Mathematics 2050: Linear Algebra – Winter 2010

Slots: 03 (Section 005),
Classrooms: EN 2043
Time: Lecture MWF 10:00 - 10:50 pm
Instructor: Dr. Margo Kondratieva
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Prerequisite:

The prerequisite is Math-1000 or six credit hours in first year math courses.

Getting Help:

There are few ways of getting help. First, I'll have **office hours Wed 11:30 - 1:00 pm** , so feel free
to come to them. If you need to speak to me outside of those times please make an appointment.
If you have a quick question or remark send me an e-mail. Do not postpone with asking for help
and clarification of anything.

Marking Scheme:

There will be weekly self-test assignments. I will ask you to report your progress with the assign-
ments every Friday in class. The **assignments** will be worth *only* **5**% of your final mark, **but
doing them is extremely important for your understanding and success in the course!**
There will also be **three midterm tests** on **February 1** , **March 1** and **March 24**. The
tests will be worth **35**% of your final mark.
The **final exam** will cover the entire course. It will be worth **60**% of your final mark.

Note: If you miss a midterm for an acceptable reason, write me a note explaining the circumstances
and I'll shift the weighting for the missed work to the final exam. Such notes should be submitted
within a week of the missed event.
Missing the final exam is a much more serious matter. It can be deferred if you have three exams
all scheduled within a 24 hour period, or if you suffer bereavement or serious medical problems.
Deferrals must be officially applied for using forms that you can obtain from the General Office
(HH-3003).

Formula Sheet and Calculators:

Graphing calculators such as the TI81,82,83,84,85,86 are allowed during tests and the final exam.
However, calculators that can do symbolic manipulations such as the TI89, TI92, or HP48G are
not allowed. If you use your calculator to store notes or formulas, you must delete this material
before the start of any test, or exam. Bringing electronic notes into an exam is the equivalent of
bringing in a cheat sheet, and will be dealt with in the same way (see MUN calendar).

Text and Course Outline:

The official text is <u>Linear Algebra I.</u> (Winter 2010) by Edgar G. Goodaire. Course Notes available in the book store. These are based on a proposed second edition of "Linear Algebra: A Pure and Applied First Course" by Edgar G. Goodaire, Pearson (2003).

You are advised to read an appropriate section before starting doing your homework assignment.

We'll cover the following material, which is organized into four units (the class schedule is tentative and may vary):

Unit 1	Euclidian space	class
1.1	Vectors and operations with them	Jan 8,11
1.2	Linear combinations, span, standard basis in $\mathbf{R}^n$	Jan 13
1.3	The dot product, length, direction, angle	Jan 15,18
1.4	Cauchy-Schwarz inequality and triangle inequality	Jan 20
1.5	The cross product and equation of a plane	Jan 22
1.6	The area and volume calculations	Jan 25
1.7	Equation of a line. Point of intersection of a line with another line or a plane.	Jan 27
1.8	Projections and distance calculations	Jan 29, Feb 3
	Test 1. Covers sections 1.1 - 1.7	Feb 1
1.9	Linear independence	Feb 5,8
Unit 2	**Matrices and Linear Equations**	**class**
2.1	Addition and multiplication of matrices	Feb 10,12
2.2	The transpose of a matrix. Properties	Feb 15
2.3	Systems of linear equations and their possible solutions	Feb 17
2.4	Elementary row operations and Row-echelon form	Feb 19
2.5	Gaussian algorithm for solving systems of linear equations	Feb 26
	Test 2. Covers sections 1.8,1.9, 2.1-2.4	March 1
2.6	Homogeneous equations and linear independence	March 3
2.7	The inverse of a matrix	March 5
2.8	Elementary matrices	March 8
2.9	LU factorization	March 10,12
Unit 3	**Determinantes**	**class**
3.1	Computing determinants. Matrix of cofactors.	March 15
3.2	Properties of determinant	March 17, 19
3.3	Determinants and matrix inverses	March 22
	Test 3. Covers sections 2.5-2.9, 3.1, 3.2.	March 24
Unit 4	**Eigenvalues, eigenvectors and diagonalization**	**class**
4.1	Eigenvlues and eigenvectors	March 26,29
4.2	Diagonalization algorithm and similarity of matrices	March 31, Apr 5
4.3	Application: linear dynamical systems	Apr 7
	Review for final	TBA, Apr 8-11
	Final exam	TBA, Apr 12-21