

MATH 162: Finite Mathematics

Course Prospectus

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CONTACTING INSTRUCTOR

When emailing me about this course, please include “Math 162” in the subject line, so I will know immediately that the message is course-related.

COURSE OVERVIEW

This course will focus on basic principles of linear algebra, including systems of equations, matrices and linear programming, and basic principles of sets, probability and statistics. The emphasis will be on solving problems by translating real situations and data into mathematical language.

PREREQUISITES & COREQUISITES

There are no formal prerequisites for this course. However, in order to succeed you must begin with a foundation of basic algebra, including how to evaluate algebraic expressions, how to solve linear equations and how to graph equations on a Cartesian coordinate plane. It is also imperative that you have a good understanding of arithmetic: you should be able to work easily with fractions, decimals and exponents, and be able to use the distributive property and the standard order of arithmetic operations. A review section is provided at the beginning of the textbook, and the course will begin with an introductory review lesson. If you find this lesson to be difficult, you will need to evaluate whether you have the necessary background to succeed in this course, or whether you will need some additional study prior to taking this course.

REQUIRED TEXT

Waner, Stefan, and Steven R. Costenoble. *Finite Mathematics*. 5th ed. Boston: Brooks/Cole Cengage, 2011.
(ISBN-13: 978-1-4390-4924-2, ISBN-10: 1-4390-4924-6)

Website associated with textbook: *Everything for Finite Math*

<http://www.zweigmedia.com/tcpage.html#ed5#en#finite>

COURSE DESCRIPTION

The first half of the course will focus on linear algebra: solving systems of linear equations, matrix operations, and linear programming. The second half will focus on basic ideas in sets and counting, probability and statistics. Lessons will be

about 2 weeks long, each with a quiz and an assignment to turn in. There will be three midterms and a final exam.

Technology Access: This course requires web access and an e-mail account. To view course files in PDF format, you will need Adobe Acrobat Reader, which can be downloaded for free from <http://get.adobe.com/reader/>. You will also want a basic calculator, which is almost certainly available on your computer.

You will be turning in assignments as Word documents or PDF files. If you have Microsoft Office, then you already have Word, Excel and Equation Editor. Otherwise, you probably have a spreadsheet and word-processing program on your computer that can export files as PDF, and there are free online equation editors and graphing calculators. These topics will be discussed more fully later.

Lectures: Lectures will primarily be PowerPoint slideshows with audio. If you do not have PowerPoint, you can download a free PowerPoint Viewer at <http://www.microsoft.com/en-us/download/details.aspx?id=13>. To view the presentations, you will open the file, choose “slideshow” and “play from the beginning.” If you have trouble, please inform me as soon as possible.

Online Tutorials: <http://www.zweigmedia.com/tcpage.html#ed5#en#finite> has online tutorials, chapter summaries, and quizzes that go along with the *Finite Mathematics* textbook. These resources are useful in providing immediate feedback and helpful hints.

COURSE OBJECTIVES

Upon successful completion of this course, students should be able to:

1. Generate a linear equation to model a real situation; evaluate, solve, and graph linear functions;
2. Generate a system of linear equations to model an application; demonstrate the use of a matrix to solve such a system;
3. Demonstrate basic algebraic operations on matrices (addition, scalar multiplication, transposition, matrix multiplication, and inversion);
4. Generate the constraining inequalities and the objective function for a linear programming problem and demonstrate its solution;
5. Demonstrate basic operations on sets (union, intersection, complement) and generate a decision algorithm to compute the cardinality of a set;
6. Demonstrate the probability of an event; and
7. Demonstrate the measures of central tendency (mean, median) and variation (standard deviation) for a data set; identify the proper and improper uses of those statistics.

COURSE REQUIREMENTS

Submit assignments on time: Late assignments will not be accepted. In extreme circumstances, you may contact me to ask for an extension.

Icebreaker and Discussion Forum: Your very first assignment will be to post an introduction for yourself on the discussion board under the “Icebreaker” discussion. This assignment is worth 20 points. For most lessons, participation in the discussion forum is not required, but is encouraged. You can ask questions about the lectures and practice problems, and respond to others’ questions. Helping each other out this way can be beneficial for everyone.

Readings and Lectures: Due to the online format of this course, it will be especially important for you to read the assigned sections in the textbook. Be sure to read “actively”—take notes, work out the examples, and understand each concept before moving on. Then view the lectures to review the most important concepts and see examples that will help you when doing your homework.

Studying and Practice Exercises: Learning mathematics is learning a new language! Vocabulary is *very* important. Make notes of the most important formulae and terms as you read and listen to the lectures. You can use 3X5 notecards and put one term or formula on each card. Flip through these cards in preparation for quizzes and tests. Practice exercises will be odd-numbered problems from your text, so the answers can be found at the back of the book. It is imperative that you do all the practice exercises and check your answers, even though they will not be turned in. You will only learn the math by *doing* it.

Quizzes: Each lesson will have a short quiz, which is open-book and open-note. Most of the questions will be matching vocabulary terms and formulas with their definitions, and True/False questions about concepts presented in the chapter. Prepare for the quizzes by studying the vocabulary and formulae for the chapter. One retake will be allowed for each quiz, with the highest score kept.

Writing Assignments: Each lesson will have one writing assignment consisting of one or two “applications” (i.e., word problems), for which you will need to write equations and find solutions. Projects will be turned in as “.doc” or “.pdf” files.

Exams: The final exam will need to be proctored. Midterm exams will not be proctored—meaning you will be “on your honor” to follow the rules. NO books, notes, graphing calculators or online resources may be used during an exam. However, you may use a basic 4-function calculator or scientific calculator. If you have any questions about whether your calculator is allowed, please ask well in advance of the exam due date. Exams will be primarily multiple-choice questions, and the final exam will be comprehensive.

Grades:

	Points per assignment	Number of assignments	Totals
Icebreaker	20 points	1	20 points
Quizzes	25 points	8	200 points
Writing Assignments	35 points	8	280 points
Mid-term Exams	100 points	3	300 points
Final Exam	200 points	1	200 points
Total			1000 points

A	900 to 1000 points
B	800 to 899 points
C	700 to 799 points
D	600 to 699 points
F	599 or fewer points

COURSE SCHEDULE

	Dates	Topic and textbook sections
1	TBD	Introduction: Algebra review (0.1, 0.3, 0.5, 0.7)
2	TBD	Functions and linear models (1.1, 1.2, 1.3, 1.4)
3	TBD	Systems of equations and matrices (2.1, 2.2, 2.3)
Exam 1		
4	TBD	Matrix algebra and applications (3.1, 3.2, 3.3)
5	TBD	Linear programming (4.1, 4.2)
Exam 2		
6	TBD	Sets and counting (6.1, 6.2, 6.3, 6.4)
7	TBD	Probability (7.1, 7.2, 7.3, 7.4, 7.5, 7.6)
Exam 3		
8	TBD	Statistics (8.1, 8.2, 8.3, 8.4)
Final Exam		