

Course Syllabus for Statistics 590: Statistical computing.

Instructor Information:

Instructor: Li Li

Email: llis@unm.edu

Online learning:

Lecture videos will be posted every weekend for the upcoming week.

ZOOM Office Hours: Monday and Wednesday 1pm-3pm. Please join the ZOOM meetings using <https://us02web.zoom.us/j/6722961897>

Material and overview:

- Textbook: Computational Statistics, Second Edition by Geof H. Givens and Jennifer A. Hoeting.
- Overview: Computational data analysis is an essential part of modern statistics. Competent statisticians must not just be able to run existing programs, but to understand the principles on which they work. They must also be able to read, modify, and write code, so that they can assemble the computational tools needed to solve their data analysis problems, rather than distorting problems to fit tools provided by others. This class gives an introduction to statistically-oriented programming using \mathbb{R} and presents frequently used methods related to optimization, integration, simulation, and smoothing. Due to COVID, consider reaching out to friends, faculty or family member you trust for help getting connected to the support that can help.
- Course topics:

Table 1: Course topics and an tentative schedule

Data structures, indexing, iteration, text manipulation, functions	Week 1
Plotting, reading in data, fitting models to data	Week 2
Tidyverse I and II	Week 3
Simulation, debugging and testing, sampling from distributions	Week 4
Relational databases and version control	Week 5
Optimization methods (chapter 2-3)	Week 6-8
Spring break	Week 9
EM algorithm (chapter 4)	Week 10
Bootstrap (chapter 9)	Week 11
Integration topics (chapter 5- 6)	Week 12-13
MCMC methods (chapter 7)	Week 14
Density smoothing (chapter 10)	Week 15

Assessments:

Approximately 7 labs (70%) and 3 quizzes (30%) will be assigned. The labs will be given by-weekly with lab guidelines. The quizzes will be given at about the end of February and March, and in early May. The instructions for the quizzes will be given later. Please upload lab reports and quizzes answers on UNM Learn.

Electronic communication:

I will occasionally send notices to the class through e-mail (to your unmc.edu account), so please check that account regularly.

Take care of yourself:

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, I strongly encourage you to seek support.

Academic misconduct:

On labs and quizzes, you are not allowed to copy and paste text or code from another student (if you copy text from some other sources, it must be cited).