

Syllabus

Math 8530 – Fall 2014

Section 001

Instructor: Dr. Jim Brown

Office: Long Hall 111

Phone: 864-656-2331

Email: jimlb@g.clemson.edu

Class Meeting:

MWF: 8:00 - 8:50 Martin M-203

Office Hours:

M: 9:00 - 10:00

F: 13:00 - 14:00

(and by appt.)

Recommended Textbook: There is no official textbook for the course. Course notes will be provided, but if you feel you really need a textbook try: *A guide to advanced linear algebra* by S. Weintraub ISBN 978-0-88385-351-1.

Material: This course will be a serious introduction to linear algebra at the graduate level. In particular, this course will not focus on basic matrix operations, finding eigenvalues, etc. We will cover such things in a more general context or in homework exercises. I will briefly review groups, rings, and fields before defining vector spaces. We will work with abstract vector spaces and linear maps, though we will also state results in the language of matrices when helpful. If you are not familiar with the basics of matrices you are better served to take 3110. Topics to be covered include:

1. Vector spaces and basic properties
2. Linear transformations
3. Working with coordinates

4. Jordan and rational canonical forms
5. Bilinear, sesquilinear, and quadratic forms
6. Tensor products, exterior products, and determinants

Please note it is possible that we will not cover every topic that is required for the ADM prelim exam. You are responsible for covering any material on the prelim syllabus we don't cover. Likely this will just be material one would already know from an undergraduate linear algebra class.

Learning outcomes:

1. The student will be able to complete any of the routine calculations normally expected of a student that has had a course in linear algebra.
2. The student will be able to explain and prove in a clear and concise manner the main theorems of linear algebra.
3. The student will demonstrate mathematical maturity by being able to read mathematics on his/her own and present reasonable proofs to the class.
4. The student will gain the ability to communicate mathematics by writing logically correct proofs.

Attendance: I will take attendance but it will not be figured into your final grade. As such, you are not required to wait any set amount of time before leaving if I am late.

Background: It is ESSENTIAL that you have proof writing experience. A graduate class is not the appropriate place to first learn to write a proof. Your proofs will be expected to be perfect when you turn them in for grading. It is assumed you have had a first course in linear algebra equivalent to 3110 at Clemson. An undergraduate course in abstract algebra equivalent to 4120 is not a formal prerequisite, but it is beneficial to have seen groups and fields at the undergraduate level (vector spaces are groups with extra structure defined over fields after all!).

Grading: Your final grade will be calculated based on the following:

Homework:	15 %
Midterm Exam:	30 %
Final Exam (cumulative):	55 %

The grading scale will be no worse than the following:

$\geq 90\%$	A
$\geq 80\%$	B
$\geq 70\%$	C
$\geq 60\%$	D

This means if your final grade is a 90%, you will receive an A for sure. However, it may be the case that your final grade is an 85% and you receive an A. If you are concerned about your grade at any point in the course you are encouraged to come talk to me about it!

Exams:

Midterm:	10/22/14, 18:00 - 20:00, Martin E004
Final:	12/11/14, 11:30 - 14:00

Make-up exams will not be given regardless of the validity of the excuse for missing the exam. If you miss the midterm, your grade will be calculated using your final exam grade as your midterm grade.

Since this is a prelim class, you can expect the midterm and final to be at the level of the prelim exams.

Homework: Homework will be collected weekly. Late homework will not be accepted. You are strongly encouraged to discuss the problems with others enrolled in the class. You will each be required to turn in your own set of solutions. These should not be multiple copies of the exact same solutions. Write each proof in your own words. You **MUST** indicate everyone you worked with on the problems as a matter of academic honesty. You should only turn in proofs that are correct, easy to read, and your very best effort. Sloppy proofs or proofs that are not easily followed will receive no points.

Using a solutions manual, looking up solutions online, on online help boards, or in other textbooks is **NOT** allowed for this course. It is also not appropriate to ask graduate students not enrolled in this course for help on the homework. You are encouraged to talk to them about the material, but not

about specific homework problems. If it becomes clear you have done any of these, you will be giving one warning. If it continues, you will be subject to the university's policies on academic dishonesty.

Accommodations: Students with disabilities who need accommodations should make an appointment with Dr. Arlene Stewart, Director of Disability Services, to discuss specific needs within the first month of classes. Students should present a Faculty Accommodation Letter from Student Disability Services when they meet with instructors. Student Disability Services is located in Suite 239 Academic Success Building (656-6848; sds-l@clemson.edu). Please be aware that accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester.

Clemson University Title IX Statement: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veterans status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 111 Holtzendorff Hall, 864.656.3181 (voice) or 864.565.0899 (TDD).