Math 221 -- Course Description

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General Issues

ere are some of the 'logistical issues' related to the course.

Text Book

.ementary Linear Algebra, 7th edition, by Howard Anton,
ohn Wiley & Sons, Inc.

urrently we think very well of the book and would suggest it's
se next year. The book is at a reasonable level for our students
not too hard nor too easy. However, more applications might
nice. Finding a better book for this group of students will
difficult. (Added later, the book breaks down slightly in
apter 6.3)

Old Syllabus

Vector spaces, Matrices, determinants, linear equations, linear
ansformations, Eigenvalues, Inner products, Canonical forms,
plications."

ur book does not cover canonical forms nor many applications. We
lieve it would be very difficult to cover canonical forms in
is class with this group of students. More applications would
nice.

What we have covered

Systems of Linear Equations -- Chapter 1

Matrices --- arithmetic of matrices
Gaussian elimination and related ideas
inverses of matrices
homogeneous linear systems

Determinants -- Chapter 2

evaluating determinants, basic properties
Cramer's rule; co-factor expansion

Geometry of real n-space -- Chapter 4

n-tuples, inner products, norms
Linear transformations from n-space to m-space; associated
   standard matrix
Eigenvectors/values (briefly)

(abstract) real vector spaces -- Chapter 5

defined
subspaces
spanning, linear independence, bases
row space/column space/null space of a matrix
rank and nullity of a matrix
general form of a solution to a system of linear equations

Inner product spaces -- Chapter 6 (skipped 6.4)

defined
orthogonal
orthonormal
(proof of) Cauchy Schwartz inequality
Gram-Schmidt and orthonormal bases
 Orthogonal matrices/change of basis

Eigenvectors -- Chapter 7

quick review
eigenspaces
diagonalizing matrices (orthogonally and otherwise)

What we wished we have also covered.

Linear transformations -- Chapter 8

definitions
kernel, range, inverses, matrix representations
similarity

ısicly we just did not have enough time to cover this. If we
ıve 3-4 more days we could covered Chapter 8 and skipped Chapter
   This would be been better. It would take some work to find
ıe needed time -- a faster pace through Chapter 1 could add 1-2
ıys and better placement of exams and reviews could maybe save a
day.

The Students:

ırrently there are no prerequisites. Although most students
ıve had calculus; maybe this should be added as a prerequisite.
: would be helpful if they have had seen vectors, dot products,
:oss products in 3-space before this class. The students are

enerally able. This is the first course where many (all?) have
deal with "abstraction" and many find this difficult. While
have not been shying away from this, the course is by no means
introduction to "proofs" and "abstraction". Whether this
urse serves as a gentle and good introduction to "proofs" and
bstraction" is unclear.

Use of the computer:

ere is some potential for using more computer problems and
plications in the class. This may be an option be to explored
later years. However, to do so may move this course away from
aling with "abstraction" and "proof".