Probability and Statistics- HS/ One Part

COURSE DESCRIPTION: Students learn counting methods, probability, descriptive statistics, graphs of data, the normal curve, statistical inference, and linear regression. Proficiency is measured through frequent online and offline assessments, as well as asynchronous discussions. Problem-solving activities provide an opportunity for students to demonstrate their skills in real-world situations.

COURSE OBJECTIVES:

PREREQUISITES: Three years of high school mathematics.

COURSE LENGTH: One Semester

REQUIRED TEXT: Probability and Statistics: Reference Guide and Problem Sets

MATERIALS LIST: No required materials for this course.

COURSE OUTLINE:

Unit 1: Representing Data Graphically

- Course Introduction
- Introduction: Representing Data Graphically
- Data and Variables
- Graphs of Categorical Data
- Two-Way Tables
- Line Plots
- Frequency Tables
- Histograms
- Stem-and-Leaf Plots
- Time Series Plots

Unit 2: Representing Data Numerically

- Introduction: Representing Data Numerically
- Measures of Center
- Box Plots

- Determining Quartiles
- Outliers
- Comparing Data Sets
- Measuring Spread
- Transforming Data Sets

Unit 3. Counting and Probability

- Introduction: Counting and Probability
- Counting Methods
- Permutations
- Combinations
- Basic Probability
- Geometric Probability
- Mutually Exclusive Events
- Overlapping Events
- Independent and Dependent Events
- Experimental Probability

Unit 4. Random Variables and Distributions

- Introduction: Random Variables and Distributions
- Creating Probability Distributions
- Interpreting Probability Distributions
- Expected Value
- Binomial Distributions
- Continuous Random Variables
- The Normal Distribution
- Standardizing Data
- Comparing Scores
- The Standard Normal Curve
- **Finding Standard Scores**

Unit 5. Sampling

- Introduction: Sampling
- Sample and Population

- Bias in Sampling
- Reducing Bias
- Statistics and Parameters
- Interval Estimates

Unit 6. Statistical Inference

- Introduction: Statistical Inference
- The Central Limit Theorem
- Estimating Means
- Mean Differences
- Estimating Proportions
- Proportion Differences

Unit 7. Relationships between Variables

- Introduction: Relationships Between Variables
- Scatter Plots
- Association
- The Correlation Coefficient
- Fitting a Line to Data
- Least Squares Regression
- Regression Analysis
- Cautions in Statistics

Unit 8: Semester Review and Test

- Semester Review
- Semester Test