STAT400: Statistical Computing

Fall 2025

http://stat400-csu.github.io

Dr. Andee Kaplan
Lectures: TR 9:30am - 10:45am Military Science Building 115
Office Hours: Th 12:30pm - 2:30pm Statistics Building 208
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Course Objectives

Computationally intensive statistical methods are a key component to modern data analysis methods. After completing this course, a successful student will be able to use statistical software to implement both traditional and state-of-the-art methods in computational statistics as well as recognize situations where these methods are required.

Prerequisites

CS160 or CS163 or CS164 or (MATH151 and MATH153)
STAT 420 or concurrent enrollment.

Texts

Statistical Computing with R (2019), M. L. Rizzo

Optional reference: Computational Statistics (2013), G. Givens and J. Hoeting – Available online at CSU library

Computing

We will use RStudio (https://rstudio.com), R (https://r-project.org), GitHub (https://github.com), and ggplot2 (https://ggplot2.tidyverse.org). All software is free and open source.

Please install on your own computer or use class RStudio server (details to follow).

Classwork and Grading

All graded classwork must be fully **reproducible** by the instructor and TA. In other words, we need to be able to run your code and have it produce the product you turned in. If this is not the case, it will be reflected in the grading. A copy of your homework will need to be turned in to https://canvas.colostate.edu and the corresponding document used to generate your homework will need to exist on the class server for full credit.

Homework (40%) Homework will be assigned weekly. All homework assignments are due at **11:59pm on the due date.** Each homework assignment will receive equal weight in the final grade and the two lowest homework assignment grades will be dropped. Late work is not accepted except in rare cases (see Documented emergencies below).

Exam (30%) There will be one midterm exam on October 20, 2022 (subject to change).

Project (30%) There will be a final project that will consist of either

1. an analysis of real data using the computational tools learned in class, or
2. an implementation of a computational task beyond the scope of lecture and homework.

You will write a paper and give an in-class presentation. More details will be announced later.

Grades will be assigned according to the following intervals:

A	A-	B+	B	B-	C+	C	D	F
[100, 93]	(93, 90]	(90, 87]	(87, 83]	(83, 80]	(80, 77]	(77, 70]	(70, 60]	(60, 0]

Any homework or exam grading dispute must be submitted in writing to me within one week after the work is returned.

Extra credit Any extra credit will be announced in lecture only. If you miss lecture, you *may* miss chances for extra credit.

Policy Regarding Academic Honesty

Statisticians need to have high ethical standards. Thus, I expect each of you to hold high ethical standards and to act with academic integrity in this class. If you have questions about what integrity means, please feel free to ask me. Behavior that will not be tolerated

in this class includes turning in a copy of somebody else's homework or code as your own, copying from somebody's exam, or failure to cite sources.

This course adheres to the CSU Academic Integrity Policy as found on the Students' Responsibilities pages of the CSU General Catalog in the Student Conduct Code. Violations will result in zero points for the assignment as a minimum penalty. In addition, CSU policy requires instructors to report violations to CSU's Office of Conflict Resolution.

Policy Regarding use of LLMs

All assignments should be fully prepared by the student. Developing strong competencies in the skills associated with this course will prepare you for success in your degree pathway and, ultimately, a competitive career. Therefore, the use of LLMs (i.e., generative AI tools) to complete any aspect of assignments for this course are not permitted and will be treated as plagiarism. If you have questions about what constitutes a violation of this statement, please contact me.

Documented Emergencies

If you have a problem that will require you to miss an exam or homework due date, please discuss this with me in advance if possible. I can grant a rare exception when the reason relates to severe and unavoidable medical or personal emergency. Documentation will be required. Things that typically are not an emergency: vacation, family reunions, ordinary work commitments, job seeking, or other voluntary events. Please schedule these so that they do not conflict with your classes.

Support Services Available

CSU provides policies relevant to your courses and resources to help with various challenges you may encounter. Please see https://col.st/2FA2g for more details.

Disclaimer

I reserve the right to make amendments to the syllabus and the schedule throughout the semester. Any updates will be posted on the class website and announced via e-mail and in class.