


Econ 504: Time Series Analysis in Economics

FALL 2023

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Time and Location: Synchronous meetings will focus on **Practice Questions and Q&A Discussions**, providing you with opportunities to engage actively with the course material. The sessions will take place within the class time slot of 8:00 AM - 9:20 AM CT and will be conducted online. For your convenience, the schedule details are provided below.

- Time: 8:00 AM - 9:20 AM CT
- Format: Online via Zoom
- Zoom Link: 
- Access via Canvas: The Zoom link is also accessible through the course website on Canvas.

I look forward to your active participation in these synchronous meetings, which will enrich your understanding of the subject matter. Should you have any questions or concerns, do not hesitate to reach out. Your dedication to these sessions will contribute to your success in the course.

To offer the maximum flexibility, the standard lectures will be asynchronous, meaning they will be pre-recorded and made available through Canvas.

TA Office Hours: On Fridays at DKH 15 (the tutoring center at the basement), between 1pm - 3pm.

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

Recommended Textbooks

- *Introduction to Computational Finance and Financial Econometrics* by Eric Zivot, <https://bookdown.org/compfinezbook/introcompfinr/>
- *Financial Econometrics* by Oliver Linton, Cambridge University Press
- *Statistics and Data Analysis for Financial Engineering* by David Ruppert, Springer-Verlag.

Exams: Exams are open-book take-home exams. Exam 1 is during 10/19-29 and Exam 2 (**cumulative**) is during the final exam periods. Please see the course schedule in page 3 below.

Grading: There will be two take-home exams. They will count toward the grade as follows. If you miss any of the exams, you cannot pass this course.

Exam I	40%
Exam II	60%

Practice Questions

There will be occasional practice questions, which will be discussed in class. These questions will be important for your take-home 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 TA during the office hours.

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 data. Both analytical problem sets and data exercises will be distributed as practice questions, in order to enhance our theoretical understandings and practical skills.

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/>

Course Schedule - subject to some changes

- Week 1: Course Introduction, Understanding Empirical Properties of Time Series Data
- Week 2: Review of Concepts in Probability Theory
- Week 3: Review of Concepts in Probability and Statistics
- Week 4: Introduction to Time Series Econometrics
- Week 5: ARMA & Unit Root Models, Descriptive Statistics
- Week 6: Volatility Models
- Week 7: Review Session for Exam I
- **Take-Home Exam 1**
- Week 8: Single Index (SI) Model & Estimation
- Week 9: Single Index (SI) Model & Estimation
- Week 10: Multi-factor Asset Pricing
- Week 11: Introduction to Portfolio Theory
- Week 12: Portfolio Theory
- Week 13: Estimation & Inference on Financial Risk
- Week 14: Quantile Methods
- Week 15: Review Session for Exam II
- **Take Home Exam 2 (cumulative, during the final exam period)**

Safety Information

Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with any kind of emergency – like fire, severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.



Run

Leaving the area quickly is the best option if it is safe to do so.

- ▶ Take time now to learn the different ways to leave your building.
- ▶ Leave personal items behind.
- ▶ Assist those who need help, but consider whether doing so puts yourself at risk.
- ▶ Alert authorities of the emergency when it is safe to do so.



Hide

When you can't or don't want to run, take shelter indoors.

- ▶ Take time now to learn different ways to seek shelter in your building.
- ▶ If severe weather is imminent, go to the nearest indoor storm refuge area.
- ▶ If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.



Fight

As a last resort, you may need to fight to increase your chances of survival.

- ▶ Think about what kind of common items are in your area which you can use to defend yourself.
- ▶ Team up with others to fight if the situation allows.
- ▶ Mentally prepare yourself – you may be in a fight for your life.

Please be aware of persons with disabilities who may need additional assistance in emergency situations.

Other resources

- ▶ police.illinois.edu/safe for more information on how to prepare for emergencies, including how to run, hide or fight and building floor plans that can show you safe areas.
- ▶ emergency.illinois.edu to sign up for Illini-Alert text messages.
- ▶ Follow the **University of Illinois Police Department** on Twitter and Facebook to get regular updates about campus safety.