

STAT 515 fa 2023 Statistical Methods I

Time/place: 2:20 – 3:35 TR, Close-Hipp Building 364
Instructor: Karl Gregory
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Office hours: See [course website](#).

Bulletin description

Statistical Methods I. (3) (Prereq: a grade of C or higher in MATH 122 or MATH 141; or both MATH 111 or higher and any statistics class) Applications and principles of elementary probability, essential discrete and continuous probability distributions, sampling distributions, estimation, and hypothesis testing. Inference for means, variances, proportions, one-way ANOVA, simple linear regression, and contingency tables. Statistical packages such as SAS or R.

Purpose of the course

This course gives students from a variety of disciplines a rigorous introduction to statistical analysis with a view to preparing them for statistical practice in their own fields. This course is also the first statistics course taken by students beginning a statistics major, and it exposes them to many concepts and methods which they will study in greater depth in later courses.

Learning outcomes

By the end of the semester, students should be able to

- Use basic set theory, probability rules, and counting rules.
- Explain what a random variable is.
- Remember common discrete and continuous probability distributions and their properties.
- Explain the concept of a sampling distribution.
- Appreciate the Central Limit Theorem and understand what it is used for.
- Perform basic sample size calculations.
- Make confidence intervals for population means or proportions.
- Test for differences between the means and proportions of two populations.
- Formulate null and alternative hypotheses for statistical hypothesis testing.
- Explain what a p -value is and how to interpret it.
- Perform simple linear regression.

- Perform simple ANOVA.
- Test for an association between categorical variables.

No required textbook

Comprehensive course notes which I expect you to read and study can be found at the [course website](#).

Computing

The statistical software R will be used throughout the semester. No previous experience with R is needed. I recommend using R studio. Download the free version at [this link](#).

Grading

- Participation and attendance (10%): On about 8 days during the semester there will be an in-class data collection activity. If you do not participate you will get a zero for that day. I will not offer any make-ups for these, but will forgive up to two zeros.
- Homework (10%): About 8 assignments during the semester. I will drop the two lowest scores.
- Two midterm exams (25% each): In class on *Monday, Oct 16th* and *Monday, Nov 20th*.
- Final Exam (30%): On *Wednesday, Dec 13th, at 12:30 pm*.

If your final exam score is higher than the lower of your two in-semester exam scores, your final exam score will replace that in-semester exam score in the calculation of your course grade. The thresholds 90%, 87%, 80%, 77%, 70%, 67%, and 60% will be used to determine the assignment of the letter grades A, B+, B, C+, C, D+, and D, respectively. The grade of F will be assigned to those earning less than 60%.

To find important dates about withdrawal from the course etc., go to [this link](#).

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 Close-Hipp, Suite 102. (803-777-6142, SADRC@mailbox.sc.edu).