INTRODUCTION: Most issues in economics are intrinsically quantitative. For example, you care not only that you get interest on your savings, but also about how much interest you get. Some issues are qualitative: If interest rates go up, would you expect the price of a share of Ford stock to go up or down? You could think about this question as follows:

A Ford share is worth something because it will pay dividends, and because you can sell it later. Imagine that the money you use to buy the share would otherwise be put into a savings account. If the interest rate on the savings account is higher, then savings is more attractive, and correspondingly the Ford stock is less attractive. So the price of a Ford share goes down if interest rates go up. But how much? In this course we will answer such questions with mathematical models.

Mathematics is a language developed for expressing and analyzing quantitative issues. This course, and its sequel ECON 1088, will teach you mathematical tools, like graphing, that you can use in your economics classes, and in your every day life. The class will also give you practice in logical thinking, which is intrinsic in mathematics (and may also be useful in every day life!). Learning another language can be intimidating to some people, particularly if it is math! To allay any fears you may have, the course includes many "user friendly" examples to show how math is useful for analyzing real issues. For example, we will use probability to model uncertainty about the future dividends and price of a share.


SOFTWARE: D.I. Schneider, Explorations in Finite Mathematics, Macmillan, 1993

HOMEWORK: Weekly homework will be assigned. Doing homework is the best way to learn the material. I encourage you to work with each other and/or consult with me on the homework. However, your answers must be written individually to be sure that you understand. Since computers are often a great way to implement mathematical ideas, some of the homework will include a personal computer assignment.

PAPER: You must write a 3 or 4 page paper which describes an economic issue, and formulates a quantitative model of the issue. The paper may be hand-written or typed. It should include a solution of the model, if the model is simple; but need not do so if it is necessarily complex.

GRADING: Homework 30%

Exam I 15%
Exam II 20%
Final Exam 25%

CURRICULUM: This class satisfies the Quantitative Reasoning and Mathematical Skills requirement of the College of Arts and Sciences. The combination of ECON 1078 and 1088 can be used as the prerequisite for ECON 3070, 3080, 3808 and 3818.
COURSE OUTLINE

Week 1  BASIC ALGEBRAIC OPERATIONS: Sets, Algebra, Polynomials
Week 2  Rational Expressions, Exponents and Radicals.
Week 3  EQUATIONS, GRAPHS, FUNCTIONS: Linear Equations and Inequalities, Quadratic Equations
Week 4  Cartesian Coordinates, Functions
Week 5  Linear and Quadratic Functions

\textbf{Exam I}

Week 6  EXPONENTIAL & LOGARITHMIC FUNCTIONS: Exponential Functions, e
Week 7  Logarithmic Functions
Week 8  MATH OF FINANCE: Simple Interest, Compound Interest
Week 9  Future Value, Present Value

\textbf{Exam II}

Week 10  SYSTEMS OF LINEAR EQUATIONS, MATRICES: 2 Variable Linear Equations, Matrices
Week 11  Matrix Multiplication, Inverse, Matrix Equations
Week 12  LINEAR INEQUALITIES AND LINEAR PROGRAMMING: Linear Inequalities, LP in 2D
Week 13  Simplex Method
Week 14  PROBABILITY: Counting Principles, Permutations and Combinations, Sample Spaces and Events
Week 15  Empirical Probability, Random Variable, Probability Distribution, Expectation