



STA 4853 (21818 in-person, section 1250)
Introduction to Time Series and Forecasting

STA 5856 (21819 in-person, section 1251)
Applied Time Series Methods

T 10:40 a.m. - 11:30 a.m. in TUR 2319
R 10:40 a.m. - 12:35 p.m. in AND 0134

Course Overview

Instructor: Dr. Thomas Ippolito

Office: Griffin Floyd 103B

E-mail: ippolito@ufl.edu

Office Hours: M 2:00 p.m. - 4:00 p.m. in Griffin Floyd 103B or by appointment

Teaching Assistant 1: Cheng Zeng

E-mail: czeng1@ufl.edu

Office Hours: W 10:00 a.m. - 12:00 p.m. in Griffin Floyd 218 or by appointment

Course Contents: Stationarity, autocorrelation, AR models, MA models, ARMA models, ARIMA models, SARIMA models; frequency domain methods and the spectral density; forecasting methods; and computationally-oriented application to case studies.

Objective of Course: To comprehend basic concepts of time series and autocorrelated responses, and learn how to build time series models and how to apply the models to real world problems.

Course Topics:

- Fundamental concepts of time series and autocorrelated responses.
- AR, MA, ARMA, ARIMA, and SARIMA Models.
- Forecasting.
- Model Identification.
- Parameter Estimation.
- Intervention Analysis.
- Unit Root Testing and Cointegration.
- ARCH and GARCH Models (time permitting).
- Spectral Domain (time permitting).
- State Space Models and the Kalman Filter (time permitting).

Prerequisite(s): STA 4210 Regression Analysis & STA 4321 Intro to Probability

Credit Hours: 3.

Required Text(s):

1. *Time Series Analysis and Its Applications With R Examples*, 4th Edition. Author(s): Robert H. Shumway, David S. Stoffer. ISBN: 978-3-319-52452-8

Optional Text(s):

1. *Time Series Analysis: Univariate and Multivariate Methods*, 2nd Edition (2005). Author(s): William W.S. Wei. ISBN: 0-321-32216-9

Course Website: [e-Learning](#)

Software: We will use [R](#), a free statistical computer language and the free-of-charge Desktop version of the [Rstudio](#) IDE.

Computational Requirements: Students will need to have frequent and reliable access to a computer capable of running R code. All computers supplied by UFIT Academic Technology classrooms and laboratories, including those at the university libraries, have R and RStudio installed and perform well enough to run any program of interest to this course without any trouble. However, because of data security policies, it's somewhat tedious (though possible) to efficiently manage an R installation on university computers. For these reasons, students with personal computers are encouraged to use them for programming tasks. Students who wish to use personal computers will likely have no trouble with the computational requirements necessary for R and RStudio. You will need the following to install R and RStudio:

- For Windows users, Windows 10 or later.
- For macOS users, macOS 10.13 (High Sierra) or later.
- Other hardware requirements (e.g. RAM, processor speed) will be satisfied if you meet the operating system requirements.

On Windows, R requires about 179 MB of space, and RStudio requires about 861 MB. Other operating systems are likely to have similar storage requirements. Additional storage will be needed for downloaded packages, datasets, and output that students produce. Students should have at least 5 GB of storage available once you have downloaded R and RStudio. Please contact the instructor if you have any concerns about the technology requirements of the course.

Course Communication:

- Use e-mail to contact the instructor regarding administrative matters. Please include **STA 4853** in the subject line.

Syllabus Changes: The instructor reserves the right to update any part of this syllabus as necessary. Students will be notified of any changes.

Course Policies

Demeanor

All members of the class are expected to follow rules of common courtesy in all classroom discussions, email messages, threaded discussion and chats.

Attendance

Attendance is expected and will be essential for performing well in the class. There is however, no attendance grade. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. For further information, refer to the [university attendance policies](#).

Every effort should be made to attend the exam on the specified exam dates. Makeup exams are warranted only under exceptional circumstances. Contact the instructor as soon as you realize you will be unable to take the exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is required for scheduling a makeup.

Assignments

- All **deadlines are at 11:59 pm** of the due/end date. These are *hard deadlines* meaning that any open or ongoing assignments will automatically be submitted at the deadline.
- Students are expected to work independently, unless otherwise specified in writing. **Offering and accepting** solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the UF Student Honor and Conduct Code**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor.
- Students are expected to **show and explain their work** where necessary.
- Acceptable document types for Canvas submissions are PDF.
- All electronically **submitted work must be as one merged file**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.
- Feedback will be provided within 7 business days from the assignment deadline.

Assignments: There will be five homework assignments. Homework assignments are to be turned in on Canvas as one file. Solutions must be legible and presented in the same order as given in the assignment. Students are expected to show ALL work for full credit. Please submit your assignments prior to the deadline and verify that the correct document was submitted on Canvas. There are no resubmissions after the deadline. Students are expected to work independently on homework assignments unless otherwise specified in writing by the instructor.

Exams: Exams will be held in-class during regular class times. See below for tentative exam dates. For the exams, you are allowed one A4 sheet (front and back) of notes and a scientific calculator or four-function calculator. Graphing calculators, TI-nspires, virtual calculators, or other

smart devices are NOT permitted. Appropriate tables will be provided, if necessary. You are not allowed to print your own tables. The one A4 sheet (front and back) of notes must be handwritten and written by the student. Students must turn in their note sheet along with their exam. Failing to turn in a note sheet or using or copying another student's note sheet is an academic integrity violation and will result in an automatic 25% deduction on the respective exam.

Exam Dates (tentative):

- Exam #1 ... February 13th, at 10:40 a.m. - 12:35 p.m.
- Exam #2 March 13th, at 10:40 a.m. - 12:35 p.m.
- Exam #3 April 24th, at 10:40 a.m. - 12:35 p.m.

Grade Corrections: If you believe there was a mistake made in the grading of your homework assignment or exam, please see the instructor within *one week* after the grade has been posted. Questions regarding homework assignments should be first sent to the TA who graded it. Grade negotiation is not appropriate.

Assignment Deadlines: All deadlines are at **11:59pm** of the due/end date. These are *hard deadlines* meaning that any open or ongoing assignments will automatically be submitted at the deadline. Sometimes students may be unable to complete their assignments due to extended hospitalization or illness, or some catastrophic event. In these cases the student must meet with the course instructor in person with all the appropriate documentation to discuss the situation. Each case will be reviewed individually.

Grading

Grade distribution:

Assignment	Tentative Chapters/Topics	Weight
Exam 1	1, 2, 3.1 - 3.3	20%
Exam 2	3.3 - 4.3	20%
Exam 3	4.4 - 5	20%
Homework		40%
Total		100%

Letter grade assignment

Grades will be based on the following scale:

Grade	Range
A	90 to 100
A-	87 to < 90
B+	83 to < 87
B	80 to < 83
B-	77 to < 80
C+	73 to < 77
C	70 to < 73
C-	67 to < 70
D+	63 to < 67
D	60 to < 63
D-	57 to < 60
E	< 57

To view the result of the letter grades to your GPA please visit the [UF Grade and Grading Policies](#).

Make-up

Requirements for assignments and other work in this course as well as policies regarding absences, religious holidays, illness and student athletes are consistent with [UF Attendance Policies](#).

Additional make-up policy requirements:

- Every effort should be made to complete the assignment during the open period. Only extreme situations will warrant an extension. Contact the instructor prior to the due date - as soon as you realize you will be unable to complete the assignment at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Extension dates need to be scheduled within a week from the assignment deadline. Student is responsible for scheduling.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request an extension. Please reference the most recent [Academic Calendar](#).

Addressing Issues

Technical difficulties

Please contact the UF Help desk via e-Learning “Help” tab or [UF IT Service Portal](#). Any requests for make-ups due to technical issues must be accompanied with appropriate documentation/proof including screenshots and communication with the help desk. You MUST contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Grievances/Commendations

Should you have any grievances or commendations with your experience in this course you can always address them

- to the instructor at ippolito@ufl.edu, or
- the [Department of Statistics](#).

For issues that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are referred to the [Office of the Ombuds](#).

UF and CLAS Policies

Dropping, Withdrawing and Incomplete

Dropping and Withdraw

For late course drops and course withdrawals check the [catalog](#).

Incomplete

An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit [CLAS incomplete grade policy and contract](#).

Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation. The instructor must be emailed the form at least 14 days before an exam for accommodations to be arranged.

U Matter, We Care

[U Matter, We Care](#) offers care related resources and programs focused on health, safety, and holistic well-being.

Academic Misconduct

Students are held accountable to the [UF Student Honor and Conduct Code](#).

Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>