

EC508: Econometrics

Jean-Jacques Forneron

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Instructor:

Jean-Jacques Forneron

Lectures: W,F 2:30-3:45pm

Class Room: CAS 216

E-mail: jjmf@bu.edu

Office Hours: W 3:50-4:50pm/F 11:00-12:00pm

Office: 415D

Teaching Assistant:

Fangning Yan

Discussion Session: M 2:30-3:45pm

Class Room: WED 130

E-mail: riyan@bu.edu

Office Hours: W 4:30-6:00pm

Office: B17A

Course Description

The aim of this course is to familiarize the students with fundamental concepts in econometrics and build their skills to perform regression analyses. This course will cover linear regression with multiple regressors, instrumental variables, nonlinear regression, regression with limited dependent variables, and an introduction to time series analysis. The emphasis of this course will be on understanding of the econometric theory and how to apply the theory to real economic data. After completing this course, the students are expected to be equipped with the knowledge of basic econometric theory and be ready for conducting regression analyses on various types of economic data.

Textbook

Textbook: James Stock and Mark Watson "Introduction to Econometrics (4th edition)," Addison-Wesley. This book is available at [Barnes & Noble at Boston University](#).

Reference: Fumio Hayashi "Econometrics," Princeton University Press.

This book is an advanced graduate level textbook, which provides theoretical foundations of the topics covered in this course.

Pre-requisites

No prior preparation in econometrics is required, but familiarity with basic linear algebra and calculus is assumed. Background in statistics at EC507 level is also assumed.

Course website

The course website will be on Blackboard learn. Announcements will be made through the course website. Please check it periodically.

Office hours

You are encouraged to come to our office hours if you have any questions on the course material. If you are unable to come to our regular office hours, please make an appointment by sending us an email. If you have questions that need brief answers, you can also ask me or the TA by sending an email, but please be aware that we may not be able to answer questions that need lengthy explanations. If you have such questions, please come to our office hours.

Grading and Exam Policies

The final grade will be determined based on problem sets (20% of final grade), a midterm exam (30% of final grade) and a final exam (50% of final grade).

- **Problem sets:**

Problem set due dates will be announced in class. You are encouraged to work in groups on problem sets, but you must turn in your own copy. Late problem sets will not be accepted as the answer key will be posted on the course website immediately.

- **Software:**

There will be some questions that require a statistical software, R. A simple editor called Rstudio can be downloaded at <https://www.rstudio.com/products/rstudio/download/#download>; it is freely available for Windows, Mac and Linux. Our TA will give a brief review on how to use R in a discussion section. When you report graphs or tables created by R, you must make sure that they have meaningful titles and labels.

- **Exams:**

The midterm will be held in class. It will take place on **Wednesday, March 16**. The final will be cumulative. The date of the final will be announced. You should periodically check the exam schedule on the Student Link: http://www.bu.edu/link/bin/uiscgi_studentlink.pl for any variations and location changes.

The exams will be closed-book. You may use a calculator during exams. A simple one is enough. If you have questions on grading (both problem sets and exams), you must contact the TA within a week after you receive your homework or exams. There will be no regrading of exams written in pencil. Makeup exams will only be given if absence is due to medical reasons (**Doctors certificate required**).

Academic conduct

Students should know and understand the CAS Academic Conduct Code. Copies of the CAS Academic Conduct Code are available in room CAS 105 and on the website <http://www.bu.edu/academics/policies/academic-conduct-code/>. Any suspected academic misconduct will be reported to the Deans Office.

Course Outline

The following is a tentative schedule of the topics we will cover. Corresponding sections in the textbook (SW) are listed below. Please note that there might be slight variations as we progress. The reference in Hayashi (H) are also given as an additional reference.

- Linear Regression, SW 4-7, 12, 18-19; H 1-2, 3-4
 - Regression with a single regressor, SW 4-5, 18
 - Review of matrix algebra
 - Regression with multiple regressors, SW 6, 9, 19
 - Asymptotic theory, SW 7
 - Inference in regression models, SW 7
 - Robust Linear Regression and Outliers
 - Instrumental variables, SW 12, 19
 - Generalized Method of Moments (GMM), SW 19
- Nonlinear regression and limited dependent variables, SW 8, 11; H 8
 - Probit and Logit, SW 11
 - Sample selection models
 - Nonlinear least squares, SW 8
- Time series analysis, SW 15-16; H 6, 9
 - Forecasting, SW 15
 - Time series regression, SW 15-16
 - Nonstationarity, SW 15