

MATH-0940: ESSENTIAL SKILLS FOR CONTEMPORARY MATHEMATICS

Cuyahoga Community College

Viewing: MATH-0940 : Essential Skills for Contemporary Mathematics

Board of Trustees:

January 2022

Academic Term:

Fall 2022

Subject Code

MATH - Mathematics

Course Number:

0940

Title:

Essential Skills for Contemporary Mathematics

Catalog Description:

This course introduces the fundamental topics necessary to complete our Contemporary Mathematics course. It is a mixture of the developmental topics that are essential to build the mathematical foundation while also strengthening the topics learned in the college-level class. This course must be taken concurrently with Math 1240.

Credit Hour(s):

3

Lecture Hour(s):

3

Lab Hour(s):

0

Other Hour(s):

0

Requisites

Prerequisite and Corequisite

MATH-0910 Basic Arithmetic and Pre-Algebra, or appropriate score on Math Placement Test; and concurrent enrollment in MATH-1240 Contemporary Mathematics.

Outcomes

Course Outcome(s):

Use and practice the foundational and theoretical skills required for topics in graph theory.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

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. Define vocabulary related to graph theory.
2. Recognize even versus odd numbers.
3. Analyze graphs and maps to reveal prior knowledge about graphing theory including trees.
4. Model a graph from everyday life like running errands or mapping.
5. Create continuous graphs that connect dots without retracing previous steps.

6. Explore possible paths between various hypothetical locations on a map.
7. Calculate factorial.
8. Create a tree from everyday life such as a reporting structure or a family tree.

Course Outcome(s):

Use and practice the foundational and theoretical skills required for correctly applying financial formulas.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

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. Round decimals.
2. Simplify expressions using the order of operations.
3. Read a table to extract information.
4. Use the definition of a percent to write percent.
5. Given a percent, fraction, or decimal, write it in the other two formats.
6. Use a calculator to evaluate formulas.
7. Solve for a variable in a formula and equation.
8. Learn and implement strategies for solving word problems.

Course Outcome(s):

Use and practice the foundational and theoretical skills required for computing probabilities.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

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. Perform fraction operations such as simplifying, adding, subtracting, multiplying, and dividing.
2. Convert between fraction, decimal, and percent.
3. Utilize word problem strategies.
4. Identify common items related to probability including a standard deck of card, dice, coins, and odd/even/prime numbers.
5. Explore Venn Diagrams including overlapping, disjoint, and complementary sets.
6. Accurately round numbers.
7. Analyze probabilities by comparing results (e.g., "Which is more likely...?").
8. Compute factorials.
9. Practice creating tree diagrams.
10. Use a calculator to compute factorial (!), nPr , nCr , and fraction operations.
11. Determine if the words "and" and "or" are implied in a problem.
12. Practice writing inequalities with "at least", "at most", "greater than", "less than", and "between".
13. Review solving linear equations.
14. Review reading a table to extract data.

Course Outcome(s):

Use and practice the foundational and theoretical skills needed to convert between different systems of measurement.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

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. Define a unit fraction.
2. Demonstrate an understanding of ratios and proportions.
3. Solve one-step equations.
4. Reduce and cancel fractions.
5. Arrange, from smallest to largest, quantities that do not involve conversions.
6. Differentiate between accuracy and precision in terms of rounding.
7. Evaluate associated geometry formulas related to area and volume.
8. Identify if a measurement is that of length, area, or volume, and English or Metric.
9. Analyze order of operations related to temperature formulas.
10. Identify which formula to use in temperature conversions.

Course Outcome(s):

Use and practice the foundational and theoretical skills needed to organize, compute, and interpret numerical data.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

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. Analyze data to reveal prior knowledge of measures of central tendency and position.
2. Use a calculator to compute descriptive statistics.
3. Evaluate and round square roots.
4. Use order of operations.
5. Calculate sums using summation notation.

Methods of Evaluation:

1. Worksheets
2. Class Participation
3. Observation
4. Homework
5. Quizzes
6. Projects
7. Self-evaluations/Essay
8. In-class collaborative work

Course Content Outline:

1. Graph Theory
 - a. Graphs, paths, and circuits
 - b. The Königsberg bridge problem
 - c. Euler paths and Euler circuits
 - d. Hamilton paths and Hamilton circuits
 - e. Traveling salesman problems
 - f. Brute force method
 - g. Nearest neighbor method
 - h. Trees, spanning trees, and minimum-cost spanning trees
2. Financial Literacy
 - a. Percents, decimals, and fractions
 - b. Percent increase, percent decrease, and percent markup and markdown
 - c. Simple interest
 - d. Compound interest
 - e. Present value

- f. Fixed and open-ended installment loans
 - g. Mortgages
 - h. Annuities, sinking funds, and retirement investments
 - i. Finance charges using the average daily balance
3. Probability
- a. Empirical probability and theoretical probability
 - b. Compound probability, conditional probability, and binomial probability
 - c. Odds against an event and odds in favor of an event
 - d. Expected value
 - e. Tree diagrams
 - f. Mutually exclusive events and independent events
 - g. The counting principle, permutations, and combinations
 - h. Probabilities involving counting methods
4. Measurement
- a. The advantage of using the metric system versus the U.S. system
 - b. The basic units used in the metric and U.S. systems
 - c. Conversions within both the U.S. and metric systems
 - d. Determining length, area, volume, mass, and temperature in the U.S. and metric systems
 - e. Dimensional analysis and converting to and from the metric system
5. Statistics
- a. Sampling techniques
 - b. Misuses of statistics
 - c. Frequency distributions
 - d. Histograms, frequency polygons, stem-and-leaf displays
 - e. Mode, median, mean, and midrange
 - f. Percentiles and quartiles
 - g. Range and standard deviation
 - h. Z-scores and normal distribution
 - i. Correlations and linear regression

Resources

Maracek, Lynn, MaryAnne Anthony-Smith, and Andrea Honeycutt Mathis. *Prealgebra*. 2nd ed. Openstax, 2020. <https://openstax.org/details/books/prealgebra-2e>

Van Dyk, Evan. *Mathematics of Finance*. 1st ed. BCcampus, 2020.

Illowsky, Barbara and Susan Dean. *Statistics*. 1st ed. Openstax, 2021. <https://openstax.org/details/books/introductory-business-statistics>

Lumen Learning. *Mathematics for Liberal Arts*. Lumen Learning, 2019. 1st ed.

Resources Other

Basic Kitchen and Food Service Management. 1st ed. BC Cook Articulation Committee, 2015.

Lumen Learning. *Mathematics for Liberal Arts*. 1st ed. Lumen Learning, 2019.

Desmos Software. <https://www.desmos.com>

Top of page

Key: 5051