

Strath Haven High School Syllabus

Course Title Statistics Course # 3712 Grades 11-12

Level College Preparatory

I. Course Description/Overview

This course is a practical hands-on approach to the study of statistics and probability. The topics include the use of graphs such as histograms, stem plots, time plots, and scatter plots to display data, using numbers such as median, mean, and standard deviation to describe data, and evaluating data distribution. Students examine relationships using correlations and least square regressions. They calculate the probability of simple and compound events. They learn to estimate with confidence as well as to explore tests of significance, and to evaluate the validity of statistics contained within published reports.

II. Course Objectives

Explore data, observe patterns and departures from patterns
Plan studies, deciding what and how to measure
Anticipate patterns in advance, producing models using probability and simulation
Utilize statistical inference to confirm models.
Formulate and defend reasoned positions after analyzing data
Apply statistical tools to explore topics relevant to SHHS students

III. Course Content

A. Examining Univariate Distributions

1. Key Concepts/Skills

Display distributions with graphs (dotplots, stemplots, histograms, boxplots)
Describe distributions with numbers (mean, median, quartiles, standard deviation)
Compare distributions of data (back-to-back stemplots, parallel dot plots)
Compare and contrast normal and skewed distributions

2. Resources

Graphing calculators (TI-83 preferred), computers, video series *Against All Odds*, text *The Basic Practice of Statistics* by David S. Moore (W.H. Freeman & Co.)

B. Examining Relationships in Bivariate Data

1. Key Concepts/Skills

Display relationships with scatterplots
Identify possible linear patterns through correlation
Predict relationships with the least square regression line
Describe variations in relationships (residual plots, outliers, influential points)
Predict relationships that are non-linear
Explore relations in categorical data (two-way tables)

2. Resources (See A-2)

C. Producing Data

1. **Key Concepts/Skills**
 - Explore observational study techniques (census, survey, random sampling)
 - Explore experimental techniques (blocking, control groups, double blind studies)
 - Differentiate between association and causation
2. **Resources (See A-2)**

D. Sampling Distributions and Probability

1. **Key Concepts/Skills**
 - Differentiate between independent and dependent events
 - Explore simple and compound probabilities
 - Understand the concept of sampling distributions
 - Explore probability distributions
 - Utilize the binomial distribution to explore two outcome events
 - Explore sampling distributions of sample proportions and sample means
 - Utilize control charts to evaluate data
2. **Resources (See A-2)**

E. Introduction to Inference

1. **Key Concepts/Skills**
 - Formulate confidence intervals
 - Apply tests of significance
2. **Resources (See A-2)**

F. Applying Inference to Problems with Categorical Variables (if time permits)

1. **Key Concepts/Skills**
 - Understand the chi-square distribution
 - Construct and analyze two way tables
 - Apply the chi-square test as a test of significance
2. **Resources (See A-2)**

IV. Types of Student Assessments and Evaluations

Quizzes, tests, homework assignments, projects, classroom performance and preparedness

V. Grading Policy

The final grade for this course is determined by the accumulation of grades from the two marking periods and the final examination. Each of the two marking periods is valued at 40% and the final examination accounts for the remaining 20% of the yearly grade. Marking period grades are based on a point system. Averages are calculated by dividing the total points earned by the student by the total number of possible points. The school scale is used to determine grades: A(90-100%), B(80-89%), C(70-79%), D(60-69%),F (below 60%).

VI. Homework

Homework is given regularly. Most assignments are due the next day, but there are also long term assignments given.

All members of the school community are expected to be respectful of each other. Negative comments about anyone's race, nationality, religion, physical appearance or ability, intellectual capabilities, gender identity, sexual orientation, work ethic, or character are unacceptable and will not be tolerated. Students are encouraged to discuss any concerns with any adult in the building.