Course SYLLABUS – Math 310: Applied Linear Algebra – S. Friedland, Fall 2002
12 PM MWF, TH 220 — call# 65936

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OFFICE HOURS: 1-2 PM MF, 11-12 W.

GRADING:
MAT LAB HW - 3.5%
QUIZZES - 10% – There will be about 7 to 9 quizzes.
EXAM 1 – 20% Chapter 1- 2 – Monday, September 23.
EXAM 2 – 20% Sections 3.1–5.5 – Friday, November 1.
FINAL – 46.5% Comprehensive, Ch. 1-6, especially Ch. 6, Week 16.

Note: The exams will be given in Lecture Center ...
In most cases, course grade is determined by total test scores. When the total does not clearly indicate what
the letter grade should be, homework and class participation will determine the letter grade.
Cutoff for A is 90% average, 80% for B, 70% for C, 60% for D.


PREREQUISITE: A grade C or better in Math 210.

HOMEWORK: Below is a tentative course schedule. Homework for a given week will be collected the
following Monday. Mat Lab HW will be collected at the specified dates No assignments will be accepted
late!
In parentheses are problems using the computer package MATLAB, available on the ICARUS account.
(Type OCTAVE.) The commands for MATLAB are stated at the Appendix of the text on p. 505-515.
One can simply follow the commands stated in MATLAB exercises for each chapter. One can also use Math
Computer Lab, 200 SEO, for MATLAB homework. The students will be notified when to submit MATLAB
homeworks. For those with access to Maple, it is possible to use similar maple commands to solve MATLAB
homeworks.

Lecture schedule and homework problems:

WEEK-DATE———-Topics—-Section——-PROBLEMS
——-CHAPTER 1——-MATRICES AND SYSTEMS OF EQUATIONS
1——Aug 26–Lin. Sys.; Row ops —-1.1 —-% 1ab, 3a, 5ab, 6ad
1——Aug 28–Echelon Form———1.2 —-% 1, 2a-d, 3
1——Aug 30–Gauss, G-Jordan———1.2+ —-% 5a-d, 6ab, 10, (2b p' 92).
2——-Sep 2–Labor Day—-
2——-Sep 4–Applications.2+ —-% 13, 19, 20a
2——-Sep 6–Matrix algebra———-1.3 —-% 2, 7, 10, 12, 29, 30, 32, (6 p' 94).

*******(LAST DAY TO DROP COURSE)********
3——Sep 9–Elem Matrices———1.4 —-% 1, 3, 6.
3——Sep 11–Inverse —-1.4+ —-% 8,9a-f, 11.
——-CHAPTER 2———DETERMINANTS
3——Sep 13–Defn, cofactors —-% 2.1 —-% 3, 4, 6.

4——Sep 16–Properties———2.2 —-% 1, 3, 7, 10, (1a-f p’ 121).
4——Sep 18–Adjoint matrix———2.3 —-% 1ac, 2ac, 5.
——-3 MATLAB problems are due on Sep 18.——-
4——Sep 20–Review - See the sample hour exams on the departmental web page
——-CHAPTER 3———VECTOR SPACES
——-Defn, examples———3.1 —-% 3,4,5,6.
5—Sep 23—**EXAM 1 *************** Ch 1-2 **Hour Exam 1 **
5—Sep 25—Subspace———3.2 —-# 1ab, 2ab, 3abcd, 4abc, 5ac, 8ab.
5—Sep 27—span———-3.2+ —-# 9abc, 10abc, 11, 13, 14.

6—Sep 30—Linear indep———3.3 —-# 1abc, 2abc, 4.
6—Oct 2—l.i. contn’d———3.3+ —-# 6ab, 7ab, 8, 9, 10.
6—Oct 4—Basis———-3.4 —-# 3, 4, 5, 7, 8.

7—Oct 7—dimension———3.4+ —-# 10, 11, 12 acd, 14ab, 16.
7—Oct 9—row, col space———3.6 —-# 1ab, 2ab, 3, 4cd, 8, 9, 19.

8—Oct 14—c.o.b. contn’d———3.5+ —-# 5, 6, 9, (1ab p’ 184).

——CHAPTER 4 ——LINEAR TRANSFORMATIONS
8—Oct 16—Lin Transf——-4.1 —# 4, 5ac, 6ab, 7bc, 8ac, 10ac, 16.
8—Oct 18—Matrix rep’ns——-4.2 —# 2ab, 3ab, 4ab, 5, 13, 16a, (1 p. 220).

9—Oct 21—Similarity———-4.3 — # 1ab, 2ab, 4, 5abc, 6.

——CHAPTER 5 ——ORTHOGONALITY
9—Oct 23—Scalar product———5.1 —# 1ab, 3ab ,5, (1 p. 307).
9—Oct 23—Orthog. subsp.———5.2 —# 1ab, 2, 3b, 4
9—Oct 25—Least squares———5.3 — # 1, 2, 3a, 4a, 5.

10—Oct 28—Inner products———5.4 —# 3, 4ab, 7, 8, 9.
10—Oct 30—Orthon. sets ——5.5 —# 1, 2, 3, 7.

3 MATLAB problems are due on Oct 30.

——Review - See the sample hour exams on the departamental web page

10—Nov 1**Exam 2 ***************Sec. 3.1 - 5.5 **** Hour Exam 2.

11—Nov 4—Orth. sets -contn’d———5.5+ — # 19, 20, 24, 25.
11—Nov 6—Gram-Schmidt———5.6 —# 1, 3, 4.
11—Nov 8—QR decomp———5.6+ — # 2, 5, 7, 8.

————CHAPTER 6 ——EIGENVALUES
12—Nov 11—Eigenvalues———6.1 — # 1abefghkl, 3, 4, 10.
12—Nov 13—Diff Eq Sys———6.2 — # 1ab, 2ab, 4
12—Nov 15—Application:———6.2+ — # 5a, 6.

13—Nov 18—Diagonalizing———6.3 — # 1abde, 2ab, 3ab, 7, 8ab.
13—Nov 22—Symmetric, Herm———6.4 — # 1a, 2, 4ace

14—Nov 27—SVD———6.5 — # 2abcd, 3a, 3b(parts b,d), 4, 5, 6.
14—Nov 29—Thanksgiving holiday

15—Dec 2—Quadratic forms———6.6 — # 1, 2, 7ae.
15—Dec 4—Positive definite———6.7 — # 1, 2, 4ac, 13.
15—Dec 6—review———-.

16—Dec 13, 8-10 AM—***FINAL EXAM*** (all, especially Chapter 6)