Linear Algebra, Math 1554 Fall 2015 Sample Syllabus

Instructor: Igor Belegradek

- **Lectures:** Skiles 246: MWF 11:05-11:55.
- **office hours in Skiles 240B:** Monday and Wednesday 1-2, or by appointment.
- **office:** Skiles 240B.
- **phone:** (404) 123-4567.
- **Email:** ib at math dot gatech dot edu
  Please include 1604 in the subject header and email from the Georgia Tech address: this would ensure your message won't end up in the spam folder, and besides, more private matters, such as grades, will not be discussed with someone with non Georgia Tech email address.

Course homepage: http://www.math.gatech.edu/~ib/1604.html. T-square will be only used for storing the grades.
Teaching Assistant: Eric Miller, emiller at math dot gatech dot edu , office hours: Monday 2-3 and Tuesday 2-3 in Skiles 141. Math Lab hour is on Monday 4-5 in Clough Commons, Room 280. Recitations: Tuesday, Thursday 3:05-3:55 in Skiles 268.
Textbooks: Linear Algebra and its applications, 4th Edition, by David C. Lay.
MyMathLab is an online interactive and educational system designed by Pearson Education to accompany its math textbooks.

- Every student **must** purchase it either from mymathlab.com (this is cheaper) or from the bookstore. Other vendors won't provide access to our custom version of MyMathLab.
- Buying it from mymathlab.com will give you MyMathLab access, online access to Lay's textbook, and Lay's Study Guide. The whole package costs about $TBA. Students can buy access to a course online with a credit card or PayPal account.
- If you prefer to own a hardcopy of the text, the bookstore offers packages of MyMathLab access code combined with a 3-hole punch or hardcover version of the textbooks that is less expensive than purchasing the text and code separately.
- The following flowchart may help you decide on which books to get (if any).
- If you want a hard copy of Lay's text, you may wish to get a used one. Older editions should not be dramatically different and in any case you will have an electronic copy.
- If you buy online access to textbooks you may in principle print them but be warned that this is a lot of hassle. You will be better off buying the 3-hole version if you need one.

Some non-obvious features of MyMathLab

- Each student gets individual problems, that is the numbers differ but the problems are similar.
- In MyMathLab homework you have unlimited number of attempts but the problem will change to a similar one after 3 attempts (click in similar exercises to get another problem). Thus nothing stops you from getting 100% on each MyMathLab homework.

- MyMathLab will be set up to accept unsimplified answers, namely 4/6 is as good as 2/3.
- The system will allow you to work on problems after the due date but you will receive no credit then.

Detailed **MyMathLab registration** page is here. Important notes:

- Course Name: math 1604 HP, Course ID: belegradek12345
- When you register for the first time, you will be asked for *Username* (and also possibly for *Student ID*). Choose both things to be your login name for T-square (such as "jsmith37"). This will help convert your homework scores from MyMathLab to T-square.
- If for any reason you have to delay purchasing MyMathLab, you can start using it for free immediately for the first 14 days. There should be a link at the bottom of the registration page for the *temporary access*.
- Pearson offers 27/7 support including phone and internet chat support line
- If you already have a MyMathLab account from previous semesters, see the Instructor for special instructions.
- This is probably not needed, but just in case the registration instruction in pdf format are here.

Content and Course Objectives:

- The course is a solid introduction to linear algebra. We shall cover chapters 1-3 and 5-7 of Lay's textbook. The topics include row reduction, solving and interpreting solutions of linear systems, LU decomposition, matrix algebra, vectors, subspaces, bases, linear independence, dimension, linear transformations, Markov chains, eigenvalues, eigenvectors, diagonalization, complex eigenvalues, orthogonality, Gram-Schmidt process, QR factorization, method of least squares, symmetric matrices, quadratic forms and constrained optimization, singular value decomposition.
- Linear Algebra concepts and methods are fundamental in many problems of Sciences and Engineering.
- The goal of the course is to teach you to solve specific problems in linear algebra and prepare you to use linear algebra in applications.

Homework will come in two varieties: computational (done and graded in MyMathLab) and theoretical (posted at the top of this webpage). Homework will be usually assigned weekly on Monday, and its theoretical portion will **not** be graded or collected.

Quizzes:

- There will be weekly quizzes in recitations, usually every Thursday (but rare changes are possible due to holidays, and those changes will be announced on the course webpage.).
- Each quiz will consists of 1-2 problems from the theoretical homework assigned on Monday of the previous week.
- All quizzes are closed-book and closed-notes. No "help sheet" is allowed on quizzes. No electronics (such as calculators, computers, mobile devices, headphones) are allowed on quizzes.
- The quizzes will be graded by the TA. All questions about grading quizzes should be first addressed to the TA. (The Instructor will deal with whatever cannot be resolved by the TA).

- There will be no makeup quizzes (except for those who miss the quiz due to Georgia Tech sponsored event, see below). If your excuse for missing a quiz seems valid to the Instructor, then the other quizzes will be given higher weight. To arrange for this you need to contact the Instructor promptly (by email).

Tests:

- There will be three in-class midterms and one cumulative final.
- All tests are closed-book and closed-notes. A one-page (two-sided if needed) "help sheet" will be allowed on midterms; you may write/type anything there. A four-page "help sheet" (again, two-sided) is allowed on the final.
- No electronics (such as calculators, computers, mobile devices, headphones) are allowed on tests.
- There will be *no makeup tests* (except for those who miss the quiz due to Georgia Tech sponsored event, see below). If your reason for missing a test seems valid to the Instructor, then the corresponding part of the final will be given a higher weight; to arrange for that you must contact the Instructor as soon as possible. With rare exceptions acceptable reasons for missing a test are limited to illness, court appearance, and taking part in a Georgia Tech events. In particular, the popular excuse ``alarm clock malfunction" will not be honored: please stock up alarm clocks beforehand.
- Midterms will be graded by the TAs/Instructor team with a detailed grading key provided by the Instructor.
  Questions about grading midterms should be asked *within one week* after the graded test is handed out.
- Midterm test dates: September 16 (Tuesday), October 21 (Tuesday), November 25 (Tuesday before Thanksgiving). All midterms are in recitations.
- The final is on December 8 (Monday) 8:00am-10:50am.

Make ups: students who miss a test/quiz due to Georgia Tech sponsored event (such as travel of student athletes) can get it made up. To do so they must bring the Instructor a note from apropriate Georgia Tech authority **well before** the test/quiz.

Grading:

- MyMathLab homework is worth 15% of the final grade. Quizzes will count for 10%. Each of the midterms is worth 15%, and the final is worth 30%. No test score will be dropped.
- All grades will be recorded in T-square, but we will not use T-square for any other purpose.
- Tentatively, there will be the following grading scheme: A=90%, B=80%, C=70%, D=60%.
- There will be no "curving" of the grades, that is performance of your fellow students will have no affect on your grades. In particular, it is possible that everybody will get an A; it is unlikely though but there is no set quota for the number of A's, B's etc.

Random thoughts on how to do well in this course:

- Read and reread the textbook and think about what you have read. Lay's text is not chatty.
- If needed, get extra practice in MyMathLab (it offers tons).
- Do all homework!

- Attend lectures and recitations; while some rare individuals can do well without going to class, there is a strong evidence that those who attend most lectures and recitations get a better grade.
- Join a study group: explaining ideas to others helps clarify them for yourself, not to mention that your peers may have something to teach you too, and most importantly to tell you when you are wrong.
- Always go to review sessions.
- Do not hesitate to ask questions, come to the office hours etc.

Needless to say that **cheating** will not be tolerated. Please report all cheating to the Instructor or your TA, and do so promptly (if you wait till after the end of the term, there will be little I can do). *What constitutes cheating on a test or quiz?* Examples are use of unauthorized materials, use of electronic devices, and getting outside help including talking, and looking in other students' papers. See the Georgia Tech Honor Code for your rights and obligations.

How to get help:

- any concerns should be promptly discussed with the Instructor. All feedback on teaching and administrative issues is appreciated. Seek help before it is too late.
- Please check out the School of Mathematics **free** tutoring center: Math Lab which will open one week after classes begin and closes the Thursday before finals.

Schedule of Topics

Topic	**Sections**	
Lectures		
Solving Systems of Linear Equations	1.1-1.2	3
Vectors, Geometry of R^n, and Solution Sets	1.3-1.5	4
Linear Independence and Linear Transformations	1.7-1.9	3
Matrix Operation and Matrix Inverses	2.1-2.3	3
LU Factorization	2.5	2
Subspaces, Bases, Dimension, Rank	2.8-2.9	2
Determinants	3.1-3.2	3
Markov chains	4.9	1
Eigenvalues, Eigenvectors, and Diagonalization	5.1-5.3	4
Complex Eigenvalues and Eigenvectors	5.5	2
Inner Products and Orthogonality	6.1-6.3	4
Gram Schmidt and QR	6.3-6.4	3
Least Squares	6.5	1
Diagonalization and Symmetric Matrices	7.1	2
Quadratic forms and constrained optimization	7.2-7.3	3