Math 4242. APPLIED LINEAR ALGEBRA

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Textbook: "Linear Algebra" by S. H. Friedberg, A. J. Insel and L. E. Spence, 4th edition, Prentice Hall, 2003.

Lectures: MWF 2:30- 3:20 PM Appleby Hall 11
Office Hours: MW 3:35 – 4:25 PM or by appointment

Pre-requisites: Satisfactory completion of a sophomore-level course in linear algebra (e.g. Math 2243/2373: Linear Algebra and Differential Equations) and current readiness to use that material. You are expected to have the skills of being adept at basic mathematical reasoning and able to write clear (and correct) mathematical proofs.

Course Description: Materials to be covered in this course are geared toward applications. The course will cover, in particular, the following in Chapters 1 to 4: Vector spaces, basis, dimension, linear transformations and matrices, null space and range, determinants. In Chapters 5 to 7, eigenvalues and eigenvectors of linear transformations (or matrices), Gram-Schmidt orthogonalization and various decompositions of linear transformations will be discussed, diagonalization and Jordan canonical form are included.

Grading policy: Homework will be assigned but not collected. Instead, a number of short quizzes, consisting of questions similar to some of the assigned homework problems, will be given on selected Mondays throughout the semester. In addition, there will be two midterm exams on October 9 (Monday) and November 20 (Monday), and the Final Exam will be given at 10:30 AM – 12:30 PM, December 18 (Monday).

The course grade is determined by the following:

Quizzes: 20%
Midterms : 20% each
Final: 40%

*Calculators are **not** allowed in the exams of this course.*

Homework Assignments

Section 1.2: # 1, 7, 10, 12 ~ 14, 17, 18, 20, 21
Section 1.3: # 1, 8 ~ 10, 12, 15, 21, 23 ~ 27, 29, 30
Section 1.4: # 1, 2a, 3a, 4a, 5a,b,e,g, 6, 10, 11, 13 ~ 15
Section 1.5: # 1, 2a~c,f, 5, 7 ~ 10, 13, 17 ~ 20
Section 1.6: # 1, 4, 9, 11 ~ 17, 28 ~ 30, 34

Section 2.1: # 1, 2, 4, 5, 6, 10, 12, 13, 15, 16, 21 ~ 25, 28, 30, 34, 35, 37, 38
Section 2.2: # 1 ~ 5, 8, 10 ~12, 16
Section 2.3: # 1, 3, 4, 9, 12, 13, 15 ~ 17
Section 2.4: # 1 ~ 7, 9 ~ 11, 16, 17, 20, 21, 23
Section 2.5: # 1 ~ 3, 5 ~ 7, 10, 11, 13
Section 2.6: # 1 ~ 8, 11, 19, 20

Section 3.1: # 1 ~ 3, 12
Section 3.2: # 1, 2a,c,e,f, 3, 4a, 5a,c,g, 6a,e,f, 7, 11, 14, 15, 17 ~ 21
Section 3.3: # 1 ~ 4, 6 ~ 10
Section 3.4: # 1, 2a,e, 3, 4a,c, 5, 7, 9 ~ 13

Section 4.1: # 1, 2, 4 ~ 9
Section 4.2: # 1 ~ 5, 7, 9, 11, 13, 15, 19, 21, 23 ~ 30
Section 4.3: # 1, 3, 9 ~ 16, 19 ~ 25, 26a,c,e,g, 28
Section 4.4: # 1, 2c

Section 5.1: # 1, 2a,c,f, 3a,c, 4a,b,e,i,j, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20, 22
Section 5.2: # 1, 2a,c,e,g, 3a,b,e,f, 7 ~ 13, 18 ~ 22
Section 5.3: # 1a,b, 2a,c,e,g,i, 3 ~ 5, 20 ~ 23
Section 5.4: # 1, 2a,c,e, 3, 6, 9 ~ 11, 16 ~ 19, 23 ~ 26, 33 ~ 42

Section 6.1: # 1, 2, 4, 5, 8 ~ 17, 19 ~ 23
Section 6.2: # 1, 2a,c,e,g,i,k,m, 4, 5, 9 ~ 14, 16, 18 ~ 23
Section 6.3: # 1, 2a,c, 3a,c, 7, 8, 10 ~ 21, 22a,d, 24
Section 6.4: # 1, 2a,c,e,f, 3, 4, 6 ~ 15, 17 ~ 20, 22
Section 6.5: # 1, 2a,d, 4, 5, 7 ~ 12, 14, 17, 19, 21, 24 ~ 26, 29, 30
Section 6.6: # 1 ~ 8, 10

Section 7.1: # 1, 2a,c, 3a,c, 4, 5, 7, 10
Section 7.2: # 1 ~ 3, 4,a,d, 5a,d,f, 6, 7, 12 ~ 14, 19