

AREC335/ECON335
Introduction to Econometrics
Fall 2018

Class Meeting:

3:30-4:45 Tue, Thu (Clark C 359)

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Course Description

The purpose of this course is to provide students with an introduction to econometrics and basic competence in applying statistical methods as a scientific tool in the analysis of practical economic problems. The course will begin with a brief preview of how econometrics can be used to answer applied, real-world question. A brief review of basic statistics and data analysis will follow, before moving into the core material, which is the linear regression model. Students will learn to specify and estimate econometric models, interpret results, and uncover and correct for common statistical problems. The lectures will balance theory and mathematical derivations on the one hand and applications to real-world and simulated data sets on the other. The training received in this course can shape attractive job candidates, and the computer work will provide skills that can be taken directly into the workplace.

Specific Class objectives

1. Starting from a research question, identify data needs, the relevant economic and econometric model, estimate the model.
2. Understand and interpret ALL output from a regression in Excel
3. Use estimated model to predict outcomes and test hypotheses
4. Be aware of potential pitfalls in estimating models via OLS

Course Readings:

- Class notes and material, posted on Canvas
- Optional: R.Carter Hill, William E. Griffiths, Guay C. Lim. Principle of Econometrics, 4^d Edition, 2011 Wiley & Sons. ISBN: 978-0-471-72360-8
Book website: <http://www.principlesofeconometrics.com>

Course Prerequisites: ([ECON 204](#)) and ([STAT 201](#) or [STAT 204](#) or [STAT 301](#) or [STAT 307](#) or [STAT 311](#) or [STAT 315](#)) and ([MATH 141](#) or [MATH 155](#) or [MATH 160](#)).

Computer Software: We will use Microsoft Excel for data analysis and econometric estimation. You can find the instructions on how to do it here: <https://support.office.com/en-us/article/Load-the-Analysis-ToolPak-6a63e598-cd6d-42e3-9317-6b40ba1a66b4>. It is assumed that you either have working knowledge of Excel or that you are capable of learning it on your own or with basic guidance. There is a very useful tutorial available from the book website, which I will upload in the class website. If you are already proficient using a specialized econometrics software, it is acceptable to use it for your homework. You will also be required to use word-processing software homework assignments and the final project.

Warning for the Unwary: This is an upper-division course that *assumes* a mature understanding of basic mathematics and calculus, statistics, and economics, as well as good study habits. If you do not keep up with the material you will suffer and possibly fail the course. However, if you work diligently, you are very likely to do well, come away with highly useful skills and most importantly enjoy this course.

Course Evaluation

As a default, the grades are as assigned as follows: A = $\geq 90\%$; B = 80-89%; C = 70-79%; D = 60-69%; F = $< 60\%$. **No curving scheme will be used.** Individual student course grade will be automatically determined by the highest score yielded by the following two weighting methods:

Method A:

Group Homework Exercises	15%
Group Project	10%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam (comprehensive)	35%

Method B:

Group Homework Exercises	15%
Group Project	10%
Final Exam (comprehensive)	75%

Important Notes:

1. The **midterm exams** and the **final exam** are in-class, closed-book. You may use a calculator and a back-to-back 8 ½ by 11-inch *cheat-sheet*. In each exam, there will be an extra credit question with variable score (based on the performance of the class). **No other grade-curving scheme will be adopted.**
2. **Method A** means that if you have done well along the way, you will not be unduly penalized for a sub-par performance on the final exam. **Method B** means that if you do well on the final, you will not be penalized for relatively poor performance on the midterm exams. **Missed midterm exams** are assigned a zero, implying that your course score will be determined by method B. No excuse is needed as to why a midterm exam is missed.
3. Homework exercises will be handed one week before the due date. You can expect 7-8 of them. When **applying formulas, be always explicit** (i.e. reproduce the formula and properly label your variables; when testing hypotheses, always clearly state your null and alternative hypothesis). **Answers containing only numbers will not be graded** (and receive a zero score).
 - a. **Group homework exercises** are assigned throughout the semester, 1 week prior to the due date. The homework with the lowest score will be dropped from your final grade. You will work in groups of 4 *people*. If you have trouble forming a group, please contact the TA.
 - b. There will be one **group project**. Each group is formed by 4 people. The project will be assigned after the core of the course material has been covered. This assignment will involve writing a formal, business style report from an econometric analysis. In addition to the econometric content, you will be graded for the style and presentation of your findings.

Tentative Course Outline (Modifications are likely and at the instructor's discretion)

Week	Date	Class	Topic	Notes	Homework
1	21-Aug	1	The simple linear regression model	Lecture 1	HW1
1	23-Aug	2	The simple linear regression model	Lecture 1	
2	28-Aug	3	Data Scaling, deriving the OLS	Lecture 1	HW2
2	30-Aug	4	Deriving the OLS	Lecture 1 bis	
3	4-Sep	5	Stats Review	Lecture 2	
3	6-Sep	6	Stats Review	Lecture 2	
4	11-Sep	7	Stats Review	Lecture 2	
4	13-Sep	8	Stats Review	Lecture 2	HW3
5	18-Sep	9	GM-theorem and Sampling distribution of OLS	Lecture 3	
5	20-Sep	10	Exam 1	-	
6	25-Sep	11	GM-theorem and Sampling distribution of OLS	Lecture 3	
6	27-Sep	12	Model specification and functional form	Lecture 4	
7	2-Oct	13	Model specification and functional form	Lecture 4	
7	4-Oct	14	Model specification and functional form	Lecture 4	HW4
8	9-Oct	15	Comparing models: R-sq	Lecture 5	
8	11-Oct	16	Comparing models: R-sq	Lecture 5	HW5
9	16-Oct	17	Comparing models: R-sq	Lecture 5	Oct 15: W withdrawal ends
9	18-Oct	18	Interval estimation and forecasting	Lecture 6	
10	23-Oct	19	Interval estimation and forecasting	Lecture 6	
10	25-Oct	20	Hypothesis testing	Lecture 7	HW6
11	30-Oct	21	Hypothesis testing	Lecture 7	
11	1-Nov	22	Hypothesis testing	Lecture 7	HW7
12	6-Nov	23	Hypothesis testing	Lecture 7	
12	8-Nov	24	Exam 2		
13	13-Nov	25	Violation of assumptions: misspecification, omitted variable	Lecture 8	
13	15-Nov	26	Violation of assumptions: misspecification, Irrelevant variables	Lecture 8	
14	20-Nov		Fall Break		
14	22-Nov				
15	27-Nov	27	Violation of assumptions: misspecification, functional form	Lecture 8	
15	29-Nov	28	Violation of assumptions: multicollinearity	Lecture 9	
16	4-Dec	29	Violation of assumptions: multicollinearity	Lecture 9	
16	6-Dec	30	Violation of Assumptions: heteroskedasticity (if time allows)	Class notes	
	10-Dec	-	Final exam: 6:20-8:20		

Course Policies and Exceptions

1. **Homework exercises** are due on the stated due date. Beyond that, no assignments will be accepted. The general rule is that **make-up exams** will NOT be administered. At the instructor's discretion, however, exceptions can be made for specific CSU-sponsored activities or DIRE circumstances, provided appropriate documentation is presented. If you have a **documented disability** that requires special arrangements, please let the instructor know immediately at the beginning of the course. Students who use alternative testing at RDS can contact me prior to the exam to make arrangements and sign applicable paperwork.
2. **Academic integrity** is expected. No cheating will be accepted, period. This course will adhere to the CSU Academic Integrity Policy as found on the Student' Responsibilities page of the [CSU General Catalog](#) and in 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.
3. **Classroom Etiquette**
No animals are allowed in the classroom except those defined in the CSU policy regarding SERVICE animals. No emotional support animals are allowed in class. Please silence your phone and other electronic devices during class. Please be quiet while in class. It can be difficult to hear in a large classroom and even quiet talking can be very disruptive to other students who are trying to listen. Please do not read newspapers, text, play games, or listen to music during class. It may not impact your learning experience, but it is distracting to others in the room. **Attendance** is not required, but highly encouraged. If you arrive late or expect to leave early, please sit near the exit to avoid disrupting the lecture. Attendance will not be considered to determine the final grade.
4. **Academic help.** If you are finding that you have difficulties in this course, **ask for help** as soon as possible. The instructor and teaching assistant want you to do well and meet your academic goals. The sooner you ask for help, the sooner we can get you back on track. *Your learning and well-being is of highest priority.*
5. **Help with personal issues. Rams Take Care of Rams**
Reach out and ask for help if you or someone you know is having a difficult time. Always feel free to come and talk to me; I will always make myself available to help connect you with any resources you need. CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to <http://health.colostate.edu>. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 (or visit <http://safety.colostate.edu/tell-someone.aspx>) to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams take care of Rams.

Principles of Community

In this course we strive to follow and extend Colorado State's University's Principles of Community, and welcome spirited discussion, lively debate and pursuit of knowledge in a manner that respects each of us as individuals.

The Principles of Community support the Colorado State University mission and vision of access, research, teaching, service and engagement. A collaborative and vibrant community is a foundation for learning, critical inquiry, and discovery. Therefore, each member of the CSU community has a responsibility to uphold these principles when engaging with one another and acting on behalf of the University.

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

Title IX: Sexual Assault, Sexual Violence, Sexual Harassment:

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

please Visit: <http://oeo.colostate.edu/title-ix-sexual-assault> for more information.