9-2013

M 221.02: Introduction to Linear Algebra

Jonathan M. Bardsley
University of Montana - Missoula, johnathan.bardsley@umontana.edu

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: MTWF 2:10-3pm, Room 305, Math Building.
Text: Gilbert Strang, *Introduction to Linear Algebra, 4th Edition.*
Prerequisite: Calc 2.
Office Hours: 1:10-2pm, Monday, Tuesday, Wednesday.

OVERVIEW: The focus of the course is on 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, and eigenvalues. Along the way we will learn about the three most import matrix factorizations: the LU factorization (from Gaussian elimination), the QR factorization (from orthogonality), and the singular value decomposition (from eigenvalues and eigenvectors).

LEARNING GOALS:

1. To learn to use Gaussian elimination to solve a system of linear equations and to construct the LU decomposition.

2. To learn about the properties of the vector space $\mathbb{R}^n$, including notions of linear independence, basis, subspace, dimension;

3. To learn how to find the rank, bases, and dimension of the four subspaces of a matrix A: $N(A)$, $C(A)$, $N(A^T)$, and $C(A^T)$;

4. To learn about the notion of orthogonality and to construct the QR factorization of a matrix;

5. To learn how to compute the determinant of a matrix;

6. To learn how to compute eigenvalues, eigenvectors and the singular value decomposition of a matrix.

ASSESSMENT: Your course grade be will determined as follows:

		Total points
Exam 1	E1	100
Exam 2	E2	100
Exam 3	E3	100
Final	F	200
HW/Quizzes	Q	100

NOTE: The Final will be comprehensive and is optional; if you are happy with your grade at the end of the semester, you don't have to take it. Moreover, if your score on the Final is higher than your score on one or more of your midterms, it will replace the lowest of these scores. Each exam will be graded on a curve. The overall quiz average Q has not been curved in the past, as quiz averages tend to be high.

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: *Please, keep your eyes on your own work.* Otherwise, I've not had many issues, 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: Two things: (i) come to class and pay attention, and (ii) 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. *Math is learned by doing.* 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:

9.15	Last day to change grade option to audit; Last day to submit override form; Last day to use CyberBear for course chages; Last day to withdraw with a partial refund.
10.28	Last day to add or drop courses or change grading options, except audit.
12.10, 1-3:00, Tuesday	**Final project presentations**.