

# ECON 56200 Econometrics I

Purdue University

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## Course Description

This masters-level course in econometrics covers the tools that will enable students to conduct empirical analysis using economic data. The course examines the statistical techniques used in testing economic theories, estimating causal effects, and making predictions. Emphasis is placed on estimating a single equation (e.g., a demand function) and the problems associated with such estimation. As part of the course, students will estimate equations using STATA, a statistical software package.

## Prerequisites

Students are expected to understand the material covered in a probability course as well as the material covered in a statistics course (hypothesis testing, confidence intervals, etc.). Knowledge of basic calculus (differentiation, but no integration) is also required.

## Required Textbook

All students are expected to obtain a copy of *Introductory Econometrics: A Modern Approach* by Jeffery M. Wooldridge. Try to find a good price. It does not matter which edition of the textbook you purchase as they all cover the same material in the same chapter order. This course follows the textbook closely. Reading the textbook will definitely help you complete your homework assignments and will help you study for the final exam. You do not need to purchase any data or workbooks that sometimes come bundled with textbooks. You only need the textbook itself.

## Required Software

All students are required to use Stata, a statistical software package, to complete their homework assignments and research project. MS-ECON students receive Stata when they join the program. Other students may access Stata in the RAWL 4082 computer lab as well as the Krannert ARCC RemoteApp. Alternatively, a student version of Stata IC is available for purchase at:

<http://www.stata.com/order/new/edu/gradplans/campus-gradplan/>

## Course Outline

Topic 1: Nature of Econometrics and Economic Data (Chapter 1)

Topic 2: Simple Regression Model (Chapter 2)

Topic 3: Multiple Regression Analysis (Chapter 3)

Topic 4: Empirical Project (Chapter 19)

Topic 5: OLS Inference (Chapter 4)

Topic 6: OLS Asymptotics (Chapter 5)

Topic 7: OLS Further Issues (Chapter 6)

Topic 8: Binary Variables (Chapter 7)

Topic 9: Heteroskedasticity (Chapter 8)

Topic 10: Specification and Data Issues (Chapter 9)  
Topic 11: Instrumental Variables Estimation (Chapter 15)  
Topic 12: Basic Time Series Analysis (Chapters 10, 11, 12, & 18)  
Topic 13: Panel Data Methods (Chapters 13 & 14)

### **Method of Evaluation**

Student evaluation will be based on 12 problem sets, 12 quizzes, a research project, a take-home midterm exam, and the final exam. The letter grade will be based on the final score after applying a grade curve. The final score is the weighted sum of the exam scores and the average problem set scores. The weights used in computing the final score are:

- Problem Sets (25%)
- Quizzes (15%)
- Research Project and Paper (15%)
- Midterm Exam (10%)
- Final Exam (35%)

### Problem Sets

Problem sets are a mix of mathematical derivations and computer assignments. Working with others on the problem sets is encouraged, but each student must turn in his or her own individual copy. To receive credit, assignments must be handed in by the deadline. Rather than allowing exceptions to this rule, each student's lowest problem set score will be excluded in calculating the average problem set score.

### Quizzes

Each topic has a multiple choice quiz that will be graded. To receive credit, the quiz must be submitted by the deadline. Rather than allowing exceptions to this rule, each student's lowest quiz set score will be excluded in calculating the average problem set score.

### Research Project

The research project is an empirical analysis of real economic data that you obtain yourself. The analysis should use the methods covered in this course. You will need to obtain data that allows you to estimate an economic relationship. You may not use a dataset provided as part of the course as this would defeat the objective of having you acquire, organize, and clean the data yourself. After conducting the econometric analysis, students write a report (10 pages or less) describing the data, the analysis, and their results. This written description of the research project must be completed by the deadline to receive credit.

### Midterm Exam

The midterm exam will be made available over a multiple days. Students may choose when to take the exam within the exam period. Students will either need to type their answer or will need a way to scan their hand-written answers in order to upload and submit them. The midterm exam is an open book exam. Students are allowed to use the textbook, their notes, the course website, and any other materials while they complete the take-home midterm. Students are not allowed to seek or accept help

with exam questions from the TA, classmates, or any other person. Exam monitoring software and/or webcam monitoring may be used.

### Final Exam

This econometrics course is cumulative with each lesson building on comprehension of the material that came before. The final exam will also be comprehensive covering all prior material. The final exam will be made available over a multiple days during finals week. Students may choose when to take the exam within the designated exam period. Students will either need to type their answer or will need a way to scan their hand-written answers in order to upload and submit them. The final exam is an open book exam. Students are allowed to use the textbook, their notes, the course website, and any other materials while they complete the take-home final. Students are not allowed to seek or accept help with exam questions from the TA, classmates, or any other person. Exam monitoring software and/or webcam monitoring may be used.

### **Student Code of Honor**

The purpose of the Purdue University academic community is to discover and disseminate truth. In order to achieve these goals, the university commits itself towards maintaining a culture of academic integrity and honesty. For this to be possible, self-discipline and a strong desire to benefit others must be present within each individual. Therefore, we students must follow the Regulations Governing Student Conduct of Purdue University out of a sense of mutual respect, rather than out of fear of the consequences of their violation.

### **Academic Dishonesty**

Academic dishonesty of any kind will not be tolerated and is grounds for receiving a failing grade in the course. Purdue University policies define dishonesty as cheating, plagiarism, knowingly furnishing false information to the University, lying, using substitutes for taking examinations, illegal cribs, copying during examinations, and /or knowingly aiding or abetting another party in committing a dishonest act. If you are unsure whether your actions would be considered cheating, please ask the instructor first.

### **Students with Disabilities**

It is the student's responsibility to notify the Disability Resource Center ([www.purdue.edu/drc](http://www.purdue.edu/drc)) of any impairment that may require accommodations. A letter Disability Resource Center listing required accommodations should be provided to the instructor within the first two weeks of the semester.

### **Online Behavior**

Disruptive behavior on the discussion boards or towards others in the class is not tolerated and is grounds for being removed from the online class. Disruptive students will be referred to the Dean of Students Office for further action.

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit [www.purdue.edu/report-hate](http://www.purdue.edu/report-hate) to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.

### **Use of Copyrighted Materials**

The video lectures, problem sets, and quizzes that are presented as part of this course are protected by copyright law. Always assume the materials presented by an instructor are protected by copyright unless the instructor has stated otherwise. Students enrolled in this course are permitted to take notes, which they may use for individual/group study or for other non-commercial purposes reasonably arising from enrollment in the course. No individual is permitted to sell or otherwise barter course videos, notes, or course materials, either to other students or to any commercial concern, without the express written permission of the course instructor.

### **In Case of Emergency**

In the event of a major emergency, course requirements including deadlines and grading procedures are subject to change.

### **Incomplete**

A grade of incomplete is given only if all four of the following conditions are satisfied: (1) the student's course work is interrupted by unavoidable absence or other causes beyond the student's control, (2) the work was passing at the time it was interrupted, (3) completing the work does not require the student to repeat the course, and (4) the Dean of Students gives a recommendation that the circumstances warrant a grade of incomplete.