

Econ 609
Econometric Methods
SPRING 2025

Instructor: Hyungsik Roger Moon, KAP 310B, 213-740-2109, email: moonr@usc.edu

Time: Mon, Wed 4:00PM - 5:50PM.

Classroom Location: KAP 167.

We may have a few zoom classes. Zoom class dates will be announced later when we need them.

Office Hours: Monday 10:30AM - 11:50PM and by appointment.

Prerequisites: Econ 611 and its equivalences.

TA: TBA. TA's office hours will be announced later.

Main Reference:

- Bruce Hansen, *Econometrics*, Princeton University Press.

We will follow mostly the lecture notes (available from Blackboard) and some chapters of Hansen (2022). Most of the problem set questions will be from the Hansen book. I strongly recommend to purchase the book by Hansen.

Other References:

- William Greene, *Econometric Analysis*, 7th ed. Prentice Hall
- Jeffrey Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, MIT Press
- Russell Davidson and James MacKinnon, *Estimation and Inference in Econometrics*, Oxford University Press
- Fumio Hayashi, *Econometrics*, Princeton University Press
- A.W. Van der Vaart, *Asymptotic Statistics*, Cambridge University Press
- Handbook of Econometrics Vol 4, Chapter by McFadden and Newey
- Bruce Hansen, *Statistics and Probability*, Princeton University Press.

Grading: There will be assignments, a midterm exam and a final. They will count toward the grade as follows.

Assignments	10%
Midterm	30%
Final	60%.

Exams:

- Midterm : March 12, Wednesday, from 4:00PM to 5:50PM, in class.
- Final: May 7, Wednesday, from 4:00PM to 5:50PM, in class

“Students requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. Please be sure the letter is delivered to me as early in the semester as possible. DSP is open Monday – Friday, 8:30 – 5:00. The office is in Student Union 301 and their phone number is (213) 740-0776.”

Description of the Course

This course is a second semester econometrics course mainly for the first year economics Ph.D. program students. The main objective of the course is to introduce basic econometrics theories in regression analysis and some of widely used econometrics models in empirical applications. The main emphasis of the lectures will be on theoretical issues. Empirical exercises will be assigned through homework assignments.

Topics

- Classical linear regression model (Lecture Notes, Chapters 3,4 of Hansen)
- Asymptotics – various convergence concepts, central limit theorems (Lecture Notes, Chapters 5,6 of Hansen)
- General inference methods – maximum likelihood method and generalized method of moments method (Lecture Notes, Chapters 7,9,13,14 of Hansen)
- Testing – Wald test, Lagrangian multiplier (LM) test (or score test), likelihood ratio (LR) test, J-test for overidentification (Lecture Notes, Chapters 8,13)
- Introduction of Nonparametrics and Resampling methods (Lecture Notes, Chapters 10,11,12 of Hansen)
- Introduction to Statistical Learning (Lecture Notes)
- Applications
 - Classical linear regression model
 - Heteroskedasticity
 - Instrumental variables
 - Limited dependent variable models
 - Simple time series regression models and tests for serial correlations (if time permits)
 - Seemingly unrelated regressions (if time permits)
 - Simultaneous equation models (if time permits)
 - Linear panel data models (if time permits)