

**Tennessee Technological University
Mathematics Department**

MATH 1630: Finite Mathematics

I. COURSE DESCRIPTION FROM CATALOG:

Brief review of basic algebra; introduction to probability; matrix algebra and linear programming; applications to business and economics. Lec. 3. Cr. 3.

II. PREREQUISITE(S):

Minimum of two years of high school algebra and one year of high school geometry.

III. COURSE OBJECTIVE(S):

Ability to analyze and synthesize ideas, information, and data arising from selected topics in mathematics.

The goal of the general education mathematics requirement is to enhance students' abilities to utilize mathematics. Students will demonstrate

1. the ability to use mathematics to solve problems.
2. the ability to create or analyze graphs (or other mathematical representations of data/relationships).
3. proficiency in mathematical computations/algorithms.
4. understanding of mathematical concepts.

IV. STUDENT LEARNING OUTCOMES:

Upon successful completion of the course the student will be able to: compute the solution to a system of equations graphically and algebraically; perform the following operations on matrices: addition, subtraction, scalar multiplication, multiplication, and transposition; perform row operations to calculate the inverse matrix and compute the solution to a system of equations; translate real world problems into linear programming problems and solve using the simplex method; and solve various simple and compound interest problems.

V. TOPICS TO BE COVERED:

CHAPTER 1 Linear Equations and Graphs

- 1.1 Linear Equations and Inequalities
- 1.2 Graphs and Lines
- 1.3 Linear Regression - **Omit**

CHAPTER 2 Functions and Graphs

- 2.1 Functions
- 2.2 Elementary Functions: Graphs and Transformations
- 2.3 Quadratic Functions
- 2.4 Polynomial and Rational Functions
- 2.5 Exponential Functions (Optional)
- 2.6 Logarithmic Functions (Optional)

CHAPTER 3 Mathematics of Finance

- 3.1 Simple Interest (Optional)
- 3.2 Compound and Continuous Compound Interest (Optional)

- 3.3 Future Value of an Annuity; Sinking Funds - **Omit**
- 3.4 Present Value of an Annuity; Amortization – **Omit**

CHAPTER 4 Systems of Linear Equations in Two Variables

- 4.1 Review: Systems of Linear Equations in Two Variables
- 4.2 Systems of Linear Equations and Augmented Matrices
- 4.3 Gauss-Jordan Elimination
- 4.4 Matrices: Basic Operations
- 4.5 Inverse of a Square Matrix
- 4.6 Matrix Equations and Systems of Linear Equations
- 4.7 Leontief Input-Output Analysis - **Omit**

CHAPTER 5 Linear Inequalities and Linear Programming

- 5.1 Linear Inequalities in Two Variables
- 5.2 Systems of Linear Inequalities in Two Variables
- 5.3 Linear Programming in Two Dimensions; A Geometric Approach

CHAPTER 7 Logic, Sets, and Counting

- 7.1 Logic
- 7.2 Sets
- 7.3 Basic Counting Principles
- 7.4 Permutations and Combinations

CHAPTER 8 Probability – As time permits

- 8.1 Sample Spaces, Events, and Probability
- 8.2 Union, Intersection, and Complement of Events; Odds
- 8.3 Conditional Probability, Intersection, and Independence
- 8.4 Bayes' Formula

VI. ADDITIONAL INFORMATION:

This course may be used to satisfy the minimum general education requirements in mathematics. It provides an opportunity for students to address real-life problems in business and economics through strategic reasoning and applications of the scientific method.

VII. POSSIBLE TEXTS AND REFERENCES:

Finite Mathematics for Business, Economics, Life Sciences, and Social Sciences, 13th Edition, Barnett, Ziegler, and Byleen

VIII. ANY TECHNOLOGY THAT MAY BE USED:

MyMathLab or *MathXL* for online homework applications

IX. STUDENT ACADEMIC MISCONDUCT POLICY:

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at [Policy Central](#).

X. DISABILITY ACCOMMODATION:

Students with a disability requiring accommodations should contact the Accessible Education Center (AEC). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The AEC is located in the Roaden University Center, Room 112; phone 931-372-6119. For details, view the Tennessee Tech's Policy 340 – [Services for Students with Disabilities at Policy Central](#).