Math 5023: Advanced Linear Algebra

MWF 2:30 - 3:20, MSCS 445

Instructor: Jeff Mermin
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Course web page: http://www.math.okstate.edu/~mermin/5023/

Office Hours TBA or by appointment.

Subject matter This course involves the theory of all things linear: vector spaces, matrices, linear forms, and homomorphisms. Various aspects of this theory are critical to every field of modern mathematical research. We will develop a few computational tools, but most of the course will be devoted to theoretical understanding.

An important subtheme is the art of discovering and writing proofs.

Relationship to other courses Math 5023 builds on the subject matter of a sophomore linear algebra course such as Math 3013; this is the only prerequisite. However, you will find it difficult if you haven't first had some success working theoretically with mathematical structures. Therefore, I suggest either Math 3613 or an A in Math 3013.

After succeeding in this course, you will be well-prepared for our Masters-level algebra classes (e.g., Math 5003/4613).

Textbook *Linear Algebra (Fourth Edition)* by S. H. Friedberg, A. J. Insel, and L. E. Spence.

Grading Your course grade will be out of 400 points, assigned as follows:
100   Homework
100   Midterm, Friday, Sep. 21
100   Midterm, Friday, Nov. 2
100   Final, Monday, Dec. 10, 2:00-3:50 AM
A total score of 360 will guarantee you an A, a 320 will guarantee a B, etc.

Exams I hope to assign take-home exams, to be distributed in class between two and seven calendar days before the official exam date. If for any reason I find this infeasible, we will have normal exams during the class period.

Homework There will be written homework assignments, due approximately every Monday. These assignments will involve proofs, and grading will emphasize clarity of exposition. All work should be written legibly on normal-sized and normal-shaped paper. Solutions should be written in complete mathematical sentences, and in such a way that a typical classmate would have no

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trouble understanding either the questions or the ideas involved in your solutions.

Late policy. Because the course builds on itself, it is important that you not fall behind. Thus late homework will in general not be accepted. However, I will allow you ten "grace days" to be used over the course of the semester.

Collaboration. Mathematics is a collaborative venture; you are encouraged to work together with friends and/or classmates on homework, including written homework. However, you must **write up your work yourself** and **acknowledge anyone who helped you**. For your own protection, you should insist that both you and your collaborators truly understand everything you claim.

Illness policy If you cannot take an exam due to illness or another emergency, you must provide documentation to arrange a make-up.

If you cannot attend a regular class due to illness or another emergency, no documentation is necessary. If you aren't sure whether or not you're too ill to attend class, please see a doctor. If you need to miss *several* classes, let me know as soon as possible, so that I may plan how to accommodate the situation.

Academic Integrity Don't cheat, or help other students cheat. Please read my "rules for written assignments" at

http://www.math.okstate.edu/~mermin/5023/airules.pdf.

(I consider this document part of the course syllabus.)

If, after reading this, you aren't sure whether or not something is allowed, ask me before you try it.

Don't violate academic integrity in any other way, either. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and fraudulently altering academic records) will result in your being sanctioned according to the OSU academic integrity process. If you have further questions, contact the Office of Academic Affairs, 101 Whitehurst, 405-744-5627, http://academicintegrity.okstate.edu.

Links and attachments The course syllabus consists of three documents: This course information sheet, the document on academic integrity, and the OSU syllabus attachment, which contains a lot of important information, including instructions about disability accomodations. (Please contact me privately during the first week of the course if you need accommodations as the result of a disability.)

Please read all three documents. They may be found at the following web addresses:

http://www.math.okstate.edu/~mermin/5023/admin.pdf
http://www.math.okstate.edu/~mermin/5023/airules.pdf
http://academicaffairs.okstate.edu/faculty-a-staff/47-syllabus-fall