

STATISTICS 2; INTERMEDIATE STATISTICS

SPRING 2026

FACULTY: AL JOSEPHY ajosephy@comcast.net

TUESDAY EVENINGS, 6-9 P.M.

LABS WEDNESDAY EVENINGS (WEEKS 3, 5, 7 AND 9) 6-9 PM

CLASS DESCRIPTION: In this class we will explore the concepts of Inferential Statistics. This class assumes that the student has a prior background in the study of Descriptive Statistics, and is comfortable with concepts like mean, median, standard deviation, can calculate standard scores, variances and has been introduced to confidence intervals. In addition the student should be familiar with the basic concepts of correlation and regression. (We will cover these concepts early on to refresh the student who hasn't done this work in a few years.) The class will provide a comprehensive introduction to the use of Statistics in testing means and proportions of data and making inferences about research claims.

The goals of the class will be to 1) introduce the student to the language and concepts of Inferential Statistics, 2) help the student to become comfortable with estimating, sample distributions and the idea of statistical significance 3) demonstrate the importance of sampling and surveys and in understanding the data generated by these surveys and 4) help the student to learn how to use significance testing to derive meaningful results from data.

We will achieve these class goals through the following:

1. We will review the basics of Probability Distributions and the Standard Normal Distribution
2. We will introduce Inferential Statistics and consider the implications of Inferential Statistics in sampling from populations
3. We will discuss estimating parameters and hypothesis testing
4. We will look at various distributions beyond the Standard Normal Distribution, including Student t, chi square and the F distribution
5. We will consider Anova, and Regression and relationships and two-way tables, a method widely used in the natural sciences

In addition to work from the textbook (Elementary Statistics; Mario Triola; thirteenth edition) including weekly homework assignments, the class will include 4 computer labs using commonly used software to solve statistical problems. The student will be asked to supplement this work with a short presentation from a research journal of the student's choice.

INTERMEDIATE STATISTICS

TOPIC SCHEDULE

- WEEK 1:** INTRODUCTION TO INFERENTIAL STATISTICS:
PROBABILITY DISTRIBUTIONS
- WEEK 2:** ESTIMATING POPULATION PARAMETERS
EXCEL WORKSHOP: PROBABILITY DISTRIBUTIONS
- WEEK 3:** HYPOTHESIS TESTING AND DECISION MATRICES
TYPE I AND TYPE II ERRORS
- WEEK 4:** INFERENCE FROM TWO SAMPLES
EXCEL WORKSHOP: INFERENCE
- WEEK 5:** REGRESSION
- WEEK 6:** MULTINOMIAL EXPERIMENTS AND CONTINGENCY TABLES
EXCEL WORKSHOP: MULTIPLE REGRESSION
- WEEK 7:** ANALYSIS OF VARIANCE (ANOVA)
- WEEK 8:** MORE ANOVA
EXCEL WORKSHOP: ANALYSIS OF VARIANCE
- WEEK 9:** NON-PARAMETRIC STATISTICS
- WEEK 10:** WRAP-UP