

ECON3334 Introduction to Econometrics (4 Credits)

Department of Economics, HKUST
Fall 2025

Instructor	Email	Office Hours
Jiaming Huang (Lecturer)	jiaminghuang@ust.hk	LSK7010, Fri 10:30am - 11:30am (or by appointment)
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Course Description

This is an introductory course to econometrics. Econometrics is a quantitative approach to economics that integrates statistics, economic theory, and mathematics. We begin with a review of mathematical tools, followed by linear regression analysis and its properties. The course has two goals: First, to equip you with techniques to evaluate econometric methods and assess econometric analysis critically. Second, to enable you to answer empirical economic questions using real-world data.

Prerequisites

Basic probability and statistics, or consent of instructor.

School Intended Learning Outcomes (SILO)

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

1. Understand key assumptions in regression models and explain their relationship to estimator properties (SILO # 1.1)
2. Use regression for economic data analysis, conduct statistical inference, and interpret results (SILO # 3.1)
3. Use R to perform basic econometric analysis (SILO # 1.2)
4. Collect data for your desired empirical analysis and provide answers to economic questions (SILO # 1.3)
5. Present your understandings of certain economic problems and use

empirical results to justify your explanation (SILO # 2.2)

For the details of SILOs, please refer to the following link:

[UG - School Intended Learning Outcomes](#)

Course Materials

Main Reference

We will mainly follow the structure of Stock and Watson (2019)

- Purchase is **not required**; slides and course materials are self-contained.
- Not all sections of the textbook will be covered; additional references will supplement the material.
- Reserved copies are available in the library. An eBook version is also accessible via the library website (limited to four concurrent users).
- Slides, problem sets, and other materials will be posted on [Canvas](#).
 - Additional references are attached in the end of each slide

Additional References

The following references are optional, but useful as background reading or supplements.

- Chiang and Wainwright (2005): Undergrad-level math reference for economists. Highly recommended if you're not comfortable with math.
- Wooldridge (2020): A popular introductory alternative to Stock and Watson (2019)
- Brockwell (2016): A readable and accessible text on time series analysis. May not have time to cover the topic in this course.
- James et al. (2021): Excellent source for statistical learning. Online lectures by the authors are freely available.

Coding Resources

Problem sets will involve some coding. You may use your preferred programming language but the lecture will use R. Below are some useful online resources:

- R: [Avanzi \(2025\)](#)
- Python:
 - [Coding for Economists](#) by Arthur Turrell
 - [QuantEcon Python Lectures](#)
- Julia:

- Lobianco ([2018](#))
- [QuantEcon Julia Lectures](#)

Teaching and Learning Activities

Lectures

- The default teaching mode is in-person on campus
- Weekly schedule:
 - L1 (2656) Mon 04:30PM - 05:50PM & Fri 12:00PM - 01:20PM, LSK1005
 - L2 (2658) Mon 01:30PM - 02:50PM & Fri 09:00AM - 10:20AM, LSK1009

Tutorials

- The TA will discuss problem sets in the tutorials.
- **Tutorial sessions are not weekly.**
- The TA will make an announcement via Canvas before each session.
No tutorial sessions in the first week.

Assessment

Problem Sets (20%)

- There will be four to five problem sets (lowest score dropped if there are five).
 - Each counted problem set shares a weight of 5% towards the final grade.
- **You may discuss the questions and work in groups, but you must submit your own solutions.**
- The problem sets will be posted in Canvas.
 - Only submissions through Canvas by the due date and time are accepted.
 - Only PDF/JPG/JPEG/HEIC files will be allowed.

Midterm Exam (30%)

- Date/time/venue announced later

Final Exam (50%)

- Cumulative, covering all the course materials including those covered by the midterm
- Date/time/venue announced later

Policies on Exams and Problem Set Submission

- Proctored midterm and final exams will be held on campus for all students.
- **No make-up exam** will be offered for the midterm. If you have a verifiable medical reason, the midterm weight will be transferred to the final exam.
- Missing the final exam will result in an "F" (fail) for the course. If you have a verifiable medical reason or other circumstances beyond your control, you may apply to the Academic Registry within one week of the missed examination to request a make-up exam.
 - Given the additional preparation time, the make-up exam—if approved—is expected to be more challenging than the original.
 - See [Academic Registry's guidelines](#) for more details.
- **There is zero tolerance of cheating.** If you are caught cheating, you will receive a zero for the course. The case will be reported to both the department and the school levels.
- Late submission of the problem sets, including uploading failure due to using a different file format other than instructed, will not be accepted unless you have a verifiable medical reason.
 - **Please make sure you submit problem sets via [Canvas](#)!**
- Re-grading must be completed within one week from the time the grade of a problem set, or an exam is released. Please contact the TA regarding re-grading.

Academic Integrity and Honesty

Please make sure to adhere to the university policy on academic integrity; see [here](#).

Schedule

Tentative topics based on readings from Stock and Watson (2019); subject to change as the course progresses:

Topic	Content	Reading	Week
Introduction	Logistics, scope of econometrics, causal inference frameworks	Ch. 1	1
Review: Probability	Definition of probability; random variables; probability distributions; moments; multivariate extension;	Ch. 2	2-4

overview of popular
distributions; limit theorem

Review: Statistics	Estimation; hypothesis testing (size, power); confidence intervals; application: randomized experiments	Ch. 3	5-7
Linear Regression with One Regressor	Conditional expectation and linear projection; causal interpretation; OLS algebra; properties of OLS (mean and variance)	Ch. 4	8
Inference with One Regressor	Hypothesis testing under finite-sample distribution; OLS asymptotics; large sample inference	Ch. 5	8
Linear Regression with Multiple Regressors	Multivariate interpretation; OLS algebra; properties of OLS (Gauss-Markov)	Ch. 6	9
Inference with Multiple Regression	Hypothesis testing under finite-sample distribution; OLS asymptotics; large sample inference	Ch. 7	9
Linear Regression: Further Issues	Heteroskedasticity; model specification (nonlinearity, omitted variable bias); goodness-of-fit; measurement error	Ch. 8 & 9	10
Instrumental Variables	Motivation; IV assumptions; estimators (IV, 2SLS); weak instruments; AK application	Ch. 12	11
Time Series Regression	Serial correlation; stationarity; AR models; local projections; nonstationarity (trends, seasonality, unit roots, breaks); LPIV application	Ch. 15	12
High-	Subset selection; shrinkage	Ch. 14	13

Dimensional Regression	estimation; dimension reduction; model averaging; multiple testing; macro forecasting application
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References

- Brockwell, J. Peter. 2016. *Introduction to Time Series and Forecasting*. New York, NY: Springer Science+Business Media.
- Chiang, Alpha C., and Kevin Wainwright. 2005. *Fundamental Methods of Mathematical Economics*. 4th ed. Boston, Mass: McGraw-Hill/Irwin.
- James, Gareth, Daniela Witten, Trevor Hastie, and Robert Tibshirani. 2021. *An Introduction to Statistical Learning: With Applications in R*. Second edition. New York NY: Springer.
- Lobianco, Antonello. 2018. "Julia Language: A Concise Tutorial." <https://syl1.gitbook.io/julia-language-a-concise-tutorial>.
- Stock, James H., and Mark W. Watson. 2019. *Introduction to Econometrics*. Fourth edition. New York, NY: Pearson.
- Wooldridge, Jeffrey M. 2020. *Introductory Econometrics: A Modern Approach*. Seventh edition. Boston, MA: Cengage Learning.