Economics 545
Econometric analysis

Lecture section (A01)

Winter Session:	Fall 2025 (202509)
CRN (Lecture):	11140
Unit Value:	1.5
Schedule Type:	Lecture
Delivery Mode:	Face-to-face
Meeting Time:	MR 10:00–11:20 AM
Building & Room:	BEC 363
Start/End Dates:	Sep 3 – Dec 3, 2025

Lab section (B01)

CRN:	11141
Unit Value:	0
Schedule Type:	Lab
Delivery Mode:	Face-to-face
Meeting Time:	Wed 9:30–10:20 AM
Location:	BEC 170
Dates:	Sep 3 – Dec 3, 2025 (see note)

Note there will be no lab in the first week of classes. Labs begin in Week 2.

Instructors.

Instructor	Chris Auld
Office	BEC 348
Email	auld@uvic.ca
Phone	250.721.8537 (email is strongly preferred)
Office Hours	Wednesdays 3:00–4:30 (see note)
Contact	Email is primary; responses within two business days.
Course TA	Fengyi Zhang
	fengyizhang@uvic.ca
Office hours:	to be scheduled as needed.

Note on Auld's office hours: generally I will be available for face to face meetings. Technical questions are much easier to answer face to face than they are on Zoom. However, Zoom is possible by request, and if the weather is poor or I am not feeling well I may move office hours to Zoom, which I will announce and/or post on my office door.

Teaching and assessment modality.

This course is delivered face-to-face and all exams are held in person. Lectures will be held in person unless illness or weather precludes, in which case no more than one-third of sessions will be moved online. There are no required devices for participation.

Course content.

Calendar Description: *Analysis of econometric methods for applied microeconomic research within the linear model, including specification, estimation, and hypothesis testing; introductory instrumental variables.*

See the learning outcomes and the course schedule for more detail on content.

Course prerequisites and corequisites.

Two undergraduate courses in econometrics, a course in linear algebra, and a course in calculus (or equivalent preparation). Please chat with me with at the start of term if you are concerned about your technical background.

Textbook and materials.

Main course text

- **Davidson, R., and J. G. MacKinnon (2021).** *Econometric Theory and Methods (manuscript).*
  Free. Roughly, we cover selected parts of the first eight chapters.

Recommended additional readings.

- **Davidson, R., and J. G. MacKinnon (1993).** *Estimation and Inference in Econometrics.*
  Free. More mathematically advanced; uses the same notation and approach as the main text.
- **Hansen, B. E. (2022).** *Econometrics.*
  Free. More advanced than the main text but particularly good on linear algebra and probability theory.
- **Wooldridge, J. M. (2019).** *Econometric Analysis of Cross Section and Panel Data* (MIT Press); *Introductory Econometrics: A Modern Approach* (Cengage).
  Good coverage of many microeconometric topics at about the same level as the main text.
- **Greene, W. H. (2018).** *Econometric Analysis* (8th ed., Pearson).
  Great wide-ranging reference, not so great to learn from.

- **Cunningham, S. (2021).** *Causal Inference: The Mixtape*.
  Accessible discussion of issues in causal inference.
- **Huntington-Klein, N. (2022).** *The Effect: An Introduction to Research Design and Causality*.
  Another accessible take on causal modeling.
- **Cameron, A. Colin and Pravin K. Trivedi.** *Microeconometrics Using Stata*, Second Edition (2022), Volumes I and II; Stata Press. See stata-press.com/books/microeconometrics-stata for details and resources (ISBN-13 978-1-59718-362-8). Succinct theoretical explanations combined with Stata code to implement.
- **Hanck, C., M. Arnold, A. Gerber, and M. Schmelzer (2024).** *Introduction to Econometrics with R*.
  Similar to the previous entry, but with R.

Datasets, slides, and example code will be posted on Brightspace. You are also strongly advised to have available an introductory undergraduate level textbook (e.g., "baby" Wooldridge) available for reference.

Software.

Assignments may be completed using any software capable of the statistical analysis required for the course, but **Stata**, **R**, or **Python** are particularly recommended. Classroom demonstrations use **Stata**. We will discuss the pros and cons of these packages in class.

Brightspace.

Announcements, archived exams, example code, lecture slides and any other course content to be made available will be posted on Brightspace. Students are responsible for checking Brightspace regularly for updates.

Learning outcomes.

By the end of the course, students will be able to:

- Apply probability theory and linear algebra to derive and prove fundamental results in econometrics.
- Derive and explain the numerical and statistical properties of the OLS estimator, including reasoning using the geometry of least squares to explain estimation, residuals, predicted values, and model fit.
- Frame empirical questions in terms of *identification* in the linear models and recognize key issues such as omitted variables and simultaneity.

- Specify, estimate, and interpret appropriate linear models and associated statistical results such as p-values and confidence intervals.

- Assess when a *causal* interpretation of regression results is warranted and when such an interpretation would lead instead to misleading conclusions.

- Explain the basic ideas in instrumental variables (IV) methods and both the opportunities and perils of such approaches.

- (Time permitting) Explain and implement basic difference in difference models and evaluate their strengths and weaknesses.

Course structure, assessments, and grading

Learning occurs through in-person lectures and independent reading. Students must request permission from the instructor before recording lectures. Learning components include lectures, in-class discussion, and posted practice materials.

Use of AI.

Since all evaluation is in person you have unlimited use of AI for this course. Assignments will be given and you are very strongly encouraged to complete them yourself, with only at most very judicious use of AI. The point of the assignments is to practice and get feedback; if an AI writes your work, you won't learn much, the TA's or my time will be wasted marking what an AI did, and critically it won't help you on the in-person midterms or final (where AI use is not allowed). This concern holds equally for all of coding, theoretical derivations, and clearly writing interpretations of results. Also, remember that even the best current LLMs often produce incorect or misleading output and are not reliable.

On a related note, be very cautious if you watch videos on YouTube or similar purporting to explain statistical or econometric concepts. Some are excellent and some are full of misinformation, and it's not always obvious which is which.

Grading scheme.

- Midterm examinations (three, held during lab time): 50% total (10%, 20%, 20%)
- Final examination (cumulative): 50%

Note that the instructor may adjust the distribution of grades to more accurately reflect achievement of learning outcomes. All exams are in person.

Assignments

The assignments are not evaluated for grading and are only for practice and feedback. Feedback is only provided on timely submissions. Late assignments may not receive feedback unless an extension has been arranged.

Mandatory / essential course components.

All exams are essential course requirements. To complete the course, you must write at least **two of the three midterms** and the final exam. If you miss a midterm due to illness or another University-recognized ground for academic concession, the weight of that midterm will be **proportionately reallocated to the other midterms** (their relative weights preserved). Documentation may be required under University policy. Essential components are deferrable under University policy.

Dates of assessments and due dates.

*Midterms (held during lab time) are **tentative** and will be confirmed by the end of the second week of classes.*

Midterm schedule

Date	Time	Location
Wed Oct 1, 2025	9:00–10:20 AM	BEC 170
Wed Oct 22, 2025	9:00–10:20 AM	BEC 170
Wed Nov 19, 2025	9:00–10:20 AM	BEC 170

Note carefully that the midterms start at 9:00am while the regular lab sessions start at 9:30am, in the interest of relaxing time pressure during the exams. Please immediately bring any intractable scheduling conflicts to my attention.

Final exam: In person, scheduled by the Registrar. Alphanumeric calculators are permitted but no other materials are allowed. *Please do not make travel plans until the official exam schedule is released. Travel conflicts are not grounds for academic concession.*

Grading scale.

The standard UVic grading scale applies:

Grade	Percentage Range
A+	90–100%
A	85–89%
A-	80–84%
B+	77–79%
B	73–76%
B-	70–72%
C+	65–69%
C	60–64%
D	50–59%
F or N	0–49%

Tentative schedule.

Weeks	Topic
1, 2	1. Course overview; linear algebra and probability review
3, 4	2. Numerical properties of the OLS estimator
5–7	3. Statistical properties of the OLS estimator
8, 9	4. Inference in the linear model.
10, 11	5. Instrumental variables
12	6. Panel data and differences in differences

Note that we may not get to the final topic, and we will spend more time on given topics if warranted by classroom discussion and feedback.

University policies and statements.

The University of Victoria requires that the following information be included in all course outlines. Students are responsible for familiarizing themselves with these policies:

- **Academic Calendar:** The Calendar is the official source for program and course requirements. See uvic.ca/calendar.

- **Academic Integrity:** Students are expected to adhere to UVic's policy on academic integrity. Violations (cheating, plagiarism, multiple submission, etc.) are taken seriously. See uvic.ca/current-students/academics/academic-integrity.

- **Accessibility and Accommodations:** The Centre for Accessible Learning (CAL) provides resources and coordinates academic accommodations. Students requiring

support should contact CAL as early as possible. See uvic.ca/centre-for-accessible-learning.

- **Equity and Human Rights (EQHR):** UVic is committed to a safe and inclusive environment. Information on discrimination and harassment policies is available at uvic.ca/eqhr.
- **Copyright:** Course materials are for registered student use only and are protected by copyright law. See uvic.ca/library/research/citation/copyright.
- **Academic Concessions:** Procedures for concessions (illness, family affliction, etc.) are described in the Calendar. See uvic.ca/current-students/academic-concessions.
- **Conflict of Interest and Academic Responsibilities (AC1205):** Full policy available at uvic.ca/universitysecretary/policies/general/AC1205.html.

Resources for students.

- Student Wellness
- Centre for Accessible Learning
- UVic Learn Anywhere (learning workshops and resources)
- Library Resources
- Centre for Academic Communication (CAC)
- Learning Strategies Program (LSP)
- Academic Advising
- Economics Undergraduate Advising: ecadvice@uvic.ca
- Student Awards and Financial Aid
- International Student Advising
- Indigenous Student Services (ISS)
- Student groups and resources including UVic Ombudsperson

Territorial acknowledgement.

We acknowledge and respect the lə$k^{'w}$əŋən peoples on whose traditional territory the University of Victoria stands, and the Songhees, Esquimalt, and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.