

Department of Economics  
Feliciano School of Business  
Montclair State University

ECON 317 Course Outline  
Instructor: Ram Sewak Dubey

Spring 2023

Lecture Schedule: T 5:30pm-8pm  
Office hours: MTR 9-10am  
Email: dubeyr@montclair.edu

School of Nursing 160  
Office: On Zoom  
Phone: 973-655-7778

**I COURSE NUMBER:** ECON 317-01

**II COURSE NAME:** Quantitative Methods for Economics

**III CREDIT HOURS:** 3 Semester Hours

**IV PREREQUISITE:** ECON 206 / ECON 207 and ECON 208; OR permission of the Department

**V CATALOG DESCRIPTION OF THE COURSE:** Introduction to elementary concepts of mathematics used in economics. Formulation of economic theory in mathematical language. Application of optimization techniques in economic models.

**VI AIMS OF THE COURSE:** The principal objective of this course is to gain facility in applying the mathematical techniques to economic analysis.

**VII COURSE LEARNING GOALS:** After completion of this course students will be able to

- A. learn the basic mathematical methods that have become indispensable for a proper understanding of the current economic literature.
- B. describe economic / market outcomes commonly observed in mathematical model and solve for the observable variables in terms of the parameters / fundamentals of the model.
- C. analyze, both qualitatively and quantitatively, how the market outcomes will change when there is a change in the fundamentals of the economy.
- D. solve for the values of the decision variables in the optimization exercises faced by the individuals (consumers) and firms.
- E. be better prepared for the required ECON 390 Applied Econometrics and ECON 438 Advanced Seminar in Economics courses.

**VIII CONTENT AND SCOPE OF THE COURSE:**

- A. Introduction

1. The Nature of Mathematical Economics - brief overview
  2. Static, Comparative Static and Dynamic Analysis- brief overview
- B. Economic Models
1. The Elements of a Mathematical Model
  2. The Real Number System
  3. Sets
  4. Relations and Functions
  5. Types of Functions
  6. Functions of two or more Independent Variables
- C. Concepts of Static Equilibrium
1. Meaning of Equilibrium
  2. Partial Market Equilibrium- A Linear Model
  3. General Market Equilibrium
- D. Linear Models and Matrix Algebra
1. Matrices and Vectors
  2. The Algebra of Matrices
  3. Commutative, Associative and Distributive Laws
  4. Types of Matrices
  5. Transpose and Inverse
  6. Determinants
  7. Finding the Inverse of a square matrix
  8. Cramer's Rule
  9. Application to Market and National Income Models
- E. Comparative Statics Analysis
1. The Use of Derivatives in Comparative Statics
    - a. One-Variable Case
    - b. Two -Variable Case
    - c. Partial Differentiation
    - d. Applications to Comparative Statics
  2. Comparative Static Analysis of General-Function Models
    - a. Differentials
    - b. Total Derivative of Composite Functions
    - c. Derivatives of Implicit Functions
    - d. Comparative Statics of General Function Models
- F. Optimization
1. The Case of One Choice Variable
  2. Logarithmic Function
  3. The Case of More than one Choice Variable
  4. Constrained Optimization: Lagrange Multiplier
  5. Application to Economic Models

**IX PROCEDURE, TECHNIQUES AND METHODS:** The instruction will use standard technique of in class lectures (face to face), discussions and real life problem solving exercises.

**X SBUS UNDERGRADUATE LEARNING GOALS SUPPORTED BY THE COURSE:**

1. Know key concepts in the discipline of economics.  
This goal will be a major emphasis.
2. Be effective communicators.  
This goal will be a minor emphasis.
3. Use the appropriate quantitative and qualitative methods to analyze and solve business problems.  
This goal will be a major emphasis.
4. Effectively use technology to retrieve, organize, analyze and communicate business information.  
This goal will be a minor emphasis.
5. Know the ethical challenges and professional codes of conduct in their disciplines.  
This goal will be a minor emphasis.
6. Be prepared to launch a career in their chosen discipline.  
This goal will be a minor emphasis.
7. Be competent in their disciplines.  
This goal will be a minor emphasis.

**XI BASIC REQUIREMENTS FOR COMPLETION OF THE COURSE:** There will be a set of nine to ten problem sets assigned during the course of the semester. Students will be required to hand in written solutions to each of the problem sets. In addition, there will be two midterms and a final examination, based on the assigned material and on class work. Since efficient way to learn the material is through participation in class, regular attendance is required. The final grade will be determined by:

1. The grades on the assigned problem sets (50% of the course grade).
2. Exams: There will be two midterms and a comprehensive final exam. The grades in the three exams will contribute 50% of the course grade.

**XII REPRESENTATIVE TEXTBOOKS/READINGS:** The primary textbook for this course is *Fundamental Methods of Mathematical Economics*, Fourth edition by Alpha C. Chiang and Kevin Wainwright, ISBN:9780070109100