

# Syllabus

## Financial Econometrics<sup>1</sup>

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	Position	Associate Professor			Major	Financial Engineering
	Group	Financial Engineering				

### 1. Course Description

This is the advanced econometrics course in discussing how to analyze economic/financial data; especially in cross-sectional and time-series data. The course focuses on a limited number of topics fairly thoroughly. Those topics include multi-variate linear regressions, system of equations estimation, simultaneous equation models, generalized method of moments, and times series data models and methods. Additional topics will be covered if time permits.

By the end of this course students should:

1. know when the estimation and hypothesis testing methods for heteroskedasticity, autocorrelation, systems of equations, simultaneous equations, and time-series models are appropriate and how to apply them;
2. know generalized method of moments;
3. be able to critically read and evaluate papers applying estimation and testing methods for the suggested models;
4. analyze estimation and testing problems involving systems of equations simultaneous equations, and time-series models;
5. be able to write a research paper applying an estimation method(s) and/or test(s) for systems of equations, simultaneous equations, or time-series models

### 2. Teaching Methods

The course will offer a series of lectures on theoretical models. Based on lectures, there will be a problem set due on each Monday in order to enhance understanding on the lectures. For the second half of the course, the lecture will focus on the features of time-series data and analytical models/tools for analyzing them while students are required to work on their own project of a short research paper. The paper is due on the last day of class.

# Specific Guideline for problem set, lab exercise and the term paper:

- 1) You may work in groups on the problem sets. If you do, please turn in just on copy of your answers with all of your names on it. Please respect the university integrity policy and do not free-ride.
- 2) A research term-paper, which incorporates methods covered in the course, is required. The data should be obtained from the Data-Lab of our department. The paper should be typed, double spaced, and with margins at least one each wide. Papers should be no more than 5 pages, which includes figures, tables, and references. A hard-copy of the paper is due on the last day of class of this course.
- 3) Please attach the code of the program you used for any econometric analysis for a lab exercise. Computer programming can be discussed in/out of the class

3. Evaluation

Assginment 25%  
Midterm exam 35%  
Final exam 40%

4. TextBooks

5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	Review of Ordinary Least Squares (undergraduate-level)	녹화강의/실시간	
2	Ordinary Least Squares (Graduate-level)	녹화강의/실시간	Problem set 1
3	Aymptotics & Hypothesis Testing	녹화강의/실시간	Problem set 2
4	Generalized Least Squares (Serial Correlation, Heteroskedasticity)	녹화강의/실시간	Problem set 3
5	Instrumental Variable Estimation	녹화강의/실시간	Problem set 4
6	Two-stage Least Squares Estimation	녹화강의/실시간	Problem set 5
7	Midterm Exam	실시간	
8	Maximum Likelihood Estimation	녹화강의/실시간	Problem set 6
9	Probit, Logit, and Tobit	녹화강의/실시간	Problem set 7
10	Longitudinal Data and Matching	녹화강의/실시간	Problem set 8
11	Time-series Data and Asymptotics (Univariate and Multivariate)	녹화강의/실시간	Lab exercise 1
12	Vector Autoregression & Impulse Response Function	녹화강의/실시간	Lab exercise 2
13	Unit Root & Cointegration	녹화강의/실시간	Lab exercise 3
14	Error Correction Models	녹화강의/실시간	Lab exercise 4
15	Volatility Models: ARCH, GARCH, and Stochastic Volatility Models	녹화강의/실시간	Lab exercise 5

## 5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
16	Final exam	실시간	

## 6. Others

# Important Notice:

If you have NOT taken the following courses, I STRONGLY recommend you NOT TO TAKE the course.

- 1) Undergraduate-level Econometrics and Statistics
- 2) Mathematical Statistics (Graduate level)
- 3) Linear Algebra

In this course, since our main objective of the course is to write an empirical paper using the course materials by the end of the semester, I presume that the class has taken all of these three courses. The course will not provide a review on the basic knowledge of those courses.