STS435: Introduction to Mathematical Statistics

Course Description, Spring 2025

Instructor
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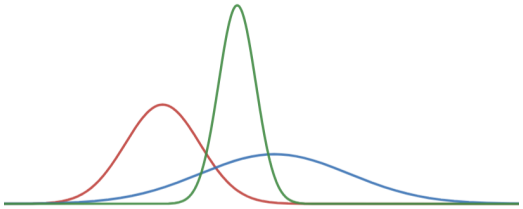


Class
MWF 11:00 PM - 11:50 PM, Neville 421

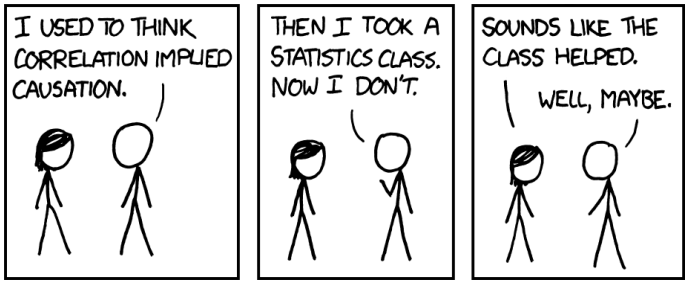
Course description
STS435 is an introduction to mathematical statistics. In this course, we will study statistical inference: the process of inferring properties about a population based on data. Here are some examples of questions that statistics can help us answer:

- How can we test if a new medication works by performing a trial on a small sample of the population?
- How can we use polls to form confidence intervals for the true proportion of a population that supports a particular policy?
- How can we predict the sale price of a house given parameters like its location, number of bedrooms, etc?

In this course, we will aim to understand both the theory and methods of statistics: We will use probability theory to build up the theory of why and how well statistical methods work. We will also learn how to use R (a programming language for statistical computing) to apply statistical methods to real-world data and interpret the results. Topics in this course include point and interval estimators, hypothesis testing, linear regression, analysis of variance, and other topics as time permits. This course culminates in a final project where you use what you have learned in the course to work with a data set of your choosing, form and test hypotheses, and report on your findings.

(Optional) Textbooks
- *Mathematical Statistics with Applications* by Wackerly, Mendenhall, and Scheaffer
- *Mathematical Statistics with Data Analysis* by John A. Rice

Prerequisites: A C or better in STS434 (Probability Theory)



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