Spring 2019
Instructor: C. M. Staniunas

Math 111 Mathematical Models for the Management Sciences

Note: Students who have received credit for Math 112 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

Office hours: MWF 9:30-10:30am and 12-1 pm
TTh 10:00am-noon

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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

Text: Mathematical Applications for the Management, Life, and Social Sciences, tenth 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

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 Laura Leonard, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Laura Leonard at your earliest convenience to schedule an appointment.

Grading Policy:
Accuracy of graded problems 10%
Completion of practice problems 10%
Tests (mastery grade) 80%
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

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 (have mastered) a topic. BUT you will get many 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 o problems each week and during the exam period
-Each problem is graded as “mastered” or “not mastered”
-Once you have mastered a topic, you need not attempt it again
-There is no penalty for multiple attempts to achieve mastery
-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

Attendance Policy: If you miss four hours of class after the add date, you may be dropped from the course OR have one point deducted from your final grade for each absence after four.
You are expected to spend 12 hours per week working for this class (3 hours in class, 9^{+} hours outside of class).
One of your assignments will be to attend one of the MCSP colloquia and complete a reaction form about what you learned. I will provide a schedule as soon as possible.

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 any assignment having the words “work independently” on it.

MATH 111 SPRING 2019 TENTATIVE SCHEDULE

date	section/topic	material	practice problems
1/14	7.5 1	Permutations, Combinations	pp470-471/ 1,3,15,17,27,41
1/16	1.1 2	Linear equations in one variable	p62/ 9,13,19,25, 31
1/18	1.2 3	Functions	pp73-74/ 7,3,15,17,19a,b, 25
1/21	1.3 4	Linear functions , *graphing lines*	pp85-87/ 13,23,27,29,35
1/23	1.5 5	Solutions of systems of linear equations	pp104-106/ 11,15,17,23,29,39
1/25	1.5	Solutions of systems of linear equations	
1/28	1.6 6	Applications of functions in Business and Economics	pp112-115/ 5,9,13,19,21,23,43
1/30	2.5 6	Where do those linear equations come from, anyway?	pp171-172/ 9,10,17,18,29a,b
2/1	**mastery**	Topics 1-6	
2/4	2.1 7	Quadratic equations, *factoring*	p134/ 13,21,23,25,29,35,41,47
2/6	2.1	Quadratic Equations	
2/8	2.2 8	Quadratic Functions: parabolas	pp143-145/ 3,5,9,31,35
2/11	2.3 9	Business Applications of Quadratic Functions	pp151-153/ 5,7,9,11,15,25 begin special functions
2/13	2.4 10	Special Functions and their Graphs	pp162-165/ 3,5,8,7,9,10,13,15,19,21,23,34,37,38,40
2/15	**mastery**	Topics 1 - 9	
2/18	3.1 11	Matrices	p194/ 11,15,17,19
2/20	3.2 11	Multiplication of Matrices	pp206-207/ 1,3,5,11*, 13*
2/22	3.4 12	Matrix Equations, solution of systems using multiplication of inverse matrices	
2/25	3.3 12	Gauss Jordan elimination	p219-221/ 1,3,5,7,11*,13*,17,19,23*, and set up the system of equations for 55
2/27	3.3	Gauss Jordan elimination, continued	
3/1	**mastery**	Topics 1-12	
Break			
3/11	4.1 13	Linear Inequalities	pp265-267/ 1,3,7,9,13,19,set up 29
3/13	4.2 13	Linear Programming: Graphical Methods	pp275-279/ 3,5,9,15, set up 25
3/15	4.3 14	The Simplex method	pp293-294/ 3,5,9,13ab, 17ab, 19,21
3/18	4.3 14	The Simplex method	p294
3/20	4.3 14	The Simplex method	pp294-295/ 29,31, set up the inequalities and objective for 51
3/22	**mastery**	Topics 1-14	
3/25	9.1, 9.2 15	Limits,Continuous functions	pp553-554/ 1,5,7,17,27,33
3/27	9.3-9.4 15	The Derivative, Derivative formulas	577-8/ 2,12 pp588-589/ 3,7,15,21,25,27,47
3/29	9.5 15	The Product Rule and the Quotient Rule	pp596-597/ 3,7,9,11,13,17,21,39
4/1	9.6 15	The Chain Rule and the Power Rule	pp603-604/ 5,7,11,15,17,25,27,41
4/3		Review derivative rules	
4/5	**mastery**	Topics 1 -15	
4/8	9.7 16	Using Derivative formulas	pp610-611/ 13,15,17,37
4/10	9.8, 9.9 16	Higher order Derivatives, Applications of derivatives in Business and Economics	pp615-616/ 3,11,17; pp624-626/ 3,13,17,27
4/12	10.1 16	Relative Maxima and Minima	pp647-649/ 1,3,5,7,17,25;
4/15	10.2 16	Concavity and points of inflection	pp660-662/ 13,17,19
4/17	**mastery**	Topics 1 - 16	
4/19		**No Classes**	
4/22	Review		
4/30	**Final**	**Exam Tuesday from 8:30 to 11:30** mastery opportunity topics 1 - 16	

Expect to turn in practice problems every class day. They will be announced at the end of every class and posted on our Inquire page and will be due the next class period. **Late work is not accepted.** You ARE allowed to help each other in doing practice problems from the book. Graded problems will be assigned on the Fridays when you do not have mastery opportunities. Please work on those **independently.** You will be allowed to try graded problems multiple times.

Subject Tutoring, located on the lower level of Fintel Library (Room 5), is open 4 pm – 9 pm, Sunday – Thursday. We are a Level II Internationally Certified Training Center through the College Reading and Learning Association (CRLA). Subject Tutors are highly trained Roanoke College students who offer one-on-one tutorials in a variety of general education and major courses. Tutoring sessions are available in 15, 30, or 45-minute appointments. Feel free to drop by for a quick question or make an appointment at www.roanoke.edu/tutoring for a longer one-on-one appointment. For questions or concerns, contact us at 540-375-2590 or subject_tutoring@roanoke.edu.