Math 341   Probability and Statistical Inference   Summer 2021

Instructor   Dr. Amites Sarkar

Text   Probability and Statistical Inference (10th ed.)
                           Hogg and Tanis

Zoom meeting time   12–1:20pm Mondays, Tuesdays, Wednesdays and Thursdays
                           I will also post class recordings on Canvas.

Syllabus

I will cover the following topics: basic probability; enumeration; conditional probability; independence; Bayes's theorem; discrete random variables; expectation, mean and variance; Bernoulli trials; the Poisson distribution; continuous random variables; the uniform, exponential and normal distributions; the central limit theorem; confidence intervals for means and proportions; sample size; hypothesis testing.

Overview

Probability deals with uncertainty: uncertainty about the future, and sometimes the past and present too. Statistics deals with the collection and analysis of data. Given this, it may seem surprising that the foundation for modern statistics is probability theory. Part of the explanation lies in the fact that a set of data (e.g. on nutrition and life expectancy) is said to show a *statistically significant* effect if such an effect is **unlikely** to be the result of pure **chance**. Probability theory is required in order to make sense of the words "unlikely" and "chance" in the previous sentence.

This course is designed to help you learn intermediate college-level probability theory and statistical inference, and to develop your problem solving skills in the fields of probability and statistics.

Grading

There will be no exams. Instead, there will be five homework assignments, each worth 20% of the total grade. These must be submitted through Canvas, and they will all be due on Fridays: 2, 9, 16, 23, 30 July.

Office hours

My office hours are 1:30–2pm on Mondays, Tuesdays, Wednesdays and Thursdays. These will occur using Zoom. My e-mail is amites.sarkar@wwu.edu

Relation to overall program goals

Among other things, this course will

i) enhance your problem-solving skills;

ii) help you recognize that a problem can have different useful representations (graphical, numerical, or symbolic);

iii) increase your appreciation of the role of mathematics in the sciences and the real world.