STA 3100 (22871 in-person, section 4515)

Spring 2025

Programming With Data in R

MWF 3:00 p.m. - 3:50 p.m. in LIT 0237

Course Overview

Instructor: Andrew Glover

Office:	Griffin Floyd 103C
E-mail:	andrew.glover1@ufl.edu
Office Hours:	T: 2 - 3, R: 1 - 2, F: 1:45 - 2:45 (all p.m.) in Griffin Floyd 103C or by appointment
Phone Number:	352-392-1941 (Email and Canvas is the preferred method of contact)

Teaching Assistant 1: Minxuan Wu

E-mail:	wuminxuan@ufl.edu
Office Hours:	R, 2:30-4:30

Course Description: An introduction to statistical computing and programming with data. Topics include basic programming in R; data types and data structures in R; importing and cleaning data; specifying statistical models in R; statistical graphics; statistical simulation using pseudo-random numbers; reproducible research and the documentation of statistical analyses.

Course Goals and Objectives:

1. Import data into R and prepare the data for analysis.
2. Write functions in R making effective use of data structures and control structures.
3. Formulate statistical models in the R language.
4. Perform, document, and interpret common statistical analyses.
5. Carry out statistical/probabalistic simulations.
6. Determine statistical graphics appropriate for a statistical analysis and produce them using R.
7. Document and report the results of data analyses and simulations in a reproducible way.

Weekly Course Schedule: This is the tentative weekly class plan, before events where class has to be canceled (hurricanes and other extreme events). Occasionally, we will have in-class coding days instead of a lecture, roughly every two or three weeks.

Week	Topics
1	R Basics & Vectors
2	Probablity Distributions & Logical Operators
3	Matrices & Arrays
4	Lists, Data Frames, & Row and Column Operations
5	Dates and Times & Programing in R
6	Tidyverse Intro & The Pipe
7	Dplyr & Lubridate
8	More Dates & Stat Graphics
9	Importing and Exporting Data
10	Spring Break
11	More Importing and Exporting & Tidy Data
12	Stings & Regular Expressions
13	Using Regular Expressions, More strings, & Factors
14	Function timing, & Simulations
15	Regression Models in R

Prerequisite(s): STA 3032 (B-) or STA 2023 (B) or AP Statistics (4).

In addition, the course assumes no prior experience with R (nor any other programming language), and it assumes no knowledge of computer science concepts more broadly.

Credit Hours: 3.

Software: We will use `R`, a free statistical computer language and the free-of-charge Desktop version of the `Rstudio` IDE.

Materials and Supplies Fees: All student materials used in this course are free. The course will not use a textbook, instead following notes prepared by the instructor and other faculty. The course will also make heavy use of free software and online materials. The volume of how-to guides for all sorts of projects in R is quite extensive, and the course will sample many of these as is seen fit. Some of the most popular, streamlined, and thorough sources for learning R programming are listed below, but many other very good sources are available.

- r4ds: R for Data Science: Visualize, Model, Transform, Tidy, and Import Data
- r4ds2e: R for Data Science (2e): Import, Tidy, Transform, Visualize, and Model Data
- rp4ds: R Programming for Data Science
- hopr: Hands-On Programming with R : Write Your Own Functions and Simulations
- ggplot2: Elegant Graphics for Data Analysis (3e)
- advr: Advanced R (2nd Ed)

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 Website: e-Learning

Course Communication:

- Use e-mail to contact the instructor regarding administrative matters. Please include **STA 3100 (4515)** in the subject line.
- For questions regarding course content, please see the instructor or TAs during office hours.

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 at lectures will not be recorded nor graded. Lectures will usually involve both a slide presentation and demonstrations of code writing and execution. Students who have laptops are encouraged, though not required, to bring them to follow along with the code writing, so that they can take their own notes in their code files and experiment with the code beyond what is shown in lecture. The code files will be posted after lecture for students' reference, though they likely will be of limited help for students who did not attend the corresponding lecture. This course will also abide by the university attendance policies.

Assignments

Assignments: There will be 10 assignments. Each assignment will be worth 10% of the final grade. You are allowed to consult any online resources that you can find, and you may consult with other students for help with the homework. You may not, however, copy answers from other students, nor have them write any code for you at any point while completing assignments. Accordingly, all students will need to submit their own copy of each homework. If you have questions about the resources allowed for assignments, please direct them to the instructor.

- Students are expected to **show and explain work** where necessary. **Show your code**.
- All electronically **submitted work must include one compiled .pdf file**, which must contain all R code in a separate code appendix.
- Upload must also contain **a single R Markdown .rmd file** along with **any included supplementary files (.jpg, .png, etc.)** needed to compile the .pdf submission. Code and compiled files *must match*.
- In Canvas, all assignments automatically default to a grade of 0, until the teaching assistant inputs specific grades.
- Feedback will provided within 7 business days from the assignment deadline.
- The final output of your code must be included. Also, remember to avoid outputting results that take up multiple pages. For example, if X is a matrix or data frame with 1000 rows, directly outputting all of X is forbidden. Instead, use head(X, n = 50) or others to display the first 50 rows/items. (It is also required to limit the number of output columns if for example X has 1000 columns.)
- It is recommended to output some intermediate results to help earn procedure credits.
- The output should be next to your code in the knitted PDF file.
- The length of knitted PDF files should be approximately 10 pages and must not exceed 20 pages.
- Your answer needs to be organized with question numbers.
- Important: Penalties will be applied if the submission does not meet the requirements.

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. Assignments submitted one day late will be given a 50% penalty, and assignments submitted more than one day late will not be accepted. 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

In total, there will be 10 assignments. The corresponding weights are:

Assignment	Weight
Assignment 1	10%
Assignment 2	10%
Assignment 3	10%
Assignment 4	10%
Assignment 5	10%
Assignment 6	10%
Assignment 7	10%
Assignment 8	10%
Assignment 9	10%
Assignment 10	10%
Total	100%

Letter grade assignment

There will be *no rounding up* of scores.

Grade	Range
A	91 to 100
A-	87 to $<$ 91
B+	84 to $<$ 87
B	80 to $<$ 84
B-	77 to $<$ 80
C+	74 to $<$ 77
C	70 to $<$ 74
C-	67 to $<$ 70
D+	64 to $<$ 67
D	60 to $<$ 64
D-	55 to $<$ 60
E	$<$ 55

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.

- 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 andrew.glover1@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.

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/