



ECON 042: Econometrics

Term: 2020 Winter Session

Instructor: Staff

Language of Instruction: English

Classroom: TBA

Office Hours: TBA

Class Sessions Per Week: 6

Total Weeks: 4

Total Class Sessions: 25

Class Session Length (minutes): 145

Credit Hours: 4

Course Description:

This course introduces the students to econometrics. It studies both the theoretical and the practical aspects of statistical analysis, with a focus on techniques for estimating econometric models of various types. Students are expected to develop a solid theoretical background in introductory level econometrics as well as practicing skills to solve real word problems.

Prerequisites: Microeconomics, Macroeconomics, Calculus II, Linear Algebra, Applied Statistics

Course Materials:

Introduction to Econometrics 3rd Edition, by James H. Stock and Mark W. Watson

Publisher: Addison-Wesley; 3rd edition (December 13, 2010)

ISBN-10: 0138009007

ISBN-13: 978-0138009007

Course Format and Requirements:

Attendance:

Attendance is MANDATORY!!! Due to the fact that this is a public speaking course students are required to attend ALL sessions. The only excused absences will be for illness documented by a



doctor's note. If you know ahead of time that you will be absent, kindly e-mail the instructor immediately. Unexcused absences will result in an automatic drop in grade. With each unexcused absence your final letter grade will be dropped $\frac{1}{2}$ a grade – NO EXCEPTIONS (e.g.: A to A-).

Grading Scale:

A+: 98%-100%

A: 93%-97%

A-: 90%-92%

B+: 88%-89%

B: 83%-87%

B-: 80%-82%

C+: 78%-79%

C: 73%-77%

C-: 70%-72%

D+: 68%-69%

D: 63%-67%

D-: 60%-62%

F: Below 60%

Course Assignments:

Quizzes

Six unannounced quizzes will be given throughout the semester. Therefore, students should be prepared in all classes to answer questions pertaining to lectures, class handouts, presentations, etc. The lowest quiz score will be dropped at the end of the semester. Under no circumstances, i.e., regardless of the reason for absence (excused or not excused), can students make up a quiz.

Computer Lab

Students will be announced if next class will be hold in computer lab. There will be lab assignment after each computer session.

Statistical Software



This course will use STATA as our main statistical software. The latest version is STATA 13, but any version later than STATA 6 suffices for the purpose of this course.

Exams

Exams will be testing your comprehension of concepts and arguments. The midterm will be taken in class and the final exam date will be announced later. The composition of exams will be discussed in class prior to the examination date. All exams will be based upon class contents.

Course Assessment:

Quizzes	15%
Computer Lab	25%
Midterm Exam	30%
Final Exam	30%
Total	100%

Course Schedule:

Week 1- Class 1	Week 1- Class 2
Brief introduction to course Why study econometrics? What is an econometric model?	Review of Probability and Statistics Data quality issues Non-parametric estimation of density function
Week 1- Class 3	Week 1- Class 4
Random Variables Controlled vs. uncontrolled experimental data Discrete vs. continuous random variables Review of probability concepts	Expected value Review of conditional predictions, neural nets, regression trees, random forest, linear model
Week 1- Class 5	Week 1- Class 6
Estimation by least squares The econometric model The least squares principle	Deriving OLS estimator; - Properties of OLS Gauss-Markov Assumptions
Week 2- Class 7	Week 2- Class 8
Statistical properties of OLS	Interval estimation and hypothesis testing



Hypothesis testing with OLS	Evaluating the Simple Linear Regression Model
Week 2- Class 9	Week 2- Class 10
Extremum estimation, maximum likelihood, likelihood Ratio test, Wald test, Lagrange multiplier test More on method of moments	Optimal weighting matrix More on linear model,
Week 2- Class 11	Week 2- Class 12
Regression algebra, Estimation by method of moments	<u>Midterm</u>
Week 3- Class 13	Week 3- Class 14
Estimating the econometric model and interpreting the results The properties of the least squares estimates of an econometric model	Inference and prediction in the Simple Linear Regression Model Interpretations of OLS estimates
Week 3- Class 15	Week 3- Class 16
Gauss-Markov Theorem Testing a single population parameter	Testing a single population parameter (Cont.) Testing multiple linear restrictions
Week 3- Class 17	Week 3- Class 18
Goodness-of-fit and selection of regressions Sample and asymptotic properties of estimators, classical measurement error, mechanics of the bootstrap	Binary variables Interactions between binary variables Functional form Binary Dependent Variables
Week 4- Class 19	Week 4- Class 20
Panel data Least squares dummy variables Interactions among dummy variables Linear probability	Discrete dependent variables Sample selection models. Inference and prediction in the GLRM Single and joint hypothesis tests of the parameters of the econometric model
Week 4- Class 21	Week 4- Class 22



Model specification issues Collinear variables Heteroscedasticity, Newey-West estimator	Consistency OLS asymptotic Time Series Analysis
Week 4- Class 23	Week 4- Class 24
Covariance stationary AR processes MA processes ARMA	Stationary time series Spurious regression Tests for stationarity Co-integration
Week 4- Class 25	<u>Final Exam (Cumulative): TBA</u>
Summary of this semester Review for final exam	

Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Shanghai Normal University's *Academic Conduct Code*. Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

Special Needs or Assistance:

Please contact the 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. Our goal is to help you learn, not to penalize you for issues which mask your learning.