UNIVERSITY OF WISCONSIN-MILWAUKEE  
Department of Economics  

Research Methods for Economics  
Fall 2019 - Economics 310  

Instructor: Jangsu Yoon  
Email: yoon22@uwm.edu  
Office: Bolton Hall #882  
Office Hours: Monday & Wednesday 12:30 - 1:30 pm and by appointment  

Class Schedule: Monday & Wednesday 2:00 - 3:15 pm at Bolton Hall #B60  

Course Description  
This course is designed for undergraduate economics major students who have taken basic level economic/business statistics courses. The research methods of economics rely on statistical tools that are used to analyze and interpret economic data. The main goal of this course is to provide a theoretical foundation for economic data analysis and to practice empirical analyses using real world examples in economics. The focus of the course is regression analysis. Specific topics include linear regression with one regressor and multiple regressors, hypothesis testing, regression with panel data, binary dependent variable, instrumental variables, and big data.  

The arrangement of the course is as follows. In the first part, we review concepts and definitions in statistics: probability, expectation, mean, variance, confidence interval. In the second part, the linear regression model and its identification, estimation, and inference with the least squares method are introduced. The Ordinary Least Squares (OLS) estimator and its properties will be presented. In the last part, some extensions of the linear regression model will be considered. We discuss how the regression analysis can be applied to various economic models with panel data, binary variable, or instrumental variables. We also figure out the relation of regression analysis and big data - machine learning problem.  

Course Requirements  
1. Midterm (30%): Wednesday, October 16  
2. Final (50%): Wednesday, December 18, 12:30 pm - 2:30 pm  
3. Problem sets (20%): No late submission will be accepted  
   (a) Assignment 1 (5%), due September 25, before the class begins  
   (b) Assignment 2 (5%), due October 9, before the class begins
Assignment 3 (5%), due November 13, before the class begins

Assignment 4 (5%), due December 4, before the class begins

The assignment is required to be submitted in hard copy or electronic copy (to the instructor’s email: yoon22@uwm.edu). Using LaTeX to write up your assignment is recommended but not mandatory.

Computer Programs

Problem sets will occasionally involve simulation or application of the methods using actual dataset. You may choose a programming language that you feel comfortable with. The commonly used programs are STATA (recommended), R, Python, Julia, MATLAB, GAUSS, SAS or even Fortran and C. A good introduction to STATA is available at http://data.princeton.edu/stata/. You are expected to learn at least one of those programs/languages by yourself or with the help of the computer lab staff. Some exemplary programming codes will be uploaded on our course webpage.

Readings

The lecture will be based on the Econometrics textbook of James H. Stock and Mark W. Watson, Introduction to Econometrics, Fourth Edition (2019). The textbook overview and some resources are available at the following homepage: https://www.pearson.com/. To supplement the main text, the following textbooks will be helpful as well.


Course Outline

1. Review of Probability Theory / Statistics
   - Main Text
     - Stock and Watson (2019), Ch 1 ~ Ch 3
   - Supplementary Material
     - Wooldridge (2019), Appendix A, B, C
2. Regression Analysis with One Regressor

- Main Text
  - Stock and Watson (2019), Ch 4 – Ch 5
- Supplementary Material
  - Wooldridge (2019), Ch 2
  - Davidson and MacKinnon (2003), Ch 2

3. Regression Analysis with Multiple Regressors

- Main Text
  - Stock and Watson (2019), Ch 6 – Ch 7
- Supplementary Material
  - Wooldridge (2019), Ch 3 – Ch 7
  - Davidson and MacKinnon (2003), Ch 3 – Ch 5

4. Regression with Panel Data

- Main Text
  - Stock and Watson (2019), Ch 10
- Supplementary Material
  - Wooldridge (2019), Ch 13 – Ch 14

5. Regression with a Binary Dependent Variable

- Main Text
  - Stock and Watson (2019), Ch 11
- Supplementary Material
  - Wooldridge (2019), Ch 17
  - Davidson and MacKinnon (2003), Ch 11

6. Instrumental Variables

- Main Text
  - Stock and Watson (2019), Ch 12
- Supplementary Material
  - Wooldridge (2019), Ch 15 – Ch 16
  - Davidson and MacKinnon (2003), Ch 8
7. Big Data

- Main Text
  - Stock and Watson (2019), Ch 14

Note

For information on the University’s policies for religious observances, incompletes, academic misconduct, grade appeal procedures, final examination policy, students called to military service, discriminatory conduct, and complaint procedures, please access the following link:
  
  http://www4.uwm.edu/secu/SyllabusLinks.pdf

Participation by Students with Disabilities

The University of Wisconsin Milwaukee supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty will work either directly with the student or in coordination with the Accessibility Resource Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student’s educational record, is confidential and protected under FERPA.

Academic Misconduct

The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others’ academic endeavors. Student academic misconduct information can be found at:

  http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm

Workload Statement

This class meets twice weekly for 75 minutes, for a total of 37.5 hours of required lecture time. You should expect to take at least 67.5 hours over the course of the semester reading the textbook and other required texts. There are also 4 homework assignments which you should expect to require at least 5 hours each. You should reserve at least 10 hours to study for and take the midterm/final exam. All told, this class is likely to take 145 hours of your time.