

SYLLABUS

Economics 671

Spring 2018

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Class Web Site: <http://web.ics.purdue.edu/~jltobias/671/671main.html>

1. Course Description

This course is primarily related to the specification of and estimation, prediction, testing and inference in the linear regression model under ideal and generalized conditions. Other topics covered include: a discussion of typical mean-independence violations and instrumental variables estimation.

Throughout the course we will apply techniques discussed in the classroom using MATLAB. I will teach you how to write your own m-files and help you to do the problems on the problem sets using MATLAB. The programming side of the course should not be excessively demanding, and instructional tutorials for basic MATLAB operations will be posted online. (I strongly recommend that you go through these as soon as possible).

Course Objectives

Students will come to understand the matrix-algebra approach to linear regression, properly interpret results of a regression analysis and know how to reproduce results commonly reported in statistical software packages. Moreover, students will learn to think critically about the assumptions made in regression problems and to question their validity in a variety of contexts. Finally, students will be exposed in an introductory sense to alternate estimation procedures when standard assumptions are violated.

2. Grading and Textbooks

Your course grade will be divided (40-60) among problem sets and an examination score, respectively. Since the problem sets count for 40 percent of your final grade, they will be graded rigorously.

There will be a midterm and final examination given in the course. Both exams will be held in-class

(with the midterm held on **Thursday, February 1**). The final exam will be given during the last scheduled lecture day of the module, which will be **Thursday, March 1**. Both exams will equally contribute toward the examination component of your final grade. That is, a simple average of these two test scores will represent 60 percent of your grade for the class.

The required textbook is *Econometric Analysis* by Greene. Though we will follow this book, you are only responsible for the topics covered in the lectures. Generally speaking, the book should serve to supplement your understanding of the lectures rather than substitute for it.

3. Course Outline

The following is a rough outline of the topics covered in this course. I have broken them down into topics I expect we will cover, although we may move faster or slower than expected.

(4 Weeks). Linear Regression model basics under ideal conditions. Specification, estimation, prediction and hypothesis testing. Finite sample properties and asymptotic properties of the OLS estimator. *Greene, chapters 1-5, 6.1-6.3, Appendices A-D*

- **First Examination (Approximately!) Here**

(1 Week). Heteroscedasticity, consequences for OLS. Generalized Least Squares estimation and Feasible GLS. Aitken's Theorem. *Greene, chapter 9, 10.2.*

(2 Weeks): Mean-Independence violations: Omitted Variables, Measurement Error in X, Simultaneity and Endogeneity. Instrumental Variables Estimation. Identification. Weak Instruments, Overidentification Testing. Examples of IV in practice. *Greene 8.1-8.3, 8.5, 8.7-8.8*

4. Policies

Students are expected to attend classes regularly, although attendance will not be taken and is not required. Use of phones and electronic devices during lectures is not permitted. Students are expected to bring a copy of the incomplete lecture notes with them to each class session, as missing material will be reviewed and completed during the lectures.

5. Academic Integrity

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, Student Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly

or indirectly, other parties in committing dishonest acts is in itself dishonest.” [University Senate Document 72-18, December 15, 1972]