



Minzu University of China
ECON 300 Elementary Econometrics
Summer 2020

Basic Information

Class hours: Monday through Thursday, 2 hours each day
Discussion: Friday, 1 hour (60 minutes)
Review Section: Saturday, 1 hour (60 minutes)
Office Hour: 2 hours (According to professors' teaching plan)
Field trip: According to professors' teaching plan
Credit: 4
Total contact hours: 60 (50 minutes each)
Instructor: TBA

Required Textbook

Christopher Dougherty. *Introduction to Econometrics*, 5th edition, Oxford University Press (June 28, 2016). ISBN-10: 0199676828

Prerequisites

Principles of Microeconomics (ECON101), *Principles of Macroeconomics* (ECON102), *Calculus* (MATH111), and *Introduction to Statistics* (STAT201)

Course Objectives

This course is designed to introduce students to the statistical foundations of econometrics, and its well-known multivariate linear model. This course will equip students with understanding of the fundamentals of probability theory and mathematical statistics behind most econometrics methods. The main concepts of asymptotic theory, and its application to the classical linear regression model are also covered. After taking this course, students should be able to : (i) manipulate economic data sets; (ii) diagnose certain problems with linear regression model and data, and know how to remedy them; and (iii) have a working knowledge of the classical linear regression model and its applicability.

Software

Computing tutorials will be held during some lectures. This is designed to help students to understand the practical implications of the theoretical content of lectures, and familiarize themselves with the use of powerful and widespread econometric software such as R and STATA. R is free and can be downloaded at <https://www.r-project.org>.

Assigned Readings and Homework Assignments

Students are expected to complete the reading prior to the lecture. The lectures and applications draw heavily on the assigned readings and homework assignments. The homework problems, at the end of each week, have been designed to illustrate theoretical concepts algebraically. Working through the homework problems is important to a good understanding of the various econometrics concepts this course will explore. Students are able to do homework problems in a group, but must submit their own work.

Evaluation: your course grade is based on

Quizzes: 20%
Assignments: 20%



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Midterm exam:	30%
Final exam (cumulative):	30%
Attendance & class participation:	10%

The in-class quizzes will be given at the end of each chapter. The tests will be objective, with the material drawn from your notes, and text definitions, examples, and case studies. You must bring a #2 pencil, preferably with an eraser.

Students must be present for all scheduled tests. A make-up test will only be given in the event of a medical emergency and upon presentation of a verifiable doctor's excuse. Scheduling vacations during exam week is not a valid excuse for missing or rescheduling the test.

Grades:

A+ = 97-100; A = 94-96 A- = 90-93; B+ = 87-89; B = 84-86; B- = 80-83; C+ = 77-79
C = 74-76; C- = 70-73; D+ = 67-69; D = 64-66; D- = 60-63; F = Below 60

Academic Honesty

Every student in this course is trusted to fully comply with the Minzu University of China Honor Code. On the test, it is expected that students will neither receive nor give aid to another student, access any material, use any electronic device other than a simple calculator. Any student in violation of the Honor Code during the test will immediately receive a F for this course.

Tentative Course Outline

*Please note that the instructor reserves the authority to change the order of topics, or to drop topics from the list. However, he/she will not add new topics.

Week 1

[1] Basic Mathematical Tools (Appendix A & B)

- 1) The Summation Operator and Descriptive Statistics
- 2) Properties of Linear Functions
- 3) Proportions and Percentages
- 4) Some Special Functions and Their Properties

[2] Fundamentals of Probability (Chapter 1)

- 1) Random Variables and Their Probability Distributions
- 2) Joint Distributions, Conditional Distributions, and Independence
- 3) Features of Probability Distributions
- 4) Features of Joint and Conditional Distributions
- 5) The Normal and Related Distributions
- 6) Review the week and Homework #1**

Week 2

[3] Fundamentals of Mathematical Statistics (Chapter 1)

- 1) Population, Parameters and Random Sampling
- 2) Finite Sample Properties of Estimators
- 3) Asymptotic or Large Sample Properties of Estimators

[4] The Nature of Econometrics and Economic Data (Chapter 2)

- 1) What is Econometrics?
- 2) Steps in Empirical Economic Analysis



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- 3) The Structure of Economic Data
- 4) Causality and the Notion of Ceteris Paribus in Econometric Analysis
- 5) **Review the week and Homework #2**

Week 3

[5] The Simple Regression Model (Chapter 3)

- 1) Definition of the Simple Regression Model
- 2) Deriving the Ordinary Least Squares (OLS) Estimates
- 3) Properties of the OLS on Any Sample of Data
- 4) Units of Measurements and Functional Forms
- 5) Expected Values and Variances of the OLS Estimators

[6] Multiple Regression Analysis: Estimation (Chapter 4)

- 1) Motivation for Multiple Regression
- 2) Mechanics and Interpretation of OLS
- 3) The Expected Value and the Variance of the OLS Estimators
- 4) Efficiency of the OLS: The Gauss-Markov Theorem
- 5) **Review the week and Homework #3**

Week 4

[7] Multiple Regression Analysis: Inference (Chapter 5)

- 1) Sampling Distributions of the OLS Estimators
- 2) Testing Hypotheses about a Single Population Parameter: the t Test
- 3) Confidence Intervals
- 4) Testing Hypotheses about a Single Linear Combination of the Parameters
- 5) Testing Multiple Linear Restrictions: the F test

[8] Multiple Regression Analysis: OLS Asymptotic (Chapter 6)

- 1) Consistency
- 2) Asymptotic Normality and Large Sample Inference
- 3) Asymptotic Efficiency of the OLS
- 4) **Review the Week and Homework #4**

Week 5

[9] Multiple Regression Analysis: Further Issues (Chapter 7)

- 1) More on Functional Forms
- 2) More on Goodness-of-Fit and Selection of Regressors
- 3) Predicting y When $\log(y)$ is the Dependent Variable

[10] Multiple Regression Analysis with Qualitative Information (Chapter 8)

- 1) Describing Qualitative Information
- 2) A Single Dummy Independent Variable
- 3) Using Dummy Variables for Multiple Categories
- 4) Interactions Involving Dummy Variables
- 5) **Review the Week and Take the Final Exam**