

Syllabus – MATH 544

Prof. Joshua Cooper, Summer I 2009

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Main Text: Johnson, Riess, and Arnold, Introduction to Linear Algebra, 5th edition.

Class: MTWTh 1:00PM – 3:15PM, LeConte (LC) 405

Office Hours: Tuesdays 12:00PM – 1:00PM or by appointment.

Objectives: Students will master the concepts and solve problems drawn from matrix algebra, solution of linear systems; notions of vector space, independence, basis, dimension; linear transformations, change of basis; eigenvalues, eigenvectors, diagonalization; and topics to be chosen from inner product spaces and the structure of their operators.

Outline: This course is an extension of the vector material of MATH 241, and begins with much the same problem solving character, but builds up the theory and abstraction to a level that will prepare you for MATH 546, for example. Proofs will be given in class, and you will be expected to do some (mostly computationally driven) proofs on your own. You will be expected to know and understand definitions and statements of theorems, and be able to apply theorems to solve problems or prove corollaries. We will also emphasize the geometric character of the subject much more than is done in the regular sections, which is one reason that a different text is used (also ours is cheaper). I expect we will at least touch on sections 1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.4, 4.5, 4.7, 5.2, 5.3, 5.4, 5.5, and 5.7. This means that we do need to keep moving along, and you will have to read the text as I can't possibly put out all the information in class and answer questions, discuss homework problems, etc. in the time allotted. Development of your mathematical precision in writing and your geometric intuition will be important goals throughout. I will make connections to other courses wherever and whenever possible, recognizing that in many cases these will be merely sneak previews.

Homework Assignments: I will assign homework problems from JRA each Tuesday. These are due the following Tuesday, and will be graded. You are encouraged to seek out your classmates in solving problems, but **do not** (a) let this get in the way of your fully learning the material, or (b) avoid writing up the solutions yourself.

Exam Schedule: We will have one cumulative final examination on Wednesday, July 1 at 1:00pm (in LC405). Please note that I do not give make-up

examinations unless your absence is due to a university function and you have discussed it with me at least one week in advance, or it is due to an emergency, which you can document to my satisfaction.

Grade Breakdown: Your course grade will be determined by your performance on homeworks (50 percent; 12.5 percent each), the final examination (40 percent), and attendance/classroom participation (10 percent). Final course grades will be assigned according to a 90-80-70-60 protocol.

Some comments about MATH 544:

- Feel free to ask questions during class; your questions are an important part of this course. Introductory courses like MATH 544 can be challenging, and very few students are able to master the material without keeping up on a regular basis. See me if you have a question about finding tutors.
- I have found that in a course like MATH 544, many students are overwhelmed by the amount of algebra that is performed on a daily basis (e.g., in lectures, homework problems, examinations, etc.). If your algebra skills are rusty, then you will have problems learning the material, and you will likely do poorly in this class. Brush off your old algebra text and refresh.
- Working together on homework problems is permitted and encouraged, but each student should write up his/her solutions independently of others (this will help greatly). Naturally, cheating on exams is an extremely serious offense and will be dealt with accordingly.
- I would like to talk to anybody with a disability that may require special attention with examinations or other aspects of the course.

My expectations for you:

1. Attend every class and be on time.
2. Read appropriate sections of the text/notes before class.
3. Attempt all homework.
4. Ask questions if you do not understand something or wish to know more.
5. Make it your goal to understand everything we do.