MTH 212 : FUNDAMENTALS OF ELEMENTARY MATHEMATICS II

Transcript title

Fund of Elementary Math II

Credits

4

Grade mode

Standard letter grades

Contact hours total

40

Lecture hours

40

Recommended preparation

MTH 211.

Description

Covers decimals, percents, ratio and proportion, integers, rational and real numbers, and statistics and probability. Second term of a sequence for students planning to become elementary teachers but open to any student wanting to study the foundations of mathematics.

Learning outcomes

1. Use a variety of problem-solving techniques to analyze and solve problems from a variety of disciplines.
2. Use linear, quadratic, and cubic equations and graphs to analyze mathematical models.
3. Explain relationships which exist between the fraction and decimal forms of rational numbers and between the decimal forms of rational and irrational numbers.
4. Create and interpret various types of statistical graphs.
5. Organize and interpret a variety of data sets using measures of central tendency and dispersion.
6. Use counting techniques to analyze mathematical problems involving real-world situations.
7. Use a variety of probability tools to analyze mathematical problems involving real-world probability situations.
8. Use the language and practices described in the Standards of Mathematical Practices (Common Core State Standards).

Content outline

Problem Solving
• Students will use a variety of problem–solving techniques to analyze and solve problems from a variety of disciplines.
o Techniques will include exploring patterns, developing mathematical models, working backwards, creating tables of data, drawing graphs, using equations, estimating the reasonableness of an answer using a calculator or other appropriate technology.
Mathematical Models
• Students will use linear, quadratic, and cubic equations and graphs to analyze mathematical models.
o Analyze a multi-dimensional problem to create linear, quadratic, and cubic equations to describe the mathematical aspects of the problem and to compare these equations to their graphical representations
Rational and Irrational Numbers
• Students will explain relationships which exist between the fraction and decimal forms of rational numbers and between the decimal forms of rational and irrational numbers
o Classify real numbers as rational or irrational and identify identifying characteristics of each
o Explore the Pythagorean Theorem, comparing and contrasting results
Quantitative Reasoning
• Students will create and interpret various types of statistical graphs.
o Create, compare, contrast, and interpret pie charts, histograms, dot plots, stem and leaf plots, and box and whisker plots.
• Students will organize and interpret a variety of data sets using measures of central tendency and dispersion
o Compute, compare, contrast, and interpret mean median, and mode.
o Compute, compare, contrast, and interpret range, variance, standard deviation, and z-scores.
• Students will use counting techniques to analyze mathematical problems involving real-world situations
o Use the fundamental counting principle to solve problems.
o Use and distinguish between permutations and combinations.
• Students will use a variety of probability tools to analyze mathematical problems involving real-world probability situations
o Use appropriate probability tools selected from listing, arrays, area models, and Pascal's triangle
Standard of Mathematical Practice
• Students will use the language and practices described in the Standards of Mathematical Practices (Common Core State Standards)
o Make sense of problems and persevere in solving them.
o Reason abstractly and quantitatively.
o Construct viable arguments and critique the reasoning of others.
o Model with mathematics.
o Use appropriate tools strategically.
o Attend to precision.
o Look for and make use of structure.
o Look for and express regularity in repeated reasoning.

Required materials

This course may require a textbook.

Grading methods

Course Assessment Requirements: at least three proctored, closed-book, no-notes examinations (one of which is the comprehensive final); all exams will consist of primarily free response questions, although limited use of multiple choice, fill in the blank, or matching may be used as appropriate; assessment of written work will include evaluation of the students' ability to arrive at correct conclusions using proper mathematical procedures and notation.

General education/Related instruction lists

- Mathematics