

**COMMON COURSE OUTLINE: Course discipline/number/title: MATH 1113: Finite Math with College Algebra**

**A. CATALOG DESCRIPTION**

1. **Credits: 4**
2. **Hours/Week: 4 hours per week or as scheduled**
3. **Prerequisites (Course discipline/number):** Successful completion of MATH 0099 OR MATH 0100 with grade of C or better or appropriate score on the RCTC placement test.
4. **Co-requisites (Course discipline/number):** None
5. **MnTC Goals (if any):** CT, MA

An introductory course in mathematical modeling and decision making with emphasis on business applications. Students will use matrices to solve problems and will get experience using Present and Future Value financial problems.

**B. DATE LAST REVISED (Month, year):** August, 1999

**C. OUTLINE OF MAJOR CONTENT AREAS:**

1. Solve exponential and logarithmic equations
2. Set up linear model to fit data points
3. Solve systems of equations using :
  - a) Gaussian Elimination
  - b) Inverse Matrix method
4. Graph Feasible Region (including endpoints) when 3 or more linear inequalities.
5. Set up probability distribution and find expected value
6. Find Transition Matrix and Steady State of a Markov process problem
7. Use financial equations to find Present and Future Value:
  - a) Compound Interest
  - b) Annuity

**D. LEARNING OUTCOMES (GENERAL):** The student will be able to:

1. Solve exponential and logarithmic equations.
2. Given 2 data points, derive the unique linear equation that contains them.
3. Given information, be able to find revenue and cost equations.
4. Find break-even point.
5. Given system of equations (3 variables).
  - a) Use Gauss/Jordan to solve.
  - b) Find the inverse of the matrix of coefficients.
  - c) Solve using the inverse matrix method by hand.
6. Using a graphics calculator, solve a system with the inverse matrix method.
7. Given a linear programming problem (2 decision variables form), solve:
  - a) Using the graphical method.
  - b) Simplex method.
8. Given a linear programming application problem, be able to:
  - a) Set up objectives, constraints and initial tableau.
  - b) identify and interpret the solution from the final tableau.
9. Given an experiment, set up the probability distribution and find expected value.
10. Given Markov Process, determine probability of beginning in a non-absorbing state and ending in an absorbing state.
11. Find long-term Steady State.
12. Given financial application problem select appropriate formula and solve for the missing information.
13. Given several data points, use regression (on calculator) to find equation of best fit.

**E. LEARNING OUTCOMES (MNTC):** Competencies from the Minnesota Transfer Curriculum (MNTC):

Goal 2: Critical Thinking (CT): The student will be able to:

1. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
2. Imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives, which can give alternative meanings or solutions to given situations or problems.



- E. LEARNING OUTCOMES (MNTC):** Competencies from the Minnesota Transfer Curriculum (MNTC): **Continued. . .**
3. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
  4. Recognize and articulate the value assumptions, which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.

Goal 4: Mathematics/Symbolic Systems (MA): The student will be able to:

1. Illustrate historical and contemporary applications of mathematics/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem solving and/or modeling strategies.

**F. METHODS FOR EVALUATION OF STUDENT LEARNING:**

1. Tests
2. Quizzes
3. Homework
4. Group Assignments
5. Comprehensive Final Exam

- G. SPECIAL INFORMATION (if any):** None