

184B – ECONOMETRICS: TENTATIVE SYLLABUS
FALL 2009

Course Overview: In this class, we will derive the Ordinary Least Squares estimators (OLS) and prove the Gauss-Markov Theorem, which shows under what conditions these estimators are the best, linear, unbiased estimators (BLUE). We will further motivate the estimators using the Maximum Likelihood Principle and the Analogy Principle. We will start by studying bivariate regression models and move on to multivariate models, learning about hypothesis testing, inference, and goodness of fit. We will then move on to studying the consequences of violating the Gauss-Markov assumptions and how we might correct for these problems. Additional topics will include a brief introduction to time series analysis, cross-sectional and panel data issues, and limited dependent variable models.

Course Meeting Times: Section 1: T-F: 9 a.m. - 10:30 a.m. Section 2: 10:30 a.m. - 12p.m.
Recitation: Wednesday 6:40 p.m. - 8:30 p.m.
Office Hours: TBA

Textbook: The required textbook for this course is James H. Stock and Mark W. Watson, *Introduction to Econometrics*, Second Edition, Pearson/Addison Wesley, Boston, 2007. (It's expensive but worth buying.)

Course Requirements: Mandatory attendance at lectures, the completion of course assignments, two midterms, and a final exam. Grading in the course will be as follows:

1. Assignments (15% of grade) – I will assign approximately 8 assignments over the course of the semester. You are required to turn in all of these exercises. You must do these exercises on your own. *Assignments will be due in class (due dates are given in the syllabus). NO late assignments will be accepted.*
2. Midterm exams (50%) - There will be 2 midterm exams given during the semester.
3. Final exam (35%) to be held during the final exam period.

Please note that there will be NO make-up exams given during the semester. Absence from an exam will be excused only for a serious illness, or bereavement (which must be documented). A student who is unable to take the final exam for a legitimate reason MUST obtain advance authorization from the Office of Undergraduate Academic Affairs. There are NO EXCEPTIONS to these rules.

Special Accommodations: If you are a student with a documented disability on record at Brandeis University and wish to have a reasonable accommodation made for you in this class, please see me immediately. Please keep in mind that reasonable accommodations are not provided retroactively.

Academic Honesty: You are expected to be honest in all of your academic work. Instances of alleged dishonesty will be forwarded to the Office of Campus Life for possible referral to the Student Judicial System. Potential sanctions include failure in the course and suspension from the University. If you have any questions about my expectations, please ask. Academic dishonesty will not be tolerated and will be vigorously prosecuted.

DATES TO REMEMBER

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| September 4: | No class today. |
| September 25: | Midterm #1, in class. |
| September 29: | Brandeis Monday schedule. Class will NOT meet. |
| October 30: | Midterm #2, in class. |
| November 26, 27: | Thanksgiving Break. No classes. |
| December 1: | Last day of class. |

ASSIGNMENT DUE DATES

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| September 8: | Assignment 1 due, in class. |
| September 15 | Assignment 2 due, in class. |
| September 22: | Assignment 3 due, in class. |
| October 9: | Assignment 4 due, in class. |
| October 16: | Assignment 5 due, in class. |
| October 27: | Assignment 6 due, in class. |
| November 13: | Assignment 7 due, in class. |
| November 24: | Assignment 8 due, in class. |

TENTATIVE OUTLINE

Please note: I highly recommend that you do the readings BEFORE lecture. We will be using both power point slides and the chalkboard/white board during lecture. You may want to print out the power point slides and bring them to class.

PART I: INTRODUCTION AND REVIEW OF STATISTICS

Readings: Chapters 2, 3 of S&W.

AUG 28 FRI *Introduction. Review of probability and statistics (descriptive statistics, probabilities, conditional probabilities, probability distribution functions, cumulative distribution functions).*

SEPT 1 TUES *Continued review of probability and statistics (confidence intervals, hypothesis testing).*

SEPT 4 FRI *Class is **cancelled** for today.*

SEPT 8 TUES *More review of probability and statistics. Introduction to econometrics. What is it and why do I need to know about it?*

ASSIGNMENT #1 DUE, IN CLASS.

PART II: BASIC REGRESSION ANALYSIS: BIVARIATE MODEL.

Readings: Chapters 4, 5 of S&W, class hand-out.

SEPT 11 FRI *The bivariate model.*

SEPT 15 TUES *Motivating Ordinary Least Squares (OLS). The Gauss-Markov assumptions.*

ASSIGNMENT #2 DUE, IN CLASS.

SEPT 18 FRI *More on the Gauss-Markov assumptions. A brief introduction to the maximum likelihood principle and the analogy principle. Goodness of fit.*

SEPT 22 TUES *Review for midterm.*

ASSIGNMENT #3 DUE, IN CLASS.

SEPT 25 FRI *Midterm #1, in class.*

SEPT 29 TUES *Brandeis Monday, no class today.*

PART III: BASIC REGRESSION ANALYSIS: MULTIVARIATE MODEL.

Readings: Chapters 6, 7, 8 of S&W.

- OCT 2** **FRI** *Return midterm #1. Omitted variable bias.*
- OCT 6** **TUES** *The multivariate model. Additional assumptions necessary for OLS estimation. Interpretation of partial regression coefficients. Heteroskedasticity vs homoskedasticity assumption.*
- OCT 9** **FRI** *Hypothesis testing.*
- ASSIGNMENT #4 DUE, IN CLASS.**
- OCT 13** **TUES** *Hypothesis testing, continued. Goodness of fit.*
- OCT 16** **FRI** *Dummy/Indicator variables. Interacting variables. Multicollinearity.*
- ASSIGNMENT #5 DUE, IN CLASS.**
- PART IV: SOME COMMON ECONOMETRIC PROBLEMS AND PROPOSED SOLUTIONS.**
- Readings: Chapter 9, 10, 11, 12, 13 of S&W.
- OCT 20** **TUES** *Internal and external validity.*
- OCT 23** **FRI** *Introduction to panel data.*
- OCT 27** **TUES** *Review for midterm #2.*
- ASSIGNMENT #6 DUE, IN CLASS.**
- OCT 30** **FRI** *Midterm #2, in class.*
- NOV 3** **TUES** *Return midterm #2. More on panel data methods. Introduction to limited dependent (binary) variable models.*
- NOV 6** **FRI** *Limited dependent variable models, cont'd.*
- NOV 10** **TUES** *Instrumental variable regression.*
- NOV 13** **FRI** *Instrumental variable regression, cont'd.*
- ASSIGNMENT #7 DUE, IN CLASS.**
- NOV 17** **TUES** *Experiments and quasi experiments.*
- NOV 20** **FRI** *Forecasting.*

Nov 24 **TUES** *Open for questions, review.*

ASSIGNMENT #8 DUE, IN CLASS.

Nov 26 - 27 **NO CLASSES. THANKSGIVING BREAK.**

DEC 1 **TUES** *Last day of class. Review for final exam.*