

## STAT 540 Computing in Statistics

Fall 2025

Dr. Karl Gregory

**Class times:** 1:15 - 2:30 pm Tuesdays and Thursdays in LeConte College 103

**Office hours:** 3:00 - 4:00 pm Tuesdays and Wednesdays in LeConte College 216C

**Bulletin description:** An introduction to statistical packages such as R and SAS with special focus on data management and computing procedures such as Monte Carlo simulation.

**Prerequisites:** C or better in STAT 301, STAT 515, STAT 509, STAT 512, or equivalent.

**Textbook:** There is no required textbook. All course materials will be posted on the course website at [https://people.stat.sc.edu/gregorkb/STAT\\_540\\_fa\\_2025/STAT\\_540\\_fa\\_2025.html](https://people.stat.sc.edu/gregorkb/STAT_540_fa_2025/STAT_540_fa_2025.html)

**Topics covered:** We will focus on three programming languages used often by statisticians:

- **R (7 weeks):** Types of objects in R, reading data into R, handling messy data, date/time formats, basic statistics functions and arithmetic, merging data sets, making plots, functions related to probability distributions, user-defined functions, conditional programming with if/else-if statements, for loops, while loops, nested loops, applying functions to arrays, matrix operations, R packages, R package creation, summarizing code in markdown.
- **Python (3 weeks):** Running a Jupyter notebook, types of objects, reading in data sets, merging data sets, making plots, user-defined functions, conditional programming with if/else-if statements, for loops and while loops, using Python and R together.
- **SAS (3.5 weeks):** Reading in data sets, creating data sets, carrying out various data analyses. The DATA step and various PROC steps.

### Grading:

1. First midterm exam (Thursday, Oct 2nd): 25%
2. Second midterm exam (Thursday, Nov 6th): 25%
3. Final Exam (Thursday, Dec 11th, 12:30 pm): 25%
4. Six homework assignments and six in-class quizzes: 25%

On each homework and quiz, up to 3 percentage points towards the 25% given to homework and quizzes may be earned. However, no more than 25 total percentage points can be earned in this category. For example, suppose a student earns 2, 3, 3, 0, 2, 3, 3, 3, 2, 3, 0, and 2 points on the homework assignments and quizzes given during the semester, for a total of 26 percentage points. This student will be awarded 25% in the homework and quizzes category. This way, a student may miss a couple of quizzes or skip a couple of homework assignments without losing any points. There will be no opportunities for extra credit. Homework assignments may not be turned in late.

If the final exam grade is higher than either of the midterm exam grades, the final grade will be applied to the lower of the midterm exam grades. For example, if a student earns 20/25 and 13/25 on the first and second midterm exams, respectively, and 21/25 on the final exam, the student's second midterm exam score of 13/25 will be replaced with the final exam score, 21/25, so that the three scores will be 20/25, 21/25, and 21/25 in the calculation of the student's final grade.

The thresholds 90%, 87%, 80%, 77%, 70%, 67%, and 60% must be met to earn an A, B+, B, C+, C, D+, or D, respectively. Students not meeting the 60% threshold will receive an F.

**Statement on the use of AI:** Most of the assessments will be in-class, on paper, for the reason that the use of AI to complete homework assignments and projects has become so pervasive, so there will be little opportunity to depend on AI during this course. Homework assignments may not be completed using AI-generated code. I will check for this.

**Honor code:** See the Carolinian Creed in the Carolina Community: Student Handbook & Policy Guide. Violations of the USC Honor Code may result in a 0 for the work in question, and, in accordance with University policy, other punishments up to and including expulsion from the University.

**Accommodations:** If you require special accommodations they must be arranged in advance through the Office of Student Disability Services in Suite 102 of Close-Hipp, 803-777-6142, [\*\*SADRC@mailbox.sc.edu\*\*](mailto:SADRC@mailbox.sc.edu).