

ECON 227-002: Economic Statistics

2021 Winter

Instructor: WenJing Cai

E-mail: wenjing.cai@mcgill.ca

Office Location: LEA 437

Office Hours: M 10:30-11:30 and 15:00-16:00

Lecture Hours: MW 16:05-17:25

TA:

Yang Ning (yang.ning@mail.mcgill.ca)

Endong Wang (endong.wang@mail.mcgill.ca)

Course Description

Distributions, averages, dispersion, sampling, testing, estimation, correlation, regression, index numbers, trends and seasonal.

Course Restriction

1. Students must register for both ECON 227D1 and ECON 227D2.
2. No credit is given for this course unless both
 - (a) ECON 227D1 is completed successfully in Fall 2020 and
 - (b) ECON 227D2 is completed successfully in Winter 2021.
3. ECON 227D1 and ECON227D2 together are equivalent to ECON 227 and to ECON 227D.
4. You may not be able to receive credit for this course and other statistics courses. Check here (www.mcgill.ca/oasis/academic/courses/course-overlap) for more details.

Required Materials

Textbook: McClave, J.T., P.G. Benson and T. Sincich. Statistics for Business and Economics, 13th Edition. Pearson Canada Ltd., 2018.

Grading Policy

COMPONENT	WEIGHT	CHAPTER	DATE
Homework	25%	Chapter 7-12	
Midterm 1	20%	Chapter 7-8	
Midterm 2	20%	Chapter 9-11	
Final	35%	Chapter 7-12	TBD

*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.

- Since this is full course (D1+D2) there is no supplemental for the Fall semester. The only supplemental, held the following August, is for D1+D2, the course as a whole.
- Deferral of a Fall final examination can be arranged with the instructor, but for the Winter final examination must be arranged through the university.

Honours to Major Transfers

- Transfers from Honours to Major are routine, although this is an unusual feature within the University: these can be done after the add/drop period. There are two time windows when transfers are permitted and transfers at any other times are not permitted.
 - Window 1, up to the end of the week following the mid-term examination, the end of the 7th week of the Fall semester (Friday, October 16).
 - Window 2, during the January add/drop period. After the end of window 2, transfer to 227 is not possible.
- If you transfer from ECON 257, the grade will be based entirely on work in ECON 227. The interim grade from 257 will not be used. The instructor in Econ 227 will determine the weights given to different elements of the work in that course. Note that this is **not** necessarily the same arrangement that is used for the microeconomics transfer 250-230; check the Econ 250 course outline for the arrangement that will be made in that case.
- For students using window 1, their marks in ECON 257D1 will be disregarded and their Fall semester grade will be determined solely on ECON 227D1 exams. Students that enter ECON 227D1 prior to September 30 are expected to write all ECON 227D1 exams, while students that enter ECON 227D1 on or after September 30, the weight of Midterm 2 will be 30 percent and the Final will be 50 percent.
- For students transferring using window 2, their grade obtained in ECON 227D2 will count for 100 percent when computing their grades in 227D.

Grade Criterion

Letter	Points	Percent
A	4	85 – 100
A-	3.7	80 – 84
B+	3.3	75 – 79
B	3	70 – 74
B-	2.7	65 – 69
C+	2.3	60 – 64
C	2	55 – 59
D	1	50 – 54
F	0	00 – 49

Lectures

- The lectures are online lecture using Zoom during usual time Mon, Wed from 16:05-17:25. Because the students will be possible in different timezone, so the lectures will also be recorded and saved in myCourses.
- Please read the Guidelines for Instructors and Students on Remote Teaching, Learning and Assessment (<https://www.mcgill.ca/tls/instructors/class-disruption/guidelines-remote-w2021>) and the course outline for this course in myCourses. You will be notified through a 'pop-up' box in Zoom if a lecture or portion of a class is being recorded. By remaining in sessions that are recorded, you agree to the recording, and you understand that your image, voice, and name may be disclosed to classmates. You also understand that recordings will be made available in myCourses to students registered in the course.
- There are detailed information about using Zoom in <https://www.mcgill.ca/tls/instructors/class-disruption/zoom>. The link of Zoom for each lecture will be sent out before every class. Questions regarding remote delivery can go to <https://www.mcgill.ca/tls/students/remote-learning-resources>.

Expectations for Student Participation

- You can use Chat in Zoom during fixed lecture time.
- You should check your email and myCourses regularly. You are encouraged to download the myCourses Pulse mobile app to stay connected and on track.

Office Hours

- Office hours are not recorded, optional and use Zoom in M 10:30 –11:30 and 15:00-16:00.
- The office hours are first-come, first-served basis.

- If you use office hours, you are expected to “arrive” prepared (ie, with your questions ready) and to be efficient so that the maximum number of students can make use of the available time.
- If you are unable to attend office hours because of scheduling conflicts, you can email your questions to me or you could ask TA.

Homework

- There are five homework, and each worth five percent.
- The submission times are listed in the schedule.
- You need to submit your homework through myCourses.

Schedule

DATE	EVENT	COVERAGE	Homework
Mon, Jan 11, 2021	Estimation with Confidence Intervals	Chapter 6.3	
Wed, Jan 13, 2022	Tests of Hypotheses	Chapter 7	
Mon, Jan 18, 2021	Tests of Hypotheses	Chapter 7	
Wed, Jan 20, 2021	Tests of Hypotheses	Chapter 7	
Mon, Jan 25, 2021	Inferences Based on Two Samples	Chapter 8	HW1
Wed, Jan 27, 2021	Inferences Based on Two Samples	Chapter 8	
Mon, Feb 1, 2021	Inferences Based on Two Samples	Chapter 8	
Wed, Feb 3, 2021	Inferences Based on Two Samples	Chapter 8	
Mon, Feb 8, 2021	MIDTERM 1 (:00 – :00)	Chapter 7-8	
Wed, Feb 10, 2021	Design of Experiments and Analysis of Variance	Chapter 9	HW 2
Mon, Feb 15, 2021	Design of Experiments and Analysis of Variance	Chapter 9	
Wed, Feb 17, 2021	Design of Experiments and Analysis of Variance	Chapter 9	
Mon, Feb 22, 2021	Categorical Data Analysis	Chapter 10	
Wed, Feb 24, 2021	Categorical Data Analysis	Chapter 10	
Mon, Mar 8, 2021	Categorical Data Analysis	Chapter 10	
Wed, Mar 10, 2021	Simple Linear Regression	Chapter 11	HW3
Mon, Mar 15, 2021	Simple Linear Regression	Chapter 11	
Wed, Mar 17, 2021	Simple Linear Regression	Chapter 11	
Mon, Mar 22, 2021	Simple Linear Regression	Chapter 11	
Wed, Mar 24, 2021	Simple Linear Regression	Chapter 11	
Mon, Mar 29, 2021	MIDTERM 2 (:00 – :00)	Chapter 9-11	
Web, Mar 31, 2021	Multiple Regression and Model Building	Chapter 12	HW 4
Mon, Apr 5, 2021	Multiple Regression and Model Building	Chapter 12	
Wed, Apr 7, 2021	Multiple Regression and Model Building	Chapter 12	
Mon, Apr 12, 2021	Multiple Regression and Model Building	Chapter 12	
Wed, Apr 14, 2021	Multiple Regression and Model Building	Chapter 12	
Thu, Apr 15, 2021	Review		Hw5
TBD	Final Exam	Chapters 7 – 12	

Learning goals

The schedule is tentative and subject to change.

- Inference Based on a Single Sample: Test of Hypothesis
 - Elements of hypothesis: Null hypothesis, Alternative hypothesis, test statistics
 - Rejection rule (p value, rejection area),
 - Test a population mean, test population proportion, test population variance (Chi-Squared distribution)
- Inferences Based on Two Samples Confidence Intervals and Tests of Hypotheses
 - Comparing Two Population Mean: Independent Sample, Paired Different Sample
 - Comparing Two Population Proportion
 - Comparing Two Population Variance (F-distribution)
 - Determining the Required Sample Size
- Design of Experiments and Analysis of Variance
 - The Completely Randomized Design: Single Factor
 - Multiple Comparisons of Means
 - The Randomized Block Design
 - Factorial Experiments: Two Factors
- Categorical Data Analysis
 - Testing Category Probabilities: One-Way Table
 - Testing Category Probabilities: Two-Way (Contingency) Table
- Sample Linear Regression
 - Linear regression model
 - Least squared Method
 - Coefficient of Determination
 - Model Assumption
 - Testing of significance
 - Residual Analysis: Outliers
- Multiple Regression
 - FIRST-ORDER MODELS WITH QUANTITATIVE INDEPENDENT VARIABLES:
 - * Estimating and Making Inferences About the β Parameters
 - * Evaluating Overall Model Utility
 - * Using the Model for Estimation and Prediction

- MODEL BUILDING IN MULTIPLE REGRESSION
 - * Interaction Models
 - * Quadratic and Other Higher-Order Models
 - * Qualitative (Dummy) Variable Models
 - * Models with Both Quantitative and Qualitative Variables
 - * Comparing Nested Models
- Residual Analysis: Checking the Regression Assumptions

Calculator

Students should have a calculator capable of statistics computations with two-variable capacity. In the winter term there will be MINITAB and EXCEL computer output.

Course Policies

Language of Submission

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.

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

Credit

- Credit will be given for ONLY ONE of the following introductory statistics courses: AEMA 310, BIOL 373, ECON 227D1/D2, ECON 257D1/D2, GEOG 202, MATH 203, MGCR 271, MGCR 273, PSYC 204, SOCI 350.
- Credit will be given for ONLY ONE of the following intermediate statistics courses: AEMA 411, BIOL 373, ECON 227D1/D2, ECON 257D1/D2, GEOG 351, MATH 204, PSYC 305, SOCI 461 with the exception that you may receive credit for both PSYC 305 and ECON 227D1/D2 or ECON 257D1/D2
- If you have already received credit for MATH 324 or MATH 357, you will NOT receive credit for any of the following: AEMA 310, AEMA 411, BIOL 373, ECON 227D1/D2, ECON 257D1/D2, GEOG 202, GEOG 351, MATH 203, MATH 204, MGCR 271, MGCR 273, PSYC 204, PSYC 305, SOCI 350.