ECO 312 Economic Data Analysis Using R

Summer 2024

Course Credits: 4
Contact Hours: 56 hours
Instructor: TBA
Email:TBA

COURSE OBJECTIVES

This course provides an in-depth exploration of economic data analysis using the programming language R. Students will learn advanced statistical and econometric techniques for exploring and visualizing data, with a focus on applications in economics and related fields. Through hands-on programming exercises and real-world datasets, students will develop skills in data management, visualization, and analysis using R. Topics include exploratory data analysis, programming skills, and using iteration, mapping, piping, and functions for programming in R.

Upon Completion of this Course, students will be able to:

1. Explore and visualize data using advanced statistical and econometric techniques in R;
2. Learn programming skills for data analysis, management, visualization, and interpretation;
3. Develop proficiency in exploratory data analysis techniques and their applications in economics;
4. Understand the principles of reproducible research and apply them to economic data analysis;
5. Critically evaluate and interpret the results of economic data analysis using R;
6. Enhance problem-solving abilities through hands-on exercises and projects using R.

PREREQUISITES

ECO 209 Analysis of Economic Data; STA 255 Introductory Business Statistics

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
2 Assignments	20 Points
2 Quizzes	20 Points
Midterm Exam	25 Points
Final Exam	35 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$.

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

1. Garrett Wickham, ***Garrett Grolemund, R for Data Science: Import, Tidy, Transform, Visualize, and Model Data***, 2016, O′ Reilly;
2. William Greene, ***Econometric Analysis***, 2017, Pearson.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	**Topics:** Topic 1: Introduction to R and RStudio Topic 2: Basics of Data Management in R Topic 3: Data Visualization in R: ggplot2 Package Topic 4: Exploratory Data Analysis (EDA) Techniques **Assessments:** Assignment #1

Module 2	**Topics:** Topic 5: Statistical Inference and Hypothesis Testing Topic 6: Linear Regression Analysis Topic 7: Time Series Analysis Topic 8: Data Analysis **Assessments:** Quiz #1
Module 3	**Topics:** Topic 9: Causal Inference and Treatment Effects Topic 10: Machine Learning Techniques in Economics Topic 11: Reproducible Research Practices Topic 12: Control Structures: Loops and Conditionals **Assessments:** Assignment #2 Midterm Exam
Module 4	**Topics:** Topic 13: Functions and Functional Programming Topic 14: Data Manipulation with dplyr and tidyr Topic 15: Introduction to Statistical Modeling with R Topic 16: Interactive Data Visualization with Shiny **Assessments:** Quiz #2
Module 5	**Topics:** Topic 17: Web Scraping and API Access in R Topic 18: Handling Big Data with R: Techniques and Tools Topic 19: Spatial Data Analysis with R: Mapping and GIS Topic 20: Advanced Econometric Techniques in R **Assessments:** Final Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

1) Late assignments are not acceptable and are subjected to grade deductions.
2) Assignments submitted in the wrong format will be counted as not submitted.
3) Failure to submit or fulfill any required course component results in failure of the class.
4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACEDEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.