

**MEDFORD HIGH SCHOOL
COURSE SYLLABUS**

Department:	Mathematics
Course Title:	Statistics Through Application
Level and/or Grade:	Standard; Grades 10-12
Prerequisite:	A passing grade in Algebra 2 and teacher recommendation

Course Description:

This course is offered as an alternative to Pre Calculus. It provides students with an introduction to important topics in statistics by focusing on the statistical thinking behind data collection and analysis. It helps students be more discerning consumers of statistics, teaching them to interpret the numbers in surveys, election polls, and medical studies. Topics include sampling, surveys, experimental design, organizing data, distributions, probability, and inference.

Additional references for students in and teachers of this course are available at www.whfreeman.com/sta (e.g. data sets for input into graphing calculators, self-tests, interactive applets).

Learning Standards: *Through communication, representation, reasoning, making connections, and problem solving, students will be able to...*

Number Sense & Operations:

- Apply computation of whole numbers, fractions, decimals, percents, integers, and exponents when working with or analyzing data; determine reasonableness of numbers in data.

Patterns, Relations & Algebra:

- Apply concepts of scatterplots and correlation; interpret scatterplots.
- Approximate a line of best fit given a set of data; use technology when appropriate.

Geometry:

- Apply geometric concepts and skills to statistical studies.

Measurement:

- Apply and analyze the use of appropriate measurement ideas, units, and tools to statistical studies; consider object to be measured, a well-defined property of the object, and a measuring instrument that assigns numbers to represent the property.

Data Analysis, Statistics & Probability:

- Collect, organize, classify, represent, and interpret data using a variety of representations.
- Select an appropriate graphical representation for a set of data and use appropriate statistics to communicate information about the data; use these notions to compare different sets of data.
- Understand and apply various methods for producing data such as sample surveys, observation studies, and experiments; distinguish between observational and experimental studies.

- Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.; describe the characteristics and limitations of a data sample; identify different ways of selecting a sample (e.g. convenience sampling, responses to a survey, random sampling).
- Design surveys and apply random sampling techniques to avoid bias in the data collection.
- Apply uniform, normal, and binomial distribution to the solution of problems; describe a set of frequency data by spread, skewness, symmetry, or other characteristics.
- Compare results of simulations with predicted probabilities.
- Use tree diagrams, tables, organized lists, basic combinatorics, and area models to compute probabilities and to solve problems.

Exploratory Concepts & Skills:

- Apply regression results and curve fitting to make predictions from data.

Course Alignment with High School Expectations for Student Learning:

Students will...

1. Analyze, interpret, evaluate and use logical reasoning to solve problems using a variety of resources and strategies.
 - Build new mathematical knowledge through problem solving.
 - Adapt and apply a variety of appropriate strategies to solve problems; reflect on the process of mathematical problem solving.
 - Monitor and reflect on the process of mathematical problems solving.
 - Make and investigate mathematical conjectures.
 - Solve problems that arise in mathematics and other contexts; use connections among mathematical ideas.
2. Communicate effectively to a variety of audiences.
 - Communicate mathematical thinking coherently and clearly to peers, teachers, and others - orally and through written work.
 - Use the language of mathematics to express ideas precisely.
3. Create works using a variety of communication forms.
 - Present arguments through writing; solve problems through projects, homework, tests, and quizzes; use technology; make oral presentations.
4. Develop skills and knowledge to reach personal and career goals.
 - Develop ‘habits of mind’: work beyond center of competence; gain attitude of persistence; seek feedback; develop confidence.
5. Work cooperatively to achieve objectives.
 - Work in pairs, small groups, and part of the whole class to solve problems.
 - Analyze and evaluate the mathematical thinking and strategies of others.

Assessment:

- See attached grading policy.

