

# Syllabus

## STA 4853 & STA 5856:

### Introduction to Time Series and Forecasting

#### Spring Semester, 2008

#### Instructor: Arthur Berg

The best way to reach me outside of class is by email. I will always be available right after class and during office hours should you wish to speak with me in person.

- **Email:** [berg@ufl.edu](mailto:berg@ufl.edu)

*Please include “time series” in the subject line.*

- **Office:** 408 McCarty Hall C

*Office hours are Mondays 5:00–6:00pm and Wednesdays 2:00–3:00pm.*

#### Class Info

- Section #1083 (STA 4853) #1815 (STA 5856), MWF, 12:50–1:40 pm (period 6), FLO 100

#### Class Webpage

- <http://www.stat.ufl.edu/~berg/sta4853>

You can access the homework assignments, lecture notes, datasets, and other relevant course material from the course website.

#### Textbook

*Time Series Analysis : Univariate and Multivariate Methods*, 2nd edition (2005), by William W.S. Wei.

#### References

- *SAS for Forecasting Time Series*, Brocklebank and Dickey, 2nd Edition (2003), SAS Publishing. ([SAS Code](#))
- *Time Series Analysis and Its Applications: With R Examples*, Shumway and Stoffer, 2nd edition (2006), Springer.
- *The Analysis of Time Series: An Introduction*, Chris Chatfield, 6th edition (2003), Chapman & Hall / CRC.
- *Time Series: Theory and Methods*, Brockwell and Davis, 2nd edition (1991), Springer.
- *Time Series Analysis*, James Hamilton, (1994), Princeton University Press.

## Prerequisites

STA 4322 or STA 5328 or equivalent. Topics covered in STA 4322 (Mathematical Statistics 2): sampling distributions, central limit theorem, estimation, properties of point estimators, confidence intervals, hypothesis testing, common large sample tests, normal theory small sample tests, uniformly most powerful and likelihood ratio tests, linear models and least squares, correlation, introduction to analysis of variance.

## Topics Covered

We will for the most part follow the organization of the textbook. This includes the following topics:

- Fundamental Concepts
- AR, MA, ARIMA, and SARIMA Models
- Forecasting
- Model Identification
- Parameter Estimation
- Intervention Analysis
- Unit Root Testing and Cointegration
- ARCH and GARCH Models
- Spectral Domain
- State Space Models and the Kalman Filter

## Software

Learning a statistical software package is not required for this course, however will be utilizing the packages R and SAS in the lectures.

## Grading Policy

Course averages of at least 90%, 80%, and 70% will guarantee the passing grades of A, B, and C, respectively. Course averages below 70% are candidates for the failing grades of D and E. If your course average starts to fall into an undesirable (or catastrophic) category, it is your responsibility to counsel with me about what your options are, and what you might realistically be able to get.

Homework	33. $\bar{3}$ %	A	90%—100%	C	70%—75%
Midterm	33. $\bar{3}$ %	B+	85%—90%	D	60%—70%
Final	33. $\bar{3}$ %	B	80%—85%	E	<60%
		C+	75%—80%		

## Assignments

**Reading** Textbook reading should be kept up with the lectures. The lectures will closely follow the reading material and you will undoubtedly do much better in the class having kept up with the reading.

**Homework** Homework will be assigned and collected periodically. Homework must be turned in at the beginning of the lecture on the due date. Late homework will not be accepted. All work must be entirely your own.

**Midterm and Final** The midterm will be on the material from the first half of the class. It will be in two parts spanning two consecutive class days. The final will cover material from the entire course with emphasis on the material that followed the midterm. You should review the lectures, homework and textbook readings in preparation of the exams.

## Changes to the Syllabus

I reserve the right to change the syllabus as circumstances necessitate, but no new policy will be enforceable until after you have been notified in class.