

Department of Economics
Barnard College
Spring 2000

Economics BC 3018: Econometrics

Professor Sharon G. Harrison

Course description: This course is designed to provide an introduction to the tools of econometric analysis. Students should complete this course with a thorough understanding of the univariate and multiple regression models as well as some extensions of these. Topics covered include estimation and inference in the classical regression model as well as forecasting, functional form, heteroscedasticity, and serial correlation. We will link theory to data through the use of computers.

Class meetings: This class will meet Tuesday and Thursday from 10:35 to 11:50 am.

Administrative Information: My office is in Room **7, Lehman Hall** and my phone number there is **854-3333**. You can also reach me by e-mail at **sh411@columbia.edu**.

Web access and computer use: It is essential that you have access to the web. The home page for this course is

<http://www.econ.barnard.columbia.edu/~sharriso/s003018>

Homework assignments will be posted on the web and will involve accessing various web pages to retrieve data. You will analyze the data using SPSS for Windows, which is available in the computer labs at Barnard. You will learn SPSS in the first few weeks of the course.

Office Hours: Wednesday 1-3 and by appointment.

Textbook: The required text for this class is: *Introductory Econometrics*, 4th edition, by Ramu Ramanathan. It is available at the Columbia University Book Store.

Evaluation: Your grade in this class will depend on your performance on: 1 midterm (25%), a cumulative final (35%), a research project (25%), and homework (15%). There will be no make-up exams given. The date of the midterm is **Tuesday, March 7**. The final is tentatively scheduled for **Tuesday, May 9 at 9 am**.

The research project: You will carry out the research project with one or two other students. The final product of the project will be a paper due near the end of the semester. However, you will be required to hand in evidence of your progress throughout the semester. Details will be discussed in class.

Teaching assistant: Your teaching assistant is Satyajit Bose. His e-mail address is sgb2@columbia.edu. His office hours will be held in the TA room in Lehman, Room 10D. In addition, he will hold two identical section meetings each week. Section will meet in the computer lab in room 401, Altschul Hall. The times for office hours and sections will be decided upon during the first week of class.

(Rough) Schedule of Topics to be Covered

(Chapter numbers in (.))

WEEK 1: Jan 18, 20:

- Statistics Review (2)
 - Random variables, Probabilities
 - Expected Value and Variance, Covariance and Correlation

WEEK 2: Jan 25, 27:

- Continue Statistics Review
 - Normal, t , and F distributions
 - Properties of an estimator
 - Hypothesis Testing

WEEK 3: Feb 1, 3:

- Introduction to Regression Analysis (1)
- Introduction to The Two-Variable Model (3)
 - Definition of Regression Function
 - The Stochastic Error Term

WEEK 4: Feb 8, 10:

- The Two-Variable Model: Estimation (3)
 - Estimation of Parameters, OLS
 - CLRM Assumptions, Gauss-Markov Theorem
 - Properties of OLS Estimates, R^2

WEEK 5: Feb 15, 17

- The Two-Variable Model: Inference (3)
 - Properties of OLS Estimates
 - Interval Estimation, Hypothesis Testing

WEEK 6: Feb 22, 24

- Multiple Regression: Estimation (4)
 - The Three-Variable Model
 - OLS Estimators, Adjusted R^2
 - Partial Regression Coefficients

WEEK 7: Feb 29, March 2:

- Multiple Regression: Inference (4)
 - Hypothesis Testing Revisited
 - Test of Significance of the Regression
 - F -tests

WEEK 8: March 7, 9:

- **Tuesday, March 7: Midterm**
- Dummy Variables in Regression (7)
 - Qualitative Variables
 - Interaction Effects
 - Comparing Two Regressions

WEEK 9: March 14, 16:

- **Spring Break**

WEEK 10: March 21, 23:

- Functional forms (6)

WEEK 11: March 28, 30:

- Multicollinearity (5)

- Perfect and Near Perfect Multicollinearity
- Consequences, Detection and Remedies

WEEK 12: April 4, 6:

- Specification Errors (4)

WEEK 13: April 11, 13:

- Autocorrelation (9)

- Graphical demonstration
- Consequences, Detection, Testing and Remedies

WEEK 14: April 18, 20:

- Heteroscedasticity (8)

- Graphical demonstration
- Consequences, Detection, Testing and Remedies

WEEK 15: April 25, 27:

- Presentations of Research Papers