ECONGA-1101.003
Applied Statistics and Econometrics I
Fall 2022
Wednesday 6:20-8:20 PM

Banani Nandi
bn2009@nyu.edu
Office hours: Wednesday 5-6 PM
Office: Room # 623

Teaching Assistant: Dragos Ailoae
dragos@nyu.edu

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 7	Introduction & Review of Matrix Algebra, Review: Statistics & Sampling	Notes, Appendix (KM- 2nd ed.) & Appendix A (G-8th ed.) Notes, Chap-4 (G-8th-ed)
2	Sept 14	Probability and Probability Distributions	Notes, Chap-2 (KM-2nd ed.) & Appendix B (G-8th ed.)
3	Sep 21	Probability and Probability Distributions (cont'd)	Notes, Chap-2 (KM-2nd ed.) & Appendix B (G-8th ed.)
4	Sept 28	The Linear Regression Model and Least Square Estimator – Part_1	Notes, Chap-7 (KM-2nd ed.) and Chap-2, 3 & 4 (G-8th ed.)
	Sept 28	**Complete Group Formation for Research Project**	
5	Oct 5	The Linear Regression Model and Least Square Estimator – Part_2	Notes, Chap- 4 (G-8th ed.)
6	Oct 12	Hypothesis Testing	Chap-5 (G-8th ed.)
	Oct 12	**Submit Project Proposal**	
MIDTERM EXAM	**Oct 19**		
7	Oct 26	Functional Forms	Chap-6 (G-8th ed.)
8	Nov 2	Endogeneity & Instrumental Variables	Chap-8 (G-8th ed.)
	Nov 2	**Submit Model Description of Project**	
9	Nov 9	Maximum Likelihood Estimation	Notes, Chap-6_Sec-6.2 (KM-2nd ed.) Chap-14 (G-8th ed.)
10	Nov 16	Non-Linear Regression (If possible)	Chap-11_Sec 11.3 (KM-2nd ed.) and Chap-7 (G-8th ed.)
	Fall Break: November 23		
	Thanksgiving Recess: November 24 and 25		
11	Nov 30	The Generalized Regression Model and Heteroskedasticity	Chap-9 (G-8th ed.)
12	**Dec 7**	**Research Project Presentation (Expanding to Lab session)**	
FINAL EXAM	**Dec 14**		
Monday	**Dec 19**	**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.