# Econ533
# Applied Econometrics
# Module 2, 2020-21

## Course Information

***Instructor: Weiwei HU***
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Office Hour: Monday 2-5 pm, or by appointment

***Teaching Assistant:***
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***Classes:***
Lectures: Tue & Fri 10:30 – 12:20 pm
Venue: PHBS Building, Room

***Course Website:***
If any.

## 1. Course Description

### *1.1 Context*

Course overview:

This is a required course for the master students in Economics and related areas. It aims to introduce skills that are useful for applied research and further studies. Students will learn how to use econometric theories and methods to analyse a variety of real world problems in economics, finance and other fields. Topics covered include linear regression, prediction, time series and panel data analysis, nonlinear models and others. Emphasis will be placed on the analysis of empirical questions using actual datasets and statistical packages.

Prerequisites:

Math, Matrix Algebra, Probability distribution, Statistics

### *1.2 Textbooks and Reading Materials*

Recommended Readings:
[1]Using Econometrics: A Practical Guide, 7e, by Studenmund
[2]Introductory Econometrics, 7e, by Wooldridge
[3]Introduction to Econometrics, 3e, by Stock and Watson
[4]Introduction to Econometrics, 3e, by Dougherty

The textbook that the lecture notes follow most closely is *Using Econometrics: A Practical Guide*. It is a very good book. Unfortunately, it is also a very expensive textbook, as all econometrics

textbooks are. You do not need to purchase an econometrics textbook, but if you would like to be able to read a textbook from time to time, I would suggest buying a used copy of Studenmund, but really any econometrics textbook published in the last 10 years is probably worthwhile.

We will use CMS (http://cms.pkusz.edu.cn/) to manage the course. The course website will appear as Econ 533: Applied Econometrics (Session E) in your CMS course list. I will send email announcements through CMS and post all related course materials there. Please check the course website every week.

Statistical Package:
One goal of this course is to equip students with the skills of making statistical analysis using packages such as STATA, SAS, MATLAB, R and others. Software analysis is heavily used in advanced classes, industries and academia. I will demonstrate examples with STATA in class. Students may choose among the popular packages according to your own preference.

To get the package, you can visit the school webpage for the instruction of STATA and SAS installation and MATLAB webpage for a student version. R is downloadable from the official webpage http://www.r-project.org/.

Some recommended tutorials for using the statistical packages are:
[1]Emmanuel Paradis. *R for beginners*.
[2]Lora D. Delwiche and Susan J. Slaughter. *The Little SAS BOOK*.
[3]STATA tutorial: http://data.princeton.edu/stata/ .

## 2. Learning Outcomes

### *2.1 Intended Learning Outcomes*

| **Learning Goals** | **Objectives** | **Assessment (YES with details or NO)** |
|---|---|---|
| 1. Our graduates will be effective communicators. | 1.1. Our students will produce quality business and research-oriented documents. | Assignment, exams and group project |
| | 1.2. Students are able to professionally present their ideas and also logically explain and defend their argument. | Assignment, exams and group project |
| 2. Our graduates will be skilled in team work and leadership. | 2.1. Students will be able to lead and participate in group for projects, discussion, and presentation. | Group project |
| | 2.2. Students will be able to apply leadership theories and related skills. | |
| 3. Our graduates will be trained in ethics. | 3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it. | Assignment, exams and group project |
| | 3.2. Our students will practice ethics in the duration of the program. | |
| 4. Our graduates will have a global perspective. | 4.1. Students will have an international exposure. | |
| 5. Our graduates will be skilled in problem-solving and critical thinking. | 5.1. Our students will have a good understanding of fundamental theories in their fields. | Assignment, exams and group project |
| | 5.2. Our students will be prepared to face problems in various business settings and | Assignment, exams and group |

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|---|---|---|
| | find solutions. | project |
| | 5.3. Our students will demonstrate competency in critical thinking. | Assignment, exams and group project |

## *2.2 Course specific objectives*

As a student in this class, you should become a better economist, researcher, and statistician. You should gain a solid understanding of what good research questions are, what valid answers look like, and how data can and cannot be used to answer questions. You will also be required to expand your knowledge of Stata - one of the most common statistical software programs. Statistical analysis in the workplace relies exclusively on software, or, more specifically, on workers who can use and understand statistical software. After completing this course, you will be able to include on your resume that you have a working knowledge of Stata. This will be very appealing to potential employers and graduate programs.

In terms of your being evaluated in this class, there are three learning objectives:

1. Econometric Theory: You will learn the ideas, techniques, and shortcomings of classical regression. You will be able to demonstrate the mathematical properties of ordinary least squares estimation, and you will learn several advanced estimation procedures.
2. Stata: You will develop a working knowledge of Stata.
3. Understanding Journal Articles: You will develop a broad enough understanding of econometrics so you can understand empirical journal articles.

## *2.3 Assessment/Grading Details*

Students are expected to attend all lectures, participate in class discussions, and read the required class materials. The course grade will be determined by:
[1] Class participation (5%)
[2] Homework (15%)
There will be three assignments which are individual work.
[3] Group project (10%)
[4] Midterm (30%)
[5] Final exam (40%)
The final will be an in-class exam on Jan 22. It will be a combination of a few mini-case questions.

Homework:

Problem sets are usually assigned every two weeks. You have to turn in your own problem set before the deadline announced. Suggested answers with detailed explanation will be posted on the Course Website after the deadline of each problem set. Please note that NO late submissions will be accepted.

If you have any questions about the problem sets, please seek help from me or TA.

Midterm and Final Exams:

There will be ONE midterm exam. The midterm exam will cover lecture materials, problem sets and assigned reading (if any). The midterm exam is scheduled in class on **December 22, 2020**. Please make sure your availability. It may contain essay-type questions which require explanation in writing, graph and calculation.

The final exam is CUMULATIVE. It may contain essay-type questions which require explanation in writing, graph and calculation.

## *2.4 Academic Honesty and Plagiarism*

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honour points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

For more information of plagiarism, please refer to *PHBS Student Handbook*.

## 3. Topics, Teaching and Assessment Schedule

This course will cover the most fundamental and important topics in applied econometrics. The following is a tentative schedule for the module. Note that this is preliminary and not a binding legal contract, as how fast we can cover these topics depends to some extent on you. The instructor may modify it and all changes will be announced in class and be posted on the course website. Some of the topics listed above might not be covered if we run out of time.

Approximate Schedule

| Session/Date | Topic | Reading | Assignment Due |
|---|---|---|---|
| Session 1 (Nov.20) | Introduction | Chapters 1 | |
| Session 2 (Nov.24) | OLS | Chapter 2 | |
| Session 3 (Nov.27) | OLS (continued) | Chapter 3 | |
| Session 4 (Dec.1) | Classical Model | Chapter 4 | Homework #1 |
| Session 5 (Dec.4) | Hypothesis Testing | Chapter 5 | |
| Session 6 (Dec.8) | Specification | Chapter 6 | |
| Session 7 (Dec.11) | Specification (continued) | Chapter 7 | |
| Session 8 (Dec.15) | Multicollinearity | Chapter 8 | Homework #2 |

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|---|---|---|---|
| Session 9 (Dec.18) | Serial Correlation | Chapter 9 | |
| Session 10 (Dec.22) | **In-class Midterm Exam** | Chapter 1-9 | In-class Exam (10:30-12:00 pm) |
| Session 11 (Dec.25) | Heteroskedasticity | Chapter 10 | |
| Session 12 (Dec.29) | Running Your Own Regression Project | Chapter 11 | Group Project Due |
| Session 13 (Jan.5) | Running Your Own Regression Project (continued) | Discussion of group projects | |
| Session 14 (Jan.6) | Time Series | Chapter 12 | |
| Session 15 (Jan.8) | Discrete Outcomes | Chapter 13 | |
| Session 16 (Jan.12) | Forecasting | Chapter 15 | Homework #3 |
| Session 17 (Jan.15) | Panel Data | Chapter 16 | |
| Session 18 (Jan.19) | Final Review/Q&A | | |
| Final Assessment | **Final Exam** | | TBD |

## 4. Miscellaneous

Students are expected to arrive for class on time and the instructor will start the class according to schedule. Students should demonstrate respect for the instructor and fellow students during the class period. Please try to avoid side conversations when your classmates raise questions or give comments. You are welcome to bring your laptop or iPad to class for learning purposes. However, you may not engage in distracting behaviour such as chatting or making phone calls.