

# EC 203 Syllabus

## Quantitative Tools for Economics and Business

Fall 2023

**Instructor:** Tim Murray, PhD

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**Office Hours:** Monday and Wednesday 10:00-12:00 or by appointment

### Textbook

Typed lecture notes with detailed examples will be posted to Canvas and will serve as the textbook for this class.

### Prerequisites

MA 101/102 *or* MA 106/MA 126, with a C or better

*Note:* If you took the MA 123/124 calculus sequence, you should take MA 220 instead of this course.

### Course Description

In this course, you will learn the mathematical and statistical techniques necessary to answer questions in economics and business. These are tools that you will use in future classes and throughout your personal and professional life.

### Course Objectives

By the end of the course, you should be familiar with the following topics and concepts:

1. Solving systems of equations and simplifying algebraic expressions
2. Calculate the derivative of a variety of functions
3. Apply algebra and derivatives to solving economic models
4. Use counting rules to calculate probability
5. Calculate expected values using discrete and continuous distributions
6. Conducting and evaluating hypothesis tests

### Grading Scale

Letter Grade	Numerical Range	Meaning
A	90-100	Excellent performance
B	80-89	Good performance
C	70-79	Average performance
D	60-69	Below average performance
F	0-59	Unsatisfactory performance

## Assignments

Homework	20%
3 Midterm Exams	16.67% each
Final Exam	30%

### Homework Assignments

Homework assignments and due dates will be posted on Canvas. Late assignments will receive a grade of 0. Homework will be a big part of how you learn in this class. The lowest homework grade will be dropped.

**Submitting Assignments:** Homework assignments will be submitted to Canvas as a PDF. This can be done using apps on your phone (e.g., Cam Scanner) or in the library. It is up to you to ensure that your upload is clear and shows all of the problems. The reason for submitting your assignments on Canvas is so that you can have your assignment in front of you as we go over the problems on the day they are due.

### Exams

There will be three midterm exams and a comprehensive final exam. Midterm exam dates will be announced in class and on Canvas. Students who request an alternative time must inform me prior to the exam.

### Classroom Expectations

Teaching will be carried out primarily through lectures and use of the whiteboard. I encourage you to participate in the class, be curious, and ask questions. I encourage you to take handwritten notes during class. [Multiple studies](#) show that writing notes by hand improves learning.

Although the class will be a learning environment, sometimes it will involve dialogue and group work, I expect that you will remain professional, polite, and civil at all times. This includes but is not limited to:

- Listening when someone else is talking and no talking over someone else.
- At times we will converse with each other when discussing policy or current events. It is okay to disagree, as long as these conversations are done with respect. Lack of respect and civility can result in being asked to leave the classroom.
- During the lecture, do not engage in sidebar conversations that will be a distraction.

### Attendance Policy

The department subscribes to VMI's "30% rule." No categories of absences (academic, athletic, guard, 3.2 cuts, etc.) are exempt from that percentage. Cadets will be notified upon reaching 20% absences. Upon reaching 30% absences, the cadet is referred to the Dean for appropriate action.

## Course Topics

The following is a tentative list of concepts and topics that will be discussed throughout the course. Any changes will be announced in Canvas.

<b>Mathematical Concepts</b>	Rules of Exponents
	Linear and Quadratic Systems of Equations
	Graphing and Slope
	Introduction to Derivatives
	Chain Rule, Product Rule, and Quotient Rule
	Partial Derivatives
	Finding Minima and Maxima using derivatives
<b>Exam 1</b>	
<b>Solving Economic Models using Algebra and Calculus</b>	Supply, Demand, and Elasticity
	The Production Function
	Profit Maximization
	Constrained Optimization and Utility Maximization
<b>Exam 2</b>	
<b>Probability</b>	Counting Rules
	Calculating Probability
<b>Describing Data and Distributions</b>	Measures of Central Tendency
	Measures of Variability
	Relationship and Dependency Between Two Variables
	PDFs and CDFs of Normal and Poisson Distributions
	Discrete Distributions and Expected Value
<b>Hypothesis Testing</b>	One-Sample T-Test
	Two-Sample T-Test
	Using and Calculating P-Values
<b>Exam 3</b>	
<b>Introduction to Finance</b>	Time Value of Money
	Annuities
<b>Final Exam</b>	

## Work for Grade Policy and Standards of Conduct

It is your responsibility to carefully read and understand these policies from both VMI and the Department. Copies of these policies are available on Canvas.

## Students with Disabilities

VMI abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 which mandate reasonable accommodations are provided for all students with documented disabilities. If you have a registered disability and may need some type of instructional and/or examination accommodations, please contact me early in the semester so that I can provide or facilitate the provision of accommodations you may

need. If you have not already done so, you will need to register with the Office of Disabilities Services, the designated office on Post to provide services for cadets with disabilities. The office is located at 207 Carrol Hall in the Miller Academic Center. Please call or stop by the office of LTC Denise Young, Ph.D., Director of Disabilities Services, for more information, 464-7741 or email [youngdh125@vmi.edu](mailto:youngdh125@vmi.edu).

### **Statement of Diversity and Inclusion**

VMI values human diversity in all its richly complex and multifaceted forms, whether expressed through race and ethnicity, culture, political and social views, religious and spiritual beliefs, language and geographic characteristics, gender, gender identities, and sexual orientations, learning and physical abilities, age, and social or economic classes. We respect the value of each member of the class, and everyone in the class is encouraged to share their unique perspective as an individual, not as a representative of any category. Multicultural and intercultural awareness and competencies are key leadership skills. College is supposed to challenge assumptions and provide new and sometimes uncomfortable ways of looking at problems. If you feel uncomfortable with the content or perspectives that are presented or discussed by me, your professor, guest speakers, or other cadets, please contact me immediately so that we can discuss those issues. I also ask you to tell me your preferred gender pronoun. Your suggestions on how to incorporate diversity into this course in a meaningful way are appreciated and encouraged.