## **Course Information**

Course Number/Section	ECON 6306.004
Course Title	Applied Econometrics
Term	Spring 2018
Days & Times	Saturday 10:00AM-12:45 PM
Classroom	GR 3.206

#### **Professor Contact Information**

Professor	Christopher Roby
Email Address	cxr113330@utdallas.edu
Office Location	
Office Hours	Before and After Class, Other times by appointment

Note: If you send me an email, please add "ECON 6306" in the subject line. I receive a lot of email correspondence and want to make sure that I can prioritize any questions/ inquiries you may have. The university requires all official email to go to your UTD address, so I will send messages to your UT Dallas address. You may then forward these emails to another address. **Email is usually the best way to get timely answers to questions. Also, if I need to make any announcements, I will send them to your UTD email address.** 

#### Econ Lab

In GR 3.416 (the Galveston Room). This is a lab which is staffed by graduate students in economics from **3pm-7pm Monday through Thursday.** General help on economics is available there. However, they will not be trained to help with specific problem set questions for our class and so should not be asked how to do or interpret specific problem set questions. Save those for me.

#### Home Page for Course is on eLearning.

**Computer Note:** Our class will be using a computer program (Stata) available in the EPPS computer labs (GR 3.206, GR 3.402, and GR 3.602). You must have a Campus ID and password to use these computers. You will also have the option of purchasing the program for personal use, which is highly recommended. You may have a background in a different programming language, for example R or SAS. I encourage you to replicate the Stata results with these programs for yourself, but they will not be supported in this class.

#### **Decorum during class:**

• No cell phones on during class and no text messaging – first time a warning, second and you lose points.

• No computer use other than for class-related activities – when I walk around the room I don't expect to see e-mail, games, social network sites, etc.

• No recording devices are to be used in class and no taking of photos in class.

#### Course Pre-requisites, Co-requisites, and/or Other Restrictions

I assume you have had college-level statistics through at least simple linear regression, basic calculus, and a general understanding of computer use. We will not be using linear algebra or calculus beyond basic derivatives, though I may demonstrate some techniques using these that will not be required. The first part of the course will review the basic regression model, along with hypothesis testing, before we continue into more advanced material.

In addition, it is assumed students have taken the principles of economics courses and, preferably, intermediate theory courses. Many, but not all, students will likely also have taken an econometrics course. This course will reinforce and extend what you learned in that class. The appendices to the textbook have material I will review as we need it, though occasionally I reference this material in the schedule. I strongly suggest you do a quick review of what is there at the beginning of the semester so that you can independently study concepts that are less familiar as you come to them in the course.

#### **Course Description**

The subject of econometrics deals with the measurement of economic relationships. We will develop in class, using economic theory, statistics, and mathematics, techniques that can be used to estimate economic relationships. A major focus will be on how a researcher can confront a theory with data and draw some type of conclusion. The techniques that we use are widely used in economics, management, political science, sociology and psychology, among others.

The core of the course will be the study of regression analysis. This method seeks to determine the influence of one or more variables on a variable of interest. We will start with a review of the theory behind regression, the interpretation of the estimated parameters, and the testing of hypotheses about the parameters. Then we will proceed to studying how to handle violations of the underlying assumptions.

This is both a theoretical and applied course. Let me emphasize, though, that this is a masterslevel course and the emphasis is on "applied." This course requires a significant amount of time spent on the computer. If you are interested in the theoretical underpinnings then you should consider the PhD-level econometrics sequence.

## **Student Learning Objectives/Outcomes**

- Introduce the statistical technique of regression analysis.
- Analyze the assumptions, strengths and weaknesses of the classical linear model.
- Use regression analysis to test hypotheses about economic behavior, with examples
- drawn from economics and other disciplines.
- Gain a working knowledge of Stata

## **Required Textbooks and Materials**

**Textbooks:** *Principles of Econometrics, 4th ed. Hill, Griffiths, and Lim, 2011.* Make sure you check the course web site for the Errata file corresponding to your edition. In addition, answers to starred problems in the textbook are available on our web site.

Using Stata for Principles of Econometrics, 4th ed. Adkins and Hill, 2011. This manual is immensely helpful and I will assume you have access to it.

The required textbooks are available at both the On- and Off-campus bookstores. You may also use the eBook edition of the textbook, but this will require you to have access to it during exams – see below with exams. You may use the international versions of the textbook. However, all

references will be to the U.S. 4th edition and page numbers and problems likely will not correspond to the international version – you are responsible for the correct 4th edition material!

**Data:** The course web site has the data that accompanies the textbook as well as Stata programs used in the text. Other data and programs will be placed there during the semester.

Other: We will use the Stata statistical package for data organization, estimation, hypothesis testing, and assignments. Students will be expected to master basic Stata statistical and programming commands. Stata will be available in the computer lab, but there is the option of purchasing the software. Information about purchasing is on the course web site and will be discussed in class. It is highly recommended that some version of Stata be purchased.

#### Advice for succeeding in this course:

• Print off Stata .do files that are posted on the web site and bring to class to annotate! This will be explained in class.

• Most of the time class material will be presented with PowerPoint. You should print them off ahead of time and take notes on them as needed.

• Go through the textbook problems that are starred for which you have answers posted on the web site.

• Go through the Stata Handbook. If you have questions about Stata commands, you should (a) search the Stata program's help and/or (b) Google the command. There is a tremendous amount of support for Stata online, including Stata's own YouTube channel. Take advantage of it!

• Do not wait until the last moment to work on problem sets. Computer work and empirical analysis are often time consuming.

#### **Course Policies**

#### Make-up Exams/ Late Assignment Policy

Unless the university has been closed, there will be no changes in exam dates; I will adjust material for the exam if we get behind. Make-up exams will only be given in extenuating circumstances with the exam itself likely being more difficult, per the additional time and information available. An alternative reweighting of scores may be available depending on the circumstance.

No extra credit assignments will be given and late problem sets will be penalized and not accepted after we have gone through the answers.

#### Grading

The grade for the course will be based on four problem sets (14% each) and two exams (22% each). You may work on the problem sets together, unless a question states otherwise, but all answers turned in must be written up independently. The answers to the starred questions in the textbook are available online, and these may help prepare you for some of the problem set questions. **The problem sets must be typed and use only one side of a sheet of paper.** 

Exams will be a combination of closed book and open book/open notes (but this method can often be a hinderance, so you do need to study appropriately!). Note that the only use of computers/laptops/tablets during exams will be to access eBooks or PowerPoints from this class. All activity on these devices must be viewable by the instructor, and no sharing of textbooks or

notes will be allowed and no cell phones may be used. You should bring a calculator with the ability to take logs and exponentials as well as powers to the nth degree. If you are using a live (as opposed to downloaded) eBook then you are at the mercy of the availability of Internet during the exam. In addition, if you are using an eBook you will be moved to a specific location in the classroom during the exam.

#### Assignments & Academic Calendar

Tentative Reading Assignment Schedule

Readings are from the Hill, Griffiths and Lim 4th ed. text and are listed (Textbook) for when they are supposed to **have been** read. In addition, you should review the accompanying sections from the Stata handbook prior to class, and then practice the Stata code after class. Exam and problem set dates are also listed below. Assume even if it does not say it that preceding each date's topic is the word "Continued" from the previous class as many will span more than one class. Please note that the schedule skips around the textbook quite a lot. This is due to my own view that certain topics go together in a different order than presented. So be careful in reviewing what you are supposed to read.

This is an ambitious schedule and so if, and when, we get behind, unless the university has been closed the dates for exams and problem sets will not change. I will change the material covered in the problem set or exam to accommodate where we are in lecture, so plan your semester accordingly.

#### January

## 13

Textbook: Introduction and Chapter 1, pp. 1 - 9; Chapter 2, pp. 40 - 56, 74-75, and Appendices 2A and 2B. Also review the Probability Primer, pp. 17-34 and pp. 639-640 (note, this reading is a review of what you should have previously had and we will not go through it in class).

Handbook: Chapter 1, 2.1 – 2.5, 2.7.

## 20

Continued and Chapter 2, pp. 56 - 68; Chapter 5, pp. 168 - 180. In addition, read textbook pp. 135 - 139 and pp. 198 - 199, and 4B. Also, review Appendices 2C and 2D.

Handbook: Chapter 4.2. Chapter 5.1 - 5.3, 5.8. NOTE, from now on I will assume you will read the corresponding handbook sections without my indicating to.

## **Problem Set 1 Given**

## 27

Continued and Chapter 3; and Chapter 4, pp. 131 - 135; and Chapter 5, pp. 180 - 189.

## February

## 3

Continued and Chapter 2 pp. 68 - 74; Chapter 4, pp. 139 - 157.

## Problem Set 1 Due

## **Problem Set 2 Given**

## 10

Chapter 5 pp. 189 -198 (you will not be required to know the Delta method) and Chapter 7, pp. 258 - 264.

## 17

Continued and Chapter 6, pp. 222 – 228; 233 – 243; (and cursory review of 243 – 246)

## Problem Set 2 Due (bring an extra copy of answers to class)

# 24 Exam 1

# March

**3** Chapter 7 pp. 264 – 273, and 275 – 281.

10

Chapter 8, pp. 298 – 313, 315 – 319.

# **Problem Set 3 Given**

17 Spring Break

# 24

Chapter 9, pp. 335 – 378; Appendix 9C.

# 31

Chapter 10 and Chapter 11. Note we will not use the method of moments much in our discussion of instrumental variables.

# **Problem Set 3 Due**

# April

7 Continued and Chapter 12 (omit pp. 490 – 492).

# **Problem Set 4 Given**

## 14

Continued and Chapter 7, pp. 273 – 275; Chapter 16, 585 – 599; browse pp. 719 – 723.

# 21

Continued and Chapter 15, pp. 538 – 560 – as time allows!

## Problem Set 4 Due (bring an extra copy of answers to class)

# 28 Exam 2

# Exam dates and homework assignment due dates <u>will not be changed</u> unless the university is closed.

## **UT Dallas Syllabus Policies and Procedures**

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

# The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.