

Course Syllabus

ECON 4050: Introduction to Econometrics – Fall 2024

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Lecture Schedule and Location

ECON 4050-001 Tuesday, Thursday 11:00AM-12:15PM Powers Hall 207

Lab Schedule and Location

ECON 4051-001 Tuesday 5:30PM-8:30PM Powers Hall 112

Student Hours

Dr. Soliman: Wednesdays from 3pm to 5pm on Zoom.
Please sign up in advance for a slot here: <https://shorturl.at/W4luy>
Teaching Assistant: TBD, contact Haoran

Course Description and Learning Objectives

ECON 4050 introduces students to the study of modern econometric techniques as employed in economics and policy analysis. Throughout the course, we will discuss how these techniques can be used to evaluate data and conduct policy analysis including the potential problems and pitfalls with doing so. The course will cover both theoretical and practical issues. Problem sets will contain applications to real data and require the use of R (a statistical software).

There are several objectives for the course:

- 1) Be able to understand statistical data presentations using averages, standard deviation, t-statistics, and hypothesis tests.
- 2) Conduct simple and multiple linear regression analyses.
- 3) Interpret coefficients, R-squared, and p-values from regression outputs.
- 4) Test hypotheses using confidence intervals, t-tests, and F-tests.
- 5) Apply econometric techniques to real-world data using software tools (R).

While the material covered in ECON 4050 is typically considered to be challenging, the usefulness is incredible. You will be able to estimate the relationship between any two variables, such as years of education and wages, exercise and blood pressure, studying and grades, campaign spending and election results, and so on. You will be able to estimate these relationships after controlling for many other confounding variables, such as intelligence, family history, gender, race, occupation, obesity, cholesterol, and so on. You will be able to evaluate the effect of government policies, such as minimum wage, retirement ages, subsidies, minimum sentencing legislation, additional police, immigration reform, access to health insurance, and so on. Furthermore, these tools are readily applicable to typical business applications such as the

effect of marketing campaigns, employee productivity, predicting future profits, predicting future stock prices, effectiveness of training programs, effectiveness of wage bonuses, and so on.

Course Materials

All relevant materials can be found on the following course website on Github:

<https://github.com/adamsoliman/IntroEconometrics>

NOTE: there is no required textbook for the course. All materials are free and available online.

Pre-requisites

ECON2110 and 2120 Principle of Microeconomics and Macroeconomics

MATH1080 Calculus One

STAT3090/MATH3090 Introduction to Statistics

Co-requisites:

ECON4051/6051 Introduction to Econometrics Laboratory Course Overview

Grading Activities and System

Grades will be based on quizzes, lab assignments, a midterm exam, and a final project that includes a presentation. The following weights will be applied to determine your final grade:

Quizzes/Attendance	10%
Lab Assignments	25%
Midterm Exam	25%
Final Project Presentation	10%
Final Project	30%

Myself and the TA will attempt to complete grading of each assignment within one week of the due date. Afterwards you will have one additional week to review the grading and appeal any errors that you think have been made. To appeal a grade, you will e-mail the person that graded the assignment and provide a detailed explanation for why you believe there is an error.

NOTE: any regrading may either increase, decrease, or not change your grade.

A	85-100%
B	75-85%
C	65-75%
D	55-65%
F	<55%

Quizzes and Attendance

There will be a quiz once or twice a week on the content of the previous week. It will be only a few questions at the beginning of the class, and you will not be graded on the content of your answer. However, I will be randomly selecting names from the course list to respond to a given question to ensure everyone is on the same page in terms of understanding of the material. This

is thus an implicit test of attendance, but there is no explicit requirement to attend any lecture or lab. However, both the lectures and labs are meant to help you learn and have deliverables. Furthermore, to obtain points for these in-person assignments, you need to attend.

Laboratory Work

There will be 9 computer labs. The labs are meant to teach you the basics of R and how to apply the material that is taught in class. In each laboratory session there will be an assignment that will be completed during the session. Your grade for all of these sessions will count for 25% of your final grade.

Exam

There will be one exam, which will be a take-home exam and sent to you on October 16th at 12:00PM. You will have 24 hours to complete it, and the exam will count for 25% of your final grade. There will not be any makeup exam and you cannot work with anyone else on it. You must return your answers to class by 12:00PM the following day (October 17th).

Final Project and Presentation

Instead of a final exam, you will have a final project and a presentation. They will be graded separately. Project guidelines, advice, and an example are on the course website. You should prepare slides for a 5-minute in-class presentation of your work. I will provide more details as the date approaches.

Course Topics

1. Simple Linear Regression
2. Introduction to Causality
3. Multiple Linear Regression
4. Linear Regression Extensions
5. Sampling
6. Confidence Intervals and Hypothesis Testing
7. Regression Inference
8. Instrumental Variables
9. Difference-in-Differences
10. Panel Data

Important Dates

- October 3rd: No Class
- October 15th: No Class (Fall Break)
- October 16th at 12:00PM, midterm is distributed and then due by 12:00PM on October 17th. No Lecture on October 17th, just drop off responses.
- November 5th: No Class (Election Day)
- November 28th: No Class (Thanksgiving Break)
- Final Project Presentations (Tentative): November 21st, November 26th, December 3rd, and December 5th

How to Be Successful in this Course

This is typically not considered to be an easy class. However, I have found that students that attend all classes and labs, complete all the material, read the material, are curious about the material, and put in a solid amount of work, all do very well.

NOTE: If you are doing all of these things and are still not doing well, please do not hesitate to contact me.

Your Well-being is Important

As a student you may experience a range of personal issues that can impede learning, such as strained relationships, increased anxiety, alcohol/drug concerns, feeling down, sadness, difficulty concentrating, lack of motivation, or other issues. These mental health concerns may impact your academic performance or your participation in daily activities. It is very important that you ask for help when you are struggling.

Time to Wait if Instructor is Delayed

If the instructor is late for class, please wait 15 minutes before leaving.

Information on Modality

All lectures and labs will be in-person and synchronous. Office hours will be conducted online, or in person by request.

Learning Environment

I will conduct the lectures (in person), but I encourage and look forward to student involvement in the lectures. This involvement will include questions, but it could also include students suggesting answers to the questions being posed, comments about the applicability of the material, discussions about the papers that we'll review, and so on.

Standard Academic Policies

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

All infractions of academic dishonesty by undergraduates must be reported to Undergraduate Learning for resolution through that office. In cases of plagiarism instructors may use the [Plagiarism Resolution Form](#).

Additionally, for undergraduate classes:

Plagiarism, which includes the intentional or unintentional copying of language, structure, or ideas of another and attributing the work to one's own efforts. Graded works generated by artificial intelligence or ghostwritten (either paid or free) are expressly forbidden.

See the Undergraduate [Academic Integrity Policy website](#) for additional information and the current catalog ("Academic Regulations" section) for the policy. Send questions to UGSintegrity@clemson.edu.

For graduate students, see the current [graduate student handbook](#) for all policies.

Accessibility

Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and are encouraged to request accommodations through SAS (Student Accessibility Services) as soon as possible. To request accommodations through SAS, please see this link: www.clemson.edu/academics/student-accessibility-services/how-to-register/requesting-accommodations. You can also reach out to SAS with questions by calling 864-656-6848, email CUSAS@clemson.edu or visiting SAS at the ASC Suite 239. Contact the office for the most updated drop-in schedule if you would prefer not to schedule an appointment.

The Clemson University Title IX Statement Regarding Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy or related conditions (including pregnancy, childbirth, termination of pregnancy, lactation, recovery from the foregoing, or medical conditions related to the foregoing), national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sex discrimination (including sex-based harassment and sexual violence) as mandated by Title IX of the Education Amendments of 1972. This Title IX policy is located on the Access Compliance and Education website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Assistant Vice President of Equity Compliance. Her office is located at 223 Brackett Hall,

864-656-3181 and her email address is alesias@clemson.edu. Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

Clemson University aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientation, religions, socioeconomic levels, political perspectives, abilities, opinions, values and experiences.

Emergency Preparation

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety. All students and employees should be familiar with guidelines from [Clemson University Public Safety](#).

Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

1. Familiarize yourself with all possible exits, safer locations, and other key information on the emergency evacuation maps in this building, and those that you visit regularly.
2. Make a plan for how you would Run, Hide, and Fight in case of an [active threat](#) in this building, and those that you visit regularly. For example:
 - a. Run – what are all the possible exits in this building, and the routes to them?
 - b. Hide – what are the potential hiding locations in this room and building that are out of sight of doors and windows, how do you lock the door(s), how would you barricade the door(s) and windows, where do you turn off the lights?
 - c. Fight – What tools are available in this room and building, should you have to fight?
3. Ensure you are signed up for [emergency alerts](#). Alerts are only sent when there is a potential threat to safety, a major disruption to campus services, and once-monthly tests.
4. Download the [Rave Guardian app](#) to your phone.
(<https://www.clemson.edu/cusafety/cupd/rave-guardian/>)
5. Learn what you can do to [prepare yourself](#) for the hazards that affect our locations.
(<http://www.clemson.edu/cusafety/EmergencyManagement/>)