SYLLABUS

Math 250 – Introductory Linear Algebra – Fall 2017

T 8:40 AM - 10:00 AM & F 8:40 AM - 10:00 AM; SEC-210, Busch Campus

Instructor: Zhi Qi, e-mail: zhi.qi@rutgers.edu, Hill Center 242, Phone: 848-445-7278, Homepage: http://www.math.rutgers.edu/∼zq44/

Textbook:

Spence, Insel & Friedberg, *Elementary Linear Algebra: A Matrix Approach, 2nd Edition*; Pearson, 2007 (ISBN # 978-0-13-187141-0)

Spence, Insel & Friedberg, *Elementary Linear Algebra (Classic Version), 2nd Edition*; Pearson, 2017 (ISBN # 978-0-13-468947-0)

The latter is a new low cost version of the former, but the content is supposed to be exactly the same. Either version of the textbook is fine.

Office Hours: F 2:00 PM - 4:00 PM, or by appointment.

Teaching Assistant: Yukun Yao, e-mail: yao@math.rutgers.edu, Hill Center 626.

Homework: There will be 13 homework sets. Homework problems will be collected on **Tuesdays** starting from the second week. The lowest three homework scores will be dropped.

Homework Policy:

1. **No late homework will be accepted under any circumstances!** (This is as much a courtesy to the grader as an incentive to stay current with the course and not fall behind.)

2. When you have worked on a problem for a while and remain stuck, you are encouraged to ask for hints from the instructor. Students may also discuss problems with one another, but must write solutions on their own. In particular if you have taken notes while discussing homework problems with friends or the instructor, you must put these notes away when writing your solution.

Quizzes: There are five short written quizzes, as indicated on the course syllabus. No makeup quizzes will be given, but your lowest quiz grade will be dropped.

Exams: There will be 2 midterms and a final. (The dates are given in the table.)

Exam Policy: All exams will be closed book and student-prepared formula sheets will not be permitted.

Academic Integrity: All Rutgers students are expected to be familiar with and abide by the academic integrity policy. **Violations of the policy are taken very seriously!**

Calculator Policy: Calculators may be used on homework but do not suffice on problems for which explanation is required. Calculators may **not** be used on quizzes or exams.

Grades: The proportions for computing your final grade will be the following:

Homework: 20 %, Quizzes: 14 %, Midterm 1: 16 %, Midterm 2: 16 %, Final: 34 %.

Lecture (**Q** = quiz)	Reading	Topics
1, Sep 5	1.1, 1.2	Matrices, Vectors, and Linear Combinations
2, Sep 8	1.3	Systems of Linear Equations; Reduced Row Echelon Form
3, Sep 12	1.4	Gaussian Elimination; Rank and Nullity of a Matrix
4, Sep 15	1.6	Span of a Set of Vectors
5**Q**, Sep 19	1.7	Linear Dependence and Linear Independence
6, Sep 22	1.7, 2.1	Homogeneous Systems; Matrix Multiplication
7, Sep 26	2.1	Matrix Algebra
8, Sep 29	2.3, Appendix E	Invertibility and Elementary Matrices; Column Correspondence Property; Uniqueness of Reduced Row Echelon Form
9**Q**, Oct 3	2.4, 2.5	Inverse of a Matrix, Partitioned Matrices and Block Multiplication
10, Oct 6	2.6	*LU* Decomposition of a Matrix
11, Oct 10	Midterm 1 (8:40 AM - 10:00 AM)	
12, Oct 13	3.1	Determinants; Cofactor Expansions
13, Oct 17	3.2	Properties of Determinants
14, Oct 20	4.1	Subspaces

15**Q**, Oct 24	4.2	Basis and Dimension
16, Oct 27	4.3	Column Space, Null Space and Row Space of a Matrix
17, Oct 31	5.1	Eigenvalues and Eigenvectors
18, Nov 3	5.2	Characteristic Polynomial
19**Q**, Nov 7	5.3	Diagonalization of a Matrix
20, Nov 10	5.5	Examples of Diagonalization
21, Nov 14	Midterm 2 (8:40 AM - 10:00 AM)	
22, Nov 17	6.1	Geometry of Vectors; Projection onto a Line
23, Nov 22	6.2	Orthogonal Sets of Vectors; Gram-Schmidt Process; *QR* factorization
24, Nov 28	6.3	Orthogonal Projection; Orthogonal Complements; Projection onto Column Space; Closest Vector Property
25**Q**, Dec 1	6.5	Orthogonal Matrices
26, Dec 5	6.6	Diagonalization of Symmetric Matrices
27, Dec 8	6.6	Diagonalization of Quadratic Forms; Spectral Decomposition for Symmetric Matrices
28, Dec 12		Review
Dec 19	Final (8:00 AM - 11:00 AM)	