

## Econ 504: Time Series Analysis in Economics

**Instructor:** Ji Hyung Lee, E-mail: jihyung at illinois.edu.

**Main Course Materials:** Course Slides and Lecture Notes, prepared by the instructor

### Recommended Textbooks

- *Econometric Modelling with Time Series* by Vance Martin, Stan Hurn and David Harris, Cambridge University Press.
- *Financial Econometric Modeling* by Hurn, Martin, Phillips and Yu, Oxford University Press
- *Introduction to Computational Finance and Financial Econometrics* by Eric Zivot, <https://bookdown.org/compfinezbook/introcompfinr/>
- *Financial Econometrics* by Oliver Linton, Cambridge University Press

**Exams:** There will be two in-class closed-book exams (**Week 6** and **Week 12**), and one open-book take-home final exam (**due date determined by University**). Please see the course schedule below.

**Grading:** As discussed above, there will be two in-class exams and one take-home exam. They will count toward the grade as follows, along with your class participation. If you miss any of the exams, you cannot pass this course.

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|--------------------------|-----------------------|
| Exam 1, 2 and Final Exam | 100% (35/35/30% each) |
| Class Participation      | Bonus Credits         |

### Practice Questions

There will be occasional practice questions, which will be discussed in class. These questions will be important for your exams.

Please use our course webpage for your questions. In this way we can openly discuss what are difficult and how to overcome. Practice questions are mainly to encourage you to "practice", and understanding them by yourself will be the most important task in this class. *The written solutions will not be provided*; you are supposed to review the course materials and find the answers by yourselves. Memorizing solutions right before the exam is not the right way to

learn. If you want to clarify your understanding, please talk to the instructor or grader by setting up an appointment.

### **Academic Integrity**

Regarding the violation of academic integrity, the student code for ACADEMIC INTEGRITY POLICY AND PROCEDURE from the University of Illinois system will be strictly followed: <http://studentcode.illinois.edu/article1/part4/1-402/>

### **Description of the Course**

This course is an introduction to time series econometric modelling. The main focus is to study econometric models and methods to understand dynamics of economic time series. We first begin by reviewing the essential concepts in probability/statistics and time series econometrics. Then some popular time series econometric models and estimation methods will be investigated. Finally, we review selected topics in economics, and learn how to apply the econometric methods to analyze and understand the empirical properties of economic time series data. Both analytical problem sets and data exercises will be distributed as practice questions, in order to enhance our theoretical understandings and practical skills.

## **Course Schedule and Topics - subject to some changes**

- Course Introduction
- Probability and Statistics
- Introduction to Time Series Econometrics
- Volatility Model I and II
- Brownian Motion
- Nonstationary Time Series: Unit Root and Cointegration
- Vector Autoregression
- Review or Advanced Topics, to be determined