

**The George Washington University
Department of Statistics**

**STAT 4181-10
Spring 2022**

Classes:	Mondays and Wednesdays
Meeting Time:	03:45 PM.- 05:00 PM
Classroom:	MON 250
Instructor:	Dr.Srinivasan Balaji
Office address:	Suite 767, Rome Hall
Telephone:	(202) 994-3383
Email:	balaji@gwu.edu
Office hours:	Mondays and Wednesdays 2:00 PM to 3:00 PM

Lectures

The semester will begin with online lectures and within a week or two we will begin with in-person lectures. It will be based on the discretion of the university. All classes will be recorded.

Text:

Time Series Analysis and Forecasting by D. C. Montgomery, C.L.Jennings, and . M.Kulahci, 2nd Edition, Wiley Series in Probability and Statistics, 2016.

Supplementary Texts:

Introductory Time Series with R by Paul Cowpertwait, and Andrew Metcalfe, Springer, 2009.

Forecasting, Time Series, and Regression by Bruce Bowerman, Richard O'Connell, and Anne Koehler, 4th Edition, Thomson Learning, 2005.

Course Description: The course would cover the following topics: Introduction and Statistical background for forecasting, Regression analysis, Time Series regression models, Exponential smoothing methods, Autoregressive processes, ARIMA models. AR(p), MA(q), ARMA(p,q) and White noise processes, Spectral analysis, ARCH and GARCH models. We will cover both theory and applications and also will use statistical packages such as R.

Prerequisites: Students are expected to have taken a first course in Statistics such as STAT 1051 or 1053 and also a course in regression such as STAT 2118.

Learning Outcomes

As a result of completing this course, students will be able to:

- 1. Formulate time series models,**
2. Build regression models with real life data,
3. Analyze time series data using R,
4. Have a working knowledge of ARIMA and related processes, autocovariance, autocorrelation and partial autocorrelation functions.

Testing and Exams

There will be a midterm exam and final exam for the class. Both are closed book exams. There will be graded homework assignments and quizzes throughout the course. There will also be a final project and a presentation towards the end of the course.

Grading Policy:

Midterm (20%)- Midterm Exam on Wednesday, March 9, 2022

Final (25%) – Final Exam during the final exam week

Quizzes – 15%

Homework Assignments - 25%

Final Project – 15%

Workload: It is expected that the student will spend about 5-6 hours a week studying and preparing for the class. This time may be evenly split between writing solutions to homework problems and reading in the textbook.

Class Policy: Late work: Will not be accepted. No make-up exams.

Blackboard: Communication will be through blackboard. IF new materials are posted in the blackboard, an email will be sent to students using blackboard.

University Policies

Academic Integrity: I support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one’s own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: <https://studentconduct.gwu.edu/code-academic-integrity>

Any case of the slightest hint of cheating will be prosecuted to the fullest extent of the university Academic Integrity Policy. You will receive an automatic F, and the case will be taken to the proper administrative channels.

Support for students outside the classroom:

DISABILITY SUPPORT SERVICES (DSS)

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to:

<http://gwired.gwu.edu/dss/>

UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300

The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:

- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals

See <https://healthcenter.gwu.edu/counseling-and-psychological-services>

Security: In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.