

MATH 561 – Linear Algebra and Applications I

MoWe 2:30 – 3:45, MDD 214

Instructor: Arturo Magidin
Office Hours: Mo 11–12; Tu 13:30–15; We 13:00–14:00
Th 11:00–12:00, 13:00–14:00; or by appointment.
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Course Moodle page: Fall 2026 Linear Algebra & Applications (MATH-561-001, MATH-497-003)

PREREQUISITES: Permission of the Instructor and the Department.

RECOMMENDED TEXTBOOK: I will be following *Linear Algebra*, 5th Edition, by Stephen Friedberg, Arnold J. Insel, and Lawrence Spence. Prentice Hall, ISBN 978-0-13-486024-4. However, I find the price of the hardcopy to be exorbitant (bordering on obscene), so I will not require the book. You may obtain used (cheaper) copies of the 4th Edition, which is very close to the 5th, for your personal use, or rely on electronic versions.

We will review the basics (Chapters 1 and 2), though from a more advanced point of view, and then move on to Diagonalizability and Canonical Forms (Chapter 5 and 7). The material on inner products (Chapter 6) will be covered in Math 562.

I will also be dedicating some lectures to applications; I will be using *Applied Linear Algebra: The Decoupling Principle*, 2nd Edition, by Lorenzo Sadun (American Mathematical Society 2008, ISBN 978-0-8218-4441-0) as my main source of those examples and applications.

In addition, some material will be taken from Sheldon Axler's *Linear Algebra Done Right*, 4th Edition. This is an open access book, and you can access a PDF and Kindle versions of the book at

<https://linear.axler.net/>

MOODLE: I will keep a MOODLE page associated to the course. The page will contain links to hand-outs and will list important dates in the calendar. I do not put grades on Moodle. The Moodle page is associated with course codes 24498.202720, 25049.202720. You should already be enrolled in that Moodle course.

MY OFFICE AND OFFICE HOURS: My office is in Maxim Doucet Hall Room 404. I will have five office hour sessions a week, tentatively set as above. We can also meet by appointment if you cannot make the regular office hours. See me just before or just after class to make an appointment. **Feel free to ask for an appointment, especially if you cannot make the regular office hours for some reason.**

READING THE BOOK PRIOR TO ATTENDING CLASS: Each class, I will note which section of the book we will be covering in the next lecture. If you have access to a copy of the textbook, I encourage you to read it ahead of time, even if you do not think you understand the material yet. It can make class time much more useful, allowing the ideas to percolate through and letting you pay more attention to what is being said in lecture, as well as pinpointing the material that you are having difficulty with, so you can be sure to ask questions during lecture.

ChatGPT, CLAUDE, GEMINI, AND OTHER SYNTHETIC TEXT EXTRUDERS.

Note that CHATGPT and other (mis)labeled “artificial intelligence” products are *not* search engines and are *not* intelligent. LLMs and other Generative AI products (generically, “AI” here) work by trying to predict the most likely next word in light of previous words in the sentence and the given prompt, on the basis of its training data. They are not reproducing “information”, nor are they making sense (any sense that is perceived in their output is the creation of those reading that output). They are also not very good at writing proofs or solving numerical problems.

There is also growing evidence that the result of cognitive offloading (having these products do the work for you) results in atrophied abilities and lack of learning. As I note below, Mathematics is learned mostly by doing. The struggle and decisions you make along the way are at least as important as the final product. That is also why I require you to show your work in homework assignments.

Use of ChatGPT, Claude, Gemini, and other such products in this class is strictly prohibited, and their use is a violation of course policy. This violation will result in at least a zero grade in the assignment, even if the result is clearly labeled as the output of an AI product. Repeat offenses, may result in more severe penalties, up to and including a grade of F for the entire course.

RECORDINGS: Under Louisiana Law, recordings and transcriptions of in-person communication requires explicit notification to everyone who may be participating that the communication is being recorded and/or transcribed. If you wish to record a lecture, or produce automatic transcription of the lecture, you will need my permission, and you will have to notify me and everyone in the classroom ahead of time, each and every time. This includes both audio and video recordings. Violation of this policy may result in you being asked to leave the classroom, confiscation of the recording technology, and other disciplinary actions.

In addition, smart glasses and other wearable devices with recording and/or other advanced technological capabilities are not permitted to be worn or used during class. This policy applies regardless of whether the smart glasses are being actively used during class. Students who require prescription lenses in smart glasses must bring and wear a separate pair of conventional prescription glasses to class. Smart glasses may not be used as a substitute for standard prescription eyewear during class. Students who arrive to class wearing smart glasses may be asked to remove them or leave class and return with appropriate conventional eyewear.

HOMEWORKS: Homework is a major part of this course, and very important. Mathematics is learned almost exclusively by doing, and that is what homework is for: to help you understand the material, and to help you zero in on the material you are finding difficult. Do not be afraid to ask for help from your fellow students, or most especially **from me**. In fact, that’s mainly what my office hours are for.

I cannot assign as much homework as I think you should do, because the volume would be too much for us all to handle. So you should try to do more than the assigned problems.

Homework will be assigned almost every week, on Wednesdays. You may work in groups on the homework, but each person must write up their answers separately. I may change the schedule a bit to accommodate very long or very short assignments, as well as midterms. In that case, I will give you advance notice of the change.

I will give you worked out solutions to the homework problems as you turn them in. Be sure to read them, and compare it with your graded assignments. **Homework is due at the beginning of class, as you come in. I will not accept late homeworks for any reason.**

TESTS: There will be one in-class midterm; there will also be a final exam, which will be two and half hours. They will take place on the following days:

Midterm: Wednesday October 7.

Final: Tuesday December 8, 11:00 am–1:30 pm

GRADING: Your final grade will be based on your homeworks and class participation, midterms, and final, in the following way:

Homeworks and class participation:	55%
Midterm	20%
Final	25%

I will drop your lowest two homework scores. Each total will then be scaled so that your final score is out of 1000 (so the final so it is out 250 points, the midterm out of 200, and the homeworks out of 550).

I do not have a rigid correspondence between numerical grades and letter grades; this is where consideration for people who have improved (or not) throughout the semester comes in, or for people who did exceedingly well in the final, etc. For your reference, however, the following are good approximations:

Letter grade	Approximate Range
A	900 – 1000
B	775 – 875
C	650 – 750
D	550 – 625
F	0 – 550.

TIME REQUIREMENTS: Expect to spend about 9–10 hours a week on this course, in addition to the two lectures. This includes working on homework, reading, and reviewing. If you find yourself regularly spending considerably more time than this, let me know!

MAKE-UP WORK: I do not receive late homeworks and will not allow anyone to make up any homeworks not turned in. If you cannot make it to class, have someone drop off the homework for you. If you will not be able to take an exam for a **valid** absence (illness, family emergency, UL-sponsored travel, etc), you must **notify me in advance** and we will arrange for a make-up exam.