

Fall 2022

Instructor: C. M. Staniunas

**Math 111 Mathematical Models for the Management Sciences**

**Note:** Students who have received credit for Math 115 or higher may not take this course. Students must receive a C or better in Math 111 or INQ 240 to declare a major in Business Administration.

Office: 161 D Trexler Hall

Student hours: MWF 9:40am-10:40am and 12:00-1pm  
TTh 11:45 - 1pm

If you can't manage these times, e-mail me and we can make other arrangements.

Phone: 375-2010, e-mail: staniuna@roanoke.edu

Text: Mathematical Applications for the Management, Life, and Social Sciences, tenth or eleventh edition, by R. Harshbarger and J. Reynolds.

Calculator Requirement: All students will need a **graphing** calculator for this course, preferably a TI-83 or TI-84. We will also use Microsoft Excel.

Grading Policy:

Accuracy of graded problem sets (average) 10%  
Daily textbook problem sets (average) 5%  
Class worksheets (average) 10%  
Tests (mastery grade) 75%

Grades will be assigned thus:

A 93-100	B- 80-82	D+ 67-69
A- 90-92	C+ 77-79	D 63-66
B+ 87-89	C 73-76	D- 60-62
B 83-86	C- 70-72	F under 60

Late work submission policy: Textbook problems must be submitted at the beginning of class. Classwork is due and must be submitted by the end of class. Graded problem sets must be submitted **no later than 24** hours after the due date.

Testing Policy : We will use mastery-based testing rather than points-based testing . You will only receive credit for answers that demonstrate that you completely understand a topic. BUT you will get a number of chances to prove mastery throughout the semester with no penalty for previous attempts.

-The course has been summarized into 16 topics

-Your mastery of questions on these topics is assessed through the working of problems on Mastery days

-Each topic is graded as “mastered” or “not mastered”

-**Miss a test day?** Attempt those masteries on the **next** mastery day

-Mastery means you understand and can demonstrate all fundamentals of the topic and are proficient at the level

desired for the course.

-Your overall test grade is determined by the number of topics you have mastered:

#mastered	Mastery grade	#mastered	Mastery grade
16	100	8	60
15	95	7	55
14	90	6	50
13	85	5	45
12	80	4	40
11	75	3	35
10	70	2	30
9	65	1	25

Do NOT expect to attempt mastery topics on days other than mastery days. See the schedule.

**You are expected to spend 12 hours per week working for this class ( 3 hours in class, 9+ hours outside of class).**

**Academic Integrity:** You are expected to be familiar with the Academic Integrity Code outlined in the booklet Academic Integrity at Roanoke College. In this class, you shall not cheat on tests or collaborate on graded problems.

Attendance Policies:

The usual course policy for absences is:

You will be working on material during class and submitting it at the end of class. If you miss class, you will have a zero for the day's work. Therefore, you are *expected* to attend *every* class. **If you have more than three absences, you may be dropped from the course.** If you miss three classes, you may receive a warning by e-mail that you are in danger of being dropped. If you miss a fourth class, you may receive another e-mail saying that you have been dropped. In that case, the grade you receive will reflect your course standing at the time, either DP or DF.

BUT:

If you are sick, especially if you have a fever, don't come to class. Call Health Services IMMEDIATELY. Do not come to class or go to any public area on campus. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them. If Health Services informs you that you should isolate and not attend class for multiple days, inform me so that we can make a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused but **you will need to do the work and graded assignments even if we extend a deadline for you.**

Masks Wear a mask in class if you have been exposed to Covid, or have just recovered from Covid (the CDC says wear it for 5 days after recovery). It's OK to wear a mask if you have a cold or don't want to risk infecting a family member with whatever virus is making the rounds.

**Tentative Schedule:**

week	section/topic	classwork
1	Introduction 7.5 1	Permutations, Combinations
2	1.1 2 1.2 3 1.3 4	Linear equations in one variable Functions Linear functions , <i>graphing lines</i>
3	1.5 5	Solutions of systems of linear equations <b>MASTERY on Friday 9/16</b> Topics 1-4
4	1.6 6 3.1 10 3.2 10	Applications of functions in Business and Economics Matrices Multiplication of Matrices
5	3.4 11 3.3 11	Matrix Equations, solution of systems using inverse matrices Gauss Jordan elimination <b>MASTERY on Friday 9/30</b> Topics 5,6,10,11
6	4.1 12 4.2 12	Linear inequalities in two variables Linear Programming: Graphical Methods
7	4.3 13 4.3	The Simplex Method More Simplex <b>MASTERY on Friday 10/14</b> Topics 12,13
		<b>FALL BREAK</b>
8	factoring 7 2.1 7 2.2 8	Factoring review Solving Quadratic Equations Quadratic Equations: parabolas
9	2.3 8 2.4 9	Business Applications using quadratics Special functions and their graphs <b>MASTERY on Friday 11/4</b> Topics 7,8
10	9.1, 9.2 14 9.3, 9.4 14 9.5 15	Limits, Continuous functions The Derivative and Derivative formulas The Product Rule and the Quotient Rule
11	9.6 15	The Chain Rule and the Power Rule Review derivative rules <b>MASTERY on Friday 11/18</b> Topics 9, 14,15
12	9.7 16	Using Derivative formulas <b>THANKSGIVING</b>
13	9.8 ,9.9 16 10.1 16 10.2 16	Higher Order Derivatives, Applications  The first derivative test Concavity, inflection points
14		Review 10.1, 10.2 <b>MASTERY on Wednesday 12/7</b> Topic 16 (final review Friday)
<b>Final</b>	<b>10:50 class</b>	<b>Tuesday 12/13 8:30-11:30</b> mastery opportunity: topics 1-16
<b>Final</b>	<b>8:30 class</b>	<b>Friday 12/16 8:30-11:30</b> mastery opportunity: topics 1-16

**Course Objective:** to provide the background in the quantitative techniques necessary to better understand advanced courses in Business and Economics.

**Learning Outcomes:** Upon completing this course, the student will be able to:

- Solve linear equations in one or more variables
- Solve applied problems using linear equations
- Solve systems of linear equations using graphing, substitution, elimination, or matrix methods
- Solve quadratic functions and use them in applications
- Solve systems of linear inequalities in two variables
- Use graphical methods and the simplex method to solve linear programming problems
- Find the derivatives of functions
- Use derivatives in business applications

**How to succeed in our Flipped Classroom** You may be used to attending a lecture, working on homework problems, and then having a few (if any!) of your questions answered during the next class period before moving on to the next lecture. In **this** class you are expected to:

- Watch** the lecture **before** class. The video will be posted on our Inquire page with some textbook problems.
- Work** the textbook problems **before** class. Submit them at the beginning of class.
- Note** which problems are giving you trouble and **ask** about them during class.
- Work** on class worksheets during class and turn those in at the end of class.
- Come to student hours** before the next class if you need more help. Do not wait until just before Mastery day.

**Accessible Education Services (AES)** is located in the Goode-Pasfield Center for Learning and Teaching in **Fintel Library**. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Becky Harman, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at [aes@roanoke.edu](mailto:aes@roanoke.edu) to schedule an appointment and/or obtain your accommodation letter for the current semester.

**Subject Tutoring**, located on the lower level of Fintel Library (Room 5), is open 4-9 PM, Sunday-Thursday. Subject Tutors are highly trained, current students who offer free, one-on-one (and small group) tutorials in over 80 courses taught at Roanoke College, including: Math 111 and INQ 240, among others. Check out all available subjects and schedule 30- or 60-minute appointments at [www.roanoke.edu/tutoring](http://www.roanoke.edu/tutoring). If you have a question, feel free to stop by, or contact us at [subject\\_tutoring@roanoke.edu](mailto:subject_tutoring@roanoke.edu) or 540-375-2590.