

## **ECON/AREC335: Introduction to Econometrics**

### **Course Section, Time and Place**

Section 001 Tuesday & Thursday, 9:30am-10:45am, in Clark C364

Section 002 Tuesday & Thursday 11:00am-12:15pm, in Clark C337

**Instructor:** Eliakim KAKPO Ph.D. Candidate

**Office:** Clark A020, Colorado State University, Fort Collins, CO 80523

**Office Hours:** On Campus: Tuesday and Thursday 2:00 pm – 3:30 pm

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This is my preferred method of communication. I check my email very frequently.

### **Course Description**

This course is an undergraduate level introduction to econometrics, the social science in which the tools of economic theory, mathematics, and statistical inference are applied to the analysis of economic phenomena. You will study and apply regression analysis to various data sets in order to familiarize students with the core concepts of estimation of economic parameters, prediction of economic outcomes, and statistical inference.

### **Course Objectives**

By the end of this course, you should be able to:

- Understand the nature and scope of econometrics as a social science
- Use statistical analysis, including the classical regression model, to estimate relevant economic parameters, predict economic outcomes, and test economic hypotheses using quantitative data.
- Understand the basic assumptions of the classical linear regression model, and identify and correct (if possible) any violations of these assumptions, such as autocorrelation and heteroscedasticity.
- Develop and maintain a working knowledge of econometrics that will provide a basic foundation for future study in econometrics and statistical techniques.

### **Prerequisites**

ECON 204 and ECON 202 (Principles of Macroeconomics and Microeconomics) ; and MATH 141 (Calculus in Management Sciences) or MATH 155 (Calculus for Biological Scientists I) or MATH 160 (Calculus for Physical Scientists I) ; and STAT 201 (General Statistics) or STAT 204



(Statistics for Business Students) or STAT 301 (Introduction to Statistical Methods) or STAT 307 (Introduction to Biostatistics).

As such I will assume that you are familiar with basic economic theory, as discussed in Principles of Micro and Macroeconomics; basic statistical concepts, including probability distributions and hypothesis testing; algebraic concepts, including the ability to graph lines and curves in two dimensions; and a basic understanding of differential calculus.

NOTE: The use of calculus in this course will be limited, but may be used from time to time in order to aid in the instruction of particular concepts.

## **Course materials**

### **Required Textbook**

Introductory Econometrics: A Modern Approach, 6<sup>th</sup> edition **Jeffrey M. Wooldridge**

You should purchase the book bundled with MindTap access with course materials and exercises that are useful.

- Bundle: Introductory Econometrics: A Modern Approach, Loose-leaf Version, 6th + LMS Integrated for MindTap® Economics, 1 term (6 months) Printed Access Card: 9781337127134
- MindTap only (e-book included, no print): Wooldridge - LMS Integrated for MindTap® Economics, 1 term (6 months) Printed Access Card for Wooldridge's Introductory Econometrics: A Modern Approach, 6th 9781305404243

### **Course Websites:**

- Canvas is our class website:
- <http://info.canvas.colostate.edu/login.aspx/>
- Mindtap access link available on Canvas

### **Course Weekly Structure**

There will be approximately 16 modules corresponding to the 16 weeks of the course. Each module relates to the notes and chapters covered in class. Class notes are available through canvas and you are encouraged to print them before class sessions. Other class materials (outside readings, statistics tables, probability distributions, etc.) will be posted online and you should make sure to print them ahead of time. Each week, you will have two in-class lectures on Tuesday and Thursday. Exam material will be largely drawn from lectures. Attendance is therefore highly recommended, and participation is strongly encouraged.



## Lectures: Required Software

We will mainly rely on Gretl for graphics, data management, basic statistics, and econometric estimation. You will use Gretl to complete problem sets and empirical exercises. Gretl is a free and user friendly econometric software package. You can download and install Gretl using the following directions:

1. Go to <http://gretl.sourceforge.net>
2. On the lefthand side, click on “gretl for Windows” if you are a Windows user, or click on “gretl on Mac OS X” if you are a Mac user.

- FOR WINDOWS USERS:
  - Check to see that your PC meets the system requirements, and then download the latest release by clicking the “gretl1.9.12.exe” link. Your download should begin automatically.
- FOR MAC USERS:
  - Follow the instructions onscreen to determine if your Mac has an Intel or PPC processor. Once determined, click on the appropriate button. Again, follow the onscreen instructions to download Gretl.

If you are already familiar with alternative commercial software (e.g. STATA, SAS, EViews, etc.), you are welcome to use it for problem sets as long as you circle or highlight your answers. Since datasets for homework will be provided in Gretl format, it will be up to you to convert files for use with different software. Furthermore, I may or may not be able to answer questions about alternative software depending on what it is.

## Supplemental Readings

Supplemental readings and other materials will be provided in the Canvas system, via the CSU Library electronic reserve or by links to websites.

## Coursework

### 1. Assignments, Evaluation and Grading

Grading will be based on six (06) problem sets, two (02) midterm exams, an individual final project (requires computer work), and a cumulative final exam. Exams will require interpretation of computer output in addition to other topics. Note that the final project is worth as much as the final exam and therefore should reflect a significant amount of independent work.



**CAUTION:** You will likely fail this course if you do not complete the problem sets and individual final project in addition to the written portions of homework and exams.

## **2. Problem Sets**

You will be required to complete six (06) problem sets. Problem set assignments will be posted to Canvas (or available via Mindtap) and announced approximately one week before they are due, and will focus on applications of the tools and concepts we're covering. Many of these problem sets will include both an analytical and computing component. You may work on these assignments with fellow classmates, this is encouraged; but all final work **MUST** be your own.

## **3. Final Project**

The final project will cover what you have learned over the full course up until the project due date. Instructions will be distributed after the first midterm. Your project will be based on data analysis and interpretation pertaining to a question that interests you.

## **4. Exams**

There will be two (2) midterm exams to confirm and evaluate your understanding; as well as a cumulative final exam in class. These exams will be modeled after the problem sets and general exam instructions will be distributed prior to the first exam.

## **Grading System**

As this is an econometrics course, your final course percentage grade will be determined using the following equation:

$$\text{Grade} = 2/5 * (\text{average of Problem Sets}) + 1/10 * (\text{midterm1}) + 1/10 * (\text{midterm2}) + 1/5 * (\text{final project}) + 1/5 * (\text{cumulative final exam})$$

Where midterm1 and midterm2 are the two midterm exam scores, chronologically. Your average problem set score will determine 40% of your final grade, your final project will determine 20%, and your exams will constitute the other 40%.

## **Letter grade**

- A+: 97.5% – 100%
- A: 93.0% – 97.4%
- A-: 90.0% – 92.9%
- B+: 87.5% – 89.9%
- B: 83.0% – 87.4%
- B-: 80.0% – 82.9%
- C+: 77.5% – 79.9%



C:70.0% – 77.4%  
D:60.0% – 69.9%  
F:59.9% or below

### **Weekly Course Time Estimates**

The expectations for homework or other work outside of instructional time equivalent to the federal credit hour definition of 2 hours of outside work for each contact hour

Attend lecture and recitation	3 hours
Complete LearnSmart and Quiz	2 hours
Work on writing assignments	1 hour
Prepare for Exams	1 hour
<u>Personal reading/study</u>	<u>2 hours</u>
Total Hours per week:	9 hours

### **Make-ups, Missing Assignments, and Regrades**

There will be NO makeup exams or assignments without a documented family or medical emergency. If you know in advance that you will be unable to take an exam, contact me as soon as possible to make other arrangements. In general, with an acceptable reason, you may arrange to take an exam early, but never late.

Late problem sets will be accepted without penalty only for the same documented family or medical emergencies as exams. If you submit a problem set in a format other than a Word Document or PDF, you have one week to resubmit it properly and a severe penalty will be applied.

### **Academic Integrity**

We take academic integrity seriously. At minimum, academic integrity means that no one will use another's work as their own. The CSU writing center defines plagiarism this way:

*“Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding credit be given where credit is due.”*

—Writing Guides: Understanding Plagiarism.

<http://writing.colostate.edu/guides/researchsources/understandingplagiarism>

### **Academic Dishonesty could result in expulsion from the university.**

This course will adhere to the CSU Academic Integrity [Policies and Guiding Principles](#) as found in the General Catalog and the [Student Conduct Code](#). At a minimum, violations will result in a



grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services. Of course, academic integrity means more than just avoiding plagiarism and cheating. It also involves doing your own reading and studying. It includes class attendance, careful consideration of all class materials, and engagement with the class and your fellow students.

### **CSU Honor Pledge**

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course. Each exam and assignment you submit, you will be required to affirm the following statement:

*"I have not given, received, or used any unauthorized assistance."*

Further information about Academic Integrity is available at CSU's **Practicing Academic Integrity** <http://learning.colostate.edu/integrity/index.cfm>.

### **Department Statement on Copyright**

Please do not share material from this course in online, print or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face disciplinary or legal action.

### **Classroom Conduct**

Students are required to act respectfully in the classroom at all times, any disruptive behavior that inhibits fellow-student learning will not be permitted and will constitute a one-day removal from lecture/recitation; a second offense will require a formal meeting with the student. Such behavior includes holding conversations during lecture/recitation, any unauthorized cell phone, laptop, or tablet use, or other behavior which detracts from the class.

### **Accommodations**

Students with disabilities may be eligible for accommodations in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. It is the student's responsibility to disclose any learning disabilities. Please contact the instructor if a special accommodation is required. To request accommodations, students should contact Resources for Disabled Students at (970) 491-6385 or go to <http://rds.colostate.edu>. Documentation of disability is required and the RDS office will assist in this process.



## **Title IX**

CSU's Discrimination, Harassment, Sexual Harassment, Sexual Misconduct, Domestic Violence, Dating Violence, Stalking, and Retaliation policy designates faculty and employees of the University as "Responsible Employees." This designation is consistent with federal law and guidance, and requires faculty to report information regarding students who may have experienced any form of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation. This includes information shared with faculty in person, electronic communications or in class assignments. As "Responsible Employees," faculty may refer students to campus resources (see below), together with informing the Office of Support and Safety Assessment to help ensure student safety and welfare. Information regarding sexual harassment, sexual misconduct, relationship violence, stalking and retaliation is treated with the greatest degree of confidentiality possible while also ensuring student and campus safety.

Any student who may be the victim of sexual harassment, sexual misconduct, relationship violence, stalking or retaliation is encouraged to report to CSU through one or more of the following resources:

- Emergency Response 911
- Deputy Title IX Coordinator/Office of Support and Safety Assessment (970) 491-1350
- Colorado State University Police Department (non-emergency) (970) 491-6425

**ECON/AREC 335 Fall 2017 Course tentative Schedule**

<b>Mod</b>	<b>Dates</b>	<b>Chapters</b>	<b>Topic(s)</b>	<b>Assignments   Tests</b>
M1	Aug 21- Aug 27	Chapter 1	Intro. Econometrics & Data	-
M2	Aug 28- Sept 03	Append. A& B	Review of Mat & Probability	-
M3	Sept 04- Sept 10	Appendix C	Review of Statistics	<b>PS #1</b> released
M4	Sept 11- Sept 17	Chapter 2	Simple Linear Regression	<b>PS #1</b> due 09/14
M5	Sept 18- Sept 24	Chapter 3	Multiple Linear Regression	<b>PS #2</b> released
M6	Sept 25- Oct 01	Chapter 4	Inference & Midterm 1	<b>Midterm1</b> on 09/28
M7	Oct 02- Oct 08	Chapter 4	Inference (continues)	<b>PS #2</b> due 10/03 <b>PS #3</b> released
M8	Oct 09- Oct 15	Chapter 6	Multiple Reg. Further issues	<b>Final project</b> instructions <b>PS #3</b> due 10/11
M9	Oct 16- Oct 22	Chapter 7	Multiple Reg. w. bin. variable	<b>PS #4</b> released
M10	Oct 23- Oct 29	Chapter 8	Heteroskedasticity	<b>PS #4</b> due on 10/26
M11	Oct 30- Nov 05	Chapter 9	Further issues- specification	<b>PS #5</b> released
M12	Nov 06- Nov 12	Chapter 15	Instru. variables and 2SLS	<b>Midterm2</b> on 11/09
M13	Nov 13- Nov 19	Chapter 10	Time Series Econometrics	<b>PS #5</b> due on 11/16
M14	Nov 20- Nov 26		FALL BREAK	
M15	Nov 27- Dec 03	Chapter 12	Autocorrelation	<b>Final Project</b> due 11/28 <b>PS #6</b> released
M16	Dec 04- Dec 10	Chapter 19	Carrying out an empir. work	<b>PS #6</b> due 12/07
M17	Dec 11- Dec 15	<b>FINALS' WEEK</b>		Final Exam 12/11 9:40a