Fall 9-1-2000

MATH 221.02: Linear Algebra

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Information Sheet: Math 221 Applied Linear Algebra, Fall 2000

Catalog Description: U 221 Linear Algebra 4 cr. Offered autumn and spring. Prereq., MATH 153. Vectors in the plane and space, systems of linear equations and Gauss-Jordan elimination, matrices, determinants, eigenvalues and eigenvectors, vector spaces, linear transformations. Calculators and/or computers used where appropriate.

Teacher: Greg St. George Office: Math 205a Phone: 243-4146 e-mail: stgeorge@selway

Office Hours Monday 10, Tuesday 3, Friday 2, Available in Corbin Lab: Friday 10, 3

Also: Molly Shulte is available M 12 and T 12 in Corbin 367

Text: Seymour Lipschutz, *Linear Algebra.* 2nd Ed. Shaum's Outline Series. This text will mostly serve as a source of practice problems.

Important Dates:

25 Sept. Last Day to Add/Drop using Dial-a-Bear. Last day to Pay Fees. Last day to receive full refund for drops.

16 Oct. Last day to drop using drop/add form. After this drops will appear on transcript (WP or WF) and a fee will be assessed. Last day to change grading options.

7 Nov. Election Day (No Class)

10 Nov. Veteran's Day (No Class)

22-24 Nov. Thanksgiving Vacation

Topics: In no particular order, we will probably cover:

Vectors in $\mathbb{R}^n$: Orthogonality, Inner products and Length, Projections, Subspaces, Graham-Schmidt.

Matrices: Introduced as Maps (see below). Operations, Applications, Determinants

Linear Maps $\mathbb{R}^n \to \mathbb{R}^m$: Kernel and Range spaces and their dimension, "transpose maps"

Systems of Equations: Gauss-Jordan Elimination and LU decomposition. Geometrical Interpretation.

Vector Spaces: Dependence, Independence, Bases.

Eigenvalues: Eigenvectors, Symmetric Matrices.

Depending on time constraints, we may also cover Singular Value Decompositions.

Grading: This will be based on Problem Sets (that is, graded homework), Quizzes, Tests, and a Final. Each of these will have a specified point value, with Tests usually being 100 and the Final usually being 150-175. The grading scale is

$$[90,\infty) \to \text{A} \quad [80,90) \to \text{B} \quad [67,80) \to \text{C} \quad [55,67) \to \text{D} \quad (-\infty,55) \to \text{F}$$

The instructor reserves the right to elevate grades based on exceptional performance on the final.

Software A scientific calculator is helpful. We will be introduced, briefly, to the software MATLAB during the course.

On reserve:

Halmos, Paul, *Finite Dimensional Vector Spaces*
Lang, Serge, *Linear Algebra*
Marcus, Marvin, and Minc Henryk, *Elementary Linear Algebra*
Strang, Gilbert, *Linear Algebra and its Applications*
Zelinsky, Daniel, *A First Course in Linear Algebra*