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Kathy Renderman Math 178

Course Description:
This course will introduce students to mathematics as it applies to the individual and society. Topics include personal finance, statistics, voting, analysis of change, and mathematical applications to current social and diversity concerns. Using real-world applications, emphasis is placed on the development of both critical thinking and mathematical problem solving. This general education mathematics course is designed to be an accessible college-level mathematics course for students majoring in the liberal arts.

Assignments

Outside Assignments -
Students are required to complete regular homework assignments and may be asked to research a variety of course-related topics including those dealing with societal disparities.

Writing Assignment -
Students may be asked to complete reflections, journal entries, short essays, and papers.

Reading Assignment -
Students are expected to read the textbook and other course handouts in preparation for each lecture.

Methods of Evaluation

Methods of Evaluation Rationale

Homework--Regular homework will allow for skills practice, timely feedback, and analyzing re-teaching opportunities.
Projects--Major assessments in the course are project-based. Students are asked to complete projects to show their mastery of the material and their ability to extend their knowledge to new and diverse situations.
Oral Presentation--Students will present the findings of their projects to the class so that a broad range of perspectives and analysis may be compared.

Papers--Students may be required to present their project findings in a more formal paper. Short essays and papers provide an opportunity to learn about mathematics in a new way and to explore diversity in the discipline. Such assignments may allow students to connect to mathematics in a culturally relevant manner.
Other--Journal entries, reflections assignments, class/group work, and other as assigned. The instruments of evaluation require students to demonstrate their mastery of the learning objectives and their ability to devise, organize, and present complete solutions to problems.

Course Objectives

- Students will employ mathematical and logical reasoning in a variety of applications.
- Students will research a current social issue and, using a mathematical lens, provide analysis of positions on the issue.
- Students will clearly communicate their reasoning and conclusions in both verbal and written form.
- Students will support their conclusions with appropriate college level mathematics.
- Students will summarize data and represent results in a variety of formats.
- Students will compare and contrast various types of investments and estimate returns over time.
- Students will compare and contrast various types of loans and estimate monthly payments.
- Students will compare and contrast apportionment methods of voting systems.
- Students will analyze growth rates using linear, exponential, logarithmic, and quadratic functions and their graphs.

CSLOs

Solve college level math problems from a variety of mathematical subject areas, especially topics that are not generally covered in a traditional mathematics course. Expected SLO Performance: 75.0

ISLOs	Students will be able to explain and apply mathematical concepts to solve problems
Core ISLOs	Students will be able to apply critical thinking and information competency skills to conclusions which are effectively communicated in written and oral English.

Utilize equations and graphs of various types of functions to analyze mathematical applications from a variety of disciplines. Expected SLO Performance: 75.0

ISLOs	Students will be able to explain and apply mathematical concepts to solve problems
Core ISLOs	Students will be able to apply critical thinking and information competency skills to conclusions which are effectively communicated in written and oral English.

Recognize and apply the concepts of mathematics as a problem-solving tool in other disciplines and contexts. Expected SLO Performance: 75.0

ISLOs	Students will be able to explain and apply mathematical concepts to solve problems
Core ISLOs	Students will be able to apply critical thinking and information competency skills to conclusions which are effectively communicated in written and oral English.

Analyze given information and develop strategies for solving problems involving mathematical and logical reasoning, using an appropriate level of mathematics to support any conclusions. Expected SLO Performance: 75.0

ISLOs	Students will be able to explain and apply mathematical concepts to solve problems
Core ISLOs	Students will be able to apply critical thinking and information competency skills to conclusions which are effectively communicated in written and oral English.

Course Outline

Core topics to be covered:

1. Mathematical Reasoning
    1. Paradoxes
    2. Formal Logic
        1. Operations on Statements
        2. Truth Tables
        3. Conditional Statements
    3. Sets
        1. Notation
        2. Venn Diagrams
    4. Number Sense
        1. Magnitudes
        2. Estimation
2. Analysis of Growth
    1. Rate of Change
        1. Tables and Graphs
        2. Percentage Change
        3. Average Growth Rate
        4. Interpolation and Extrapolation
    2. Picturing Growth with Graphs
        1. Types of Graphs
        2. Interpretation
        3. Misleading Graphs including those with racial disparities
        4. Regression
    3. Comparison of Growth Rates
        1. Linear
        2. Exponential
        3. Logarithmic
        4. Quadratic
3. Voting and Apportionment
    1. Voting Systems
    2. Voting Power
    3. Apportionment
4. Personal Finance
    1. Compound Interest
        1. Power of Compounding
        2. APY vs. APR

        3. Future and Present Value
    2. Borrowing Money
        1. Installment Loans
        2. Estimating Payments
        3. Home Mortgages
        4. Managing Credit
    3. Investments
        1. Types of Investments
        2. Saving for Retirement
    4. Income Taxes
5. Statistics
    1. Data Summary and Presentation
        1. Measures of Central Tendency
        2. 5-Number Summary
        3. Visual Representations of Data
    2. The Normal Distribution
        1. Bell Curve
        2. Standard Deviation
        3. Z-scores
        4. Percentile Scores
    3. Correlation vs. Causation