APEC 8213: Econometric Analysis III

Instructor:	**Paul Glewwe**	**Spring, 2026**
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Class Website:	https://canvas.umn.edu/courses/540298	
Office Hours:	By Appointment (send me an e-mail to schedule an appointment)	
Class Meetings:	Lectures MW 10:15 a.m. – 11:30 a.m., Ruttan Hall B22	
	Discussions F 1:55 p.m. – 2:45 p.m., Ruttan Hall 135B	
Teaching Assistant:	Matt Braaksma	
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TA Office Hours:	Mondays and Wednesdays 9:00-10:00 a.m. Waite Library (Ruttan 2nd floor)	

Course Description:

This course is a continuation of Apec 8211 and 8212. It will cover maximum likelihood estimation, generalized method of moments estimation, multinominal and ordered logits and probits, censoring and selection models, density estimation, semi-parametric estimation, time series econometrics, dynamic panel data models, and machine learning. The focus will be on empirical work rather than on theoretical topics. Students should have completed Apec 8212 or an equivalent course.

The course will make use of the same textbooks used in Apec 8211 and 8212:

Bruce Hansen: *Probability and Statistics for Economists*
Bruce Hansen: *Econometrics*

Both were published in 2022 by Princeton University Press. They are available both in hard cover and as e-books.

Grading:

There will be homework and a final exam. Their weight in the final grade will be:

Homework: 50%
Final: 50% (Monday March 16, 10:15 a.m.)

Computer Assignments:

Much of the homework will involve econometric estimation. You can do it using either R or Stata.

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The University of Minnesota requires that syllabi include references to the policies on student conduct; use of personal electronic devices in the classroom; scholastic dishonesty; makeup work for legitimate absences; appropriate student use of class notes and course materials; grading and transcripts; sexual harassment; equity, diversity, equal opportunity and affirmative action; disability accommodations; mental health and stress management; and academic freedom and responsibility. Please review them here:

https://policy.umn.edu/education/syllabusrequirements-appa

Lectures (7 weeks, counting first recitation):

I. Estimation methods (January 21, 23 (**Friday**) and 26)

    1. Maximum likelihood: Hansen, **Probability and Statistics for Economists**, 10.1-10.19
    2. Application of maximum likelihood: Probit and Logit Models: Hansen 25.1-25.9
    3. Generalized method of moments: Hansen, 13.1-13.27

II. Multinominal and ordered logits & probits; censoring & selection models (Jan. 28 and Feb. 2)

    4. Binary, Multinominal and Ordered Logits and Probits: Hansen, 25.1-25.9, 26.1-26.10
    5. Censoring and Selection Models: Hansen, 27.1-27.11

III. Density estimation and semiparametric econometrics (February 4 and 9)

    6. Nonparametric density estimation: Hansen, **Probability and Statistics for Economists**, 17.1-17.15
    7. Nonparametric regression: Hansen, 19.1-19.25

IV. Time Series Econometrics (February 11, 16, 18 and 23)

    8. Part 1: Hansen, 14.1-14.9
    9. Part 2: Hansen, 14.10-14.18
    10. Part 3: Hansen: 14.19-12.29
    11. Part 4: Hansen: 14.30-14.43

V. Additional Topics for Panel Data (February 25)

    12. Instrumental Variables for Panel Data, Dynamic Panel Models: Hansen, 17.28-17.33, 17.36-17.42

VI. Machine Learning (March 2 and 4)

    13. Introduction, ridge regression and lasso: Hansen, 29.1-29.11
    14. More on lasso, regression trees and random forests: Hansen, 29.12-29.21

Final Exam, in class, March 16, 2026 (the Monday **after** spring break)**.**