ECON 042: Econometrics

General Information

Term: 2020 Summer Session	**Class Sessions Per Week: 5**
Instructor: Staff	**Total Weeks: 5**
Language of Instruction: English	**Total Class Sessions: 25**
Classroom: TBA	**Class Session Length (minutes): 120**
Office Hours: TBA	**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: Intro to Microeconomics, Intro to Macroeconomics, Calculus II, Linear Algebra, Applied Statistics

Course Materials:

James H. Stock and Mark W. Watson, ***Introduction to Econometrics,*** 3rd Edition, Publisher: Addison-Wesley (2017)
ISBN-13: 978-9352863501
ISBN-10: 935286350X

Course Format and Requirements:

Students will go through the material principally by means of lectures and visual presentations, and also in-class discussion and assigned readings. It will be hard for you to achieve a good grade in this course without regular attendance. Please turn off all cell phones during lecture. No texting during class lectures. You are encouraged to ask questions since extra credit may be given for thoughtful questions.

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%**

Grading Scale (percentage):

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: <60

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 Wuhan 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.

Course Schedule:

Class 1:
Brief introduction to course
Why study econometrics?
What is an econometric model?

Class 2:
Review of Probability and Statistics
Data quality issues
Non-parametric estimation of density function

Class 3:
Random Variables
Controlled vs. uncontrolled experimental data
Discrete vs. continuous random variables
Review of probability concepts

Class 4:
Expected value

Review of conditional predictions, neural nets, regression trees, random forest, linear model

Class 5:
Estimation by least squares
The econometric model
The least squares principle

Class 6:
Deriving OLS estimator; - Properties of OLS
Gauss-Markov Assumptions

Class 7:
Statistical properties of OLS
Hypothesis testing with OLS
Interval estimation and hypothesis testing

Class 8:
Evaluating the Simple Linear Regression Model
Extremum estimation, maximum likelihood, likelihood

Class 9:
Ratio test, Wald test, Lagrange multiplier test
More on method of moments
Optimal weighting matrix

Class 10:
More on linear model,
Regression algebra,
Estimation by method of moments

Class 11:
MIDTERM

Class 12:
Estimating the econometric model and interpreting the results
The properties of the least squares estimates of an econometric model

Class 13:

Inference and prediction in the Simple Linear Regression Model
Interpretations of OLS estimates

Class 14:
Interpretations of OLS estimates (Cont.)
Gauss-Markov Theorem

Class 15:
Testing a single population parameter
Testing multiple linear restrictions

Class 16:
Goodness-of-fit and selection of regressions
Sample and asymptotic properties of estimators, classical measurement error, mechanics of the bootstrap

Class 17:
Binary variables
Interactions between binary variables
Functional form

Class 18:
Binary Dependent Variables
Panel data
Least squares dummy variables

Class 19:
Interactions among dummy variables
Linear probability
Discrete dependent variables

Class 20:
Sample selection models.
Inference and prediction in the GLRM
Single and joint hypothesis tests of the parameters of the econometric model

Class 21:
Model specification issues
Collinear variables

Heteroscedasticity,
Newey-West estimator

Class 22:
Consistency
OLS asymptotic
Time Series Analysis

Class 23:
Covariance stationary
AR processes
MA processes
ARMA

Class 24:
Stationary time series
Spurious regression
Tests for stationarity
Co-integration

Class 25:
Summary of this semester
Review for final exam

Final Exam (Cumulative): TBA