McGILL UNIVERSITY
DEPARTMENT OF ECONOMICS

ECON 227D1-002
ECONOMIC STATISTICS[1]
FALL 2023

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Teaching Assistants: Yang Ning and Sanah Sarin

Course Overview:
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.

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 **lander17282**, 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.

[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 (8)	20 percent	Due Sundays before 11:59pm starting September 24
Midterm 1	20 percent	Chapters 1 – 3 (Monday, October 23, 19:00 – 20:30)
Midterm 2	20 percent	Chapters 4 – 5 (Monday, November 20, 19:00 – 20:30)
December Exam	40 percent	Chapters 1 – 8 (Date and Time To Be Determined)

- 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 227D1 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.

Exam Style and Student Expectations:

My exams tend to reward students who have sufficient knowledge of the underlying concepts and have developed an intuitive approach to the material. Memorization is almost never rewarded.

To give you the best chance for success in my course, I strongly encourage you to come prepared and on time, avoid absences, participate regularly with a positive attitude, read the relevant materials before class and do the relevant lab exercises before the subsequent class, dress appropriately and identify problems and seek help as soon as they occur.

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.
- As with traditional on-campus office hours, you are received on a first-come, first-served basis and not by appointment. You sit in a virtual waiting room until the instructor is ready to admit you.
- 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 eight (8) MyLab labs, one for each chapter and each worth 2.5 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 accessible at all times (except during exams) at https://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 eight 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.
- In the event that 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/s/).

Exams:

- There are two 90-minute midterms written outside of class time (Monday, October 23 and Monday, November 20) 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.
- While the instructor will announce the date, time and location of the December exam, you are ultimately responsible for ensuring the accuracy of the information.
- 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 December 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 December exam, you must request a deferred exam according to the process described here. December 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 vigourously 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 Office for Students with Disabilities (OSD) 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.

Tutorials:

A video library of solutions to selected practice questions from the textbook is posted on myCourses in place of traditional in-class tutorials. Ideally, you should try to answer the questions on your own and in advance of watching the videos.

TA Support:

- TA support is available for this course. TAs will provide regular office hours to answer student questions, but not to provide tutoring or to provide answers to lab questions.
- Specifics about the TAs will be provided on myCourses beginning around the third week of classes.

Tentative Lecture Schedule and Assigned Readings:

DATE	EVENT	COVERAGE
August 30	Introduction	—
September 6	Math Review	—
September 11	Math Review	—
September 13	Describing Data: Graphical	Chapter 1
September 18	Describing Data: Graphical	Chapter 1
September 20	Describing Data: Numerical	Chapter 2
September 24	LAB 1 DUE	Chapter 1
September 25	Describing Data: Numerical	Chapter 2
September 27	Probability	Chapter 3
October 1	LAB 2 DUE	Chapter 2
October 2	Probability	Chapter 3
October 4	Probability	Chapter 3
October 12	Discrete Random Variables and Probability Distributions	Chapter 4
October 16	Discrete Random Variables and Probability Distributions	Chapter 4
October 18	Discrete Random Variables and Probability Distributions	Chapter 4
October 15	LAB 3 DUE	Chapter 3
October 23	Continuous Random Variables and Probability Distributions	Chapter 5
October 23	MIDTERM 1 (19:00 – 20:30, TBD)	Chapters 1 – 3
October 25	Continuous Random Variables and Probability Distributions	Chapter 5
October 29	LAB 4 DUE	Chapter 4
October 30	Continuous Random Variables and Probability Distributions	Chapter 5
November 1	Sampling and Sampling Distributions	Chapter 6
November 6	Sampling and Sampling Distributions	Chapter 6
November 8	Sampling and Sampling Distributions	Chapter 6
November 12	LAB 5 DUE	Chapter 5
November 13	Estimation: Single Population	Chapter 7
November 15	Estimation: Single Population	Chapter 7
November 19	LAB 6 DUE	Chapter 6
November 20	Estimation: Single Population	Chapter 7
November 20	MIDTERM 2 (19:00 – 20:30, TBD)	Chapters 4 – 5
November 22	Estimation: Additional Topics	Chapter 8
November 26	LAB 7 DUE	Chapter 7
November 27	Estimation: Additional Topics	Chapter 8
November 29	Estimation: Additional Topics	Chapter 8
December 3	LAB 8 DUE	Chapter 8
December 4	Review	Chapters 1 – 8
TBD	DECEMBER EXAM	Chapters 1 – 8

Course Objectives / Learning Outcomes:

Chapter 1

- Explain how decisions are often based on incomplete information.
- Explain population vs sample, parameter vs statistic and descriptive vs inferential statistics. Explain random vs systematic sampling.
- Identify types of data and levels of measurement.
- Create and interpret graphs to describe categorical and numerical variables and relationships between variables.
- Explain appropriate and inappropriate ways to display data graphically.

Chapter 2

- Calculate and interpret the mean, median and mode, range, variance, standard deviation and coefficient of variation for a set of data.
- Apply the empirical rule and Chebyshev's theorem to describe the variation of population values around the mean.
- Explain the weighted mean and when to use it.

Chapter 3

- Explain and apply basic probability concepts and rules.
- Use a Venn or tree diagram to explain simple probabilities. Calculate conditional probabilities.
- Determine whether events are statistically independent. Use Bayes' theorem for conditional probabilities.

Chapter 4

- Interpret the mean and standard deviation for a discrete random variable.
- Know how and when to use the binomial and Poisson distributions to calculate probabilities.
- Explain covariance and correlation for jointly distributed discrete random variables.

Chapter 5

- Explain the difference between discrete and continuous random variables.
- Know how and when to use the uniform, normal and exponential distributions.
- Translate normal distribution problems into standardised normal distribution problems. Calculate probabilities using a standard normal distribution table.
- Evaluate the normality assumption.
- Use the normal approximation to the binomial distribution.
- Explain jointly distributed variables and linear combinations of random variables.

Chapter 6

- Describe a simple random sample and why sampling is important. Explain the difference between descriptive and inferential statistics. Describe sampling distributions and sample variances.
- Determine the mean and standard deviation for the sampling distribution of the sample mean and sample proportion.
- Describe the central limit theorem and its importance

Chapter 7

- Distinguish between a point estimate and a confidence interval estimate.
- Construct and interpret a confidence interval estimate for a single population mean, population proportion and population variance using the z, t and/or χ^2 distributions.
- Determine the required sample size to estimate a mean or proportion within a specified margin of error.

Chapter 8

- Form confidence intervals for the difference between two dependent population means, two independent population means and two independent population proportions.

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.