



Math 110 – Math in Society Course Syllabus

Course description: Provides an introduction to mathematical thinking emphasizing analysis of information for decision-making.

Credit hours: 3

Course Prerequisites and Corequisites: See general course prerequisites.

Outline of Suggested Topics: The following is a list of suggested topics to accompany the text *Mathematical Excursions* by Aufmann, Lockwood, Nation and Clegg. The topics can be augmented or diminished, as long as the objectives for the course are practiced. Decisions concerning order of presentation are left to individual instructors.

Course outline:	<u>Approximate time spent</u>
• Problem-Solving <ul style="list-style-type: none">○ Inductive and Deductive Reasoning○ Problem-Solving with Patterns○ Problem-Solving Strategies	15%
• Sets <ul style="list-style-type: none">○ Basic Properties of Sets○ Complements, Subsets and Venn Diagrams○ Set Operations○ Applications of Sets○ Infinite Sets	20%
• Logic <ul style="list-style-type: none">○ Logic, Statements and Quantifiers○ Truth Tables, Equivalent Statements and Tautologies○ The Conditional and Biconditional○ The Conditional and Related Statements○ Arguments○ Euler Diagrams	15%
• The Mathematics of Finance <ul style="list-style-type: none">○ Simple Interest○ Compound Interest○ Credit Cards and Consumer Loans○ Stocks, Bonds and Mutual Funds○ Home Ownership	10%
• Combinatorics and Probability <ul style="list-style-type: none">○ The Counting Principle○ Permutations and Combinations○ Probability and Odds○ Addition and Complement Rules○ Conditional Probability○ Expectations	20%
• Statistics <ul style="list-style-type: none">○ Measures of Central Tendency○ Measures of Dispersion○ Measures of Relative Position○ Normal Distributions○ Linear Regression and Correlation	20%

Student Learning Outcomes (SLO): At the end of MTH 110, a student who has studied and learned the material should be able to:

1. Demonstrate understanding of elementary logic in order to make persuasive arguments, understand conflicting reports, identify faulty reasoning, detect bias, assess risk, suggest alternatives, and draw solid conclusions. [EEO: 3]
2. Use sets as a tool for organizing information, recognize that relationships between and among sets provide the foundation for many valid arguments. [EEO: 2]
3. Use counting techniques, estimation, proportional reasoning, percents, and unit conversions to more ably interpret numerical quantities that occur in everyday life. [EEO: 1, 2]
4. Demonstrate understanding of basic probability and how it is involved in virtually every decision we make – either explicitly or implicitly. [EEO: 1, 4, 7]
5. Use statistics to critically evaluate and interpret statistical studies and corresponding reports. [EEO: 1, 2, 4, 5, 6, 7]
6. Use functions to model various relationships with enough precision to gain insight into how things work and to make reasonable predictions about the future. [EEO: 1, 2, 4, 5]

There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.

Exemplary Educational Objectives (EEO):

1. To apply arithmetic, algebraic, geometric, higher-order thinking, and statistical methods to modeling and solving real-world situations.
2. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
4. To use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results.
5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.
6. To recognize the limitations of mathematical and statistical models.
7. To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.