

SOSC 4330: Quantitative Data Analysis for Social Research III

Class Hours: Monday 9:00-11:50 a.m.

Fall 2023

Instructor: Wen WANG

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Office Hours: Monday 12:00 - 1:00 p.m.

Class Room: 4402

Web: Canvas

Office: 2352 Academic Building

TA: Wei LI

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Course Description

This course provides an overview of basic microeconomic methods and applications that are widely used in quantitative social science research. Topics include linear and non-linear models, causal inference (instrumental variables, difference-in-differences, regression discontinuity), techniques for correct statistical inference, and alternative methods for causal inference. The course serves as a foundation for basic microeconomics models, emphasizing both the practical implementation of these models and the application of these models to the question of causal inference in social analysis.

The purpose of this class is twofold:

1. To introduce students to quantitative techniques that are used both to assess data before empirical work and to carry out data analysis in the completion of such work.
2. To familiarize students with modern statistical and econometric software in order to use these models and techniques (i.e., R is introduced in tutorials and used to do statistical work in lectures).

Course Prerequisites

- Students are familiar with materials covered in in **SOSC 2400** or its equivalent.

- Students have university level mathematics background and programming skills.

Course Policy

Assessments

Assessments of this course include both individual work and group work. We will split the class into **6-8** groups. Students can choose their group members. The size of the groups will depend on total enrollment. The groups should have a roughly equal number of students. Please go to the [link](#) to complete your group information before **OCT 1**.

For the group project, your team will collaborate to write a term paper. The paper should use what you have learned in class to do quantitative analysis for a generalizable social science topic. Before the mid-term, you should consult with the instructor and TA to choose a proper research topic (i.e., the research could be practical using available data).

- **10%** of your grade will be determined by your attendance and participation in class. You are required to do in-class programming exercises and attend TA tutorial.
- **10%** of your grade will be determined by two assignments, each worth 5 points. The purpose of these assignments is to practice your programming skills.

Assignment	Handed Out	Due Date
1. Coding Exercise (individual work)	Sep 25	Oct 9, 6:00 p.m.
2. Coding Exercise (individual work)	Oct 16	Nov 12, 6:00 p.m.

- **40%** of your grade will be determined by a mid-term presentation (**20%**) and a referee report (**20%**). This is **individual work**. You read **ONE** paper chosen from the **reading list** — the choice is exclusively. Write a **three-page** referee report and present the papers in class. Please assign your presentation dates and time using [the Canvas Page](#) before **OCT 1**. Some guidelines for the referee report:
 - **Format:** A4 size, 1-inch margins, 12-point, Times New Roman font, 1.25 spaced
 - **Structure:** 1. summarize the paper including research question, contribution, data, methods, and conclusion; 2. assessment and critique of evidence, data, and methods; 3. possible policy implications/extensions/follow-up studies.
 - **OCT 30's** lecture will be reserved for presentations of the paper you referee. **NOV 6 (6:00 p.m.)** is the deadline for submitting the referee report.

- **40%** of your grade will be determined by a term paper (**20%**) and a presentation (**20%**) as a group project (**18 min** presentation + **2 min** discussion (Tentative)).

Presentation: Classes on **NOV 27** will be reserved for your team to present your research in class. Please assign your presentation dates and time using [the Canvas Page](#) after having a team and submit the presentation slides to TA the day before the presentation. We will take a note of your presentation to give fair grades. When one group is giving presentation, the other groups can ask questions or give comments. The comments/feedback received should be incorporated into the final draft of the term paper.

Term Paper:

- **Format:** up to 30 pages including reference, tables and charts; A4 size, 1-inch margins, 12-point, Times New Roman font, 1.25 spaced

- **Structure:**

Abstract: (1 page, 100-150 words) summary of key points for non-experts audience

Introduction: (2-3 pages) research question, research significance, summary of research methods and results

Literature Review: (2-3 pages) a review of previous relevant research, justification of your contribution to literature

Data: data collection process, variable of interest, summary statistics of data

Method: data analysis, models, and quantitative methods

Results: regression results, research output, intuitions of the results

Reference: see [referencing guide](#) for reference format

- **DEC 15th (6:00 p.m.)** is the submission date of the term paper with revisions.

- **Peer Evaluation:** each team member is required to download the peer evaluation form from Canvas, fill it and send it to me by yourself after submitting the final paper by **DEC 15th**. **20%** of your grade from team works will be determined by the peer evaluation. **80%** will be determined by the works' quality.¹

- **Tutorial: (Tentative)**

1. instructions for R; 2. data analysis and fundamental quantitative methods

¹The team works includes term paper and paper presentation, which count for 40% of your grade.

Grading Policy

- **Late submission:** late delivery of due items will **NOT** be accepted.
- **Re-grade policy:** if you want to ask for regrading, please submit your argument in writing along with your assignment. We will reassess your entire assignment using the copies we saved for regrading. The answer to “[grade grubbing](#)” is “no” and your grade may end up lower after reassessment.

E-mail Policy

I am usually quick to respond to student emails. To avoid missing your emails, I prefer you answer my email in 2 days. I will not respond to certain emails students sent including emails for missed class for which there was no presentation, emails to request an extension on an assignment for which the syllabus already established the deadline.

Free-rider Policy

- [Guidance to avoid or deal with the free-rider issue](#)
- I will not define anybody to be “free rider” directly. If all the other team members agree that they don’t want to keep collaborating with one person, please comply the following rules to split the team: 1. each group member need to send an email to TA to justify their request. 2. the peer evaluation (10% of total score) will not be split. 3. the student who leaves the group must find a new proposal & presentation topic.

Academic Dishonesty Policy

HKUST is committed to high standards of [academic honesty](#). Cheat and plagiarism are not acceptable. According to guidelines of the university, plagiarism/cheat cases typically resulted in at least the failure of a course. If you have any concern about this, include a proper citation/quotes and use software(i.e., [turnitin](#), [iThenticate](#)) to detect plagiarism.

To protect personal information and team registration information, **please go to Canvas to download the syllabus with hyperlinks.**

Class Schedule (Tentative)

Please check the class schedule for updates as class contents are subject to change, contingent on enrollment size, mitigating circumstances and the progress we make as a class.

Week	Topic	Date	Notes	Due
1	Causality, Experimental Ideal	Sep 4	Introduction	-
2	Experiment, Regression	Sep 11	Lecture	-
3	Confounders & IV	Sep 18	Lecture & Program	-
4	IV & Validity	Sep 25	Lecture & Program	Team (OCT 1)
5	Difference-in-Difference	Oct 9	Lecture & Program	Assignment (OCT 9)
6	Two-way Fixed Effect	Oct 16	Lecture & Program	
7	Midterm Presentation	Oct 30	Lecture & Program	-
8	Defend for Common Trend	Nov 6	Lecture & Program	-
9	Regression Discontinuity	Nov 13	Lecture & Program	Assignment (NOV 12)
10	Sharp RDD & Fuzzy RDD	Nov 20	Lecture & Program	-
11	Final Presentation	Nov 27	Lecture	-
		Dec 15		Final Paper

Textbook and Reference

Angrist, J. D. & Pischke, J.- S. (2008). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Cameron, Colin & Pravin Trivedi. (2005) *Microeconometrics: Methods and Applications*. Cambridge University Press.

Resources

Research Topics

- [Research Topics](#) (see in Canvas)
- [Data Sources](#) (see in Canvas)

Reading

- [Reading Guide](#)
- [A Review of the Literature](#)

Writing

- [Referee Report Template](#)
- [How to Write an Effective Referee Report and Improve the Scientific Review Process](#)
- [Guidelines to Write a Referee Report](#)
- [Research Paper Template \(20-page\)](#)
- [Writing Tips For Economics Research Papers](#)

Programming

- [Download R](#)
- [Download RStudio](#)
- [R manuals website](#)
- [R packages website](#)
- [Basic R Tutorial](#)