MATH 544 University of South Carolina
D. Meade Spring 2000

MATH 544 (Section 2) – Linear Algebra

Instructor Professor Doug Meade

Office Hours:	M 4:00 – 5:00, Th 8:30 – 9:30 and by *prior* appointment
Office:	LeConte College 300E
Phone:	777-6183
E-mail:	`meade@math.sc.edu`

WWW URL `http://www.math.sc.edu/~meade/math544-S00/`

Meeting Times TTh 9:30AM– 10:45AM, LC 401

Text *Linear Algebra and Its Applications*, updated second edition, by David C. Lay, Addison–Wesley, 2000.

Prerequisite Completion of MATH 142 with a grade of C or better.

Overview Linear algebra is one of the fundamental topics in mathematics. Even if you do not know what linear algebra is, we have all been using many of the ideas for several years. While matrices will be common in this course, linear algebra is much more than "matrix algebra".

A second, and equally important, objective of this course is the exposure to mathematical proofs. The early parts of the course emphasize manipulative aspects more than the theoretical issues. As the course progresses, however, the same topics will be revisited — with more of an emphasis on the abstract theory of linear algebra. Many proofs will be presented and discussed in class; you will be expected to produce similar proofs for homework and on exams.

A solid knowledge of linear algebra — both manipulations and theory — will be helpful in almost any upper-division course in mathematics or any course that uses mathematics: differential equations, numerical analysis, optimization, ...

Course Content We will be exploring the topics in Chapters 1, 2, 4 — 6. Specific topics that will be covered include:

Chapter 1: Linear Equations in Linear Algebra
- basic terminology for linear systems and matrices
- solutions to linear systems and Gaussian elimination
- linear transformations

Chapter 2: Matrix Algebra
- definitions and examples
- rank, subspace, basis, dimension
- application: computer graphics

Chapter 4: Vector Spaces
- vector spaces, null spaces
- independence, bases, dimension, rank
- application: Markov chains

Chapter 5: Eigenvalues and Eigenvectors
- determinants
- characteristic equation
- diagonalization

Chapter 6: Orthogonality and Least-Squares
- inner product, length
- orthogonal projection
- Gram–Schmidt process
- inner product spaces

Grading Your grade in this course will be based on your performance on homework, two (2) mid-term exams, and a final exam. The weights assigned to each of these components will be:

Homework	10%
Mid-term exams (2)	60%
Final exam	30%

Course grades will be determined according to the following scale:

A	90 –100
B	80 – 89
C	70 – 79
D	60 – 69
F	0 – 59

Note that the deadline to drop this course with a grade of W is Monday, February 21, 2000.

Exams There will be two (2) exams during the semester. *Tentative* dates and topics for these exams are:

Tuesday, February 15	Chapters 1 and 2
Thursday, March 28	Chapters 4 and 5

There will be no make-up exams. If you miss one exam due to a documented reason of illness, family emergency or participation in a University sponsored event, your score on the final exam will be used to replace the missing exam score. Excuses such as oversleeping, forgetting the time or location of the exam, and lack of studying are explicitly noted as unacceptable grounds for missing an exam.
A comprehensive final will be given at 2:00P.M. on Tuesday, May 2, 2000.

Homework A minimum set of homework problems will be announced for each section that we discuss. The assigned problems will be collected each week, typically on Thursday. You will have an opportunity to ask questions about the assigned problems before it is collected. Homework is collected at the beginning of the class in which it is due. Your homework grade will be determined from your nine (9) highest homework scores.
No late homework will be accepted for a grade.

Study Hints Before each class, you should both review the material from recent sections and read the section to be discussed that day. This will allow you to both understand my presentation of new material and identify questions that you need to resolve within your in-class group time.

Attendance Regular class attendance is important. Consistent with the USC Undergraduate Bulletin, a grade penalty may be applied to any student missing more than three classes (10%) during the semester.

Academic Honesty Cheating and plagiarism will not be tolerated in this course. You will be working in groups in class and are encouraged to discuss homework problems with others. You will have to take all quizzes and exams on your own. Violations of this policy will be dealt with in a manner consistent with University guidelines.