ECON 4570-02: Econometrics
Fall, 2024

Instructor: Huaming Peng, SAGE 3403, email: pengh5@rpi.edu.

Time and Location: MR, 10:00 am-11:50am at Russell Sage Laboratory 2701

Office Hours : M, 11:55am- 01:55pm or by appointment

Course Description:

This course introduces you various econometric methods for analyzing econometric data. It emphasizes both the theoretical and the practical aspects of econometric analysis, focusing on techniques for estimating econometric models of various kinds and for conducting tests of hypotheses of interest to economists. Topics covered this semester include linear and nonlinear regression model and its various extensions with classical assumptions being violated. qualitative and limited dependent variables, panel data and time series econometrics, forecasting, robust estimation and applied econometrics.

Course Learning Outcomes for ECON 4570:

Students who successfully complete this course should be able to:

- develop a solid theoretical background in introductory level econometrics.
- demonstrate an ability to implement the techniques learned in the course.
- demonstrate an ability to critique empirical studies in economics.
- demonstrate an ability to carry out econometric analysis independently.

Prerequisite: MATH 2010 (or equivalent), ECON 2010 (or equivalent), or Permission of Instructor.

Class Materials

Materials for this course (such as syllabus, lecture slides, problem sets, exams, etc.) will be posted to blackboard learning management system.

Software: Stata and/or R

Textbooks

Required Textbook:

- James H. Stock and Mark W. Watson, *"Introduction to Econometrics"*, 4th edition, Pearson, 2018 (SW).

Additional References:

- Joshua D. Angrist and Jorn-Steffen Pischke, *"Most Harmless Econometrics: An Empiricist's Companion"*, Princeton University Press, 2009

Course Schedule (This schedule is subject to change)**:**

Lectures	Topics	Readings
1-4	Review of Probability and statistics	SW, Ch.1-3
5-6	Simple linear regression model	SW, Ch.4-5
7-9	linear regression with multiple regressors	SW, Ch.6-7
10-11	Nonlinear regression	SW, Ch.8
12-13	Assessing Studies based on multiple regression	SW, Ch.9
14-15	Regression with panel data	SW, Ch.10
16-17	Regression with a Binary Dependent Variables	SW, Ch.11
18-19	Instrumental variables regressions	SW, Ch.12
18-19	Experiments and Quasi-Experiments	SW, Ch.13
20-22	Prediction with Many Regressors and Big Data	SW, Ch.14
23-24	Introduction to Time Series Regression and Forecasting	SW, Ch.15
25-26	Estimation of Dynamic Causal Effects	SW, Ch.16
25-26	Additional Topics in Time Series Regression	SW, Ch.17
25-26	The Theory of Linear Regression with One Regressor	SW, Ch.18
25-26	The Theory of Multiple Regression	SW, Ch.19

Assignments and Grading:

There will be about four problem sets, a midterm exam and a final exam. The assignments will count toward the overall grade as follows.

Courses	Problem sets	Midterm	Final
ECON4570	**30%**	**35%**	**35%**

The problem sets must be submitted via the links on LMS before the deadlines specified on the problem sets. Without permission late problem set will not be graded and receive a grade of zero. In addition, to allow for the possibility of unexpected emergency, I will drop one lowest problem set score in calculating your final grade. The midterm exam will be given in class on **10/03/2024**. The final exam will be given in class on **12/05/2024**. All exams are closed book and closed note. Note that you can bring a calculator, but no mobile phone is allowed in both exams! You can also bring a cheat sheet (both front and back) to the exams.

The grading scale is as follows

Numerical overall Grade (curved)	$90-100$	$85-89$	$82-84$	$79-81$	$76-78$	$73-75$
Letter grade	A	A^-	B^+	B	B^-	C^+
Numerical overall Grade (curved)	$70-72$	$67-69$	$64-66$	$60-63$	$0-59$	
Letter grade	C	C^-	D^+	D	F	

Absences from Exams

All classes will be in-person format. Class Attendance is **highly recommended**. It may affect your final grade, especially when your numerical overall grade lies on the borderline. For exams missed because of major illness, death in the family, etc., please contact the Student Experience Office, as they will inform me and I will arrange a replacement for you.

Academic Integrity

Students must work independently on all course assignments (except graduate student oral presentations). All work must be original and not copied or written in collaboration with other students. Copying and pasting from published sources or the internet is considered plagiarism and is not acceptable. Plagiarized work will receive an automatic grade of zero.

Student-teacher relationships are built on trust. Acts which violate this trust undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities and The Rensselaer Graduate Student Supplement define various forms of Academic Dishonesty and procedures for responding to them. Submission of any assignment that is in violation with these policies will result in a penalty that is deemed by the instructor to be appropriate to the infraction ranging from a grade of zero on the assignment in

question, to failure of the class as a whole. The student will also be reported to the Dean of Students and/or the Dean of Graduate Education as appropriate. If you have any questions concerning this policy before submitting an assignment, please ask for clarification.

Help with Writing, Design or Oral Presentation

If you would like help with writing assignments, visual design projects, or oral presentations, please visit the Center for Global Communication+Design (Comm+D) online at http://www.commd.rpi.edu to find helpful resources or to schedule an online video conference. Comm+D is a FREE resource for all members of the Rensselaer community.