ECON122: Econometric Theory. Spring 2016.

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Lectures: Tuesdays and Thursdays, 12:30-1:50pm, SH 147.

Office Hours: Beare: Thursdays, 3-5pm, Econ 209.
                   Wu: Wednesdays, 2-3pm, SH 234.

Overview:
ECON122 is a course on econometric theory aimed at students who have already taken an introductory course on linear regression and are comfortable with the use of matrix algebra. It covers the fundamental statistical theory underlying linear and nonlinear regression, instrumental variables, generalized method of moments, and maximum likelihood. Econometric computation using the numerical software package MATLAB is also covered.

Prerequisites:
Students may enroll in ECON122 if they have successfully completed courses on linear regression (typically ECON120B or MATH181B) and linear algebra (typically MATH20F or MATH31AH). Concurrent enrollment in ECON120C is encouraged.

Textbook:
The required textbook for the course is *Econometric Theory and Methods* by Russell Davidson and James G. MacKinnon. We will follow this text closely, so it is critical for all students to obtain a personal copy, and to *read* it. We will cover most of the material in the first ten chapters.

Software:
Students will need to use the numerical software package MATLAB to complete some assigned problems. Access to MATLAB is provided at the computer lab in Econ 100.

Website:
Course materials will be uploaded to the course website at tritoned.ucsd.edu.

Assessment: Quizzes: 10%
                  MATLAB assignment: 10%
                  First midterm exam: 20%
                  Second midterm exam: 20%
                  Final exam: 40%

Quizzes and exams take place at the following times in SH 147:

Quiz #1:	Tue 4/5, 12:30-12:45pm.
Quiz #2:	Tue 4/12, 12:30-12:45pm.
First midterm exam:	Tue 4/19, 12:30-1:50pm.
Quiz #3:	Tue 4/26, 12:30-12:45pm.
Quiz #4:	Tue 5/3, 12:30-12:45pm.
Quiz #5:	Tue 5/10, 12:30-12:45pm.
Second midterm exam:	Tue 5/17, 12:30-1:50pm.
Quiz #6:	Tue 5/24, 12:30-12:45pm.
Quiz #7:	Tue 5/31, 12:30-12:45pm.
Final exam:	Mon 6/6, 11:30am-2:20pm.

There is a fifteen minute quiz given at the beginning of seven of the Tuesday lectures, as indicated above. Students need to bring their own paper and pens to solve these quizzes, which will be collected and graded each week. Quiz grades account for 10% of final assessment. This will be calculated by considering only the best five out of seven quiz grades obtained over the term, with each contributing 2% weight.

There will be no make-up midterm exams. Students who miss a midterm exam for a valid medical reason, supported by a doctor's certificate, will have proportionally more weight assigned to other parts of the course assessment. Students who miss the final exam for a valid medical reason, supported by a doctor's certificate, will need to take a make-up final exam.

There will be a number of problem sets to complete during the course; roughly one per week. These problem sets will not be collected or graded, aside from the questions involving MATLAB (see following paragraph). Note however, that many quiz questions and some exam questions will be very similar or identical to problem set questions.

In some of the problem sets, you will find questions that require you to use MATLAB to perform various computations. Your answers to these questions must be turned in at the end of the term, and will account for 10% of final assessment. The precise due date will be announced during class. You should begin work on this assignment well before the end of the term.

Grading:
Your final grade will be determined based on how well you perform on the assessment tasks just described. The numerical cutoffs you need to reach in order to achieve an A, B, C etc. will not be determined until I have all the final exam grades in front of me. I will provide some advice about what kind of grade you can expect following each of the two midterm exams.

Topics:

1. Linear regression with matrix notation.
2. Geometry of linear regression.
3. Statistical properties of linear regression.
4. Hypothesis testing in linear regression models.
5. Confidence intervals for linear regression.
6. Nonlinear regression.
7. Generalized least squares.
8. Instrumental variables.
9. Generalized method of moments.
10. Maximum likelihood.

These topics correspond roughly to the first ten chapters in the assigned textbook. Some material in these chapters will not be covered, as indicated in lectures.