

ST 495/590 – FALL 2016

Applied Time Series Analysis

Time and place: TTh 01:30-2:45pm, 01108 SAS Hall

Instructor: S.N.Lahiri, 5140 SAS Hall, (919) 515-1906
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Course TA: Lin Yu; lyu9@ncsu.edu

Course URL:

<http://www.stat.ncsu.edu/people/lahiri/courses/st590/>

Office hours: SNL: TTh 2:50-3:50pm
LY: TBA (in SAS 1101)

Prerequisite for course: ST 512. This course requires two semesters of statistical methods, normally ST 511-512. Students are expected to be familiar with basic statistical ideas such as parameter estimates, standard errors, confidence intervals, t-tests and F-tests, etc.

Text: *Time Series Analysis and Its Applications*, 3rd edition, by Robert H. Shumway and David S. Stoffer; Springer.

Home work: Homework sets will be assigned regularly - about one set (consisting of upto 6 problems) every two weeks. Students are expected to hand in solutions to all the problems. However, only a (randomly?) selected part of the assigned problems will be graded. Solutions to all problems will be provided.

Exams and the quiz: There will be one in-class and two take-home exams, and one in-class exam.

Dates for the exams & the quiz are:

- Exam 1: September 27, 2016 (Take Home),**
- Exam 2: November 02, 2016 (6-8pm; Location - TBA)**
- Quiz : December 01, 2016 (In class)**
- Exam 3: December 01, 2016 (Take Home).**

Make up policy: Make-up of missed exams will be allowed only for university approved reasons.

Grades: Your grade for this course will be determined based on your performance on homework assignments (10%), one quiz (15%) and three exams (25% each).

Syllabus/Content:

- Exploratory analysis of time series
- Time domain methods, such as ARIMA models
- Frequency domain methods (periodogram, spectrum,...) analysis, filtering, and transfer functions
- Transfer function modeling in the time domain
- Further topics, such as long memory and conditional heteroscedasticity models, and nonparametric time series methods, as time permits.

Student learning outcomes for the course: The student will

1. be capable of selecting, carrying out and interpreting appropriate statistical methods for describing and analysing time series data sets, in the context of their own research interests;
2. have an appreciation of a range of methods for analyzing time series data and their use and limitations in a research context;
3. be able to examine critically their own and other researchers' use of methods of analysis for time series data.

Academic Integrity:

1. NCSU has a policy on academic integrity, which you may find in the Code of Student Conduct (<http://policies.ncsu.edu/policy/pol-11-35-01>).
2. It is the understanding and expectation of the instructor that the student's signature on any test or examination means that the student neither gave nor received unauthorized aid.
3. As noted above, you are encouraged to work together to master the exercises assigned as homework. All tests and the final examination are submitted for a grade, and must be your own individual work.

Students with disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. http://www.ncsu.edu/provost/offices/affirm_action/dss/ . For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation(<http://policies.ncsu.edu/regulation/reg-02-20>- 01).