LINEAR ALGEBRA

This course is an introduction to the fundamentals of linear algebra.

Instructor and Contact Information

Instructor: Anton Leykin
Office: Skiles 109
Office Hours: Mon 2-3pm, Fri 2-3pm, or by appointment.
E-mail: anton.leykin@math.gatech.edu

Course Websites

Course Web Page: http://people.math.gatech.edu/~aleykin3/math1554-fall2015
Course Information: t-square.gatech.edu (*required*)
Textbook/Homework Access: http://www.mymathlab.com (*required*)
Learning Catalytics: https://learningcatalytics.com (*required*)
On-line Discussions: www.piazza.com (*highly recommended*)

Course Description and Learning Outcomes

Course Meeting Times: Lecture meets Mon, Wed, and Fri from 12:05-12:55pm in D. M. Smith 105. Recitations meet on Tue and Thu from 12:05-12:55pm (see locations below).

Teaching Assistants, Office Hours, and Meeting Locations:

Section	*TA*	*Email Address*	*Location*	*Office Hours*
E1	Kolay, Sudipta	skolay3@math.gatech.edu	Skiles 255	
E2	Fishel, Eydan	efishel3@gatech.edu	Howey N210	
E3	Sun, Xiaowen	xsun305@math.gatech.edu	Howey S104	

Textbook:

MyMathLab Course Information: We will be utilizing MyMathLab (MML) for homework through a joint code for the Thomas *Calculus* text and the Lay *Linear Algebra* text. In order to register, you will need our course id listed below.

MyMathLab Course ID: *leykin79802*

Important notes on MML:

- See the flowchart at http://www.math.gatech.edu/system/files/faset-textbooks-flowchart-fall2015.pdf
- If you already have an account on MyMathLab using this combined textbook within the past 18 months, then you do not need to purchase a new code. Login to your account on MyMathLab, select the option to add a new course, and enter our course ID.
- If you already have a MyMathLab account that used either the Thomas or the Lay texbook in the past 18 months, but you were unable to add our course using the previous step, please send an email to gatechmath@yahoo.com and include the following information:

1 Your First and Last Name
2 The email address used to register for MML
3 Your Login ID for MML
4 Our course ID (listed above)

You should receive a reply within 36 business hours from the Pearson support team regarding your account status. In the meantime, you can access our course using the "temporary access" option when registering. Please do not pay for a new code until you receive a reply from Pearson.

- If you do not have a MyMathLab account using the Thomas or Lay textbooks, or if your account is over 18 months old, you will need to purchase a new code for our course. Please refer to the registration document, located in the "Resources" section on t-square, to create your new account.

*When signing up for **MyMathLab**, it will be immensely helpful (for grading purposes) if you will **set your STUDENT ID to your USERID for the GT system** (i.e., your T-square USERID, as in "gburdell3", etc).*

MyMathLab comes with an entire electronic version of the textbook; it is your choice if you would also like to own the textbook in print. You may purchase a MyMathLab code either from the bookstore or on-line while registering at http://www.mymathlab.com. If you prefer to own a hardcopy of the text, the bookstore offers packages of MyMathLab combined with a loose-leaf or hardcover version of the Thomas and/or Lay textbook(s) that is less expensive than purchasing the text(s) and code separately.

PLEASE NOTE: GEORGIA TECH HAS A SPECIAL CODE PACKAGE THAT INCLUDES BOTH TEXTBOOKS. THIS CODE CAN ONLY BE PURCHASED THROUGH THE CAMPUS BOOKSTORES OR DIRECTLY FROM PEARSON. CODES PURCHASED BY OTHER VENDORS WILL NOT WORK!

Course Organization

This course will consist of lectures and recitations. You are required to attend all scheduled sessions at all times. The Center for Academic Success will also provide our class with a PLUS ("Peer Led Undergraduate Study") leader. PLUS sessions will also meet twice per week. These sessions are optional, but strongly encouraged.

Course Requirements and Grading

HOMEWORK: Homework will be assigned on-line and will consist of exercise problems on MyMathLab. You are expected to understand **all** homework problems for the tests and quizzes. In order to increase the effectiveness of recitation, you should attempt the problems **before** the recitations. Exercises on MyMathLab will be due at 11:59 PM on the assignment's due date. **No late homework will be accepted**.

LECTURES: We will use Learning Catalytics (learningcatalytics.com), beginning on the second week of classes. Learning Catalytics is free with your subscription to MyMathLab. You will need to bring an internet capable device (smart phone, tablet, laptop, etc) to class each day in order to access the questions.
Class participation will be based on your attendance in the lectures (measured by Learning Catalytics).

RECITATIONS: The TAs will expect that you have attended lecture and reviewed the textbook before class, and they will not lecture on the course material. Instead, you will spend the recitation time working on practice problems.

QUIZZES AND TESTS: We will have four 20-minute quizzes and three 50-minute tests during the term. Quizzes will be given during the first 20 minutes of recitation, and tests will be administered during the last

50 minutes of the lecture period. Quizzes and tests will be administered in the recitation: see *Important Dates*.

FINAL EXAM: The final exam will cover all course materials. All students must take the final examination.

No books, notes, calculators, cell phones, or other electronic devices are allowed during the final exam, tests, and quizzes.

GRADES:

Your course score will be computed according to the following:

	Percentage	***Scores dropped/replaced?***
Participation	5%	
Homework	10%	The lowest score is dropped.
Quizzes	20%	The lowest score is dropped.
Tests	40%	In case of a documented absence, the missing score is replaced by the score on the final.
Final Exam	25%	

Letter grades will be determined based on the following intervals. ***Do not expect any deviation from the following scale:***

A: 90% and higher, **B**: [80%, 90%), **C**: [70%, 80%), **D**: [60%, 70%), **F**: [0%, 60%).

Midterm grades will be assigned on **September 25**. A satisfactory grade will be assigned to all students with a midterm average of 70% or higher (based on the above weighting of grades).

Class Policies

Attendance: You are expected to come prepared and actively participate in every lecture and recitation session. In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class.

Class disruptions of ANY kind will NOT be tolerated and may result in your removal from the classroom. Please show courtesy to your fellow classmates and instructor by adhering to the following class rules:

- Turn off all laptops, cellular phones, i-pods and other electronic devices.
- Come to class on time and stay for the entire class period.
- Refrain from conversing with your fellow students.
- Put away any reading materials unrelated to the course.

Academic Dishonesty: All students are expected to comply with the Georgia Tech Honor Code (the honor code can be found at http://www.policylibrary.gatech.edu/student-affairs/code-conduct). Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. Cheating includes, but is not limited to:

- Using a calculator, books, or any form of notes on tests.
- Copying from ***any*** source, including classmates, tutors, internet sources, or a solutions manual.
- Allowing another person to copy your work.
- Taking a test or quiz in someone else's name, or having someone else take a test or quiz in your name.
- Asking for a regrade of a paper that has been altered from its original form.

Regrading of Papers: If a problem on your test has been graded in error, you must submit a regrade request

to me (not your TA!) ***in writing*****,** along with your paper, no more than ***one week*** after the tests have been returned in class. A regrade request can only be submitted if you have done something CORRECT on your test that has been marked as incorrect. You MUST check your answers with the solutions BEFORE submitting such a request.

Make-Ups: There will be no make-ups. Should you have to miss any classes due to medical or other emergencies, athletics events, etc., please take steps to document your absence with the Office of the Dean of Students. See http://www.deanofstudents.gatech.edu/content/25/absences.

Students with Disabilities and/or in need of Special Accommodations: If you are in need of classroom or testing accommodations, please make an appointment with the ADAPTS office to discuss the appropriate procedures. More information is available on their website, http://www.adapts.gatech.edu. Please also make an appointment with me to discuss your accommodation, if necessary.

Calculators: The use of calculators is NOT ALLOWED.

Announcements: *You are responsible for obtaining any announcements or materials placed on the Course Web Page, MyMathLab, or T-square.*

Additional Help: *Asking questions is a key to success!* Please stop by your TA's or lecturer's office hours whenever you have questions. Free help is also available Monday-Thursday afternoons in the Math Lab, located on the second floor of Clough Commons. It is also to your advantage to join our class page on Piazza (www.piazza.com) so you can participate in course-related discussions.

Please note: *items on the syllabus and course schedule are subject to change. Any changes to the syllabus and/or course schedule will be relayed to the students in class and through e-mail.*

Important Dates Throughout the Term

17 August – First Day of Classes
27 August – Quiz #1
7 September – Labor Day (No Class)
10 September – Test #1
25 September – Progress Reports Due
24 September – Quiz #2
8 October – Test #2
10-13 October – Fall Recess (No Class)
22 October – Quiz #3
25 October – Last day to withdraw with a grade of "W"
5 November – Test #3
19 November – Quiz #4
25-29 November – Thanksgiving Break (No Class)
4 December – Last Day of Classes
11 December (11:30am – 2:20pm) – Final Exam

Tentative Course Schedule

(Disclamer: Dates match to topics only approximately.)

Week and Dates	***Topics***	***Sections***	***Approx. # of hours***
Week 1 August 17-21	Solving systems of linear equations	1.1-1.2	2
Week 2 August 24-28	Vectors, geometry of $\boldsymbol{R}^n$, and solution sets	1.3-1.5	3
Week 3 August 31-September 4	Linear independence and linear transformations	1.7-1.9	3
Week 4 September 7-11	Matrix operation and matrix inverses	2.1-2.3	3
Week 5 September 14-18	*LU* factorization, Leontief model, Applications to computer graphics	2.5-2.7	3
Week 6 September 21-25	Subspaces, bases, dimension, rank	2.8-2.9	3
Week 7 September 28-October 2	Determinants	3.1-3.3	3
Week 8 October 5-9	Markov chains, eigenvalues, eigenvectors	4.9, 5.1, 5.2	3
Week 9 October 12-16	Diagonalization, Google PageRank	5.3, notes	3
Week 10 October 19-23	Complex eigenvalues and eigenvectors	5.5	2
Week 11 October 26-30	Inner products and orthogonality	6.1-6.3	4
Week 12 November 2-6	Gram–Schmidt and *QR*	6.3-6.4	3
Week 13 November 9-13	Least squares; diagonalization and symmetric matrices	6.5-6.6, 7.1	3
Week 14 November 16-20	Quadratic forms and constrained optimization	7.2-7.3	2
Week 15 November 23-27	Singular value decomposition	7.4	2
Week 16 November 30-December 4	Review for Final Exam		