

Math 4242, 4 Credits, Fall 2015
Linear Algebra with Applications

— *Syllabus* —

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Time & Place

MW 9:05 – 9:55, VinH 211

Text

P. Olver & C. Shakiban, *Applied Linear Algebra*, Prentice Hall, 2006.

Office Hours

MW 10:10 – 11:00, M 3:50-4:40, T 1:25-2:15, VinH 509 or by appointment.

Contact

All material regarding the course can be found on my homepage <http://www.math.umn.edu/~scheel>. Best way to reach me is email to scheel@math.umn.edu.

Description

This is a one-semester course on linear algebra. I will assume basic acquaintance with vectors and matrices, linear equations, eigenvalues, and determinants. The course studies these topics in more depth, in particular with regard to applications. Topics include Gram-Schmidt orthogonalization, eigenvalues and diagonalization, QR decomposition, and singular value decomposition.

Midterm Exams

Wednesday, October 7, 2015

Wednesday, November 11, 2015

Wednesday, December 16, 2015

Homework

Homework will be assigned but not collected. Instead there will be weekly quizzes consisting of problems very similar to the homework problems. If you can do the homework problems you should have no trouble with the quizzes. One quiz score can be dropped.

Composition of Grade

There will be grades for quizzes and three midterm exams. All exams and quizzes are open book/notes, calculators allowed. Final grade is composed of quizzes (25 %) and midterm exams (25% each, 75% total).

Preliminary schedule

WEEK	MATERIAL	READING
09/09	Gauss elimination, pivoting	1.2-1.4
09/14	Inverses, linear systems, determinants	1.5,1.6,1.8,1.9
09/21	Vector spaces, span, bases, dimension	2.1-2.4
09/28	Kernel, Range, adjoints, solvability	2.5
10/05	Midterm I	
10/12	Inner products, norms, positive definite, Cholesky	3.1-3.6
10/19	Minimization, least squares, interpolation	4.1-4.4
10/26	Orthogonal bases and matrices, Gram-Schmidt	5.1-5.3
11/02	Orthogonal polynomials and projections, Fourier	5.4-5.7
11/09	Midterm II	
11/16	Linear transformations	7.1-7.3
11/23	Eigenvalues, diagonalization	8.1-8.3, 9.1
11/30	Symmetric matrices, singular values, Jordan form	8.4-8.6
12/07	Linear iteration, Markov chains, iterative solvers, QR	10.1, 10.4-10.6
12/14	Midterm III	

Grading policy and academic conduct

Please refer to the University guidelines at

- <https://policy.umn.edu/education/gradingtranscripts>
- <https://policy.umn.edu/research/academicmisconduct>