Course Description:
This is a PhD-level course in applied econometrics. The point of departure for this course is the generalized linear regression model covered in AEC 625. This course considers a number of extensions commonly used in applied econometric analysis, including discrete choice, limited dependent variable, panel data, and simultaneous equations models. As well, the class will explore new solutions to problems of identification such as propensity score matching, difference-in-difference estimators, and regression discontinuity design. The course will have a strong applied orientation, emphasizing problems of data measurement, model selection, and model specification encountered in practical applications of econometrics.

Objectives:
The course objectives are:
- To increase the depth and breadth of students’ knowledge and understanding of applied econometric analysis;
- To cover the theory and application of econometrics at a level appropriate for PhD students in applied economics;
- To give students exposure to common problems encountered by applied econometricians and to direct students to possible solutions to these problems;
- To prepare students to conduct high quality applied econometrics as part of their thesis research;
- To enable students to critically evaluate and contribute to the applied econometrics literature; and
- To provide students with experience in effectively applying econometric models and tools.

Learning Outcomes:
By the end of this course, students will be able to apply econometric modeling techniques introduced through lectures, reading assignments, and class exercises. In particular, students will:
- Know what constitutes accepted and appropriate applied econometric methods;
- Be able to match econometric techniques with underlying data types and economic models and questions;
- Be able to critically evaluate and contribute to the applied econometric literature;
- Be aware of pitfalls, problems and their solutions that arise in applied econometric research; and
- Be able to apply econometric tools at the level of PhD students.

Prerequisites:
AEC 625 or equivalent
Course Structure:
Lecture (twice weekly for 90 minutes each) plus lab or discussion section (once weekly for 60 minutes)

Course Content:

1. Models for Panel Data (15%)
   a. General framework
   b. Pooled regression model
   c. Fixed effects model
   d. Random effects model
   e. Random coefficients model
2. Systems of Regression Equations (10%)
   a. Seemingly unrelated regressions model
   b. Estimation
3. Instrumental variables estimation (15%)
   a. Assumptions of the model
   b. Instrumental variables estimator
   c. Two-stage least squares estimator
   d. Specification tests
   e. Weak instruments
4. Simultaneous Equations Models (20%)
   a. Fundamental issues
   b. General framework
   c. Identification
   d. Two-stage least squares estimation
   e. Three-stage least squares estimation
   f. Full information maximum likelihood estimation
5. Discrete Choice Models (20%)
   a. Binary choice models
   b. Random utility
   c. Multinomial logit model
   d. Conditional logit
   e. Nested logit
   f. Multinomial probit
   g. Mixed logit
6. Censored and count data models (10%)
   a. Tobit
   b. Models for counts of events
   c. Duration models
7. New method of identification (10%)
   a. Propensity score matching
   b. Difference-in-difference estimators
   c. Regression discontinuity design

Textbook:
**Software:**
STATA / IC 11

**Grading:**
Midterm exam 30%
Final Exam 40%
Problem sets 20%
Participation 10%

**Students with Disabilities:**
Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

**Expectations for Student Conduct (cheating policies):**
Oregon State University defines academic dishonesty as: “An intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.” Academic dishonesty includes: Cheating, Fabrication, Assisting, Tampering, Plagiarism. More information, including the process by which academic dishonesty cases are handled, is available at: [http://oregonstate.edu/admin/stucon/achon.htm](http://oregonstate.edu/admin/stucon/achon.htm)