ECON 4650-090 Fall 2019 Principles Of Econometrics

Course Syllabus: **Economics 4650-090 Principles of Econometrics Online**

3 Credit Hours

Course Description: The study of regression models in economics. Topics include data analysis, statistical estimation, inference, and forecasting.

This class has the potential for being one of the most rewarding classes you can take as an undergraduate. You will learn to use the statistical software R (along with Excel) to perform econometric analysis. This will be an applied class and should prepare you for working with data in a job environment or in a graduate school. The class builds on Economics 3640 and we will review basic probability and statistics as we move through the course material.

Prerequisites: Econ 3640: Probability and Statistical Inference for Economists - you must have gotten a C or better. If you didn't take this class 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.

Instructor: Kelsey Carlston. Please contact me using my email ([kelsey.carlston@utah.edu)](kelsey.carlston@utah.edu) or the Canvas messaging service. Emails to the instructor will generally be answered within 24 hours. I strongly encourage you to use the discussion board for general questions about the chapters, assignments and to prepare for exams – it is a great way to collaborate and connect with you peers.

I will not hold regular office hours, but will be available by appointment. My desk is in the Economics Department, and you can ask the front desk to show you where I sit.

Goals

- To be able to use the statistical software package R to read data and perform analysis
- To understand and utilize multivariate regression analysis
- To learn about the statistical foundations of ordinary least squares
- To be able to detect violations of classical model assumptions (CLRM)
- To deal with violations of the CLRM when necessary
- To summarize, analyze various kinds of data
- To communicate results effectively

Evaluation

- Set of discussions (10% grade)
- Set of assignments (15% grade)
- Midterm examination (30% grade, open book)
- Final examination (30% grade, open book)
- One applied paper (15% grade)
- Extra credit (up to 3%)
- Grades are as follows:
  - A+: 97 - 100

- A: 93 - 97
- A-: 90 - 93
- B+: 87 - 90
- B: 83 - 87
- B-: 80 - 83
- C+: 77 - 80
- C: 73 - 77
- C-: 70 - 73
- D+: 67 - 70
- D: 63 - 67
- D-: 60 - 63
- E: Below 60

Text

The textbook is *Introduction to econometrics : Econ 4650, University of Utah.* It's a custom edition based on 10 chapters from the full text A.H. Studenmund, *Using Econometrics: A Practical Guide* (6/e). The ISBN 10 for the custom text is: 1-269-78866-3 and for the full text it is: 0-13-136773-0. You can use either. These chapters are generally available as pdfs through this course page. Older editions of the text are also acceptable, but please be aware that the order of the chapters and some content (e.g., the assignment questions) may be different in older editions. A copy of the custom edition textbook is available at the Marriott Library Reserve Desk.

Modules

The online course is based on a series of modules which track chapters from the custom text--chapters from the "full text" are noted in parenthetical remarks. The majority of work in this course is applied and these modules are designed to help you succeed in assignments, exams, and your paper/project.

The first chapter is a review of statistics (chapter 17 in full text). You should be comfortable with this material from Economics 3640, or your basic probability and statistics course. We then progress through ordinary least squares, and the important assumptions of the "classical" regression model (custom edition text chapters 2 and 3; full text chapters 2 and 4).

We then move through hypothesis testing and model specification, including the choice of explanatory variables and the choice of functional form (custom edition text chapters 4, 5, and 6; full text chapters 5, 6 and 7). The midterm, an exam administered by the University Testing Center, will be based mainly on this material. Diagnostics are covered in the next three modules: muliticollinearity, serial correlation, and heteroskedasticity (custom edition text chapters 7, 8, and 9; full text chapters 8, 9, and 10). The final exam, also administered by the University Testing Center, will focus on the diagnostic tests and solutions to violations of the assumptions of the classical model.

The final module (custom edition text chapter 10; full text chapter 11) will help you with your final project. Modules will open up over the course and include overviews, links to videos, sample data, R code, and assignments.

Each module has a mix of videos, articles, and book chapters which will cover course material. If you feel you need additional resources to fully understand the material or would like further information on a subject, please contact me and I will find additional resources. The assignments and project are also

meant to serve as active learning and should be thought of as educational tools. Please take them seriously as they are an important part of understanding the course.

Discussions, Assignments, Project and Exams

We have ten discussions that constitute 10% of the total credit, one for each module. You are required to write the meaning of each of the important terms in that module. These discussions (due on Sundays) are designed to help you review the key concepts of this course. I will open other discussions for assignments, the project, and exams, which are not mandatory. You can also open discussions on any topic, allowing you to ask and answer questions, find data, and provide helpful comments to other members of the course. You can earn up to 1.5% extra credit by actively and meaningfully participating in those discussions.

We have five assignments in this course. Assignments (schedule is listed below or under "Assignments" tab) are available on Canvas for download, and must be uploaded before the due date noted (usually due on Mondays). These assignments are designed to enhance your understanding of key material and ensure you are able to apply your understanding appropriately. Whenever possible, please only submit one **PDF** file for each assignment and make sure to write your name on each file you submit.

The project requires you to apply the knowledge to the real world. You will choose your own topic, collect the relevant data, run the econometric model, and perform the diagnostics. Your final report should be around 8 pages, double-spaced.

The midterm and final exams will be timed and administered at the Uonline center (or an approved proctoring center). Both the midterm and final exams are open book tests. Please see THIS LINK for information about exam scheduling.

Software

The course uses R extensively. It is widely used in business, academia, and government. R is also free and operates the same across computing platforms. Because this course is very applied in nature, we will learn econometrics by *doing*econometrics and thus by learning to use R. It is available at http://cran.us.r-project.org, where you can download it for Linux, OS X, and Windows. Within each of the class modules, the commands needed to complete the assignment are included in the text guides for reference and use. You will also discover thousands of useful ways to use R on the internet.

Course Policies

Late Policy. I will release assignment solutions the day after assignments are due. Therefore, late assignments will be penalized 30% on the first day, and an additional 10% for each day late thereafter. Under extenuating circumstances, email me and the most likely compromise will be 50% credit for assignments more than 3 days late, but that is subject to my approval.

Electronic or equipment failure:
 - It is your responsibility to maintain your computer and related equipment in order to participate in the online portion of the course.
 - Equipment failures will not be an acceptable excuse for late or absent assignments.

Document archiving:
 - You are responsible for making sure your assignments, including attachments, are received before the deadline.

Please Note: *It is your responsibility to maintain your computer and related equipment in order to participate in this online course. Equipment failures will not be an acceptable excuse for late or absent assignments.* Classroom equivalency: Discussion threads, e-mails, and chat rooms in an Online course are all considered to be equivalent to classrooms, and student behavior within those environments shall conform to the Student Code.

University Policies

The Americans with Disabilities Act. 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 this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, (801) 581- 5020. CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

University Safety Statement. The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which Includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581- 8365, or the Office of the Dean of Students, 270 Union Building, 801- 581-7066. For support and confidential consultation, contact the Center for Student Wellness, SSB 328, 801- 581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

The Assignment Schedule is located directly below this syllabus, or in the Assignments Section of this website.

Note that this syllabus is subject to change though students will be notified if and when a change occurs.