

# MTH 9873: Time Series Analysis

## Course Outline

Professor Andrew Lesniewski  
Baruch College, CUNY  
Fall 2018

**Time and location:** Mon 6:05 – 9:00 pm, VC 5-175

**Office:** VC 6-258

**Phone:** (646) 312-4183

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**Office hours:** Mon 4:00 – 6:00 pm, or by appointment

### Teaching Assistants:

Nikos Rachmanis: [nikos.fxcube@gmail.com](mailto:nikos.fxcube@gmail.com)

Stephanie Wang: [Yicen.Wang@baruch.cuny.edu](mailto:Yicen.Wang@baruch.cuny.edu)

**Office hours:** By appointment

### Topics covered by the course include:

1. Stationary ARMA time series models and their estimation
2. VAR models
3. Non-stationarity, unit roots, and cointegration
4. Stochastic volatility: GARCH and extensions
5. Bayesian methods:
  - a. State space models
  - b. MCMC
  - c. Particle filters

**Homepage:** Baruch MFE private forum site is available to registered students. If you're not registered but would like forum access, please contact the course TAs.

**Textbook:** Lecture notes to be posted online. A list of recommended readings will be provided with each set of notes. Good general references are:

1. R. S. Tsay: *Analysis of Financial Time Series*, Wiley (2010)
2. R. S. Tsay: *Multivariate Time Series Analysis*, Wiley (2014)
3. J. D. Hamilton: *Time Series Analysis*, Princeton University Press (1994)

**Assignments:** Will be assigned weekly. Some problems will involve some programming in a language of your choice. However, I strongly urge to use the following tools:

- (i) python/pandas/numpy/scipy
- (ii) or R,

for computing, and

- (i) Bloomberg,
- (ii) or Yahoo Finance,

for data. Assignments can be printed out and submitted or e-mailed to the TAs.

**Grading:** Homework: 50%, Final Exam: 50%

**Prerequisites:** Solid grounding in probability and statistics, linear algebra, programming in Python or R (I know, everybody has these).