

Rutgers University, New Brunswick  
Department of Economics

Economics 220:322:01  
Econometrics  
Spring 2018

*Please note that some sections of the syllabus is subject to change during the semester. Announcements in class, via email, or on Sakai supersede anything written here.*

**Class Location:** Hardenbergh Hall, A7 (CAC)

**Class Hours:** Monday, Wednesday, 4:30 - 5:50 pm

**Course site:** <http://sakai.rutgers.edu>

**Final Exam: Friday, May 4, 4:00 - 7:00 pm**

(if you register to the class the assumption is that you do not have a conflict with the class hours or the final exam)

**Instructor:** Vladimir Kolchin

**Email:** [vkolchin@economics.rutgers.edu](mailto:vkolchin@economics.rutgers.edu)

**Office:** NJ Hall 406 (or 306), CAC

**Office Hours:** Monday, Wednesday, 6:00 - 7:00 pm, or by appointment

**Class prerequisites:** Intro to Micro (220:102), Intro to Macro (220:103), Calculus I (640:135), and Intro to Statistics (960:211 or 960:285). It is strongly suggested that you refresh the material you learnt in the statistics course at the beginning of the econometrics. Econometrics is a lower level mandatory course for the econ major.

### Learning Outcomes

Econometrics is a set of research tools used to estimate and test economic relationships. The methods taught in this introductory course can also be employed in the business disciplines of accounting, finance, marketing and management and in many social science disciplines. The aim of this course is to provide you with the skills helpful in filling the gap between being “a student of economics” and being “a practicing economist.” By taking this introduction to econometrics you will gain an overview of what econometrics is about, and develop some “intuition” about how things work. The emphasis of this course will be on understanding the tools of econometrics and applying them in practice.

Students who successfully complete Econ 322 should be comfortable with basic statistics and probability. **They should be able to use a statistical/econometric computer package to estimate an econometric model and be able to report the results of their work in a non-technical and literate manner.** In particular a student who successfully completes Econ 322 will be able to estimate and interpret linear regression models and be able to distinguish between economic and statistical importance. They should be able to critique reported regression results in applied academic papers and interpret the results for someone who is not trained as an economist.

### Course Materials

Textbook: James H. Stock and Mark W. Watson, Introduction to Econometrics 3rd Edition, Updated, Pearson. The class will also be using MyEconLab and the access to MyEconLab can be purchased online or from the bookstore.

You have a number of options:

MyEconLab access card (all digital) (ISBN 0133487679 or 9780133487671)

MyEconLab + Looseleaf Package (ISBN 0133848914 or 9780133848915)

MyEconLab + Bound Text Package (ISBN 0133595420 or 9780133595420)

## Course Outline

Introduction	(Chapter 1)
Review of Statistical Concepts	(Chapters 2 and 3)
The Simple Linear Regression Model	(Chapters 4, 5 and 17)
Midterm 1	the week before the Spring break
The General Linear Regression Model	(Chapters 6, 7 and 18)
Non-linear Effects in Regression models	(Chapter 8)
Assessing Regression Models	(Chapter 9)
Midterm 2	mid April
Additional Topics in Regression Analysis	(Chapters 10, 11 and 12)

**NOTE: I reserve the right to add, drop or replace topics as the course develops. Not all topics will be covered in the same detail.** Time constraints may cause some topics to be omitted.

## Course Assessment

<u>Assessment</u>	<u>Weight</u>
Homework Assignments (MyEconLab)	20%
Midterm 1	25%
Midterm 2	25%
Final Exam	30%

## Academic Integrity and Grading Policy

- Students are expected to maintain Academic Integrity. Therefore, cheating in an exam/quiz will be reported and considered as a serious violation. You may take a look at academic integrity policy at: <http://academicintegrity.rutgers.edu/resources-for-students/>
- Students with disabilities must present a letter from the RU Office of Disability Services before the first quiz (disability policies and procedures are at: <http://disabilityservices.rutgers.edu/>)
- Students are expected to attend all classes. If you expect to miss one or two classes because of illness or a family emergency, please use the University absence reporting website (<https://sims.rutgers.edu/ssra/>) to indicate the date and reason for your absence. An email is automatically sent to me.
- During the term, there will be two midterms and one final exam. All exams are cumulative. If you do not attend an exam, you will receive a zero grade for that exam.
- Only if a student misses an exam due to a cogent and verifiable reason, s/he will be allowed to take a make-up exam at the end of the course. A student should inform about the reason for absence before the exam. The make-up exam will be cumulative. The questions and format of the make-up exam may differ from the scheduled exam. If you have travel plans that overlap with exams, then it is advised for a student to deregister and enroll in another section of the course that does not have a conflict with his/her plans.
- There is no extra-credit work in this class.

### Important dates:

Tuesday, Jan 16:	First day of classes
Tuesday, Jan 23:	Last day to drop classes without a “W” grade
Wednesday, Jan 24:	Last day to add classes
Saturday, Mar 10 – Sun., Mar 18:	Spring break
<b>Monday, Mar 19:</b>	<b>Last day to drop with a “W” grade</b>
Monday, Apr 30:	Last day of classes
Tuesday, May 1 & May 2:	Reading days
<b>Friday, May 4, 4:00-7:00 pm</b>	<b>Final Exam</b>

<b>Grading Policy:</b>	100% > A ≥ 83%;	83% > B+ ≥ 75%;	75% > B ≥ 70%;	
	70% > C+ ≥ 65%;	65% > C ≥ 60%;	60% > D ≥ 50%;	50% > F

## Detailed Outline:

### 1. Introduction (Chapter 1)

- Brief introduction to course
- Why study econometrics?
- What is an econometric model?
- Sources of data.

### 2. Review of Statistical Concepts (Chapter 2 and Chapter 3)

- Random Variables
- Controlled vs. uncontrolled experimental data
- Discrete vs. continuous random variables
- Review of probability concepts
- Expected value
- Sample moments of a random variable
- The joint density function
- Marginal density, conditional density and independence
- Covariance and correlation
- The Normal density
- Review of Statistics
- Hypothesis tests
- p-values

### 3. The Simple Linear Regression Model (Chapters 4, 5, and 17)

- The econometric model
- The least squares principle
- Estimating the econometric model and interpreting the results
- The properties of the least squares estimates of an econometric model
- Inference and prediction in the Simple Linear Regression Model
- Interval estimation and hypothesis testing
- Evaluating the Simple Linear Regression Model

### 4. The General Linear Regression Model (Chapters 6, 7, and 18)

- The econometric model with more than one independent variable
- The least squares principle
- Estimating the GLRM and interpreting the results
- Inference and prediction in the GLRM
- Single and joint hypothesis tests of the parameters of the econometric model
- Model specification issues
- Collinear variables

### 5. Non-linear effects in Regression models (Chapter 8)

- Binary variables
- Interactions between binary variables
- Functional form

### 6. Assessing Regression Models (Chapter 9)

- threats to validity of model
  - internal threats
  - external threats

### 7. Additional Topics in Regression Analysis

- Regression Models with Binary Dependent Variable (Chapter 11)
- Estimating regression models with panel data (Chapter 10)
- Instrumental Variable estimation (Chapter 12)

Homework in the 2<sup>nd</sup> half of the course requires use of statistical software. You are free to use any program you are familiar with. STATA will be used in this class. **You do not need to purchase STATA.** It is available in every computer lab on campus. There is even an option to operate it remotely.

### Other Useful Information:

#### Student-Wellness Services:

*Just In Case Web App*, for a mental health crisis for you are a friend:

<http://codu.co/cee05e>

*Counseling, ADAP & Psychiatric Services (CAPS)*, for non-emergency psychological health issues:

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 [www.rhscaps.rutgers.edu/](http://www.rhscaps.rutgers.edu/)

*Violence Prevention & Victim Assistance (VPVA)*

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 [www.vpva.rutgers.edu/](http://www.vpva.rutgers.edu/)

*Disability Services*

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

*Scarlet Listeners*, for confidential peer counseling and referral hotline:

<http://www.scarletlisteners.com/> or call (732) 247-5555

### Some Thoughts and Advice

As you work through this course, here are a few tips to keep in mind.

- Econometrics isn't easy. It takes work. Sometimes you'll need to re-read the text or notes several times before you start to "get it."
- Have a diverse learning approach. The best chance of success comes when you study the subject from multiple angles. Read the text before class. Come to class. Take notes and ask questions. Read the text and notes again. Do practice problems. Repeat.
- The best way to learn is by doing. Practice. Put effort into homeworks. Try to prove results to yourself. Do extra exercises in the book. Developing intuition is important, but so is being able to put those ideas into action.