

ECONGA-1101.001
Applied Statistics and Econometrics I
Fall 2023
Wednesday 6:20-8:20 PM

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Course Objective:

This course is the first in a two-semester sequence of courses designed to teach applied statistics and econometric techniques for quantitative research and analysis. The course will begin with a review of various topics in statistics that are needed to understand econometric theory, including random variables, mathematical expectations, estimation and inference. After the review of statistics, we will study the simple regression model, multivariate regression analysis, hypothesis testing, and the generalized regression model. Regarding estimation methods, we will study Least Square, Instrumental variables and Maximum likelihood estimators.

Grading

Research Project & Paper 30%
Homework 10%
Mid-term 30%
Final Exam. 30%.

The project is an applied econometric research project that involves collecting an appropriate data set, conducting an econometric analysis, and writing the results in the form of a short research paper. It will be due the last week of class. The theory and methods included in Statistics & Econometrics I are best suited to cross-sectional data analysis. Time series and panel data analysis is introduced in Statistics & Econometrics II. For this reason, you should focus your first-semester term project on a cross-sectional dataset. You are required to form a group (minimum 5 students in a group is desired) for project work. Details relating to the project will be provided to students in class.

Course Material

The required textbook for the course is:

- “Econometric Analysis”, 8th edition, by William H. Greene, Prentice Hall (2018) (G-8th ed.).

A supplementary textbook for the course is:

- Elements of Econometrics by Jan Kmenta, Second Edition (KM- 2nd ed.), The University of Michigan Press, second edition, copy right by Macmillan Publishing Company

An optional textbook that you may find useful is:

- “A Guide to Econometrics”, 5th edition, by Peter Kennedy, Blackwell (2003) (K-5th ed.)

Computer Requirement

The statistical package R (or STATA) will be used primarily throughout the course. You are encouraged to become familiar with any of these packages. However, use of R Package is preferable and Lab session also will use R programs.

Course Outline

Week	Date	Topic	Readings/Chapters**
1	Sept 6	Introduction & Review of Matrix Algebra, Review: Statistics & Sampling	Notes, Appendix (KM- 2 nd ed.) & Appendix A (G-8 th ed.) Notes, Chap-4 (G-8 th -ed)
2	Sept 13	Review: Statistics & Sampling (cont'd) Probability and Probability Distributions	Notes, Chap-2 (KM-2 nd ed.) & Appendix B (G-8 th ed.)
3	Sept 20	Probability and Probability Distributions (cont'd)	Notes, Chap-2 (KM-2 nd ed.) & Appendix B (G-8 th ed.)
4	Sept 27	The Linear Regression Model and Least Square Estimator – Part_1	Notes, Chap-7 (KM-2 nd ed.) and Chap-2, 3 & 4 (G-8 th ed.)
	Sept 27	Complete Group Formation for Research Project	
5	Oct 4	The Linear Regression Model and Least Square Estimator – Part_2	Notes, Chap- 4 (G-8 th ed.)
6	Oct 11	Hypothesis Testing	Chap-5 (G-8 th ed.)
	Oct 11	Submit Project Proposal	
MIDTERM EXAM	Oct 18		
7	Oct 25	Functional Forms	Chap-6 (G-8 th ed.)
8	Nov 1	Endogeneity & Instrumental Variables	Chap-8 (G-8 th ed.)
	Nov 1	Submit Model Description of Project	
9	Nov 8	Maximum Likelihood Estimation	Notes, Chap-6_Sec-6.2 (KM- 2 nd ed.) Chap-14 (G-8 th ed.)
10	Nov 15	Non-Linear Regression (If possible)	Chap-11_Sec 11.3 (KM-2 nd ed.) and Chap-7 (G-8 th ed.)
	Fall Break: November 22		
	Thanksgiving Recess: November 23 and 26		
11	Nov 29	The Generalized Regression Model and Heteroskedasticity	Chap-9 (G-8 th ed.)
12	Dec 6	Research Project Presentation (Expanding to Lab session)	
FINAL EXAM	Dec 13		
Monday	Dec 18	Final research paper is due by 11 PM & should be submitted via Assignment location in NYU Class (as well as via email to me).	

** Both the textbook sections mentioned above and class notes are required to study the topics included in above table.