Economics 120B
Econometrics, Spring 2007
Prof. Dahl, UC San Diego

Description: This course aims to prepare students for practical empirical research in an academic or business setting. It covers the fundamentals of regression analysis, including estimation and hypothesis testing in a multivariate framework. The course also covers advanced concepts such as heteroskedasticity and instrumental variables. An emphasis will be place on how to use regression to infer casual relationships.

The material can be difficult and the workload substantial, particularly for people who find math courses challenging. However, your payoff for all this work is a set of skills and analytical tools that are extremely useful and in high demand in the marketplace.

Time: Tuesdays and Thursdays, 8:00 am to 9:20 am

Place: HSS 1330

Instructor: Gordon Dahl
office hours: Tuesdays, 12:00 pm to 1:00 pm
location: Economics Building, Room 227
phone: 822-0644
email: eco120b@weber.ucsd.edu (email is the preferred contact method)

TAs: Ayelen Banegas
office hours: Friday, 12:00 pm to 1:30 pm
location: Sequoyah, Room 139
email: mbanegas@ucsd.edu
John McAdams
office hours: Mondays, 9:00 am to 10:30 am
location: Sequoyah, Room 226
email: jmcadams@ucsd.edu

Class Web Site: https://webct6web.ucsd.edu/webct

This class web site will contain the syllabus, lecture notes, homework assignments, and occasional class announcements. You should check it regularly.

Prerequisites: One of EC 120A, Math 183, or ECE109. This requirement will not be waived.

Text: *Introduction to Econometrics, 2nd Edition*, by Stock and Watson

Software: Part of the course involves learning to use a software package called *Stata*. Students have access to *Stata* in several computer labs (EC 100, ERC 116, ERC 117). Individual copies of *Small Stata* can be leased at http://www.stata.com/order/schoollist.html for about $45, while *Intercooled Stata* can be leased for about $90. *Stata* is essential for problem sets.

Homework: Homework is an integral part of this course, because the best way to learn econometrics is to do it. I will periodically assign problem sets throughout the semester. These assignments will be posted on the web, and it is your responsibility to check the class web page for homework assignments regularly.

Your answers will be due at the *beginning* of class, normally one to two weeks after a problem set is assigned. Late problem sets will not be accepted for any reason; if you cannot attend class, you can either have a classmate turn in your homework for you, or you can turn it in to either of the TAs *before* class begins.

Students can work together on problem sets, although solutions must be written up and handed in separately (including any computer output). It is a good idea to attempt the problems on your own before meeting with a group. While you can collaborate with others, any homework you turn in must represent your own work.

Homework will be graded on a three-point scale. A score of 1 will be given to homework which is clearly incomplete, but has made a start towards answering some of the questions. A score of 2 will be given to homework which is largely complete, but does not answer every question in full. A score of 3 will be given to homework which is clearly well-done, and answers all of the assigned problems.

Solution keys to the homework will be posted on the class webpage. As these solutions will be comprehensive and the homework is only graded for completeness, homework will not be returned to students. If you want a copy of your homework, make a copy before you turn it in.

Tests: There will be a midterm and a final exam. The midterm will be administered during regular class time, on Thursday, May 3. The final exam will take place on Monday, June 11, starting at 8:00 am. There will be no make-up exams, and any conflicts or emergencies should be approved by me in advance of the exams. In case of illness or accident at the time of the midterm – with proper documentation from a doctor or the police – the final will be weighted 90%.

Grades: The following weights will be used to determine your course grade:

Homework:	10%
Midterm exam:	40%
Final exam:	50%

Grading Policy: If you think a mistake was made in grading the homework or exams, you may ask for a regrade. You must write out your reason for a regrade and turn it and your exam (or homework) in within 10 days of when the exam was first returned to the class. Include an email address on your written explanation so we can let you know the result of the regrade. If you ask for a regrading, your whole homework or exam is subject to regrading. This may bring to light some previously unnoticed errors, and you may end up with a lower score, not higher. Note that unless your answer is fully correct, the assignment of partial credit must be a matter for judgment, and we are unlikely to change your grade since we want to treat all class members equally.

Cheating: Cheating will not be tolerated in this class. If you are caught cheating, helping someone else cheat, or plagiarizing on an exam or homework, you will be penalized. One possible penalty is a failing grade in my class.

Miscellaneous: Disabilities will be accommodated; contact the office of undergraduate student affairs in Sequoyah Hall 245. For all matters regarding dropping or adding the course, waitlists etc., please contact the office of student affairs or use online resources provided by the university.

If you have any further questions please feel welcome to email eco120b@weber.ucsd.edu or come talk during office hours.

COURSE OUTLINE (rough guide and subject to change):

1. Introduction: Why Study Econometrics?
Who needs data anyway? If you had some, what would you do with it? Econometric models, parameter estimates, prediction and the testing of economic theories. Getting good data: Experimental vs. nonexperimental data. Cross-sections, Time-Series, Panels.
Reading: Stock & Watson - Chapter #1.

2. Probability and Statistics: A quick review
Probability, random variables, the normal distribution and the central limit theorem, inference, confidence intervals and hypothesis testing. Asymptotics of the sample mean. Using *Stata*.
Reading: Chapters #2 and #3.

3. Simple Regression (one regressor)
Fitting a line through a cloud of points. Least squares, unbiased estimates, consistent estimates, confidence intervals, hypothesis testing, omitted variable bias, R^2.
Reading: Chapters #4 and #5.

{Review and midterm about here}

4. Multiple Regression: Estimation
The second explanatory variable, interpreting coefficients, efficiency & heteroskedasticity, omitted variable bias.
Reading: Chapter #6.

5. Causal Inference and Random Assignment
Random assignment vs. omitted variable bias. Reading: Ch #13.

6. Multiple Regression: Inference
Confidence intervals (CI) for parameters, CI for predictions, hypothesis testing, single (t) vs. multiple (F) tests. Etiquette for reporting results.
Reading: Chapter #7.

7. Sources of Bias: measurement error, sample selection, simultaneity and omitted variables
Omitted Variable Bias again, Measurement Error, Fixed Effects, Sample Selection, Simultaneity.
Reading: Chapters #9 and #10.

8. Identification and Instrumental Variables
Causal inference again, instrumental variables vs. omitted variable bias, two-stage least squares, natural experiments.
Readings: Chapter #12.