ECO 4421 (0409): Econometrics
Syllabus

Instructor: Scott Kostyshak
Email: skostyshak@ufl.edu
Phone: 352-392-0403
Office: MAT 304

Spring 2017
Course Time: T/R 16:05 — 18:00 (Periods 9 & 10)
Course Location: MAT 0107
Office Hours: W 13:55 — 15:50 (Periods 7 & 8)

TA: Alan Secor
Email: alan.secor@ufl.edu
Office: MAT 341

Office Hours: M 9:35 — 11:30 (Periods 3 & 4)

Course Description:

ECO 4421 introduces students to the concepts and methods used in empirical economic research. The emphasis is on the practical use of basic econometric techniques to estimate economic relationships or to evaluate policy. It includes topics needed to plan and implement your own empirical projects, and to understand potential problems with the empirical analyses of others, such as understanding endogeneity, relaxing assumptions that rarely hold in practice such as homoskedasticity, and testing assumptions like missing-at-random. Understanding selection bias and interpreting results accordingly is a critical part of working with any topic in economics and thus we must understand concepts in microeconomics to understand the decisions taken by individuals. We will explore various applied microeconomic topics, including the mincer specification (students must at a minimum have taken ECO 3101 in order to understand the structural concepts that we will explore empirically). The course has the following objectives:

1. Learn the practical *intuition* of general statistical concepts, including standard errors, hypothesis testing, and confidence intervals.

2. Learn to disentangle causation from correlation.

3. Learn the basics of the R statistical programming language.

4. Learn the dangers of relying on assumptions that do not typically hold in economics (e.g. homoskedasticity).

5. Learn to work with data, being aware of practical issues such as violations of missing-at-random.

6. Understand selection bias and how to interpret results accordingly.

Prerequisite:

ECO 2013 & ECO 2023 & ECO 3101. Students should also be familiar with basic concepts in probability and statistics. For example, you should be familiar with material in Appendices A, B, C (excluding "maximum likelihood") in the Wooldridge text, including how to take a partial derivative and the intuition of what a derivative is used for. The course includes a brief statistics and probability refresher just in case. However, if you are not familiar with this material, you should make time out of class to review it in detail.

Texbook and Readings

The textbook for this course is J. M. Wooldridge, *Introductory Econometrics: A Modern Approach* (fifth edition), South-Western Publishing. You will also be responsible for material from class that is not covered in the textbook.

A separate textbook which is not required, but covers much of the same material, is Stock & Watson *Introduction to Econometrics* (third edition), Pearson. If a topic is confusing in lecture, and it is not cleared up by Wooldridge, consider reading the corresponding section in Stock and Watson.

Software and Programming

There will be problem sets, some of which will involve empirical analysis and will require the use of a statistical software. R is the statistical software for this course. You will likely find RStudio (http://www.rstudio.org) to be a more user-friendly way of using R. You are not required to have any knowledge of R or other programming experience, but you must be willing to learn. R and RStudio are already installed on many computers around campus (e.g. Marston Science Library). You can also install R on your personal computer—R is free (open source) and available for Windows, Mac, and Linux. To download R, go to: https://www.r-project.org/. You are encouraged to work with other students on the problem sets, but each student must write up his or her answers separately.

Exams

There will be three exams. The location of all exams is the same location as where we normally meet for class. I will set the date for each exam at least 2 weeks before it will be given.

Grades

Your final grade will be calculated as follows:

Exam 1	10%
Participation	10%
Assignments	25%
Exam 2	25%
Exam 3	30%
Total	100%

Your final letter grade will be determined as follows:

93–100	A
90–92	A-
87–89	B+
83–86	B
80–82	B-
77–79	C+
73–76	C
70–72	C-
67–69	D+
60–66	D
0–59	E

Attendance Policy and Behavior

Irregular attendance or inattentiveness will most likely result in a substantial reduction in course performance. Econometrics requires participation and attention. Please shut off or put away laptops, tablets, ipods, phones and other electronic devices or toys during class, unless asked otherwise. Also notify me if you will be absent from class.

Student Responsibility

Enrollment in this course constitutes acknowledgement of the following:

1. I understand that the University of Florida expects its students to be honest in all of their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the University.

2. I will adhere to university copyright policies as found at http://www.uflib.ufl.edu/admin/Copyright.htm

3. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Course Outline

1. **Mathematical and Statistical Tools**
Wooldridge, Appendices A & B

2. **Introduction to R**

3. **Review of Statistical Inference**
Wooldridge, Appendix C

4. **Introduction to Econometrics**
Wooldridge, Chapter 1
This chapter explains what econometrics is and how it is different from traditional statistics.

5. **Simple Regression**
   Wooldridge, Chapter 2
   Here we study basic regression. We will use concepts such as elasticity and other microeconomic topics you should already know from ECO 3101.

6. **Multiple Regression**
   Wooldridge, Chapter 3
   More regression and applied microeconomics topics, such as the mincer specification.

7. **Multiple Regression: Inference**
   Wooldridge, Chapter 4

8. **OLS Asymptotics**
   Wooldridge, Chapter 5

9. **Multiple Regression: Data Scaling and Functional form**
   Wooldridge, Chapter 6
   In Economics we often want to explore specific functional forms (based on theory seen in ECO 3101).

10. **Dummy Variables**
    Wooldridge, Chapter 7