



Carleton University

Department of Economics

Carleton University - ECON 4002 A

Statistical Analysis in Economics

Fall Term 2023

Instructor: Matt Webb, Loeb Building, B-846

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TA: Sunny Karim

Lectures: Thursdays 8:35-11:25

Tutorials: Tuesdays 8:35 - 9:55

Office hours: Thursdays 1:30 - 3:30, Loeb Building, B-846

Course Webpage: cuLearn

Course and Tutorial Locations: Log into Carleton Central to view the locations on your timetable.

Lectures are held for three hours per week, and tutorials for one and a half hours per week.

Prerequisites:

ECON 2210 (or equivalent) with a grade of C+ or higher, and ECON 2220 (or equivalent) with a grade of C+ or higher. Precludes additional credit for STAT 3500 (no longer offered), STAT 3508, and STAT 3558. Students who believe they have taken a similar background course or courses from another university must provide appropriate documentation to the Department of Economics Undergraduate Administrator, Renée Lortie.

Course Text - Required

- *The Effect: An Introduction to Research Design and Causality* by Nick Huntington-Klein, CRC press, html version available here <https://theeffectbook.net/>
- Other readings may be assigned for specific topics. These readings will be announced in class, and posted on cuLearn.

Other Texts - Recommended

- *Mastering Metrics: The Path From Cause to Effect* by Joshua D. Angrist and Jörn-Steffen Pischke, Princeton University Press
- *Causal Inference: The Mixtape* by Scott Cunningham, Yale University Press, html version available here <https://mixtape.scunning.com/>

Tutorials:

Weekly tutorials will be given by the Teaching Assistant, starting September 26th. These tutorials will involve working through additional problem sets based on the course material. These problem sets are not marked, but are great practice for the midterm and assignments. The tutorials will also provide an additional opportunity for students to ask questions they may have.

Programming Languages:

Students are free to use whichever programming language they wish for the assignments. However, bonus marks, or an equivalent incentive, will be given if multiple programming languages are used for assignments.

Evaluation:

- Midterm Exam: 25% - November 2nd, covers material through to October 19
- Assignment I: 15%
- Assignment II: 15%
- Final Exam: 45% - covers all course material

Important Dates:

The evaluation dates listed below are subject to change, but are unlikely to do so:

- Assignment I
 - Available online September 26th
 - Due October 10th, in tutorial, or before
- Midterm : November 2nd, in class
- Reading Week: October 26
- Assignment II
 - Available online November 7th
 - Due November 21st, in tutorial, or before
- Final Exam:
 - TBD, during final exam period
 - Exam to be held in person
 - Students are not to make travel plans during the exam period: December 10-22

Table 1: Topics Covered:

Lecture	Date	Topics	Readings
1	Sep. 7	Potential Outcomes and DAGs	T.E. Ch. 5,6,7,10
2	Sep. 14	Regression - Basics	T.E. Ch. 13
3	ASync	Programming, Stats Review	notes
4	Sep. 28	Regression - good and bad controls	TE Ch. 8,9
5	Oct. 5	Monte Carlo Simulations	T.E. Ch. 15 & notes
6	Oct. 12	Instrumental Variables - basics	T.E. Ch. 19
7	Oct. 19	Instrumental Variables - issues	notes
8	Oct. 26	Reading Week	
9	Nov. 2	Midterm	
10	Nov. 9	Regression Discontinuity Design	T.E. Ch. 20
11	Nov. 16	Difference-in-differences - classical	T.E. Ch. 18
12	Nov. 23	Difference-in-differences - modern	notes
13	Nov. 30	Alternative statistical inference	notes
14	Dec. 07	Class Choice	notes

Notes: Additional readings will be assigned during the term. Class on September 21st will be asynchronous.

Assignments:

Late assignments will not be accepted.

Individuals may work together on assignments, but are encouraged to work alone. Students may work in groups of up to four individuals, and must list all groups members on their assignments.

Midterm Exam:

There will not be a make up exam for those who miss the midterm. Those missing the midterm for a valid reason will have the weight of the midterm shifted to the final, resulting in a final worth 60%, the assignments will then be worth 20% each. **Medical notes are not required for those missing a midterm, in line with the Covid exemptions.**

Tutorial Schedule

Week	Date	Topic
1	Sep 5	none
2	Sep 12	none
3	Sep 19	none
4	Sep 26	Problem Set 1
5	Oct 3	Problem Set 2
6	Oct 10	Assignment 1
7	Oct 17	Practice Midterms
8	Oct 24	Reading Week
9	Oct 31	Take up Midterm
10	Nov 7	Problem Set 3
11	Nov 14	Problem Set 4
12	Nov 21	Assignment 2
13	Nov 28	Problem Set 5
14	Dec 5	Practice Final

Additional Information

Course Standing

Standing in a course is determined by the course instructor subject to the approval of the Department Chair and the Faculty Dean. This means that course grades may be scaled upwards or downwards in a rank preserving manner to better fit the relevant departmental distributional norm. No grades are final until they have been approved by the Dean.

Academic Misconduct - Plagiarism

Please be aware that plagiarism is serious offence at Carleton and should be recognized and avoided. For information please see

<https://carleton.ca/economics/plagiarism-resources-and-accommodations/>.

Copyright of Course Materials

Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

Accessibility and Accommodation

For Students with Disabilities:

Students with disabilities requiring academic accommodations are encouraged to contact a coordinator at the Paul Menton Centre for Students with Disabilities (ext. 6608) to complete the necessary letters of accommodation. After registering with the Centre, please set up an appointment with me to discuss your needs at least two weeks prior to a test or in-class mid-term exam. This is necessary in order to ensure sufficient time to make the necessary arrangements.

For Religious Observance:

Students requesting academic accommodation on the basis of religious observance should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory academic event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student.

Students who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.

For Pregnancy:

Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.