

Economics 476/576

Implementing Econometrics Using Stata and Python Syllabus

ECON 476/576
Winter 2024
T/Th 4:40-6:30 pm
CRN: 40875 (EC476)/40887 (EC576)
TA: Serra Kirch dehen@pdx.edu
Classroom: URBN 411

Professor John Luke Gallup
jl Gallup@pdx.edu
pdx.edu/profile/john-gallup
Office Hours: T/Th 3:50-4:40 pm
Office: URBN 450G or
pdx.zoom.us/j/7232927375

Applied data analysis is probably the most marketable skill of economics graduates. This course provides nuts and bolts techniques for implementing econometric analysis using Stata software, the Python language with an introduction to R and SQL. Topics implemented in both Stata and Python include processing data, graphing techniques, regression methods, nonparametric smoothing, and programming.

This will be an “inverted” course, where most of the class time will be spent solving problems on the computer, and homework time will be for watching video lectures, reading and individual research projects. The course is a good complement to writing a thesis or a major empirical research paper. At the end of this course, you can credibly write on your CV that you know Stata and Python data processing well and are conversant in R and SQL data extraction.

Recommended prerequisite: an econometrics course or statistics courses including regression analysis.

The main text for the course is ***An Introduction to Modern Econometrics Using Stata*** by Christopher F. Baum (Stata Press: ISBN-13: 978-1-59718-013-9).

An optional additional text for those interested in focusing on programming is ***An Introduction to Stata Programming***, also by Christopher F. Baum (Stata Press: ISBN 978-1-59718-045-0).

All other readings are on [Canvas](#).

You will need a computer that has enough disk space to run Stata and Python. If you do not have access to a computer, talk to me. The Stata software licensing codes are on Canvas in the Software folder. This license is only valid until mid April, but Stata is available on the Econ Lab computers (the classroom).

There will be short weekly quizzes about the readings for the forthcoming week each Tuesday. Each student will be expected to read all the assigned material, participate in

classroom exercises, and complete the take-home assignments.

Students will complete either an empirical research project or create a command in Stata or Python.

Grades are determined by

- 15% on weekly quizzes
- 40% on class exercises
- 45% on research paper

Regular attendance is vital since much of the class time is devoted to participatory exercises. All assignments are due in class on the dates announced and will be marked down if late. It's always better to turn in an assignment late than not at all.

Do not plagiarize or **engage in** any other form of **academic dishonesty**. While I encourage you to discuss your assignments with other people, the final product must be your own, containing full citations to any work on which you draw. **I vigorously pursue suspected cheating** because it undermines honest work.

Students with accommodations approved through the Disability Resource Center should tell me during the first week of term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval should contact the DRC immediately.

Portland State University supports equal opportunity for all, regardless of age, color, disability, marital status, national origin, race, religion or creed, sex or gender, sexual or gender identity, sexual orientation, veteran status, or any other basis in law.

I have a responsibility to create a safe learning environment. As a faculty member, I am required to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment, violence or discrimination with a confidential employee who does not have this reporting responsibility, you can find [a list of](#) those individuals. More information about [Title IX](#).

Course Outline and Readings

- Week 1, Class 1&2 (January 9, 11)
 - Introduction to Stata: loading data & manipulating variables.
 - Baum, Chapters 1 & 2
 - Stata Youtube videos:
 - [Tour](#) of the Stata 18 interface
 - [Import Excel data](#)
 - peruse the titles of Stata [data management](#) videos for future reference
- Week 2, Class 3&4 (January 16, 18)
 - project proposal due January 18
 - Creating effective descriptive statistics
 - Baum, Chapter 3
 - Stata Youtube videos:
 - [Descriptive statistics](#)
 - [Tables and cross tabulations](#)
 - [t test](#) for two samples
 - [merge](#) two datasets
 - Stata manual for [summarize](#), [tabulate oneway](#), [by](#), [tabulate](#), [summarize\(\)](#), [table](#), [ttest](#)
- Week 3, Class 5&6 (January 23, 25)
 - Graphics
 - Stata Youtube videos:
 - [Bar graphs](#)
 - [Histograms](#)
 - [Basic scatterplots](#)
 - Stata manual for [twoway line](#) (read carefully)
 - Nonparametric smoothing
 - Stata manual for [kdensity](#), [npregress intro](#).
- Week 4, Class 7&8 (January 30, February 1)
 - Stata programming
 - Baum, Appendix B
 - Stata manual for [syntax](#)
 - Stata User Guide Chapter 18: [Programming Stata](#)
- Week 5, Class 9&10 (February 6, 8)
 - Regression and diagnostics
 - Baum, Chapter 5 and 7.1-7.2
 - Stata Youtube video:
 - [Simple linear regression in Stata](#)
- Week 6, Class 11&12 (February 13, 15)
 - Regression with indicator variables
 - Baum, Chapters 7
 - Stata Youtube videos:

- Factor Variables 1, 2, 3
- Stata panel regression
 - Introduction to xt commands
- Week 7, Class 13&14 (February 20, 22)
 - literature review due February 20
 - Python basics & descriptive statistics
 - Install Anaconda Python distribution
 - video: JupyterLab IDE intro
 - Read Stata to Python Equivalent by Daniel M. Sullivan (concentrate on 1-6, skim the rest)
- Week 8, Class 15&16 (February 27, 29)
 - Python graphics videos
 - Matplotlib (skip add at beginning, watch up through histograms, to 24:35; rest optional)
 - Plotly
 - *optional* Dash web app (to host a user-selectable data server and Plotly graphs)
 - Stata maps
 - Stata manual SP Intro 7 up to “Testing whether ordinary regression is adequate”
Read Intro 4 if you are interested in manipulating mapping data files
- Week 9, Class 17&18 (March 5, 7)
 - Big data in Stata and Python
 - “Big Data in economics”
 - Instrumental variables estimation in Stata
 - Stata Youtube: instrumental variables
 - *Master of Economics students only*: Baum, Chapter 8
- Week 10, Class 19&20 (March 12, 14)
 - final paper due March 19
 - R Intro
 - download R and RStudio (the IDE)
 - Getting Started in R~Stata from Oscar Torres of Princeton DSS (Read from page 13 on, and then read pages 6-7 at the end)
 - Intro to R videos from Google Developers (watch sections 1-3)
 - SQL and RDBMs
 - Connecting to MySQL using Python

Readings

- Baum, Christopher F. 2006. ***An Introduction to Modern Econometrics Using Stata***. College Station, Texas: Stata Press. ISBN 978-1-59718-013-9.
- Baum, Christopher F. 2009. ***An Introduction to Stata Programming***. College Station, Texas: Stata Press. ISBN 978-1-59718-045-0. (optional)