Department of Economics
Rutgers University
Spring 2016

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ECON 50: 220: 322
ECONOMETRICS
Instructor: Noha Emara

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Classroom and time: BSB-335, Mon./Wed./Fri., 11:15am- 12:10pm.

COURSE DESCRIPTION
This course introduces students to multiple regression methods for analyzing data in economics and related disciplines. Extensions include regression with discrete random variables, instrumental variables regression, analysis of random experiments and quasi-experiments, and regression with time series data. The objective of the course is for the student to learn how to conduct – and how to critique – empirical studies in economics and related fields. Accordingly, the emphasis of the course is on empirical applications. The mathematics of econometrics will be introduced only as needed and will not be a central focus.

PREREQUISITES
Microeconomic Principles (50:220:102) AND Macroeconomic Principles (50:220:103) AND Introduction to Statistics I (50:960:283).

TEXTBOOK AND SOFTWARE
The text for this course is: James H. Stock and Mark W.Watson, Introduction to Econometrics 3rd Edition, Addison-Wesley 2010. This is an excellent textbook and should be available in the University Bookstore on Cooper Street. The software that will be used in this course is STATA.

      The software that will be used in this course is STATA. The software is available at most of public labs on campus. Some labs are open in the evening and at the weekend. No prior knowledge of this software package is assumed. This package will be introduced in lectures and in the assignments as the course proceeds. Also a helpful handout on how to use STATA is posted on the course website.

      The text has an excellent additional resource website. The address is http://www.Pearsonhighered.com/stock_watson/. At this website you will find answers to selected exercises that appear at the end of each Chapter of the book. You will also find a tutorial on how to use STATA at this site.

WEB ACCESS
The course web page is available through Sakai. Announcements, Assignments, additional papers to accompany each chapter, and a secure grade book will all be on Sakai website. You are responsible for checking announcements, grades, and discussion board frequently. If you miss a class, please check Sakai for any announcements, handouts and other information.

ONLINE ASSIGNMENTS
There will be a total of five assignments. The five assignments will count a total of 20% toward your final grade. The assignments consist of a series of multiple choice STATA and non-STATA questions. The assignments will be posted on almost every other Wednesday and answers will be submitted online. You will have ONE WEEK to finish and submit the assignment. The post dates for the assignments are **January 27, February 10, February 24, March 30 and April 13**. The due dates for the assignments are **February 3, February 20, March 2, April 6, and April 20**.

FRIDAYS ONLINE CLASS'S ASSESSMENTS
There will be no in-class instructions on Fridays. However, on every Friday (fourteen Fridays excluding the spring recess) throughout the semester, you are required to take an online assessment posted under Sakai. The assessments are either multiple choice questions or YouTube videos related to our in-class discussions, or the articles assigned on different topics. These Friday's assessments are posted on every Friday at 12:00am and will be due on the same day at 11:59pm. This means you will have **ONE DAY** to finish and submit the assessment. The total fourteen assessments will count a total of 20% of your final grade in the course.

EXAMS
- Two Midterms and one non-cumulative Final exam. All exams are multiple-choice question and are taken in class.
- The first Midterm is scheduled for Wednesday **February 17**.
- The second Midterm is scheduled for Wednesday **March 23**.
- The final exam TBA

THERE WILL BE NO MAKE-UP EXAMS WITHOUT A DOCUMENTED MEDICAL EXCUSE.

GRADING
Online Assignments 20%
Hybrid Friday Class Quizzes 20%
Midterm Exam I 20%
Midterm Exam II 20%
Final Exam 20%

GRADES CUTOFF

A	90-100
B+	85-89.99
B	80 - 84.99

C+	75 - 79.99
C	70 - 74.99
D	60 - 69.99
F	0 - 59.99

IMPORTANT DATES
• Wednesday January 20: First day of the class.
• Wednesday February 17: Midterm exam I (in-class).
• Wednesday March 23: Midterm exam II (in-class).
• Spring Recess: March 12 – 20.
• Wednesday April 27: Last day of the class (in-class).
• Friday April 29: Last day of the class (Hybrid).
• Final Exam TBA (in class).

FINAL REMARKS
• I will NOT accept late assignments and I will NOT accept any assignments by email or fax.
• You can use a calculator for the exams.
• You may work with your classmates on the assignment and/or Friday's assessments but each student has to submit the answers online and independently.
• Midterm and Final exams are closed book.
• You must turn off your cell phone during the class and exams.
• Attendance is important in this course.
• Academic dishonesty, including cheating, is never acceptable.

TENTATIVE TOPICS
These topics are subject to change. Students are responsible for all topics covered in the lecture notes. Often my treatment of topics will be different from that of the textbook. The textbook should be viewed as complements to the lectures, not as substitutes.

Topic 1: Introduction, Review of Probability & Statistics
· Introduction to the course
· Discrete vs. continuous random variables
· Probability distribution function (density) and cumulative distribution function
· Special distributions: Normal, Chi-square, F and student t-statistic
· Law of large numbers and the Central limit theorem
· Hypothesis testing and confidence intervals for the estimates
Readings: Chapters 1, 2, and 3.

Topic 2: Ordinary Least Squares
· One regressor, estimation and assumptions: Sections 4.1 – 4.3 and 4.4
· Multiple regressors, estimation and assumptions: Sections 6.2 – 6.5
· Hypothesis testing and confidence intervals for one regression coefficient: Sections 4.5, 5.1 – 5.3 and 5.5 – 5.6
· Testing hypotheses on more than one coefficient: Sections 7.1 – 7.6

Topic 3: Violation of OLS Assumptions
· Heteroskedasticity
· Omitted Variable Bias
· Other forms of misspecification
· Multicollinearity
Readings: Sections 5.4, 6.1, 6.7, 9.2 – 9.3

Topic 4: Nonlinearities
· Interactions between regressors
· Other nonlinear specifications
Readings: Sections 8.2 – 8.3

Topic 5: Binary Dependent Variable
· Linear Probability Model
· Probit
· Logit
· Introduction to maximum likelihood estimation
Readings: Chapter 11.

Topic 6: Instrumental Variables
· TSLS in the General IV Model
· Instrument Relevance and Exogeneity
Readings: Sections 12.1 – 12.3

Topic 7: Introduction to Panel
· Before and After Regression
· Cross-section Fixed Effects
· Time Fixed Effects
Readings: Sections 10.1 – 10.4

Topic 8: Introduction to Time Series Econometrics
· 1st Order and Pth Order Autoregressions
· Autoregressive Distributed Model
· Lag Length Selection Using Information Criteria
· Non-Stationarity: Testing for a Unit Root and Testing for Breaks
Readings: Chapter 14

<u>Instructions on Accessing STATA</u>:

If you are on campus, you can easily access STATA on most public labs on campus. But if you are off campus, you can access STATA by using the RU Apps.

The link to RU apps is <u>https://apps.rutgers.edu/novnc/</u>

You will need to click on "connect" to the upper right part of the screen and then log in with your net id and password on the black box that you will get once you click the apps link. Next, you will get a blue screen, scroll all the way down and click on "Menu" on the lower left part of the screen. Next click on "Education" then choose "STATA".

The trick is, you need to have your data (in csv format) saved under your RU home directory (H:). Once you have it there you can access it and use it through STATA. Please note that data saved on USB will not be accessed through the RU apps website. The only accessed files are those saved under your H directory.

You can upload your files to the H directory through the Scarlet mail account (assuming you have one, it is the most recent one).

To upload a file you should be able to go to the website http://scarletmail.rutgers.edu/index.php [1], on the left side click on scarletdocs, sign in with your netid username/password, under drive & next to create click on the up arrow, click files, choose the file you would like to upload, and choose open.

If you have a clam account you can use a program like Webdrive, secure shell client (use the ssh secure file transfer), or some other program to connect to clam.rutgers.edu, use your clam userid & password, and the default port 22.

Now go to apps.camden.rutgers.edu, type in your netid username/password, click connect, open firefox (on this Linux server not your local computers firefox), and follow the steps up to the point of getting to your scarletdocs. When you click on scarletdocs you should see in the middle of the page what you had uploaded.

If you have questions regarding accessing STATA from off campus, please contact help@camden.rutgers.edu