

# SPRING 2019 - STAT 720: Time Series Analysis

12:50 pm – 2:05 pm MW Leconte College 201A

Jan 14, 2019 – Apr 29, 2019

**Instructor:** Karl Gregory  
**Office:** 219C LeConte College  
**Email:** gregorkb@stat.sc.edu  
**url:** <http://people.stat.sc.edu/gregorkb>  
**Office phone:** (803)777-3859  
**Office hours:** Monday 2:30 p.m. – 5:00 p.m.  
Tuesday 2:30 p.m. – 5:00 p.m. or by appointment.

## Bulletin description

(Prereq: STAT 704 and 512) Stochastic properties, identification, estimation, and forecasting methods for stationary and nonstationary time series models.

## Purpose of the course

To provide to graduate students from various disciplines a rigorous introduction to the analysis of time series data with emphases on ARMA models, detrending techniques, forecasting, and spectral analysis, as well as on theoretical results such as laws of large numbers and central limit theorems in the context of time series data.

## Learning outcomes

By the end of the semester, students should be able to do the following:

- Understand basic features of time series data such as stationarity, strict stationarity, etc.
- Discuss theoretical results such as laws of large numbers and central limit theorems in the context of time series data.
- Apply detrending techniques.
- Identify appropriate models for the dependence structures of time series.
- Perform spectral analyses of times series.
- Make forecasts.
- Implement a variety of time series methods in R.
- Read, understand, implement, and explain methods recently introduced in time series literature.

## Textbook

The following texts are recommended:

1. *Introduction to Time Series and Forecasting*, 2nd edition, by P.J. Brockwell and R.A. Davis, Springer, 2002.
2. *Time Series: Theory and Methods*, 2nd edition, P.J. Brockwell and R.A. Davis, Springer, 1991.

## Grading

The graded components of the course are the following:

**Homework (30%):** There will be 4 or 5 assignments during the semester.

**Midterm Exam (35%):** This exam will take place on **Wednesday, March 6th**.

**Final project (35%):** Entails a 20-minute presentation to the class and the submission of a written report.

The thresholds 90%, 80%, 70%, and 60% will be used to determine the assignment of the letter grades A, B, C, D, and F, respectively.

## Honor Code

See the Carolinian Creed in the Carolina Community: Student Handbook Policy Guide. Violations of the USC Honor Code may result in a 0 for the work in question, and, in accordance with University policy, other punishments up to and including expulsion from the University.

## Accommodations

If you require special accommodations, they must be arranged in advance through the Office of Student Disability Services in room 112A LeConte (777-6142, TDD 777-6744, [sasds@mailbox.sc.edu](mailto:sasds@mailbox.sc.edu)).