

MATH 544 (Section 501) – Linear Algebra

- Instructor** Professor Doug Meade  
Office Hours: MWF 9:00 - 10:00 and 11:00 – noon and by *prior* appointment  
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- WWW URL** <http://www.math.sc.edu/~meade/math544-S11/>
- Meeting Times** MWF 10:10AM– 11:00AM, LC 310
- Text** *Linear Algebra and Its Applications*, updated third edition, 2006, by David C. Lay, Addison–Wesley (ISBN: 978-032128713-7).
- 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, 5, and 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 28, 2011.

## Exams

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

Friday, February 18	Chapters 1 and 2 (thru §2.2)
Friday, April 1	Chapters 2, 3, and 4 (thru §4.4)

**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 9:00A.M. on Wednesday, May 4, 2011.

## 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 Wednesday. 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

Reading each section **in advance** of the lecture is strongly encouraged. Benefits of this preparation include obtaining a familiarity with the terminology and concepts to be encountered (so you can distinguish major points from side issues), being able to formulate questions about the parts of the presentation that you do not understand, and having a chance to review the skills and techniques that will be needed to apply the new concepts.

## Attendance

Regular class attendance is important — and expected. Students missing more than 10% of the class meetings (4 days) can have their grade lowered.

## Academic Honesty

Cheating and plagiarism will not be tolerated. 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.