MATH-0812: SPECIAL TOPICS IN PRESTATISTICS

Cuyahoga Community College

Viewing: MATH-0812 : Special Topics in Prestatistics

Academic Term:

Fall 2020

Subject Code

MATH - Mathematics

Course Number:

0812

Title:

Special Topics in Prestatistics

Catalog Description:

This course introduces the fundamental algebraic topics necessary to complete a college-level statistics course. Topics include operations with rational numbers, sets of numbers, order of operations, operations with real numbers, solving linear equations, introduction to problem-solving, graphing equations, simplifying exponential expressions, function notation and radical and exponential functions.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

MATH-0910 Basic Arithmetic and Pre-Algebra, or sufficient score on math placement test, or departmental approval.

Outcomes

Course Outcome(s):

Compute and translate algebraic expressions used in statistics.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Differentiate between an expression and an equation.
2. Define a variable and write an expression.
3. Translate a written expression into an algebraic expression.
4. Translate 'at least" and "at most" into algebraic inequalities.
5. Identify strict, inclusive, and compound inequalities.
6. Simplify an expression using the order of operations.
7. Use order of operations in applications.
8. Evaluate expressions.

Course Outcome(s):

Construct, solve, and graph linear equations and inequalities in one variable.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Solve linear equations, in one or more steps, using the Addition, Subtraction, Multiplication and Division Properties.
2. Solve linear equations involving fractions and decimals.
3. Use linear equations to solve applications including direct and inverse variation.
4. Graph linear inequalities on the number line.
5. Translate an interval from inequality to interval notation to plus/minus notation.
6. Convert from plus/minus notation to inequality notation.
7. Solve literal equations used in statistics.
8. Solve compound linear inequalities.
9. Solve absolute value equations and inequalities in one variable.

Course Outcome(s):

Use the Cartesian coordinate system and linear equations in two variables to solve applications related to statistics.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Read and graph ordered pairs on the rectangular coordinate system.
2. Read and graph ordered pairs on on a scatter plot.
3. Use scatterplots in applications.
4. Identify independent and dependent variable values.
5. Read and interpret graphs and use a graph to compute percentage error.
6. Interpret graphs in applications.
7. Identify and graph linear equations in two variables including horizontal and vertical lines.
8. Write a linear equation in slope/intercept statistical form.
9. Compute the slope of a line given two points.
10. Describe the slopes of vertical and horizontal lines.
11. Interpret the average rate of change, including marginal change, in applications.
12. Convert an equation from point-slope form into slope-intercept form.
13. Use the point-slope form of a line in applications.

Course Outcome(s):

Learn notation and beginning counting methods using select topics in Set Theory.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Write sets using the listing method.
2. Write sets using the set selector method.
3. List the possible subsets of a given set.
4. Determine the intersection, union and complement of sets.
5. Determine the cardinality of a given set.
6. Classify sets as disjoint or not disjoint.
7. Determine the cardinality the intersection, union and complement of sets.

Course Outcome(s):

Write and compute summations of sets of data.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Summarize a given sum of values using summation notation.

2. Compute and compare the sum of squares and the square of a sum for a given set of values,

3. Compute and compare the sum of the products and the product of sums for given sets of values.

4. Define and compute a partial sum.

5. Use a table to find various sums.

Methods of Evaluation:

Homework

Quizzes

Worksheets

Exams

Final Exam

Course Content Outline:

1. Algebraic Expressions used in Statistics

A. Translating English into Algebra

B. Order of Operations and Evaluating Numerical Expressions

C. Simplifying Algebraic Expressions

2. Equations, Inequalities and Problem Solving Techniques

A. Solving Linear Equations

B. Inequalities and Interval Notation

C. Solving Absolute Value Equations and Inequalities

D. Solving Literal Equations

3. Graphing Linear Equations in Two Variables

A. Properties of Rectangular Coordinate System

B. Interpretation of Graphs

C. Graphing Linear Equations

D. Computing Slope and Average Rate of Change
E. Equations of Lines

4. Sets, Cardinality and Counting

A. Sets and Set Operations

B. Cardinality of Sets

5. Functions and Area Under Functions

A. Introduction to Functions

B. Writing and Computing Sums

Resources

Davis, D., Armtsrong, B., McCraith, M. *Prestatitics*. 1st. Boston: Cengage, 2019.

Agut, C., Agut, I. (2016) *Prestatistics*, Kona.

Illowsky, B., Dean, S. (2019) (Dec 2, 2019) *Statistics*, OpenStax.

Desmos. (2019) *User Guide*, Desmos. http://s3.amazonaws.com/desmos/Desmos_User_Guide.pdf

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Resources Other

1. Software: Desmos (desmos.com)

2. Software: Excel (microsoft.com)

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