ECON 4650-001: PRINCIPLES OF ECONOMETRICS

Spring 2020

Instructor:	Márcio Santetti	**Time:**	TuTh 2:00 – 3:20 pm
Email:	santetti.phd@outlook.com	**Place:**	Marriott Library 1120

Course Page:

1. Canvas course page

Office Hours: Before or after class, or by appointment via email.

Main References: I will follow no specific textbook, since my class notes come from a variety of references. In addition to our class notes, these are the most useful references to the covered topics. Students can pick any of these to consult during the semester.

- A. H. Studenmund, *Using Econometrics: a practical guide*, 5th edition, Pearson, 2006. **This reference is available at the University bookstore**.
- J. H. Stock and M. W. Watson, *Introduction to Econometrics*, Pearson, 2015.
- J. M. Wooldridge, *Introductory Econometrics: a modern approach*, 4th edition, Cengage, 2009.
- D. N. Gujarati, *Basic Econometrics*, 4th edition, McGraw-Hill, 2004.
- C. Hanck, M. Arnold, A. Gerber, and M. Schmelzer, *Introduction to Econometrics with R. Mimeo.* Available here.
- [**optional**] J. Maindonald and W. J. Braun, *Data analysis and graphics using R: an example-based approach*, volume 10, Cambridge University Press, 2006.

Software requirements: All applied exercises will be done using the open-source statistical package ***R***. In addition, Excel will be used to prepare the data sets before importing to ***R***. All instructions on using these two programs will be given both in class and also in instructional videos posted on Canvas by the instructor.

Course Overview: This course is primarily designed to help undergraduate students in exploring the basic statistical techniques that allow Econometrics practitioners to study economic theories with the use of real world data. The main idea is to apply the concepts learned in ECON 3640, such as descriptive techniques, probability theory, and statistical inference, and also learn more advanced econometric techniques, allowing students to have more autonomy in exploring real data sets, both asking and answering relevant empirical questions about our economy. Finally, the skills learned in this course are strongly relevant both in academic and working carrers.

Prerequisites: ECON 3620 and ECON 3640.

Course Outline: "Econometrics is the unification of economic theory, statistics, and math" (Frisch, quoted in Page's *Applications of Mathematics in Economics* (2013), p. 75).

This course provides an introduction to the basic econometric techniques that allow us to use real data to explore economic phenomena. The focus will be on applying statistical and econometric concepts to artificial and real world data, following the basic steps of any econometric procedure: collecting, treating, analyzing, and presenting data and its results.

Course Outcomes:

At the completion of this course, you will be able to:

1. Collect, treat, analyze, and present economic data in an informative and concise way;
2. Use descriptive and estimation techniques to understand real economic phenomena;
3. Work with Excel and *R* to prepare and perform econometric exercises with real data sets;
4. Have a general overview on the most popular and applied statistical techniques that aim to explain economic phenomena.

Grading Policy: Midterms (30%) + Applied project (20%) + Class attendance (10%) + Final exam (40%) .

Extra credit: I personally like to engage students to participate in class and help to solve in-class problems. In exchange, they can get extra credit for exams. Therefore, many opportunities will be announced in class for extra credit.

Important Dates:

Classes begin	**January 6th**
Midterm I	**February 13th**
Last day to withdraw from classes	**March 6th**
Midterm II (take-home)	**TBD**
Spring Beak	**March 8–15**
Applied project submission deadline	**April 21st**
Classes end	**April 21st**
Final Exam	**April 24th, 1:00–3:00 pm**

Letter Grade Distribution: The grading system follows these standards:

- Excellent, superior performance: A (93-100%), A- (90-92.9%)
- Good performance: B+ (87-89.9%), B (83-86.9%), B- (80-82.9%)
- Standard performance: C+ (77-79.9%), C (73-76.9%), C- (70-72.9%)
- Substandard performance: D+ (67-69.9%), D (63-66.9%), D- (60-62.9%)
- Unsatisfactory performance: E (0-59.9%)

Assignment and Exam Details:

- **Assignments:** I do not ask students to turn in any assignment during the semester. My approach is to give at least one problem set regarding each topic of the course, and give them freedom to work on them with no deadline. The idea is to allow students to apply the content learned in class on specific problems as a means to prepare for the exams. Therefore, you take your own time to work through the problems with no commitment of returning them to the instructor.
- **Midterm I:** The first midterm exam will be composed of an in-class part (80%) and a take-home practice (20%). For the latter, students will be given specific data sets to work with and perform different econometric analyses.
- **Midterm II:** The second midterm exam will be a shorter evaluation regarding the content following the first midterm. It will consist of a take-home exam, where you will be asked to perform econometric estimations in *R* and to interpret the results you obtain. Its date will be discussed in class, and you will be given a 12-hour window to complete it.

- **Applied project:** The idea of the applied project is to propose a *hands-on* experience to the student, in which she is responsible for formulating a research question, looking for the data (using cross-section data is strongly recommended), and performing the appropriate econometric treatments and techniques. The goal is that, by the end of it, that question can be answered. The project must be between 8 and 10 pages, double-spaced, with the required econometric outputs and bibliography. All necessary assistance will be provided by the instructor upon students' requests, and more details will be given in class. As a final note, the project can be done in pairs, or individually.
- **Final Exam:** The final exam is comprehensive, asking students to work on problems referring to all topics. It will have a computer-based component (requiring R) and paper-based problems.
- **Required materials:** All exams are closed-book, with no notes or handouts allowed. Students can, and should, use a scientific calculator to perform quantitative assessments. I provide all necessary and useful formulas attached to each exam, so the time-consuming effort to memorize formulas is taken out of the equation. For the Final Exam, students must use lab computers, or their personal laptops, to perform applied analyses.

Class Policies:

You can expect me to:

- Grade and provide feedback on exams until the class following an exam day;
- Reply to emails within 24 hours during the week and within 48 hours on weekends and holidays;
- Be readily available to answer students on their doubts and general concerns, via email or immediately after class or at a specific time that works for both of us.

I expect you to:

- Come to class in time.
- Attend class. While it is not a large component of your grade, attendance is expected at all classes; you will be responsible for all material covered in class. You are not required to let me know if you will be missing class. In the event you do miss class, you may check with another students to check his/her notes or directly with me, so the specific parts of one of the books will be recommended for you to read.
- Take the exams on the scheduled dates. No make-up exams will be allowed.
- Come to class prepared (having reviewed the previous class content) and respectfully participate in-class discussions and activities.
- Immediately notify me in the event of an emergency that prevents you from doing an exam or completing the course.
- Ask questions if any expectations or assignments are unclear.
- Be courteous of your instructor and fellow classmates when using technology. Always give speakers your full attention and make sure that any use of technology during class enhances your learning and does not distract you or others from course content.

Tentative Course Schedule:

- **Week 1**: Course introduction, Statistics refresher, ***R*** intro.
- **Week 2**: Simple linear regression - overview and OLS methodology.

- **Week 3**: The Classical Linear Regression Model (CLRM).
- **Week 4**: Multiple linear regression.
- **Week 5**: Inference: confidence intervals and hypothesis testing.
- **Week 6**: Additional topics on functional forms.
- **Week 7**: Violations of the Classical Model I: Bias.
- **Week 8**: Review and **Midterm exam**
- **Week 9**: Open for adjustments.
- **Week 10**: **Spring Break**.
- **Week 11**: Violations of the Classical Model II: Multicollinearity.
- **Week 12**: Violations of the Classical Model III: Serial correlation.
- **Week 13**: Violations of the Classical Model IV: Heteroskedasticity.
- **Week 14**: A *hands-on* with real world data.
- **Week 15**: Introduction to Time Series data.
- **Week 16**: Course wrap-up and final exam review.

Important Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.

Institutional Policies and Procedures:

Faculty and Student Responsibilities:
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 the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and failing grade. Students have the right to appeal such action to the Student Behavior Committee. "Faculty . . . must strive in the classroom to maintain a climate conducive to thinking and learn- ing." PPM 8-12.3, B.

"Students have a right to support and assistance from the University in maintaining a climate conducive to thinking and learning." PPM 8-10, II. A.

Wellness Statement:
Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a students ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness: www.wellness.utah.edu 801-581-7776.

Student Names & Personal Pronouns:
Class rosters are provided to the instructor with the students legal name as well as "Preferred first name" (if previously entered by you in the student profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and

update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected.

Academic Dishonesty:

The instructor of this course will take appropriate actions in response to Academic Dishonesty, as defined the Universitys Student Code. Acts of academic dishonesty include but are not limited to:

- Cheating: using, attempting to use, or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity. Unauthorized assistance includes:

  Working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done individually;

  Depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;

  Substituting for another student, or permitting another student to substitute for oneself, in taking an examination or preparing academic work;

  Acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission;

  Continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity;

  Submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or engaging in any form of research fraud.

- Falsification: altering or fabricating any information or citation in an academic exercise or activity.

- Plagiarism: representing, by paraphrase or direct quotation, the published or unpublished work of another person as ones own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

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, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Withdrawal Policy and "I" Grade Policy:

Failure to withdraw from school results in a E or EU grade being recorded in all classes. Students may officially withdraw (W) from a class or all classes after the drop deadline through the midpoint of a course. A W grade is recorded on the transcript and appropriate tuition/fees are assessed. The grade of W is not used in calculating the students GPA.

An Incomplete grade can be given for work not completed due to circumstances beyond your control. You must be passing the course and have completed at least 80% of the required coursework. Arrangements must be made between you and the instructor concerning the completion of the work. You may not retake a course without paying tuition. If you attend class during a subsequent term, in an effort to complete the

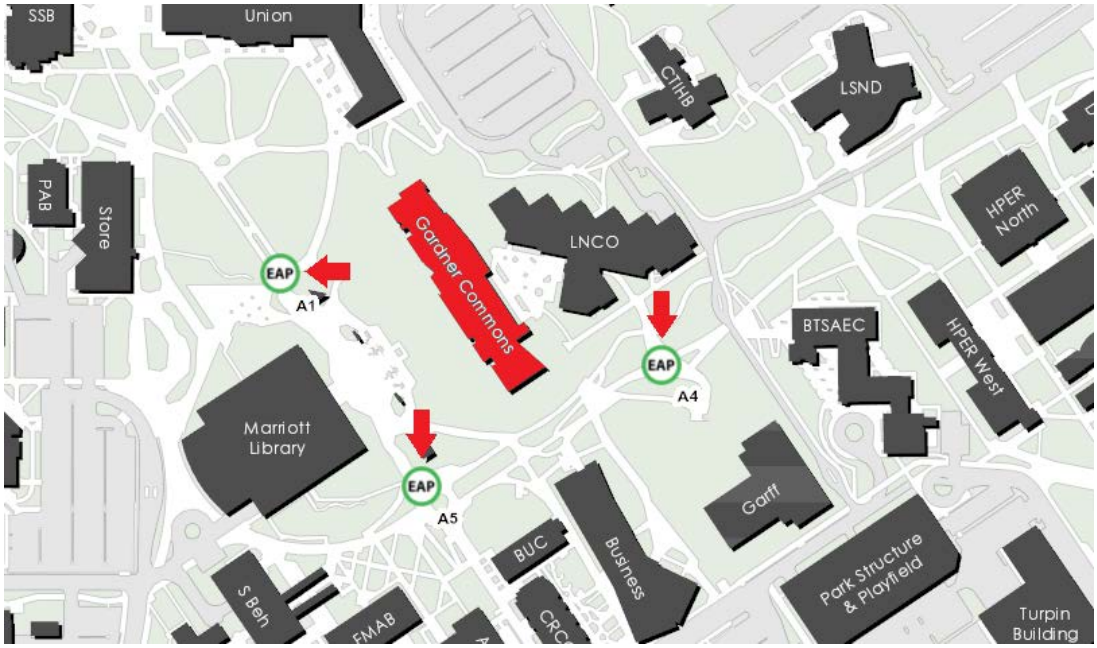
coursework, you must register for the course. Once the work has been completed, the instructor submits the grade to the Registrars Office. The *I* grade will change to an *E* if a new grade is not reported within one year. A written agreement between you and the instructor may specify the grade to be given if the work is not completed within one year. Copies of the agreement are kept by the instructor and the academic department.

Americans with Disabilities Act (ADA) Statement:

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 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

Additionally, the University endeavors to provide reasonable accommodations and to ensure equal access to qualified persons with disabilities. Inquiries concerning perceived discrimination or requests for disability accommodations may be referred to the University's Title IX/ADA/Section 504 Coordinator: Director, Office of Equal Opportunity and Affirmative Action, 201 South Presidents Circle, Rm. 135, Salt Lake City, UT, 84112. 801-581-8365 (voice/tdd), 801-585-5746 (fax). www.oeo.utah.edu.

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.

College of Social and Behavioral Science
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