COURSE SYLLABUS

Course Title: **Computational Finite Mathematics**

Abbreviated Title As Appears on Transcript: Comp Finite Math

Course Number: DMAT 145

Credit Hours: 3 credits [semester credit hours]

Course Description: A single course on finite mathematics for business majors. Topics include linear equations, matrices, linear programming including geometrical and simplex methods, optimization, mathematics of finance, sets and counting, probability, markov chains, and game theory.

Prerequisite: Successful completion of 3 years high school mathematics (C- or higher) or instructor consent.

Course Workload: 3 semester credit hours • 3 student work hours per credit hour • 14 week Carnegie semester = 126 hours student course workload average

Examination Requirements: Proctored written final examination must be passed at 60% or higher to earn passing grade in course. "B" and "A" grade paths have additional examinations.
See https://www.distancecalculus.com/grades/ for more information.

Course Professor: Robert R. Curtis, Ph.D.<rcurtis@rwu.edu>, <robert@distancecalculus.com>

University Information: Roger Williams University, University College, 1 Empire Plaza, Providence, RI, USA 02903. Roger Williams University, 1 Old Ferry Road, Bristol, RI 02809.
Accredited by New England Commission of Higher Education (NECHE).
See https://www.rwu.edu/academics/accreditation/ for more information.

E-Textbook: *Finite Math & LiveMath* by Robert R. Curtis, Ph.D.
Applied Finite Mathematics by Rupinder Sekhon (Connexions)

Mathematical Software: LiveMath™ Computer Algebra & Graphing System

ADA ACCOMMODATIONS

Roger Williams University has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Students with disabilities who need accommodations in order to fully participate in this class are urged to contact Student Accessibility Services, as soon as possible, to explore the arrangements needed to be made to assure access. Student Accessibility Services is open Monday through Friday from 8:00AM to 5:00PM Eastern Time; Email: sas@rwu.edu or Voice: 401-254-3841.

For more information about SAS, visit
https://www.rwu.edu/undergraduate/academics/student-academic-success/student-accessibility-services-sas

Learning Outcomes for DMAT 145 - Computational Finite Mathematics

1. To identify, manipulate, and understand the core concept of functions
2. To understand and compute the key components of linear equations
3. To understand and compute matrix algebra and systems of linear equations
4. To understand and compute the concept of linear programming, and various methods of analysis
5. To study topics in Mathematics of Finance
6. To understand and compute set notation, analysis, and counting
7. To understand and compute the core topics of Probability and Sampling
8. To understand and compute with the Conditional Probaiblity formula
9. To understand and compute Markov Chains
10. To understand and compute the basics of Game Theory

Syllabus Topics Outline for DMAT 145 - Computational Finite Mathematics

1. Getting Started
   - 1.1. Email and Chat
   - 1.2. Learning About the Course
   - 1.3 Required Hardware
   - 1.4. Software Fundamentals

2. The Big Picture
   - 2.1. Solving (easy) equations in 1 variable.
   - 2.2. What if you can't solve for x?
   - 2.3. Finding solutions numerically
   - 2.4. Finding solutions graphically
   - 2.5. Solving equations of more than 1 variable

3. Functions
   - 3.1. Function notation
   - 3.2. Data sets
   - 3.3. Graphing functions
   - 3.4. Data sets and smooth curves
   - 3.5. Domain and Range
   - 3.6. Algebraic combinations of functions

4. Linear Functions
   - 4.1. Algebraic definition
   - 4.2. Slope
   - 4.3. Graphing linear functions by hand
   - 4.4. Properties of linear functions
   - 4.5. Linear data sets
   - 4.6. Applications

5. Matrices
   - 5.1. Connection to systems of linear equations
   - 5.2. Matrix operations
   - 5.3. Solutions of systems of linear equations
   - 5.4. Matrix Inverses
   - 5.5. Row Operations
   - 5.6. Applications to Cryptography
   - 5.7. Leontief Models

6. Linear Programming
   - 6.1. Systems of Linear Inequalities
   - 6.2. Feasibility
   - 6.3. Minimization and Maximization
   - 6.4. Geometry of Linear Programming
   - 6.5. Simplex Method

7. Mathematics of Finance
   - 7.1. Simple and Compound Interest
   - 7.2. Present Value
   - 7.3. Classification
   - 7.4. Applications

8. Sets and Counting
   - 8.1. Definitions
   - 8.2. Tree Diagrams
   - 8.3. Permutations

9. Probability
   - 9.1. Sampling and Probability
   - 9.2. Independence
   - 9.3. Tree Diagrams and Combinations
   - 9.4. Conditional Probability
   - 9.5. Binomial Probability
   - 9.6. Markov Chains
   - 9.7. Game Theory