

ECON 4315: Econometrics Analysis

2022 Winter Session				
Total Class Sessions: 25	Instructor: Staff			
Class Sessions Per Week: 6	Classroom: TBA			
Total Weeks: 4	Office Hours: TBA			
Class Session Length (Minutes): 145	Language: English			
Credit Hours: 4				

Course Description:

The objective of this course is to provide the basic knowledge of econometrics analysis that is essential equipment for any undergraduate student of economics, management, and social science. The goal of this course is to apply tools of economic theory, mathematics, and statistical inference to give participants the foundation for understanding specialized applications with confidence when needed. Focuses will be on harnessing the power of data and regression techniques to estimate relationships and test hypotheses based on economic models. We will also emphasize the identification of causal effects critical to policy analysis, decision-making, and strategic planning. This course covers applications of econometrics in a variety of areas using statistical computer packages.

Course Prerequisite:

College level introductory statistics and calculus I is required.

Learning objectives:

By the end of this course, students will be able to:

- 1. Apply the mathematical and statistical tools required for econometric analysis
- 2. Know the basic principles of econometric modeling and analysis
- 3. Analyze the assumptions that underpin the classical regression model
- 4. Apply regression analysis to real-world economic examples and data sets
- 5. Conduct hypothesis testing and prediction
- 6. Recognize and make adjustments for several common regression problems.
- 7. Identify causal effects, critical to policy analysis, decision-making, and strategic planning

Course Materials:

Textbook:

Jeffrey Wooldridge, Introductory Econometrics: A Modern Approach, 6th Edition, Cengage Learning.

Recommended Books:

Stock & Watson, Introduction to Econometrics, 4th Edition, Pearson ISBN: 9780134461991



Goldberger, Arthur S. *A Course in Econometrics*. Cambridge, MA: Harvard University Press, 1991. ISBN: 9780674175440.

Course Format and Requirement:

The primary format of this course is lecture, problem solving and discussion. Familiarizing with the course material before class, you will gain a better understanding the information presented during lecture. Each student will be responsible for learning as much as possible. Students are strongly encouraged to ask questions on things you did not understand.

Attendance

Attendance will not be taken but all quizzes will be the taken at the beginning in class. Arriving late may cause you to miss a quiz, impacting your performance assessment. There is no made-up quiz.

Course Assignments and Assessment:

Attendance:

Attendance at all class sessions is required. You have to notify the instructor in advance of your absence. If you fail to attend class regularly, your final course grade will be lowered. Likewise, you should arrive at class on time. Tardiness is disruptive and disrespectful to me and to your classmates. Please make every effort to arrive punctually.

Assignments:

There will be five assignments in total. They will involve both theoretical and practical (i.e. working with data) exercises, with an emphasis on the practical implication. You are encouraged to work together with a classmate on these assignments but you should turn in your own copy of the solutions.

Quizzes:

There will be five quizzes in total. Short, in-class quizzes will test your comprehension of course materials. You are supposed to make adequate preparation before each quiz. You are not allowed to consult your classmates or read your textbook or handout during the quizzes. You should be well-prepared before the class.

Exams:

There will be two midterm exams and one final exam during the course. In the exams, you are responsible to explain theoretical and empirical concepts and answer problem questions and empirical exercises. The exams will be closed-book. Also, you are not allowed to communicate with your classmates. Students are required to take all exams, and there are NO MAKE-UP EXAMS.

100%
30%
20%
20%
15%
15%



Grading Scale (percentage):

A+	Α	A-	B +	В	B-	C+	С	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	

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:

Tentative Course Schedule

Class	Topics	Assessment
Class 1-5	<i>Introduction to the Course</i>What is Econometrics?	Assignment#01 Quiz#01
	 The Simple Regression Model Definition of the Simple Regression Model Deriving the Ordinary Least Squares Estimate A Note on Terminology Properties of OLS on Any Sample of Data Fitted Values and Residuals Algebraic Properties of OLS Statistics Goodness-of-Fit Expected Values and Variances of the OLS Estimators 	
	Multiple Regression Analysis: Estimation	
	 Motivation for Multiple Regression 	
	The Model with Two Independent Variables	
	• Mechanics and interpretation of Ordinary Least	



	 Squares The Expected Value of the OLS Estimators Including Irrelevant Variables in a Regression Model Omitted Variable Bias: The Simple Case Omitted Variable Bias: More General Cases The Variance of the OLS Estimators The Components of the OLS Variance Multicollinearity Variances in Misspecified Models Estimating s2 Standard Errors of the OLS Estimators Efficiency of OLS: The Gauss-Markov Theorem 	
Class 6-10	 Multiple Regression Analysis: Inference Sampling distributions of the OLS Estimators Testing Hypotheses about a Single Population Parameter: The t Test Testing against One-Sided Alternatives Testing Multiple Linear Restrictions: The F Test Multiple Regression Analysis: Further Issues Effects of data Scaling on oLS Statistics Beta Coefficients More on Functional Form More on Using Logarithmic Functional Forms Models with Quadratics Models with Interaction Terms 	Assignment#02 Quiz#02 MidTerm#01



Information: Binary (or Dummy) Variables Quiz#03 • Describing Qualitative Information • A Single dummy Independent Variable • Using dummy Variables for Multiple Categories • Interactions Involving dummy Variables Interactions among Dummy Variables Allowing for Different Slopes Testing for Differences in Regression Functions across Groups • A Binary dependent Variable: The Linear Probability Model Heteroskedasticity • Consequences of Heteroskedasticity for oLS • Heteroskedasticity-Robust Inference after oLS Estimation More on Specification and Data Issues • Using Proxy Variables • Properties of OLS under Measurement Error Measurement Error in an Explanatory Variables • Properties of OLS under Measurement Error Measurement Error in an Explanatory Variables • Properties of OLS under Measurement Error Measurement Error in an Explanatory Variables Class 16-20 Basic Regression Analysis with Time Series Data • The nature of Time Series Regression Models Assignment#04 Quiz#04 WidTerm#02 Serial Correlation and Heteroskedasticity in Time Series Regressions • Properties of OLS with Serially Correlated Errors Unbiasedness and Consistency Efficiency and Inference Goodness of Fit Serial Correlation in the Presence of Lagged Dependent Variables • Testing for Serial Correlation A 1-test for AR (1) Serial Correlation with Strictly Exogenous Regressors The Durbin-Watson Test under Classical Assumptions Properties of OLS	Class 11-15	Multiple Regression Analysis with Oualitative	Assignment#03
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Class 21-25	 Pooling Cross Sections Across Time: Simple Panel Data Methods Pooling Independent Cross Sections across Time The Chow Test for Structural Change across Time Policy Analysis with Pooled Cross Sections 	Assignment#05 Quiz#05 Final Exam
	 Differencing with More Than Two Time Periods Potential Pitfalls in First Differencing Panel Data Instrumental Variables Estimation and Two Stage Least Squares 	
	 Motivation: omitted Variables in a Simple Regression Model Statistical Inference with the IV Estimator Properties of IV with a Poor Instrumental Variable Computing R-Squared after IV Estimation IV Estimation of the Multiple Regression Model Two Stage Least Squares 	