

SYLLABUS: MATH 221
LINEAR ALGEBRA

John Bardsley

Associate Professor of Mathematics

308, Math Building, 243-5328

bardsleyj@mso.umt.edu

<http://web.math.umt.edu/bardsley/courses/221/221.html>

Time and Place: MWF 11:10-noon, Room 312, Math Building.

Text: Gilbert Strang, *Introduction to Linear Algebra, 4th Edition*, Wellesley-Cambridge Press, 2009.

Prerequisite: Calc 2.

Office Hours: MWF 1pm, subject to change.

OVERVIEW: The focus of the course is on the problem of solving systems of linear equations. We will make use of Gaussian elimination and, building from there, learn about properties of the vector space \mathbb{R}^n , orthogonality, determinants, eigenvalues, and finish with the singular value decomposition.

LEARNING GOALS:

1. To learn to use Gaussian elimination to solve a system of linear equations and to compute the matrix inverse.
2. To learn about the properties of the vector space \mathbb{R}^n , including notions of linear independence, basis, subspace, dimension, orthogonality;
3. To learn how to find bases for the four subspaces of a matrix A : $N(A)$, $C(A)$, $N(A^T)$, and $C(A^T)$.
4. To learn about basic properties of matrices, such as rank, null-space, and how to compute determinants, eigenvalues, eigenvectors and the singular value decomposition.

ASSESSMENT: Your course grade will be determined as follows:

		Total points
Exam 1	E1	100
Exam 2	E2	100
Exam 3	E3	100
Exam 4	E4	100
HW/Quizzes	Q	100

NOTE: Exams 3 and 4 will be given during finals week. Exam 3 will be over new material since Exam 2, while Exam 4 will be comprehensive over Exams 1 and 2. Exam 4 is optional, and if it is taken, $F = (E3+E4)/2$ will replace, if higher, the lowest score on Exams 1 and 2. Thus there are three possibilities for your final average:

$$\begin{aligned} \text{percent} &= (E1 + E2 + E3 + Q)/4 \\ \text{percent} &= (E1 + E2 + E3 + E4 + Q)/5 \\ \text{percent} &= (\max(E1, E2) + F + E3 + E4 + Q)/5 \end{aligned}$$

The grades (A,B,C,D,F) given on a particular exam will be determined by the *overall* performance of the class on that exam. The final quiz grade will also be determined in this fashion.

HOMEWORK, QUIZZES, and EXAMS: Homework will be given daily and you will be tested on the homework material with a quiz once a week, usually on Tuesdays. Exams will be based on homework and quiz material.

IMPORTANT NOTE: Announcements made in class are considered addenda to this syllabus. Make sure you stay informed as to the progress of the class.

CONDUCT & ACADEMIC HONESTY: I've not had many issues with this stuff, but I've got to let you know: (i) your conduct should be in line with the Student Conduct Code, which you can find on the UM home page; and (ii) you must practice academic honesty, because it's the right thing to do, but also because academic misconduct is subject to penalty.

HOW TO BE SUCCESSFUL: Do the homework. When preparing for exams and quizzes, practice doing the homework and similar problems from the book until you are able to do them correctly without the aid of the book or notes. If you don't understand something, ask questions in class or during office hours immediately.

FOR ANY STUDENT WITH A DISABILITY: If you have a disability that has, or might have, an effect on your performance in this class, please let me know. I will do my best to accommodate you.

Important Dates:

2.10	Last day to drop/add via CyberBear or to change grade option to audit;
3.26	Last day to add or drop courses or change grading options, except audit.
5.10, Thursday, 10-12am	Final exam and/or project presentations.