Math 314 (814) Matrix Theory

Section 004: MWF 10:30-11:20 Oldfather (OldH) 304

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WWW pages for this class: http://www.math.unl.edu/∼mbrittenham2/classwk/314f13/

(There you will find copies of nearly every handout from class, lists of homework problems assigned, dates and review sheets for exams, etc.)

Office Hours: To be determined. I'm also available whenever you can find me in my office and I'm not horrendously busy. You are also quite welcome to make an appointment for any other time; this is easiest to arrange just before or after class, or via email.

Text: *Linear Algebra and its Applications*, by David C. Lay (4th edition, Addison-Wesley).

ACE outcome 3: This course satisfies ACE Outcome 3. You will apply mathematical reasoning and computations to draw conclusions, solve problems, and learn to check to see if your answer is reasonable. Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well youve mastered the material.

This course, as the text and course titles are meant to imply, is intended to illustrate the theory, techniques, and applications of linear algebra (i.e., solutions to linear equations) through the use of matrices (whatever they are). Our basic goal will be to work through most of the material from the first seven (7) chapters of the book:

Ch. 1, Linear Equations in Linear Algebra
Ch. 2, Matrix Algebra
Ch. 3, Determinants
Ch. 4, Vector Spaces
Ch. 5, Eigenvalues and Eigenvectors
Ch, 6, Orthogonality and Least Squares
Ch, 7, Symmetric Matrices and Quadratic Forms

Homework will be assigned from each section, as we finish it. It is an essential ingredient to the course - as with almost all of mathematics, we learn best by doing (again and again and ...). Cooperation with other students on these assignments is acceptable, and even encouraged. However, you should make sure you are understanding the process of finding the solution, on your own - after all, you get to bring only one brain to exams (and it can't be someone else's). For the same reason, I also recommend that you try working each problem on your own, first. A small selection of the homework problems will be collected, graded, and returned; this will count 100 points toward your final grade.

Quizzes will be given each Friday, during weeks that do not also contain an exam (in *our* class...) or the first day of classes. Each will typically consist of one question (modelled on a homework problem) from the material covered through the previous Wednesday. Your lowest two quiz grades will be dropped before computing your final quiz average, which will count 150 points toward your grade. A missed quiz will count as zero (and will therefore be the first grade dropped); a make-up quiz can be arranged only under the most unusual of circumstances.

Midterm exams will be given two times during the semester, **in the evening, outside of normal class time**, on dates which will be determined in consultation with the class. Each exam will count 100 points toward your grade. You can take a make-up exam only if there are compelling reasons (a doctor SAYS you were sick, jury duty, etc.) for you to miss an exam. Make-up exams tend to be harder than the originals (because make-up exams are harder to write!).

A **Project** will be assigned for you to work in small groups of no fewer than 3 and no more than 5 people. The project will explore a longer and more open-ended question than a typical homework or exam problem. The goal of the project is two-fold: you and your fellow group-members will solve a more challenging problem, and you will write a report on your work, describing background, methods, and conclusions. Your group will submit a written report on the project and you will be graded on both the quality of both the mathematical solution and of the exposition. The project may involve use of some mathematical software package such as MatLab, Mathematica, Maple, etc. to do some computation. More detail about the project will be discussed later in the semester. The project will count 50 points towards your grade.

Finally, there will be a regularly scheduled **final exam** on **Friday, December 20, from 10:00am to 12:00noon**. It will cover the entire course, with a slight emphasis on material covered after the last midterm exam. It will count 150 points toward your grade. You must arrange your personal and work schedules to allow you to take the exam at this scheduled time.

Your course grade will be based upon this total of $100 + 150 + 2 \times 100 + 50 + 150 = 650$ points, and will be converted to a letter grade, taking into account the overall average of the class. However, a score of 90% or better will guarantee some kind of **A**, 80% or better at least some sort of **B**, 70% or better at least a flavor of **C**, and 60% or better at least a **D**.

In mathematics, new concepts continually rely upon the mastery of old ones; it is therefore essential that you thoroughly understand each new topic before moving on. Our classes are an important opportunity for you to ask questions; to make <u>sure</u> that you are understanding concepts correctly. Speak up! It's <u>your</u> education at stake. Make every effort to resist the temptation to put off work, and to fall behind. Every topic has to be gotten through, not around. And it's a lot easier to read 50 pages in a week than it is in a day. Try to do some mathematics every single day. **Class attendance** and **doing the homework** are your best methods for insuring that you will keep up with the material, and to make sure that you understand all of the concepts.

Departmental Grading Appeals Policy: The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion, or sexual orientation. If you believe you have been subject to such discrimination or harassment, in this or any other math course, please contact the department. If, for this or any other reason, you believe your grade was assigned incorrectly or capriciously, then appeals may be made (in order) to the instructor, the department chair, the department grading appeals committee, the college grading appeals committee, and the university grading appeals committee.

ADA Notice: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office [www.unl.edu], 132 Canfield Administration, 472-3787 voice or TTY.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Blackboard account during the last two weeks of class. You will get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Some important academic dates

Aug. 26	First day of classes.
Sept. 2	Labor Day - no classes.
Sept. 6	Last day to withdraw from a course without a **'W'**.
Oct. 18	Last day to change to or from P/NP.
Oct. 21-22	Fall break - no classes.
Nov. 15	Last day to withdraw from a course.
Nov. 27	Student holiday - no classes.
Nov. 28 - DEc. 1	Thanksgiving Vacation - no classes.
Dec. 14	Last day of classes.
Dec. 16-20	Final exam week.
Dec. 17	Math 107H final examination.