

Department: MATHEMATICAL SCIENCES

Semester hours: 3

Course Title and Number: MATH 210 Finite Mathematics

Course description: Introduction to mathematical topics with applications to business, social science, and other fields. Includes such topics as functions and graphs, matrix algebra and solutions of linear equations, inequalities and linear programming, elementary combinatorics, and probability. Not used in major or minor GPA calculation for mathematical sciences majors or minors.

PRQ: MATH 110 with a grade of C or better, or previous credit in MATH 210, or satisfactory performance on the Mathematics Placement Examination.

Course objectives:

1. To develop in the students effective habits in logical thinking.
2. To develop the student's quantitative skills.
3. To develop the student's capacity in problem solving and decision making.
4. To strengthen concepts important to students in their own major (e.g. probability in the social sciences or financial math for business majors)

Content:

**1. Sets and counting**

Sets, a fundamental principle of counting, Venn diagrams and counting, the multiplication principle, permutations and combinations, further counting problems, the binomial theorem, multinomial coefficients and partitions.

**2. Probability.**

Experiments, outcomes, events, assignment of probabilities, calculating probabilities of events, conditional probability and independence, tree diagrams, Bayes' theorem.

**3. Linear equations and straight lines.**

Coordinate systems and graphs, linear inequalities, the intersection point of a pair of lines, the slope of a straight line.

**4. Matrices.**

Solving systems of linear equations, arithmetic operations on matrices, the inverse of a matrix, the Gauss-Jordan method for calculating inverses, input-output analysis.

**5. Linear programming.**

A geometric approach, slack variables and the Simplex tableau, the Simplex method - maximum and minimum problems.

**6. Financial math.**

Percents, compound interest, annuities, mortgages, amortization.

Textbook: Finite Mathematics by S. Tan (NIU edition)