STS 434: Probability Theory

Course Description, Fall 2023

Instructor
Jane Wang
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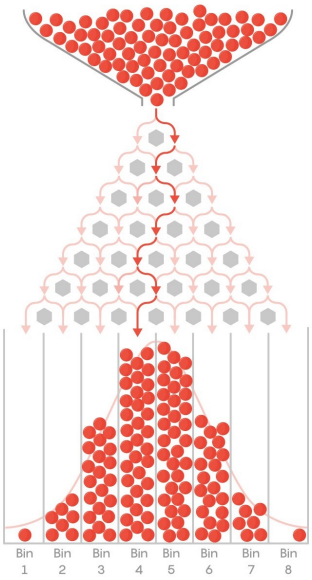
Class
MWF 1:00 PM - 1:50 PM in Neville Hall 421

Credits: 3

Prerequisites: C or better in MAT 228 (Calculus III)



(Optional) Textbooks

- *Introduction to Probability*
  by David F. Anderson, Timo Seppäläinen, and Benedek Valkó
- *Probability*, by Jim Pitman

Course description

Probability is the study of randomness and chance. It helps us model many day-to-day phenomena and also forms the theoretical foundation for statistics. In this course, we will build our intuition for probability, study common probability models, and apply the models to analyze and predict real-world situations.

Some examples of questions that we can answer with probability are:

- If we buy a lottery ticket, what are our expected winnings?
- How many people do we need to have in a room before it is more likely than not that two people share the same birthday?
- If there is some randomness to when buses arrive and you just missed the bus, how long do you expect to wait for the next bus?

To answer these questions and others, we will study topics such as counting techniques, discrete and continuous random variables, expected value and variance, independence and conditional probability, limit laws such as the central limit theorem, moment generating functions, and multivariate probability distributions.