Syllabus for Ec 122: Econometrics

Fall, 2013

Room: 125 Baxter
Days and Times: Tuesdays and Thursdays, 1 - 2:30pm

Required Text: Principles of Econometrics, 4th Edition, Hill, Griffiths, and Lim, Wiley, 2011.
Recommended Text: Applied Econometrics in R, Kleiber and Zeileis, Springer, 2008.

Instructor: Bob Sherman
    Office: Baxter 119
    Phone: 4337
    Office Hours: Fridays, 1 - 2:30pm and by (dis)appointment.

TA: Kyle Carlson
    email: kyle21c@gmail.com
    office hours: Mondays, 2:30 - 4pm

Secretary: Sabrina Boschetti
    Office: Baxter 123
    Phone: 4228

Course Description: Econometrics is the study of y's and x's and u's. The y's are observed economic response variables, the x's are observed variables that determine the y's in some way, and the u's are unobserved variables that also determine the y's. For example, y could be wages, the x's might include variables like education and experience, and the u's might involve variables like ability and motivation. In this example, one may want to determine the rate of return to education, that is, the effect of an additional year of schooling on expected wages. Data is collected on the y's and x's. Interest centers on using the data together with economics, statistics and computing to (i) determine the causal effect of one of the x's on $\mathbb{E}(y \mid x)$ (ii) predict values of y given the x's and (iii) test economic theories about the relationship between the x's and y. This class will emphasize objectives (i) and (iii). As we will see, the relationship between the x's and the u's will be critically important in determining how difficult it will be to achieve these objectives. The hope is that by the end of the class you will begin to understand something of what constitutes sound econometric analysis.

Grading: There will be 9 homework sets and a take-home final exam.

Homework: 50%
Final: 50%

Letter grades will be determined as follows:

A: 90% or higher
B: 80-89%
C: 70-79%
D: 60-69%
F: Below 60%

I will give pluses and minuses for grades A through D. For example, a score of at least 90 but less than 93 will be an A-, a score of at least 93 but less than 97 will be an A, and a score of at least 97 will be an A+. Similarly for the other letters.

Homework sets will be based on material covered during the week in lectures, in the text, in handouts, and in the Sunday comics. The handouts will consist of journal articles (one every other week, roughly) whose purpose will be to give you some idea of the types of problems that econometrics can be used to address. Homework assignments will be given each Tuesday and will be due the following Tuesday at the beginning of class. I will try to have the homeworks graded by the beginning of class on the Tuesday after they are handed in. No homework sets will be given during finals week. The goal of the homework sets will be to get students to think and compute. This means that there will be analytical problems and computational problems. The computational problems will involve either simulation exercises or exercises involving analysis of real data sets.

The final will test your understanding of material from the entire course, but will have no computing component. You can pick up the exam from my mailbox after 9am on Wednesday, December 11. The exam must be returned to me (or under my door, if I'm out of my office) by 5pm Friday, December 13. You may take as much time as you want for the exam.

Collaboration Policy: You are encouraged to freely collaborate on the homework sets. That

is, you may discuss and even work out solutions to the homework sets together. However, you must write up your own solutions. No copying. You are on your own for the final exam. No collaboration on the final.

Homework Make-up Policy: You must have a doctor's note or be able to give evidence of some other serious personal matter to be able to make up a missed homework assignment. It is not sufficient for you to be busy or even overwhelmed with other assignments or tests. Please plan ahead. I sometimes make exceptions for job interviews, NSF Fellowship proposal deadlines, Monday Night Football, important stuff like that, but in such cases, you must see me at least a week in advance.

Books on Reserve at Sherman-Fairchild

1. Principles of Econometrics, 4th Edition, Hill, Griffiths, and Lim, Wiley, 2011.
2. Applied Econometrics in R, Kleiber and Zeileis, Springer, 2008.

Computing: You are encouraged to use R. However, you may use any package you wish, such EViews, Excel, SAS, Stata, HANSL, GRETL, (see page viii of the text for more on these packages). You may also use Mathematica or Matlab. Mathematica and Matlab can be downloaded free from the IMSS website by any Caltech student. R can be downloaded free from the R website

http://cran.stat.ucla.edu/.

Let me emphasize that you will be on your own for support with any package except R. Also, you are strongly discouraged from relying exclusively on Excel.

I will post notes, homeworks, journal articles, etc, at Moodle, which can be accessed at

https://courses.caltech.edu/login/index.php

with your IMSS username and password, using my last name "sherman" as the enrollment key. Here are links to R tutorials that you may find useful:

http://cran.r-project.org/doc/manuals/R-intro.pdf
http://www.cyclismo.org/tutorial/R/

A good quick refererence book for R is

R in a Nutshell, Adler, O'Reilly, 2010.

Here are links to free online R books available through springerlink (from on-campus IP's):

Full series:

http://www.springerlink.com/content/t83625/

Specific books:

http://www.springerlink.com/content/978-0-387-74730-9/
http://www.springerlink.com/content/978-0-387-93836-3/
http://www.springerlink.com/content/978-0-387-77316-2/
http://www.springerlink.com/content/978-0-387-98140-6/

Here's a tentative schedule for the fall term. It's far too ambitious, but as a famous poet once

said: "A man's reach should exceed his grasp, or what's a heaven for?"

Date	Material Covered
Week 1	HGL Chapters 1-2, Matrix Approach, FWL
Week 2	FWL, HGL Chapter 3
Week 3	HGL Chapters 4-5
Week 4	HGL Chapters 6-7
Week 5	HGL Chapters 8-9
Week 6	HGL Chapters 10-11
Week 7	HGL Chapters 11-12
Week 8	HGL Chapter 13, Bootstrap
Week 9	HGL Chapters 14-15
Week 10	HGL Chapters 15-16

Some milestones (millstones?):

October 18: Last day to add class
November 20: Last day to drop class
December 5: Last day of class
Decmber 11: Final exam, a day without class