Math 107
Linear Methods
Spring 2009, Section 2
CRN: 29210
TTh 9:30-11:00
Ohlendorf 225

Instructor: Dr. Christopher Mouron
Office: 320 Ohlendorf Hall
Office Hours: MWF 9:00-10:00 AM, TTh 11:00-11:50 AM, or by appointment
Phone: x3720
Email: mouronc@rhodes.edu
Text: Finite Mathematics and its Applications (9rd edition) by Goldstein, Schneider and Siegel

Class materials will be posted at:
\\Fileserver1\acad_dept_pgm\Math_CompSci\Mouron_Chris\Public\Math107spring09

Course Description: Linear algebra is a powerful subject with applications to many problems that arise in human endeavors. We will study some methods that have been developed to address these problems and examine some of their theoretical foundations. The problems and examples we will consider come from subjects like business, economics, and politics. We will use Excel throughout the course.

We will begin with a brief review of (systems of) linear equations. Then, we will learn how to solve linear systems using Gauss-Jordan elimination. We will discuss matrix algebra with applications to input-output analysis and Markov processes. Input-output analysis is used to determine how interdependent producers should behave. Markov processes are used to predict long term values of interdependent quantities that vary probabilistically.

Next, we will talk about linear programming (LP) problems. An LP problem is one in which you seek to maximize some linear function, such as profit, subject to certain linear constraints, such as budgetary or workforce limitations. You will learn to solve LP problems geometrically, using the simplex method, and by computer.

Integer and 0-1 programming problems, which are closely related to LP problems, are too labor-intensive to solve by hand. We will learn how to solve them using Excel. We will touch briefly on the subject of computational complexity.

We will take a look at game theory, the study of strategic interactions between competing interests. We will explore the connection between game theory and LP problems.

Course Content: I will assume that you are familiar with the material covered in sections 1.1 through 1.4; I will briefly review this material, but it would be a good idea to review those sections on your own. We will cover in order: Chapter 2 (systems of linear equations, matrices and Gauss-Jordan elimination), Chapter 8 (Markov processes), Chapter 3 (linear programming), Chapter 4 (the simplex method) and Chapter 9 (game theory).

Course Prerequisites: As a minimum the student should have completed courses in Algebra I, Algebra II and Geometry.

Attendance Policy: will follow the College's attendance policy, which can be found on page 70 of the Catalogue. In particular, a student will be giving a warning after 7 absences and a written recommendation to the Dean may be made that the student be dropped from the course is class attendance does not improve. In the case of a missed test, the student will be allowed to make-up the test only if both of the following conditions are satisfied:

1) I am contacted before the test is given (at least 1 week in the case of absence due to the attendance of an official school function.)
2) I am given proper documentation.

Finally, the student is responsible for all material and notes due to an absence. Get the notes from another student. Come to my office for any materials handed out in class.

Homework (15%): Mathematics is not a spectator sport. In order to learn the techniques and concepts, the student must work problems outside of class. There will be two types of problems assigned:

1) Practice exercises. These are problems that the student should do before the next class meeting. If a student has difficulty with an exercise, the student may ask me to do it in class (provided time allows) or in my office.
2) Graded exercises. These problems will be collected usually once a week. Due to the fact that I have 30 students, it is imperative that the work turned in is neat and organized. The student will be graded on correctness of the work. Also the student is required to show all work leading to an answer. The students may work together on these problems but the work turned in must be the students own, i.e. no copying. Copying homework will be considered an honor violation and students suspected of copying homework will be referred to the Honor Council. Also, if student do work together on homework, they must document who they worked with.
3) Pop quizzes. If it is evident to the instructor that the students are not keeping up with the homework, a pop quiz may be given.
4) Minute quizzes. Often, short quizzes that test the basic understanding of a concept may be given at the end of class.

Also, the student is expected to "pre-read" the text before the lecture. This is a excellence way for the student to familiarize him/herself will the material covered and will aid the student in following the lectures.

Written Group Projects (10%): There will be 2 projects that will consist of longer, more involve applications of calculus. A group may consist of 1, 2 or 3 students. These projects must be typed and will be graded on correctness of the mathematics and written exposition. For the first project, a rough draft will be mandatory. For the second, a rough draft will optional.

Late homework and projects will not be accepted. You will have plenty of time to complete assignments to turn in. If you are sick, have a roommate, classmate or friend turn in your homework for you. If they can get it to me before noon, it will be accepted. I f you plan to miss class for other reasons, turn in the homework early or have a classmate turn it in during class.

Tests (50%): There will be 3 tests throughout the semester. Unless otherwise notified, the test will be closed book and notes. The tentative test dates are:

1) February 10
2) March 10
3) April 17

Final Exam (25%): The final exam will be cumulative. Unless otherwise notified, the exam will be closed book and notes. The final exam will be Tuesday, May 5 at 5:30 a.m.

Grades: Grades will be earned for the following percentages:

A	Score >= 93%	*C*	73% <= Score < 77%
A-	90% <= Score < 93%	*C-*	70% <= Score < 73%
B+	87% <= Score < 90%	*D+*	67% <= Score < 70%
B	83% <= Score < 87%	*D*	63% <= Score < 67%
B-	80% <= Score < 83%	*D-*	60% <= Score < 63%
C+	77% <= Score < 80%	*F*	Score < 60%

Math Support Center (MSC): The MSC is a free problem session run by students in the evenings. It is a place to enhance your understanding of the concepts of the course. However, it is not a place to get the answer for the work that is to be turned in.

Honor Code: The student is expected to conduct him or herself within the guidelines of the College's Honor Code. If you have any questions about what is or not allowed, please ask.

If you have a documented disability and wish to receive academic accommodations, please contact myself and the Office of Student Disability Services as soon as possible.