STAT 471: Introduction to R Programming [Fall 2025]

Professor Cory Suzuki
Instructor

August 25, 2025

Class Meetings: Mondays and Wednesdays, 12:30PM-1:45PM in LA5-343
Office Hours: Mondays from 10AM-11:30AM and Tuesdays from 2PM-4PM in TBD

1 Prerequisites

STAT 381. No programming experience required, but it is helpful!

2 Course Description and Logistics

Traditional statistical methods and modern advances in Machine Learning benefit greatly from computational capabilities in the digital age. That in essence is the motivation for this course: an introduction to the R language and programming. You'll not only learn practical computing skills for academia, you'll also be learning the fundamental R knowledge used in the Data Science and Machine Learning forefront. This course will cover topics such as basic data types and operations, creating data visualizations, conducting Exploratory Data Analysis (EDA), creating simulations to realize statistical distributions, and Monte Carlo & Bootstrapping methods. If time permits during the course, I will also introduce a soft introduction to elementary time series analysis in R and go over a couple machine learning techniques. These are "special topics" that I personally believe will prepare you for your future coursework and career goals.

NOTE: I strongly recommend regular class attendance as I will be going over live coding demos and provide announcements and hints regarding class assignments and projects/exams. If there is an extraordinary circumstance beyond your control that affects your attendance, please note that the student is responsible for either attending my office hours/email me or catching up with a classmate.

3 Office Hours Policies

Office hours are a great way to clarify questions and get further help with course content. My weekly office hours in FO5-132 are as follows:

Mondays: 10AM-11:30AM
Tuesdays: 2PM-4PM

I will try to inform you all if I ever have to cancel/reschedule my weekly office hours in advance (this rarely occurs as I haven't ever had to cancel office hours, but it is a possibility. Take advantage of my office hours as that is the perfect opportunity for me to better supplement your learning!

4 Tentative Course Schedule: When will topics be taught?

There are no required texts, although we will use these texts as soft references:
- R for Data Science by Garett Grolemund and Hadley Wickham, O'Reilly Publishing
- Statistical Computing with R by M. L. Rizzo, Chapman and Hall/CRC

- Time Series Analysis and Its Applications With R Examples by Robert Shumway and David Stoffer
- Introduction to Statistical Learning with Applications in R by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani

I have provided a rough outline for the course schedule in the table below. This will allow you to get a better idea on what will be covered during every class. Please note that due to course pacing whether we speed up or slow down, we may not be able to go over exactly everything. In the table, homeworks and programming assignments are abbreviated as HW and PA respectively. You can expect PA's to be pretty short (1 or 2 questions/tasks) and homeworks will be a few questions (no more than 6 because that would be overkill). **HW's and PA's will be due Saturdays at 11:59PM.** The midterm exam will be administered into two parts; Part A will be a mix of multiple choice and free response questions that will test your R programming skills. Part B will be a take-home exam where you will be given a dataset to work with and will be asked to perform an EDA analysis and/or any additional general programming questions. Prior to the midterm, you'll be given a study guide to help you. Here are the topics for the semester:

Week	Topics	Due Assignments
Week 1	Syllabus, R and Rstudio Installation, and Basic Data Types and Operations	
Week 2	Loops and Writing Functions	PA1 Due
Week 3	Bisection and Newton-Raphson Algorithms	HW1 Due
Week 4	Importing Spreadsheet Data and Data Cleaning Techniques	
Week 5	Data Transformation and Manipulation	HW2 Due
Week 6	Data Visualization and EDA	PA2 Due
Week 7	Introductory SQL and Databases in R	HW3 Due
Week 8	Hypothesis Testing in R and Midterm Parts A/B Assigned	
Week 9	Simulations of the Normal and Poisson Distributions, CLT, and LLN	Midterm Part B Due
Week 10	Linear and Logistic Regression Analysis	HW4 Due
Week 11	Introduction to Natural Language Processing (NLP)	PA3 Due
Week 12	Bootstrap, Jacknife, and Cross Validation in ML and Final Project Assigned	HW5 Due
Week 13	Acceptance-Rejection Algorithm Sampling and MCMC Methods	PA4 Due
Week 14	Fall Break (No Classes)	HW6 Due
Week 15	Introduction to Time Series Analysis	Final Project Due
Week 16	Final Project Presentations and Class Closing	

Table 1: Class Components

5   Grading Policies and Late Work

This class will mainly consist of four short programming assignments, six homework assignments, a take-home midterm exam, and a final project instead of the traditional homework and exams format. Submissions should be put into the correct class Canvas folder. For any source codes you submit, please include (we'll cover this on day 1) your name and the question you're writing the code for in your source code (.R or .rmd) file(s). Failure to do so will result in your submission receiving deductions or no credit. For any problems that require by-hand mathematical computations, please show all your work! The following weights will be applied to each component of the class:

Component	Weight	Total Points Possible per Assignment
Homework Assignments (6)	30%	100
Programming Assignments (4)	20%	100
Midterm part A	15%	120
Midterm part B	15%	100
Final Project	20%	100

Table 2: Class Components

The class will also follow the traditional grading scale, however, if necessary I will curve the grading scale at the end of the semester provided that programming can be quite challenging to learn. From here on out until further notice, the current grading scale is:

Letter Grade	Range Cutoff	Curved Range Cutoff
A	90%-100%	85%-100%
B	80%-89%	70%-84%
C	70%-79%	55%-69%
D	60%-69%	40%-54%
F	0%-59%	0%-39%

Table 3: Class Grading Scale

Late work will be accepted, however a deduction of 50% per day late will be applied to the assignment or exam. After 2 days, the assignment will receive no credit.

6   Tips For Success

Let's be honest, college is full of new experiences, but I can reassure you that you'll have an enriching educational journey and that you'll meet a lot of great people. Here are some tips on class success to get you started:

1. Don't be afraid to ask questions! As a student in undergrad, I was always scared to ask questions because I thought I might ask something nonsensical. This isn't the case as I learned new things and it turns out other people had the exact same question! *In my class, there are no such things as dumb questions!*

2. Form small study groups! This one is pretty important, you learn a lot more about others' approaches to problem-solving and build strong connections.

3. Don't be discouraged about making mistakes! We all make mistakes and actually, this is how we learn!

7   University Withdrawal Policy

It is the student's responsibility to withdraw from classes. Instructors have no obligation to withdraw students who do not attend courses, and may choose not to do so. Withdrawal from a course may require the signature of the instructor and department chair, and is permissible only for serious and compelling reasons.

8   University Attendance Policy

Students may have a valid reason to miss a class. When any of the following reasons directly conflict with class meeting times, students are responsible for informing faculty members of the reason for the absence and for arranging to make up missed assignments, tests, quizzes, and class work in so far as this is possible. Excused absences include, but are not limited to:
1. Illness or injury to the student
2. Death, injury, or serious illness of an immediate family member or the like
3. Religious reasons (California Education Code section 89320)
4. Jury duty or government obligation
5. University sanctioned or approved activities (examples include: artistic performances, forensics presentations, participation in research conferences, intercollegiate athlete activities, student government, required class field trips, etc.)
Faculty members are not obligated to consider other absences as excused. Faculty members will ask for documentation as they deem appropriate for each excused absence.

9 Special Needs Statement

Students with disabilities who require reasonable academic accommodations are strongly encouraged to register withj the Bob Murphy Access Center (BMAC) each semester. Students must submit supporting disability documentation to BMAC and provide faculty of any BMAC verification of accommodations as early in the semester as possible. BMAC is located at the Student Success Center, Room 110 and can also be reached by phone at (562)-985-5401 or via email at bmac@csulb.edu.

10 Resources

Below are some on-campus resources that you can check out that might come in handy.

If you would like to request diagnosed disability accommodations for the class, feel free to consult with a Bob Murphy Access Center (BMAC) specialist and they will help you out. In addition, if you are already registered with BMAC, you may let me know so I can provide the appropriate accommodations granted by the American Disabilities Act (ADA).

ASI Beach Pantry is a sub-facility at the University Student Union that provides food staples and items for students in need. If you are facing any food insecurities, you may swing by the USU with your Beach ID and get the provisions you need.

CAPS is a free service provided at Brotman Hall that provides you the opportunity to connect with therapists in case you need someone to talk to. Like your instructors, CAPS is here to support you on your academic journey.