting models, including moving average and exponential smoothing
- Apply autoregressive models and autoregressive integrated moving average models

Copyright of Lectures:

- Course materials, such as course outlines, assignment questions, lectures, lecture notes, presentation slides and exam questions, irrespective of format, are the intellectual property of the instructor.
- If you upload these materials to file sharing sites, or distribute, publish or broadcast or share these materials with others outside the class in any way, in whole or in part, without prior expressed permission of the instructor, then you are in violation of the Copyright Act of Canada and McGill's Code of Student Conduct and Disciplinary Procedures.
- You must also seek prior expressed permission of the instructor before, for example, photographing, recording or taking screenshots of slides, presentations, lectures and notes on the board. If you are found to be in violation of an instructor's intellectual property rights, you could face serious consequences pursuant to the Code of Student Conduct and Disciplinary Procedures. Additional consequences could involve possible legal action under the Copyright Act of Canada.

Academic Integrity:

McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures.

Student Assessment Policy:

The University Student Assessment Policy exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads. Students are encouraged to review this Policy, which addresses multiple aspects and methods of student assessment (eg, the timing of evaluation due dates and weighting of final examinations).

Students' Rights:

Additional policies governing academic issues that affect students can be found in the Handbook on Student Rights and Responsibilities.