Last updated: February 12, 2015

## Math 250 Syllabus, Spring 2015

**Instructor**: Daniel Scheinerman

Email Address: ds965@math.rutgers.edu

Lecture Location and Time: SEC-216. Monday and Wednesday, 5:00-6:20 PM

Office Hours Location and Time: Hill 624. Thursdays, 1:30-3:00pm

**Textbook**: Spence, Insel, & Friedberg: Elementary Linear Algebra: A Matrix Approach, 2nd Edition, Prentice Hall. (ISBN # 978-0-13-187141-0) You do not need to bring the textbook to lecture.

Section Website: http://math.rutgers.edu/~ds965/250S15.html

**Course Topics**: Vectors in n-space, systems of linear equations, Gaussian elimination, span and linear independence of a set of vectors, matrix algebra, determinants, subspaces of nspace, basis and dimension, eigenvalues and eigenvectors, diagonalization of a matrix, geometry of vectors, projections, orthogonal sets of vectors, symmetric matrices, and applications.

#### Grade Breakdown:

Quizzes: 10% Homework: 10% Midterm 1: 20% Midterm 2: 20% Final Exam: 40%

### Assignment Details

Homework: The majority of assigned homework problems can be found here: http://math.rutgers.edu/courses/250/homework.pdf. Homework will be due each Monday in lecture. Occassionally, additional homework problems may be announced in lecture. Students may work together in solving homework problems, but the writeup should be their own original work. NO LATE HOMEWORK WILL BE ACCEPTED. To account for inevitable emergencies, I will drop the lowest two homework scores for each student.

**Quizzes**: There will be weekly quizzes. They will be administered in lecture. I will drop the lowest two quiz scores for each student.

**Midterms**: There will be two midterms throughout the course. They will take place during lecture, and last the entire lecture period. The midterm dates are February 25 and April 8.

Final Exam: The final exam will be Wednesday, May 8, from 4:00-7:00 PM.

### Policies

Academic Integrity Policy: You can find the academic integrity policy at http://academicintegrity.rutgers.edu/files/documents/AI\_Policy\_2013.pdf Violations of this

are taken very seriously.

**Disability Policy**: Please visit http://disabilityservices.rutgers.edu/. More importantly, if there are any disabilities or other issues you would like to speak to me about, please let me know sooner rather than later, ideally before the course begins.

Absence Policy: Class attendance is mandatory. Any absence MUST be reported to https://sims.rutgers.edu/ssra/. If you know you will miss a lecture, please let me know at least a week in advance. If you miss a lecture due to illness or other emergency, please report it to the website in addition to letting me know.

Lecture schedule is on next page.

# Lecture Schedule

Date	Lecture	Reading	Topics
1/21	1	1.1, 1.2	Matrices, Vectors, and Linear Combinations
1/26	N/A	N/A	Class Cancelled - Snow day
1.28	2	1.3	Systems of Linear Equations
2/2	3	1.4	Gaussian Elimination
2/4	4	1.6	Span of a Set of Vectors
2'/9	5	1.7	Linear Dependence and Linear Independence
2/11	6	1.7, 2.1	Homogeneous Systems, Matrix Multiplication
,		,	Matrix Algebra
2/16	8	2.3	Invertibility and Elementary Matrices
1		App. E	Uniqueness of Reduced Row Echelon Form
2/18	9	2.4	Inverse of a Matrix
,		2.5	Partitioned Matrices and Block Multiplication
2/23	10	2.6	LU Decomposition of a Matrix
2/25	11	Midterm Exam #1	
2/20	11		
3/4	12	3.1	Determinants; Cofactor Expansions
3/9	13	3.2	Properties of Determinants
3/11	14	4.1	Subspaces
3'/23	15	4.2	Basis and Dimension
3/25	16	4.3	Column Space, Null Space and Row Space of a Matrix
3/30	17	5.1	Eigenvalues and Eigenvectors
4/1	18	5.2	Characteristic Polynomial
4/6	19	5.3	Diagonalization of a Matrix
4/8	21	Midterm I	Exam $\# 2$
,			
4/13	20	5.5	Examples of Diagonalization
4/15	22	6.1	Geometry of Vectors; Projection onto a Line
4/120	23	6.2	Orthogonal Sets of Vectors;
			Gram-Schmidt Process; $QR$ factorization
4/22	24	6.3	Orthogonal Projection; Orthogonal Complements
			Projection onto Column Space; Closest Vector Property
4/27	25	6.4	Least Squares Method; Normal Equations;
			Solving Inconsistent Systems
4/29	26	6.5,  6.6	Orthogonal Matrices; Diagonalization of Symmetric Matrices
5/4	27	6.6	Diagonalization of Quadratic Forms
			Spectral Decomposition for Symmetric Matrices
5/8	Final Exam		