# STAT 5856 Time Series and Forecasting Methods
# Spring 2020

**Basic Course Information:**

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| **Instructor:** | Minjing Tao (tao@stat.fsu.edu) |
| **Office:** | LOV 316 |
| **Class Hours:** | TuTh 12:30PM – 1:45PM at OSB 110 |
| **Office Hours:** | TuTh 2:00PM – 3:00PM or by appointment |
| **Course website:** | Canvas (https://canvas.fsu.com/) |

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| **Teaching Assistant:** | Chenran Wang (cw16d@my.fsu.edu) |
| **Office:** | LOV 428 |
| **Office Hours:** | We 3:00PM – 4:00PM |

## Textbooks (all optional, for your reference):

1. Pankratz, A. (1991). Forecasting with Dynamic Regression Models. John Wiley and Sons.

2. Box, G.E., Jenkins, G.M., and Reinsel, G.C. (2008). Time Series Analysis, Forecasting and Control (Fourth Edition). John Wiley and Sons.

3. Tsay, R.S., (2010). Analysis of Financial Time Series (Third Edition). John Wiley and Sons.

Each topic will mainly focus on one textbook. See the topics below for details.

**Course Objectives:** This course discusses a class of linear time series models that include autoregressive (AR) models, moving-average (MA) models, ARIMA models, dynamic regression models, and ARCH/GARCH models, and a very brief introduction for spectral analysis. These models have been widely applied to data in many fields of social, biological and physical sciences. You will learn how to build time series models and how to apply the models to real world problems. **This course will use SAS as the computing environment (online version: SAS OnDemand for Academics).**

## Prerequisites:

STA2122, STA2171, QMB 3200 or equivalent. Knowledge of PC or the Unix System used by the university computing network. Familiarity with the basic ideas of statistics and probability, including sample mean, standard deviation, expected value, variance, independence, covariance, correlation, normal distribution and multiple regression.

## Topics Covered in the Course:

- ARIMA Models (including AR, MA, ARMA, and seasonal ARIMA models): model checking, identification, estimation and forecasting (Textbook: Box et al., 2008)
- Dynamic Regression Models, including Rational Distributed Lag Models and intervention analysis (Textbook: Pankratz, 1991)
- ARCH/GARCH Models (Textbook: Tsay, 2010)
- Spectral Analysis (very general and basic introduction)

## Grading Policy:

Weights toward the final course grade are:

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| Homework assignments and lecture performance | 40% |
| Midterm (March 10, Tuesday, in class) | 30% |
| Final Exam (April 28, Tuesday, 10:00AM – 12:00PM) | 30% |

The grade cutoffs will be 93% for A, 90% for A-, 87% for B+, 83% for B, 80% for B-, 77% for C+, 73% for C, 70% for C-, 67% for D+, 63% for D, and 60% for D-.

## Other Policies:

- **Classroom policies:** You are required to attend all classes, Missing three or more classes without a good excuse may fail the course or get an incomplete. In addition, please come to class on time.

- **Homework:** Homework problems will be assigned approximately every 2 to 3 weeks (about 5 assignments in total). Homework must be neatly written, preferably typed. You can discuss with other students, but each student must independently write his/her own solutions. **NO late homework.**

**University Attendance Policy:** Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

**Academic Honor Policy:** The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at http://fda.fsu.edu/Academics/Academic-Honor-Policy.)

**Americans With Disabilities Act:** Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

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Student Disability Resource Center
108 Student Services Building
Florida State University
874 Traditions Way, Tallahassee, FL 32306-4167
(850) 644-9566 (voice) or (850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/
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