

THE UNIVERSITY OF CHICAGO
Graduate School of Business
Business 41914, Spring Quarter 2007, Mr. Ruey S. Tsay

COURSE INFORMATION

Course website:

<http://faculty.chicagogsb.edu/ruey.tsay/teaching/mts/sp2007>

A useful web site for U.S. data:

Fed. Res. at St Louis: <http://research.stlouisfed.org/fred2/>

Course Objective:

- To study the basic theory of multivariate processes
- To gain experience in analyzing multivariate time series data
- To learn multivariate time series models, including vector AR and ARMA models with exogenous variables
- To understand co-integration and error-correction models
- To study structural specification of a vector process
- To learn state-space models and Kalman filter.

Textbook: No textbook is assigned.

References: (not required)

1. *Time Series Analysis: Forecasting and Control*, 3rd ed., by Box, Jenkins and Reinsel (1994), Prentice Hall. Chapters 10 and 11.
2. *A Course in Time Series Analysis* by Peña, Tiao and Tsay (2001), John-Wiley. Chapters 14 and 15.
3. *Introduction to Multiple Time Series Analysis* by H. Lutkepohl (1993), 2nd Edition, Springer-Verlag.
4. *Time Series Analysis* by J. Hamilton (1994), Princeton University Press. Chapters 10, 11, 13, 18, 19 & 20.

5. *Time Series Analysis by State Space Models* by Durbin and Koopman (2001), Oxford University Press.
6. *Elements of Multivariate Time Series Analysis* by G. C. Reinsel (1993), Springer-Verlag.

Articles: Assigned readings often include journal articles. You may download them from e-journals via the library.

Office hour:

Wednesday: 1:30 pm to 2:30 pm or by appointment.

My phone number 702-6750, My office: HPC 455

E-mail: ruey.tsay@ChicagoGSB.edu

(this is the easiest way to make contact with me)

Teaching assistant: Mr. David Matteson

- e-mail: matteson@uchicago.edu

Grading:

Mid-term (40%), Final project (40%), and homework assignments (20%).

Special notes:

- Homework is due *Before* the class one week after being assigned.
- No late homework assignments will be accepted. Solutions or discussions will follow after the assignments are handed in.
- You may discuss assignments with each other, but **must turn in your own answers**.
- No e-mail submission of any assignment will be accepted.
- In class exam: Week 7, open book.
- Final project is due on Friday of Week 10 before 5:00 pm.

Computing:

The software packages used are SCA, R, and S-Plus, but you may use any software of your choice.

Course Outline: All topics include applications

1. Transfer function models

2. Stationary vector autoregressive and moving average models
3. Estimation, modeling, and forecasting
4. Unit-root, co-integration and error-correction models
5. Seasonal models
6. Structural specification
7. State-space model and Kalman filter
8. Multivariate volatility models if time permits.

GSB Honor Code

This course requires students to follow the GSB Honor Code and Standards of Scholarship in examination, final project and assignments. The GSB Honor Code requires students to sign the following pledge, “I pledge my honor that I have not violated the Honor Code during this examination.”, on every examination.