

MATH 3203.001, Spring 2025

Matrix Methods — Syllabus

Instructor Information

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The preferred method of contact is via Canvas.
uttyler.instructure.com

Class Meeting Times

Section	Days	Times	Location
001	MoWe	09:05 – 10:00	CAS 104

Office Hours

MoWeFr 13:30 — 14:30 RBN 4011

1. COURSE INFORMATION

1.1. Official Course Description. Matrices and matrix algebra, determinants, systems of linear equations, Gaussian elimination, eigenvalues and eigenvectors, linear transformation, applications in science and engineering.

1.2. Course Prerequisites. A grade of C or better in Math 2413.

2. IMPORTANT DATES

13 Jan.	First Day of Classes
20 Jan.	MLK Jr. Day – <i>No Classes</i>
27 Jan.	Census Date
17 Mar. – 21 Mar.	Spring Break – <i>No Classes</i>
31 Mar.	Withdrawal Deadline
18 Apr.	Good Friday – <i>Class Cancelled</i>
28 Apr. – 2 May	Finals Week

3. COURSE CONTENT

3.1. Textbook. There are many free textbooks available for Linear Algebra, but as a vast departure: I'm not picking one. The lecture material will actually follow the order of the extraordinary video series by Grant Sanderson, better known as 3Blue1Brown. Supplements will come from the textbooks.

Primary: <https://www.3blue1brown.com/topics/linear-algebra> by Grant Sanderson

Reference: *Linear Algebra with Applications*¹ by W. Keith Nicholson²

Reference: *Linear Algebra*³ by Jim Hefferon⁴

Reference: *Fundamentals of Matrix Algebra*⁵ by Gregory Hartman⁶

Reference: *Introduction to Applied Linear Algebra - Vectors, Matrices, and Least Squares*⁷ by Stephen Boyd⁸ and Lieven Vandenberghé⁹

Reference: *Linear Algebra*¹⁰

by David Cherney, Tom Denton, Rohit Thomas¹¹, and Andrew Waldron¹².

Recommended: *The 5 Elements of Effective Thinking* by Edward Burger and Michael Starbird
ISBN 978-0691156668

This inexpensive book can totally change how you view learning and I recommend it to anyone who thinks they might struggle with course material, whether or not they're in my classes.

3.2. Student Learning Outcomes. Students should be able to successfully:

- Understand the basic properties of Euclidean space including linear independence, dimension, rank, orthogonality, norm and projection.
- Perform basic matrix operations including row reduction, transpose, finding the inverse and finding the determinant.
- Solve systems of linear equations using substitution, Gauss-Jordan elimination, Cramer's rule and inverse matrices.
- Find eigenvalues and eigenvectors as well as understanding their properties and importance to matrix theory and applications.

4. COURSE POLICIES

4.1. Academic Honesty. *All work submitted must be your own.* If this is determined not to be the case, you will be referred to the Director of Judicial Affairs, with a consequence appropriate to the level of the infraction. You will be reminded of the UT Tyler Honor Code on every exam.

Submitting the homework or lecture notes of another student is **plagiarism** and will result in an earned grade of 0 for the category, not just the assignment. Cheating on an exam will result in an F for the course. Posting copyrighted material to the internet without the prior written permission of the copyright holder is illegal.

4.2. Civil Environment. The free exchange of ideas is a central part of a university education. Class will be conducted in a polite and professional manner and I expect students to behave politely and professionally. *Disruptive behavior will not be allowed and is judged at my sole discretion.* Persistent incivility will result in your removal from the classroom.

4.3. Canvas & Email. You are expected to check Canvas at least daily, and also expected to check your university email. **All at-home work will be submitted via Canvas.**

4.4. Personal Electronics. Students are required to have access to a device capable of accessing Canvas and a device capable of scanning hand-written work for upload to Canvas. **Graphing calculators are not permitted in this class.** You are expected to keep all personal electronics (phones, laptops, tablets, headsets, earpods, etc.) stowed in your bag during class *unless actively being used for class purposes.*

4.5. Late & Missed Work. Late work will not be accepted. Missed lecture notes and homework will count as 0s. A student who will miss one exam for a *documented, University-sanctioned* reason must notify me at least 2 weeks before the exam, and an alternative will be arranged. A student missing one exam due to documented illness or emergency is eligible to replace the missed exam grade with the grade from their final exam, but then is *unable to receive extra credit.* Students missing more than one in-class exam have failed the course and will receive an F. Students missing the final exam have failed the course and will receive an F.

4.6. Final Exam Policy. A student may earn at most one letter grade higher in the course than they earn on the final exam: *particularly, a grade of F on the final results in a grade of at most D in the course.*

5. UNIVERSITY POLICIES

The University has many policies required to be disclosed to students; as they frequently change, and in fact the location of the list of these policies frequently changes, it is better to read the [University Policies and Information](#) page linked from the Canvas course.

6. COURSE STRUCTURE

The course content will be tentatively organized by week in Canvas modules; this is subject to change as our use of class time necessitates. Your grade will be computed on the 4.0 scale by a weighted average: lecture notes will be weighted 5%, homework will be weighted 5%, in-class

exams will have a total weight of 60%, and the final exam will have a weight of 30%.

$$\begin{aligned} \text{Grade} &= .05(\text{LN}) + .05(\text{HW}) \\ &\quad + .60(\text{EXAMS}) + .30(\text{FINAL}) \\ &\leq 0.2 + 0.2 + 2.4 + 1.2 = 4.0. \end{aligned}$$

6.1. Lecture Notes, 5%. Students who consistently attend class and participate by writing notes and asking questions outperform students who do not. In order to encourage attendance, you will be required to scan and upload your hand-written course notes before 23:59 on the same day as class. *When that you miss class, make sure to obtain lecture notes from a classmate and submit them before the deadline. Notes will not be provided by the instructor.* Each day's notes will be graded as a 0 (no meaningful notes), 1 (halfway complete and meaningful notes), or 2 (complete and meaningful notes). The notes *do not need to be an exact transcript of class to be complete*, but must contain all meaningful ideas from class.

There are 24 days for which notes can be submitted; your grade for lecture notes will be calculated as the double the average of your highest 20 grades.

6.2. Homework, 5%. There is no practice as reliable as working homework to help you learn mathematics, so I will assign homework regularly. You are encouraged to work together and even more strongly encouraged to contact me when you struggle. Homework must be written by hand, scanned, and uploaded to Canvas before 23:59 on the due date. Homework will be graded for *completeness only*, on a similar scale as lecture notes: 0 for minimal completion, 1 for at least half completion, and 2 for full completion. This is to encourage you to attempt the homework before class without the stress-for-correctness that often leads students to cheat.

There are 24 homework assignments; your grade for lecture notes will be calculated as the double the average of your highest 20 grades.

6.3. In-class Exams, total 60%. There will be 3 comprehensive in-class exams. Each exam grade will be reported on the 4.0 scale (with interpreted letter grade).

6.4. Final Exam, 30%. The comprehensive final exam grade will be reported on the 4.0 scale (with interpreted letter grade). Students who do not take the final earn an F for the

6.5. Extra Credit. If you have a positive score on at least 20 lecture notes and at least 20 homeworks, your final exam will replace your lowest in-class exam grade *if that improves your overall grade.*

6.6. **Grade Scale.** Student letter grades will be recorded based upon their earned points.

Points	[0, 1.0]	(1.0, 1.5)	[1.5, 2.5)	[2.5, 3.5)	[3.5, 4.0]
Letter	F	D	C	B	A

6.7. **Recording Grades.** It is the responsibility of the student to pick up exams in a timely fashion and keep a record of your grades.

I apologize if any of these links are no longer accessible.

NOTES

1. <https://lyryx.com/linear-algebra-applications/>
2. <https://contacts.ucalgary.ca/info/math/profiles/101-152962>
3. <https://joshua.smcvt.edu/linearalgebra/>
4. <https://joshua.smcvt.edu/math/hefferon.html>
5. <https://open.umn.edu/opentextbooks/textbooks/fundamentals-of-matrix-algebra>
6. <https://www.vmi.edu/academics/departments/applied-mathematics/faculty-and-staff/>
7. <https://web.stanford.edu/~boyd/vmls/>
8. <https://web.stanford.edu/~boyd/>
9. <http://www.seas.ucla.edu/~vandenbe/>
10. <https://www.math.ucdavis.edu/~linear/>
11. https://www.math.ucdavis.edu/people/general-profile?fac_id=rthomas
12. https://www.math.ucdavis.edu/people/general-profile?fac_id=wally