Econ 4650-001: Principles of Econometrics

Instructor: Hyeon Kim
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(Old Law Library)
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Course Webpage: on Canvas
Class: M. W. 11:50 am - 1:10 pm, BEH S 115
Office Hours: F. 3-5 pm or by appointment
(Study Room 1750 B in the M LIB)

Course Description: Econometrics is based on the development of statistical techniques for estimating economic relationship, testing economic theories, and evaluating and implementing government policy and business decisions focusing on the problems inherent in collecting and analyzing non-experimental economic data. The general application of econometrics includes the forecasting of important macroeconomic variables - interest rates, inflation rates, and gross domestic product (GDP) -, the cause-and-effect of many socio-economic phenomena such as the effect of education attainment on wage rate and the effect of income on the environment, and so on.
This course will study the statistical foundations and methodology of measuring causal effects of socio-economic phenomena to understand empirical economic analyses and to carry out such an analysis using the statistical software R. Topics include random variable(s), probability, (sampling) distribution, statistical inference, simple linear regression, multiple regression, nonlinear regression, and so on.

Prerequisite(s): This course has two prerequisites Econ 3620 (Mathematics for Economists) and Econ 3640 (Probability and Statistical Inference for Economists). If you didnt take these classes or equivalent before, you are not eligible for taking this course. If you believe you took similar equivalent courses before, please let me know as soon as possible, indicating which courses you have taken.

Required Text(s): (SW) *Introduction to Econometrics*, 3rd edition, Update (2014).
Author(s): James H. Stock and Mark W. Watson; **ISBN-13:** 978-0133486872
Note: I recommend you rent or buy the book from www.amazon.com or campus bookstore; the 3rd and 2nd editions will be available too.

Optional Text(s):

- **(Wooldridge)** *Introductory Econometrics - A Modern Approach* by Jeffrey M. Wooldridge, any editions.
- **(Studenmund)** *Using Econometrics: A Practical Guide* by A. H. Studenmund, 4th edition or later.
- **(Metrics)** *Mastering Metrics: The Path from Cause to Effect* (2015) by J. D. Angrist and J-S. Pischke.
- **(Intro_R)** *An Introduction to R: Version 3.4.1* (2017) by W. N. Venables, D. M. Smith and the R Core Team (on Canvas)
- **(Dummies)** *R for Dummies*, 2nd ed. (2015) by de Vries, Andrie, Meys, Joris and Meys, Joris (access to ebook via the Marriott lib.)
- **(R in Action)** *R in Action: Data Analysis and Graphics with R*, 2nd ed. (2015) by Robert I. Kabacoff (access to ebook via the Marriott lib.)
- **(RBook)** *The R Book*, 2nd ed. (2013) by Michael J. Crawley (access to ebook via the Marriott lib.)

Course Objectives: At the completion of this course, a successful student will be able to:

- have a basic theoretical and conceptual understanding of econometric model such as multivariate regression analysis.
- to some extent, understand and interpret empirical economic analysis.
- execute an empirical analysis using the statistical software R.

Software: It is required to use statistical software R for assignments and detailed instructions about R will be posted on Canvas.

Grading Assessment: The course grade will be based on participation, assignments, exams, and a short project. The official course grade will be based on the sum of the grade you have made on each part.

- **Participation (15%):** We're supposed to have **23 classes** excluding exam days and the first two weeks (Jan. 19^{th}: last day to add and drop classes) during this semester and attendance is expected and will be taken each class. You are allowed to miss **3 classes without penalty** but any further absences will result in point deductions. In addition **more than 10 absences will lead to zero points**.
- **Assignments (35%):** There will be five assignments and each assignment will be based either on theoretical (or conceptual) questions or on practical application of R program, or both. Please see the course outline and schedule for dates of assignments.
- **Exams (35%):** There will be two in-class exams, midterm (15 points) and final exam (20 points). Detailed instructions will be posted later on Canvas.
- **Project (15%):** There will be a short project that applies theoretical and computational techniques with real data set. Detailed instructions will be posted later on Canvas.

Letter Grade Distribution:

- Tentative grading scale is: A range ≥ 90; B range ≥ 75; C range ≥ 60; D range ≥ 50.
- It might be adjusted based on class performance.
- The following distribution was used for the Fall 2017 semester.

>= 90.0	A	70.0 - 75.9	B-	50.0 - 54.9	D+
87.0 - 89.9	A-	64.0 - 69.9	C+	45.0 - 49.9	D
84.0 - 86.9	B+	60.0 - 63.9	C	40.0 - 44.9	D-
76.0 - 83.9	B	55.0 - 59.9	C-	<40.0	E

Course Policies:

- You are not allowed to use cell phones and computers in class unless instructed to do so.
- Important information will be announced via Canvas. You will need check your email address linked to CANVAS.
- No makeup exams will be given unless absence is due to a documented medical/family emergency or a previously approved excused absence.
- No late submission of assignments and project will be accepted without an agreed prior extension from the instructor.
- The Mark "I (incomplete) will be given only for work incomplete because of circumstances beyond the student's control such as medical reasons or family emergency. An "I" should be used in a way that will permit a student to retake the course without paying tuition.

- For the assignments, discussion amongst students (groups) is encouraged, but when in doubt, direct your questions to the instructor.

Academic Policies:

- All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.

- In particular, you should be mindful of the Academic misconduct defined in the Academic Policies such as cheating, misrepresenting one's work, plagiarism, inappropriately collaborating, fabrication and so on. **Cheating on the exams** (or other forms of academic dishonesty) may lead to failure of class (or expulsion from the class). For the assignments, discussion amongst students (groups) is encouraged but **copies and exact duplicates are unacceptable**. If you are found responsible for misconduct (e.g. offering and accepting solutions from others), all involved parties will be penalized.

- The University of Utah is committed to fostering a safe, productive learning environment. The University of Utah policy advocates vigorous and appropriate action to ensure that all students and employees have an environment free of discrimination and sexual misconduct. Discrimination is partiality or bias in the treatment of a person or group that is unfair or illegal. Discrimination in violation of university policy is treating someone differently based on color of skin, race, national origin, age, religion, status as a person with a disability, veterans status, sex, sexual orientation, gender identity/expression, and genetic information.

  As defined by University Rule, R1-012: *Discrimination Complaint Rule*, Sexual Misconduct is a broad term used to encompass a range of behaviors including Sexual or Gender-Based Harassment, Intimate Partner Violence, Sexual Exploitation, Stalking, Nonconsensual Sexual Contact, and Nonconsensual Sexual Penetration. Sexual Misconduct also includes the crimes of dating violence, domestic violence, sexual assault and stalking as defined by state and federal law.

  The University is fully committed to the principle of equal opportunity and access. Any student, staff, faculty member, or participant in university services or activities who believe that there is or has been discriminated against or sexual harassment should contact the Office of Equal Opportunity and Affirmative Action at 801-581-8365 (For more details, `https://oeo.utah.edu/`).

- The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

Tentative Course Outline and Schedule[1]

Week	Topic	Reading Assignment	Note
01 (01/08, 10)	Introduction to the Course Economics Questions and Data R and RStudio Basics	Syllabus SW Ch.1; Metrics (Intro)	
02 (01/17)	Review of Probability and Statistics R Basic Programming	SW Chs. 2 & 3 Wooldridge Appendices	01/15 MLK Day A1
03 (01/22, 24)			
04 (01/29, 31)			
05 (02/05, 07)	Simple Linear Regression Hypothesis Tests and Confidence Intervals	SW Chs. 4 & 5	02/19 Presidents Day A2
06 (02/12, 14)			
07 (02/21)			
08 (02/26, 28)	Hypothesis Tests and Confidence Intervals **Midterm**	SW Ch. 5	
09 (03/05, 07)	Multiple Linear Regression Hypothesis Tests and Confidence Intervals	SW Chs. 6 & 7	A3
10 (03/12, 14)			
11 (03/19, 21)	**No Class**		**Spring Break**
12 (03/26, 28)	Hypothesis Tests and Confidence Intervals	SW Ch. 7	A4
13 (04/02, 04)	Nonlinear Regression Assessing Studies Project Q & A	SW Chs. 8 & 9	A5
14 (04/09, 11)			
15 (04/16, 18)			
16 (04/23)	Review		Project
16 (04/26)	**Final Exam (10:30 am - 12:30 pm)**		

Assignment	Chapter(s)	Points	(Due) Date	Assignment	Chapter(s)	Points	(Due) Date
1	2 & 3	7	02/02	2	4 & 5	7	02/26
3	6 & 7	7	03/16	4	6 & 7	7	03/30
5	8	7	04/13				
Exam	**Chapter(s)**	**Points**	**Date**	**Exam**	**Chapter(s)**	**Points**	**Date**
Midterm	2, 3, 4, & 5	15	02/28	Final	6, 7, & 8	20	04/26
Project		15	04/23				

Important Dates:

- Friday, January 19th: Last day to add, drop, audit, and elect CR/NC
- Friday, March 9 th: Last day to withdraw from classes

[1] I reserve the right to make such alterations to this tentative schedule as circumstances may warrant.

CSBS EMERGENCY ACTION PLAN

BUILDING EVACUATION

EAP (Emergency Assembly Point) – When you receive a notification to evacuate the building either by campus text alert system or by building fire alarm, please follow your instructor in an orderly fashion to the EAP marked on the map below. Once everyone is at the EAP, you will receive further instructions from Emergency Management personnel. You can also look up the EAP for any building you may be in on campus at http://emergencymanagement.utah.edu/eap.

CAMPUS RESOURCES

U Heads Up App: There's an app for that. Download the app on your smartphone at alert.utah.edu/headsup to access the following resources:

- **Emergency Response Guide:** Provides instructions on how to handle any type of emergency, such as earthquake, utility failure, fire, active shooter, etc. Flip charts with this information are also available around campus.
- **See Something, Say Something:** Report unsafe or hazardous conditions on campus. If you see a life threatening or emergency situation, please call 911!

Safety Escorts: For students who are on campus at night or past business hours and would like an escort to your car, please call 801-585-2677. You can call 24/7 and a security officer will be sent to walk with you or give you a ride to your desired on-campus location.

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