Course Description and Outline
This course centers on the use of regression analysis in economics. Students should be able to read, understand and interpret (and know the limitations) applied economic papers that apply basic econometric techniques. In particular, we will focus on the use of regression and how to avoid its misuse. To oversimplify, we will examine models of the form $y = Xb + e$. We will learn how to estimate the coefficient vector $b$, how to test hypotheses; and how to forecast future values of $y$ based on known values of $X$. You can get a pretty detailed idea of some of the course material by looking at the tentative outline below. The course is largely theoretical, though it includes also hands-on computer work. The aim of the course is to develop careful, applied, econometricians laying the necessary groundwork for potential econometric courses in your future PhD studies.

Class Sessions
There will be two meetings per week, each lasting one hour and fifty minutes, Tuesdays and Thursdays from 1:30 to 3:20. Most class sessions will involve a lecture and some in addition also a discussion section.

Students are expected to do the suggested readings before the class. Since part of the exams, the in class quizzes are often “open book”, it is suggested that you bring the respective reading material to class. Active participation in the class is required.

Problem Sets:
(a) During the quarter you or your study group of max. 3 students will go over several problem sets which will require you to apply the topics we discuss in class and in the readings. In order to solve the problem sets some amount of math (calculus and a limited amount of statistics) is required.
(b) You are encouraged to work in your group on the problem sets. You should write all the names of the group members that participated in your study/problem set on each of the problem sets and your group name.
(c) Grading of the problem sets: The total number of problems sets is not fixed yet. Let’s say, we have in total $M$ problem sets. For your final grade $M-1$ problem sets will be taken into account only. The problem set that will be dropped from the evaluation is your problem set that received the least points during the quarter. So your study group can screw up once without regret.
(d) Please write legibly or use a computer.
(e) Generally, PSs are due 1:30pm on the due date. If you or your group misses the deadline, you’ll obtain 0 points for the PS.
Office Hours:
My weekly office hours are Tuesdays 3:40pm to 5:00pm, Savery Hall Room 349. If this time window systematically conflicts with your time schedule, please let me know in class, so that we can find a different time. Also, feel free to email me at hgwolff@u.washington.edu for any research or urgent course related questions. Please note, however, that emails with questions regarding course material shortly before problem set due dates or exams will NOT be answered.

Exams:
There will two 110 minute midterm exams. They are tentatively scheduled for:

(a) Exam 1: Feb 5
(b) Exam 2: March 12

A small portion (typically the last 15 minutes) of these exams will be “open book”. Hence feel free to bring the required textbook that we have used during the quarter if you think it could help you.

Assessment & Evaluation
Class Participation: 10%
Problem Sets: 20%
Midterm Test1: 35%
Midterm Test2: 35%

Course outline
The tentative outline of the course is as follows:

1. Introduction:
   What is “Econometrics”?
   Why is it important?
   Review of Random Variables, Sampling and Estimation from you prior Statistics course (R1 to R8 in Dougherty)
   Probability distribution example: X is the sum of two dice
   Expected value of a random variable
   Expected value of a function of a random variable
   Population variance of a discrete random variable
   Expected value rules
   Independence of two random variables
   Alternative expression for population variance
   The fixed and random components of a random variable
   Continuous random variables
   Covariance, covariance and variance rules, and correlation.
   Sampling and estimators
   Unbiasedness and efficiency
Conflicts between unbiasedness and minimum variance
Estimators of variance, covariance, and correlation
Asymptotic properties of estimators: plim and consistency
Asymptotic properties of estimators: simulations and the CLT

2. Simple Regression Analysis
   Simple regression model
   Deriving linear regression coefficients
   Interpretation of a regression equation
   Goodness of fit

3. Properties of the Regression Coefficient and Hypothesis Testing
   Types of Data and Regression Model
   Assumptions for regression models with non-stochastic regressors
   The random components and unbiasedness of the OLS regression coefficients
   A Monte Carlo Experiment
   Precision of the regression coefficients
   Testing Hypothesis regarding the regression coefficients
   The F test and Goodness of fit

4. Multiple Regression Analysis
   Derivation and interpretation of the multiple regression coefficients
   Properties of the multiple regression coefficients
   Multicollinearity
   Goodness of Fit
   Prediction

5. Transformation of Variables
   Linearity and nonlinearity
   Logarithmic transformations
   Models with quadratic and interactive variables

6. Dummies
   Illustration
   Extension to more than two categories
   Multiple Sets of dummies
   Slope dummies
   The Chow test
Fixed Effect Models (Year and State Fixed Effects)
Difference in Difference Estimation

7. Model Specification
   The effect of omitted variables
   The effect of including a variable that ought not to be included
   Proxy variables
   Testing
   Residual Analysis

8. Heteroskedasticity
   Heteroskedasticity and its implications
   Detection
      Goldfeld-Quandt test
      White test
   Remedies of Heteroskedasticity

9. Stochastic Regressors and Measurement Error
   Consequences of Measurement Error
   Identification
   Instrumental Variables

Advanced Topics:

10. Simultaneous Equations and Instrumental Variables
11. Binary Choice Models
12. Limited Dependent Variable Models
13. Introduction into Panel Data Models
Reading and Textbooks

Some of the reading will consist of journal articles, that summarize key advances in the literature or provide recent empirical examples.

As textbooks for this course the following book is required:


Missed Classes:

If you miss a class, it is your responsibility to get a copy of the lecture notes from your class mates. Please understand that I do not provide private one to one lectures or summaries via email of what has been covered in class. However, that being said, always feel free to come to my office hours with questions concerning the class material or your research ideas.

Help with Writing

The Odegaard Writing & Research Center offers free, one-one-one help with all aspects of writing at any stage in the writing process. To make an appointment or browse the center's online resources, please visit: http://www.depts.washington.edu/owrc. Located on the third floor of the Odegaard Library, the OWRC is open Sunday through Thursday from 12:00-9:00 p.m. To make the best use of your time there, please bring a copy of your assignment with you and double-space any drafts you want to bring in. The OWRC will not proofread papers or talk with you about grades.

And finally a message by the UW Human Resources:

Violence awareness and prevention remains an important issue. Please include the following information in the announcement section of 2009 -2010 course syllabi:

*UW SafeCampus*

Preventing violence is everyone's responsibility. If you're concerned, tell someone.

* Always call 911 if you or others may be in danger.
* Call 206-685-SAFE (7233) to report non-urgent threats of violence and for referrals to UW counseling and/or safety resources. TTY or VP callers, please call through your preferred relay service.
* Don't walk alone. Campus safety guards can walk with you on campus after dark. Call Husky NightWalk 206-685-WALK (9255).
* Stay connected in an emergency with UW Alert. Register your mobile
number to receive instant notification of campus emergencies via text and voice messaging. Sign up online at www.washington.edu/alert

For more information visit the SafeCampus website at *www.washington.edu/safecampus*. 