In this course, we will continue to build understanding of econometric theory and applications.

**My Office Hours**
Mondays and Fridays 1-2pm, 531 Saunders Hall; kwaks@hawaii.edu

**Prerequisites**
Economics 628 or equivalent.

**Course Materials**
Jeffrey Wooldridge, “Econometric Analysis of Cross-Section and Panel Data”.
Please see reading list for required readings. Access to [www.jstor.org](http://www.jstor.org) and [www.nber.org](http://www.nber.org) will be useful. Access to Stata will be required for the Empirical Methods part of the course.

**Requirements and Grades**
Final class grades will be based on the following:
- Problem Sets 30%
- Empirical Paper 30%
- Final Exam 40%
Under no circumstances will late problem sets be accepted. There are NO MAKEUP EXAMS so it is essential that you be able to attend the scheduled final exam. If you require any disability-related special accommodations for exams, please speak to me the first week of class so that we can make appropriate arrangements.

**COURSE OUTLINE**

**Linear Estimation and Models**
- I. OLS (review)
- II. IV (review)
- III. Unobserved Effects Panel Data Models
  - A. Fixed Effects (Within) Estimators
  - B. Between Estimators
  - C. Random Effects Estimators

**Non-Linear Estimation and Models**
- I. Maximum Likelihood Methods
  - A. Duration models
  - B. Consistency, Asymptotic Normality, and Efficiency
  - C. Classical Testing, Hausman-Wu Tests
  - D. Partial Likelihood
- II. Generalized Method of Moments
  - A. Abowd and Card, 1989
  - B. Consistency and Asymptotic Normality
C. Hypothesis Testing
D. Empirical Likelihood
E. Classical Minimum Distance Estimation

III. Discrete Response Models
A. Linear Probability Model
B. Probit and Logit Models
C. Multinomial Logit Model
D. Ordered Logit and Ordered Probit Models

**Empirical Methods in Applied Economics**

I. Statistical Problems
   A. Heteroskedasticity
   B. Serial Correlation

II. Causal Inference and Identification Problems
   A. Measurement Error in X
   B. Omitted Variables Bias
   C. Incorrect Functional Form of Conditional Expectation
   D. Rank

III. Unconfounded Treatment Assignment
   A. Random Assignment
   B. Multivariate Matching
   C. Propensity Score Methods

IV. Alternatives to Unconfoundedness
   A. IV
   B. Regression Discontinuity Design
   C. Difference-in-Differences
   D. Control Function Approach
   E. One- and Two-sided Censoring, Parametric and Semi-parametric

VII. Panel Data Models
    A. Correlated Random Effects
    B. Seemingly Unrelated Regression
    C. Optimal Minimum Distance

VIII. Issues with Time Series Data
LECTURE AND READING SCHEDULE

Review of Linear Estimation Models

Week 1
8/21 (T)  Review of OLS
-- Notes from last semester.
-- Wooldridge, Ch 4.

8/23 (Th)  Review of OLS cont’d

Week 2
8/28 (T)  Review of IV
-- Notes from last semester
-- Wooldridge, Ch 5. Also, Ch 18.

8/30 (Th)  Panel Data Models: FE, Between, and RE Estimators.
To be cont’d in Week 15
-- Wooldridge, Ch 10, 11. Also, Ch 17.

Maximum Likelihood Methods

Week 3
9/4 (T)  Intro to Maximum Likelihood
-- Wooldridge, Ch 13.

9/6 (Th)  Duration Models
-- Wooldridge, Ch 20.
Econometrica, Vol. 47.

Week 4
9/11 (T)  Consistency, Asymptotic Normality, and Efficiency
-- Wooldridge, Ch 13.

9/13 (Th)  Classical Testing
-- Wooldridge, Ch 13.

Week 5
9/18 (T)  Hausman-Wu Tests

9/20 (Th)  Partial Likelihood
-- Wooldridge, Ch 13.
-- Cox, D. R.
Generalized Method of Moments

Week 6
9/25 (T) Intro to GMM
-- Wooldridge, Ch 14.

9/27 (Th) Consistency and Asymptotic Normality
-- Wooldridge, Ch 14.

Week 7
10/2 (T) Hypothesis Testing in the GMM Framework
-- Class notes.

10/4 (Th) Empirical Likelihood

Week 8
10/9 (T) Classical Minimum Distance Estimation
-- Wooldridge, Ch 14.

10/11 (Th) Odds and Ends
Quick Overview of Quantile Regression, Bootstrap (if time permits)
-- Class notes.

Discrete Response Models

Week 9
10/16 (T) Linear Probability Models
-- Wooldridge, Ch 15.

10/18 (Th) Probit and Logit Models
-- Wooldridge, Ch 15.

Week 10
10/23 (T) Multinomial Logit Models
-- Wooldridge, Ch 15.

10/25 (Th) Ordered Logit and Ordered Probit Models
-- Wooldridge, Ch 15.
Empirical Methods in Applied Economics

Week 11
10/30 (T) Statistical Problems

11/1 (Th) Causal Inference and Identification Problems

Week 12
11/6 (T) Unconfounded Treatment Assignment
Multivariate Matching
-- Class notes.

Propensity Score

11/8 (Th) NO CLASS

Week 13
11/13 (T) Alternatives to Unconfoundedness
IV

RDD

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11/15 (Th)  Alternatives to Unconfoundedness, cont’d

Diff-in-Diff

Control Function Approach

Week 14
11/20 (T)  Alternatives to Unconfoundedness, cont’d

One-Sided and Two-Sided Censoring, Parametric

11/22 (Th)  Thanksgiving Holiday

Week 15
11/27 (T)  Alternatives to Unconfoundedness, cont’d

One-Sided Censoring, Semi-Parametric

11/29 (Th)  Panel Data Models
-- Wooldridge, Ch. 10, 17.

Week 16
12/4 (T)  Issues with Time Series Data

12/6 (Th)  Issues with Time Series Data, cont’d