Econometrics  
AS.440.606.81  
Summer 2015 - Online  
Syllabus

Instructor:  
Genevieve Briand  
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Term Info:  
May 11 – August 20 (14 weeks)

Office Hours: Thursdays, 11:30am-1:30pm ET  
connect.johnshopkins.edu/gbriand1  
(I will sign off at 12 noon if no one enters the session by that time, unless given specific notification about late arrivals)

Textbook:  
(Earlier or more recent editions may be used, although students must ensure that they answer the proper questions from the 4th edition when completing problem sets.)

Stata:  
Available in computer labs or via personal license.  
stata.com/order/new/edu/gradplans/direct-ship-pricing/  
(A 6-month license of Small Stata is sufficient for this course.)

Website: blackboard.jhu.edu

Course Description:  
This course focuses on the application of statistical methods to the testing and estimation of economic relationships. After developing the theoretical constructs of classical least squares, common problems encountered when applying this approach are discussed, including serial correlation, heteroskedasticity, and misspecification. Techniques for dealing with these problems are then presented. The foundational concepts of regression analysis are first developed using cross-sectional data then extended to the contexts of time-series and panel data. Models with simultaneity and instrumental variables are also presented.

Prerequisites: 440.605 Statistics
**Course Overview:**
Introduction to econometrics
- Review of matrix algebra and statistics

Cross-sectional data
- Simple (univariate) regression model
- Multivariate regression model
- Statistical inference: hypothesis testing
- Asymptotic properties of estimators
- Heteroskedasticity
- Dummy variables, misspecification, measurement error

Time-series data
- Times series regression issues (lagged variables, serial correlation)

Advanced topics
- Panel data (combination of cross-sectional and time series data)
- Endogeneity (instrumental variables, simultaneous equations)

**Course Goals:**
Upon completion of this course, students will be able to do the following:

- Interpret ceteris paribus effects of independent variables
- Understand linear regression output statistics
- Perform regression analysis using statistical software
- Design correlational studies using cross-sectional, time-series, pooled, and panel data sets
- Test and control for heteroskedasticity, serial correlation, and misspecification
- Identify the theoretical underpinnings of OLS with finite and asymptotic samples

**Course Structure:**
The course will be administered through the JHU Blackboard platform from which all relevant coursework will be made available. Students should log into Blackboard daily to check for announcements posted on the course homepage. The course is segmented into 14 weeks of instruction, during which students will be expected to complete assigned readings from the textbook and/or other sources, listen to recorded lectures with accompanying slides, and submit answers to an assigned problem set. For the purposes of the course, a week will begin at 12:00am on Monday morning and end at 11:59pm on the following Sunday evening. NOTE: week 14 is a short week, ending Thursday at 11:59 pm. Students are free to view lecture materials and submit assignments at any time throughout the week. However, answers to problem sets not submitted by the end of the week will be counted as late and penalized accordingly. Grades and solutions to problem sets will be posted on the Wednesday of the week after which they were assigned. Students are expected to review problem set solutions and compare with their work to ensure they are correctly applying the concepts covered. Weekly office hours will be held online on mid-Thursdays during which students may elicit further commentary on specific topics from the instructor and/or seek additional guidance on assigned problems.

**Getting Help:**
You have a variety of methods to get help on Blackboard. Please consult the help listed in the "Blackboard Help" link for important information. If you encounter technical difficulty in completing or submitting any online assessment, please immediately contact the designated help desk listed on the AAP online support page. Also contact your instructor at the email address listed atop this syllabus before assignments are due.
Grading:
Problem Sets – 30%
Paper – 20%
Midterm Exam – 20%
Final Exam – 30%

Problem Sets:
Problem sets will be assigned on a weekly basis throughout the term. Students will be required to make use of Stata (an econometric analysis software package) to complete problem sets. Completed solutions must be submitted through Blackboard (in the “Problem Sets” section) as PDF files by the end of week they are assigned (i.e. 11:59 PM Sunday night). Students may feel free to collaborate on problem sets in small groups, though each student must submit their own set of answers. Students should not post solutions on the general discussion board for all to see. Late submissions will be penalized 15% for submitting one day late, 30% for submitting two days late, and 100% for later submissions. Plagiarizing solutions from sources other than a student’s own work will result in a zero grade.

Exams:
Two exams will be administered during the course. The exact format of these exams is TBD. Exams will be cumulative with a focus on the most recent concepts presented. Calculators will be required to complete some questions. Exams will have a time limit, but students will be free to consult notes and textbooks during the examination.

Paper:
The paper assignment will be a student-written critique of a prominent piece of econometric research. The critique should be 3-5 pages in length, exclusive of charts and/or graphs, and be submitted as a PDF via Blackboard by the final day of the term. Specific requirements for the paper are posted on Blackboard.

University Policies:
This course adheres to all University policies described in the academic catalog. A few to pay close attention to are noted below.

JHU Ethics Statement
The strength of the university depends on academic and personal integrity. In this course, students must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Students should report any violations they witness to the instructor.

Plagiarism
Read and adhere to JHU’s Notice on Plagiarism.

Dropping the Course
Students are responsible for understanding the university’s policies and procedures regarding withdrawing from courses found in the current catalog. Students should be aware of the current deadlines according to the Academic Calendar.

Students with Disabilities
Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students with documented disabilities should contact the coordinator listed on the Disability Accommodations page. Further information and a link to the Student Request for Accommodation form can also be found on the Disability Accommodations page.

All AAP online courses are offered through Blackboard. Blackboard 9.1 works to comply with Web Content Accessibility Guidelines (WCAG) issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government. For more information on Blackboard and its development, please visit their accessibility site.
### Schedule:

| Week 1       | May 11 – May 17 | Introduction, Statistics and Matrix Algebra Review  
|             |                | Chapter 1, Appendix B.1-B.4, Appendix D  
|             |                | Problem Set 1 |
| Week 2      | May 18 – May 24 | Simple Regression Model  
|             |                | Chapter 2  
| Week 3      | May 25 – May 31 | Simple Regression Model (Cont’d)  
|             |                | Stata Introduction  
|             |                | Chapter 2  
| Week 4      | June 1 – June 7 | Multiple Regression Analysis: Estimation  
|             |                | Chapter 3  
| Week 5      | June 8 – June 14 | Multiple Regression Analysis: Inference  
|             |                | Chapter 4  
| Week 6      | June 15 – June 21 | Asymptotics, Further Issues  
|             |                | Chapter 5, Chapter 6  
| Week 7      | June 22 – June 28 | Exam Period  
|             |                | Midterm Exam |
| June 29-July 5 |               | Independent Day Break |
| Week 8      | July 6 – July 12 | Binary Variables  
|             |                | Chapter 7  
| Week 9      | July 13 – July 19 | Heteroskedasticity  
|             |                | Chapter 8  
| Week 10     | July 20 – July 26 | Specification and Data Problems  
|             |                | Chapter 9.1-9.2, 9.4  
| Week 11     | July 27 – August 2 | Time series, Serial Correlation  
|             |                | Chapter 10, Chapter 11.1-11.3,  
|             |                | Chapter 12.1-12.2, 12.5  
| Week 12     | August 3 – August 9 | Panel Data  
|             |                | Chapter 13, Chapter 14 (excluding 14.3)  
| Week 13     | August 10 – August 16 | Instrumental Variables, Simultaneity  
|             |                | Chapter 15, Chapter 16  
| Week 14     | August 17 – August 20 | Exam Period  
|             |                | Final Exam |