



ECON 4225: Econometrics

2022 Spring Session	
Total Class Sessions: 25 Class Sessions Per Week: 5 Total Weeks: 5 Class Session Length (Minutes): 145 Credit Hours: 4	Instructor: Staff Classroom: TBA Office Hours: TBA Language: English

Course Description:

This course introduces the theory and applications of 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 will learn the basic theories and concepts of econometrics and the methods and tools needed to analyze data and perform quantitative analysis of economic phenomena.

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

Course Assignments:

Homework:

There will be weekly homework problem sets. Students must hand in completed work on the due date. Late work will NOT be accepted. It is important that students attempt all problem sets to familiarize with and apply learned concepts.

Computer Lab

Students will be notified if next class will be held 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:

There will be one midterm exam and one final exam, which are worth 25% and 35% of your grade respectively. The exams will cover material from lectures, textbook and homework assignments. Both will be closed-book, closed-note exams. The final exam will be cumulative.

**Course Assessment:**

Homework assignments	20%
Computer lab	20%
Midterm exam	25%
Final exam	35%
Total	100%

Grading Scale (percentage):

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
98-	93-	90-	88-	83-	80-	78-	73-	70-	68-	63-	60-	<60
100	97	92	89	87	82	79	77	72	69	67	62	

Course Materials:

James H. Stock and Mark W. Watson, *Introduction to Econometrics* 4th Edition;

Publisher: Pearson;

ISBN-10: 0134461991

ISBN-13: 978-0134461991

Course Format and Requirements:

The primary format of this class is lecture, in-class discussion and assigned readings. Students are strongly recommended to read relevant textbook chapters and attend class prepared. Attendance will not be taken but to achieve success in this class, regular attendance is expected.

Cellphones and other electronic devices are not allowed in class. Therefore, please keep them off during lecture.

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 Chengdu University of Technology'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