

STAT400: Statistical Computing

Fall 2021

<http://stat400-csu.github.io>

Dr. Andee Kaplan

Lectures: TR 9:30am - 10:45am Natural Resources 108

Office Hours: TR 11:30am - 12:30pm Online via Zoom (see Canvas for link)

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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.

COVID-19

We will have live lectures with office hours on Zoom. I will record lectures to Canvas for those who need to miss class due to vaccination or illness (quality not guaranteed).

Important information for students: All students are expected and required to report any COVID-19 symptoms to the university immediately, as well as exposures or positive tests from a non-CSU testing location.

If you suspect you have symptoms, or if you know you have been exposed to a positive person or have tested positive for COVID, you are required to fill out the COVID Reporter (<https://covid.colostate.edu/reporter/>). If you know or believe you have been exposed, including living with someone known to be COVID positive, or are symptomatic, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you. If you do not have internet access to fill out the online COVID-19 Reporter, please call (970) 491-4600. You may also report concerns in your academic or living spaces regarding COVID exposures through the COVID Reporter. You will not be penalized in any way for reporting. When you complete the COVID Reporter for any reason, the CSU Public Health office is notified. Once notified, that office will contact you and, depending upon each situation, will conduct

contact tracing, initiate any necessary public health requirements and notify you if you need to take any steps.

For the latest information about the University's COVID resources and information, please visit the **CSU COVID-19 site**: <https://covid.colostate.edu/>.

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 RStudio Cloud (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 <https://rstudio.cloud> for full credit.

Homework (40%) Homework will be assigned weekly. All homework assignments are due at **4pm 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 21, 2021 (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.

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 COVID-19 Recovery Page](https://covidrecovery.colostate.edu) (<https://covidrecovery.colostate.edu>) On our road to recovery during these unprecedented times, Colorado State University is committed to the health of our students, faculty and staff, as well as to the health of our university and our ability to continue to empower our community through our land-grant mission of academics, research and outreach.

CSU Health Network Counseling Services A variety of services are offered (151 W. Lake St., Drop-in hours: Monday-Friday 9am-4pm). If you are having difficulty coping, are feeling depressed, or need other psychological assistance, please contact the counseling center.

CSU Disability Center Located in the TILT building. Students with both permanent and temporary limitations and health conditions (physical and mental health) are eligible for support. If you need specific accommodations in this class, please meet with me outside of class to discuss your needs as early in the class as possible.

CSU TILT The Institute for Learning and Teaching has programs to help students improve their study habits, reduce test anxiety, learn about academic integrity, and more.

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.