Course Syllabus
ECON 8740: Applied Statistics and Econometrics
FALL 2012
CRN: 87710 & 81074
TR 2:30 - 3:45 P.M.
CLASSROOM SOUTH #510

Professor: Shif Gurmu
Office: Department of Economics, AYSPS Building #538
Phone: (404) 413-0161
Email: Use uLearn E-mail system from the course homepage
Office Hours: Tuesday and Thursday 1:00 - 2:00 PM or by appointment.

TA: Fatma Romeh
Office: Vault TA room, basement level of the AYSPS Building
Phone: TBA
Email: Use uLearn e-mail system from the course homepage or fromeh1@student.gsu.edu
Office Hours: Tuesday 10:00 - 11:00 AM; Thursday 10:00 - 11:00 AM; Friday 1:00 - 2:00 PM.

Homepage: The class Web site can be accessed through uLearn. The home page will be used primarily to post lecture materials, data sets, assignments, and announcements. We will also use the E-mail feature of uLearn.

Course Objectives: The course provides an elementary but comprehensive introduction to the practice of econometrics. It deals with applications of statistical methods to the testing and estimation of economic relationships. The main topics covered include review of probability and statistical inference, the linear regression model, extensions of the basic linear regression model, and introduction to problems that arise when analyzing cross section, time series and panel data by means of regression models. We will use statistical and econometric software to analyze real world data.

Software: We will primarily use Stata statistical and econometrics software package for computer work in this course as well as in Econ 8840 next semester. Stata Version 12 is available on all machines in the Econometrics Lab (#720) and Open Access Student Computer Lab both on the 7-th floor of the Andrew Young School of Policy Studies (AYSPS) Building. Optional - Stata is also available for purchase at GradPlan pricing (student-pricing). The software (Stata Version 12) can be purchased directly from Stata corporation. Details are provided on page 3.

Prerequisites: Principles of microeconomics, principles of macroeconomics, and introductory probability and statistics.

Required Text:
**Grading:** There will be two exams (a midterm exam and a comprehensive final exam) and a series of assignments and empirical projects. Several homework problems that will not be graded are also assigned. The problems come from various sources, and are designed to enhance your understanding of the material covered in the course. The dates and points for the exams, assignments and projects are given in the following table.

<table>
<thead>
<tr>
<th>Requirement:</th>
<th>Date</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assignments and projects</td>
<td>Will be announced in advance</td>
<td>40</td>
</tr>
<tr>
<td>2. Midterm Exam</td>
<td>Thursday, October 4 in class (May include a supplementary take-home project)</td>
<td>25</td>
</tr>
<tr>
<td>3. Final Exam</td>
<td>Thursday, December 6, 1:30 - 4:00 PM (Classroom South 510)</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The Plus (+) and Minus (-) grading system will be used in assigning the overall letter grade for the course. Unsatisfactory performance on any one of the major components, assignments versus exams, would result in a failing grade. You must take the exams on the dates and times indicated above. There are no exceptions. Please check that you have no conflicts with ECON 8740 final exam schedule. If you must miss the midterm exam because of a legitimate reason (illness and family emergency), you can make-up the missed points by adding weights to the final exam. If you have to miss any exam, you need to notify me of your situation in advance unless it is an extreme emergency. For a homework assignment to count, it must be handed in on time and must represent an independent work.

**Attendance:** Regular attendance is required (see University policy in the General Catalog).

**Further Requirements and Policies:**

- Wednesday, October 9 is the last day to withdraw and possibly receive a W grade.
- Please refer to the GSU policy on Academic Honesty (Section 409).
- Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which an accommodation is sought.
- Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.
- This course syllabus provides a general plan for the course; deviations may be necessary.
Purchase of Stata 12 for Personal Computers (OPTIONAL):

Stata is available for purchase at GradPlan pricing (student-pricing) through arrangement between Stata Corporation and Georgia State University. Stata Version 12 can be purchased from Stata Corporation and picked up from Information Systems Technology (IS&T) reception desk on the 13 floor of the Commerce Building. The Commerce Building is on Broad Street, across from the RCB Building. Once you place the order, Stata Corporation will let you know if there is change in pick-up address on campus. The following versions of Stata 12 are available at student-pricing.

1. Stata/IC (Intercooled) software with PDF documentation ($179 for perpetual license; $98.00 for one-year license; $65 for six-month license)
2. Small Stata software with PDF documentation ($49.00 for one-year license; $29 for six-month)

Unfortunately, Small Stata is limited to 1200 observations which is problematic for most of the exercises and illustrations used in this and subsequent courses. Small Stata is not helpful for graduate students at all.

Stata/IC allows datasets with as many as 2,047 variables. The number of observations is limited only by the amount of RAM in your computer. Stata/IC can have at most 798 right-hand-side variables in a model. Small Stata is limited to analyzing datasets with a maximum of 99 variables on approximately 1,200 observations. Small Stata can have at most 99 right-hand-side variables in a model.

To order a copy for pick up at the university (GSU, IS&T reception desk on the 13th floor of the Commerce Building) contact Stata Corporation directly:
   Phone: 800-782-8272 (Monday through Friday 8:00 to 5:00 Central Time)
   Fax: 979-696-4601
   Online: http://www.stata.com/order/new/edu/gradplans/gp-campus.html

From Stata Corporation - Ordering online is easiest! Be sure to include your GSU.EDU email address when ordering. Once your order is processed, you will be contacted by a StataCorp sales person with campus pick up times and location. Typically, orders are available for pick up within 2 or 3 business days after the order is placed. Payment may be by credit card (Visa, MasterCard, American Express or Discover) or a faxed university purchase order. To pay by check, please mail a check payable to StataCorp with your order to

   StataCorp
   4905 Lakeway Drive
   College Station TX 77845
Topics and Reading List

1. Review of Mathematical Tools, Probability Distributions and Statistical Inference
   - Basic Mathematical Tools
   - Probability Distributions
   - Point and Interval Estimation
   - Properties of Estimators
   - Hypothesis Testing and Confidence Intervals
   
   Wooldridge: Appendices A, B, and C

2. Nature of Econometrics and Economic Data
   2.1 What is Econometrics?
   2.2 Economic Data

   Wooldridge: Chapter 1

3. Linear Regression with a Single Regressor
   3.1 Definition of the Simple Regression Model
   3.2 Ordinary Least Squares (OLS) Estimation
   3.3 Inference

   Wooldridge: Chapters 2

4. Linear Regression with Multiple Regressors
   4.1 Specification of the Model
   4.2 OLS Estimation
   4.3. Inference

   Wooldridge: Chapters 3-4
5. Further Issues in Linear Regression

5.1 Functional Forms and Other Specification Issues

*Wooldridge: Chapter 6*

5.2 Qualitative Information and Dummy Variables

5.2.1 Dummy Independent Variables

5.2.2 A Binary Dummy Dependent Variable: The Linear Probability Model

5.2.3 Policy Analysis and Program Evaluation

*Wooldridge: Chapter 7*

5.3 Heteroskedasticity

5.3.1 Nature and Consequences of Heteroskedasticity

5.3.2 Testing for Heteroskedasticity

5.3.3 Weighted (Generalized) Least Squares

*Wooldridge: Chapter 8*

5.4 Data Problems

*Wooldridge: Chapter 9*

6. Regression Analysis With Time Series Data

6.1 Nature of Time Series Data

6.2 Models with Lags

6.3 Trends and Seasonality

6.4 Serial Correlation

*Wooldridge: Chapters/sections 10.1-10.5, 11.1-11.3, 12.1-12.5*

7. Other Topics in Regression (Time-permitting)

7.1 Instrumental Variables Estimation and Two Stage Least Squares

*Wooldridge: Chapter/Section 15.1 - 15.5*

7.2 Policy Analysis with Pooled Cross Sections

*Wooldridge: Chapter/Section 7.6, 13.1 - 13.2*