Revised Course Proposal
MAT 2120G: Finite Mathematics

1. **Catalog Description**

   a. Course level: MAT 2120G

   b. Title: Finite Mathematics

   c. Credit: 3-0-3

   d. Term to be offered: F,S

   e. Short Title: Finite Math

   f. Course Description: Elementary counting theory, probability, and linear programming, with applications to business and social science.

   g. Prerequisites: MAT 1271 with a grade of C or better, or satisfactory placement by department guidelines.

   h. The course is writing active.

2. **Student Learning Objectives**

   a. *List student learning objectives that are designed to help students achieve one or more of the established goals of general education and university-wide assessment.*

   In completing this course, students will be able to:

   i. express themselves in the language of mathematics using correct mathematical exposition and symbolism *(writing).*

   ii. read, interpret and solve linear programming problems graphically and by computational methods such as Simplex, Crown's Method, and the Dual Method *(critical thinking, writing).*

   iii. read, interpret and solve counting problems using Venn diagrams, the Fundamental Principle of Counting, combinations, permutations, and complements *(critical thinking, writing).*

   iv. read, interpret and solve probability problems using counting techniques and the rules of probability *(critical thinking, writing).*

   b. *Indicate additional student learning objectives, if any, that are designed to help students achieve the goals of the course and/or a particular discipline or program.*

Upon successful completion of this course, students will:

    i. be prepared for more advanced courses requiring knowledge of linear programming and probability.

    ii. appreciate the importance of mathematics and its applications in both business and the social sciences.

3. Course Outline

The following is a sample syllabus. The textbook has a variety of topics that allows each instructor and class to tailor the course to their specific interests.

Week 1   **Linear Equations**

- graphing lines
- systems of linear equations
- word problems
- using linear systems

Week 2   **Matrix Solutions to Linear Systems**

- formulating systems of equations from real-world applications
- solving linear systems using matrices
- solutions of dependent systems of equations

Weeks 3-4   **Linear Programming**

- systems of linear inequalities
- graphical solution of linear programs

Weeks 5-7   **Algebraic Solutions of Linear Programs**

- Simplex Method
- Crown's Method
- Dual Method (optional)

Weeks 8-10   **Counting Techniques**

- Fundamental Principle of Counting
- permutations
- combinations
- special counting techniques

Weeks 11-15   **Probability**

- introduction to vocabulary and basic concepts
- applying counting techniques to probability

- the Addition Rules of Probability
- dependent vs. independent events
- conditional probability
- the Multiplication Rules of Probability
- Bayes' Theorem
- binomial experiments

4. **Evaluation of Student Learning**

   a. Evaluation may include quizzes, 3-4 tests, group problem solving, and a final exam.

   b. This course satisfies the criteria for a writing active course through the emphasis on correct mathematical writing when the student supplies complete reasoning as part of the solutions to problems.

5. **Rationale**

   a. The course develops critical thinking skills and the ability to apply mathematics. It will be placed in the Mathematics segment of the general education program.

   b. This course has always been taught at the 2000 level, since the skills and concepts covered in the course require a more than minimal level of mathematical maturity. It is a course which builds on students' skills in algebra and geometry, with a prerequisite of MAT 1271 or its equivalent.

   c. This course is a revision of MAT 2120C and should maintain the same curriculum identification number as MAT 2120C. This course does not duplicate any other course.

   d. MAT 2120G is required in the following majors and programs: all majors in the School of Business; economics; and economics with international studies.

6. **Implementation**

   a. The course will be taught by faculty members in the Department of Mathematics.

   b. The text to be used is *Finite Mathematics*, An Applied Approach, 2nd edition, by Long and Graening, Addison-Wesley, 1997.

   c. There are no additional costs to the student.

    d. This course will first be offered in Spring 2001.

7. **Community College Transfer**

A community college course may be judged equivalent to this course.

8. **Date Approved by the Department:** 4/10/00

9. **Date Approved by the College Curriculum Committee:** 4/21/00

10. **Date Approved by CAA:** 10/19/00

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