

Math 227-101: Introductory to linear algebra

3.0 Credit Hours

**Online: Mondays, Tuesdays and Thursdays from 10am until 11:45am via Zoom
(Details will be released via canvas)**

Summer 2021

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Office Hours: Online via Zoom Twice a week (Tuesdays from 11:45am through 1:00pm) or by appointments. It is also strongly suggested that you email me ahead of time to make an appointment due to potential scheduling conflicts. Other office hours can be added by appointment only.

***If at any point during the semester you are wondering about your grade in the class, please make an appointment to conference or chat with me individually.

Beside that, a gradebook will be available on canvas and you can always view it to learn your current status in class.

Course Description:

This course is an introduction to linear algebra and matrix algebra for mathematics, science, and engineering majors. Emphasis will be distributed between rote calculation, applications and simple proofs. Topics include: systems of linear equations, elementary row operations, row echelon form, reduced row echelon form, solution sets of linear systems, linear independence, linear transformations, the matrix of a linear transformation, matrix algebra, determinants, vector spaces, subspaces, null spaces, column spaces, bases, coordinate systems, eigenvectors, eigenvalues, the characteristic equation, and diagonalization. Additional topics may include several of the following: singular values, inner products, orthogonality, the Gram-Schmidt Orthogonalization Process, least squares problems, and linear models. The course topics roughly correspond to much of Chapters 1-6 of Lay's textbook discussed below.

General Departmental Learning Goals:

The Department of Mathematics and Statistics Learning Goals for its classes are itemized below.

1. Increase students' command of problem-solving tools and facility in using problem-solving strategies, through classroom exposure and through experience with problems within and outside mathematics.
2. Increase students' ability to communicate and work cooperatively.
3. Increase students' ability to use technology and to learn from the use of technology, including improving their ability to make calculations and appropriate decisions about the type of calculations to make.
4. Increase student's knowledge of the history and nature of mathematics. Provide students with an understanding of how mathematics is done and learned so that students become self-reliant learners and effective users of mathematics.

Please visit <https://umich.app.box.com/s/diox2c9k5qlkzg0socxvlt1avmpmr37y> for the departmental learning goals.

Course Objectives:

Learn the techniques and applications in the Course Description and attain the Program Learning Goals. More specifically:

1. learn Calculus III
2. improve problem solving abilities
3. improve communication
4. learn to use a computer to do Calculus.

Prerequisites:

Calculus II, Math 116 or equivalent course.

Program Learning Goals:

Please visit <https://umich.app.box.com/file/141798424177> for the departmental learning goals.

Required Textbook:

Linear Algebra and its Applications by David C. Lay, FOURTH Edition.

Dearborn Discovery Core Goals:

DDC goals for Intersections can be found here: <https://umdearborn.edu/faculty-staff/academic-program-and-course-development/dearborn-discovery-core-general-education>

Technical Requirements for this Course:

1. Internet connection with speed fast enough to watch videos, to do online homework, and to upload PDF files.
2. A computer with a screen large enough to watch the videos and do online homework (you can also do online homework with a cell phone).
3. A (free) app on your telephone to create PDF snapshots of your written work, or a scanner to scan your written work to PDF. Only PDFs will be accepted, no JPEG files will be accepted. A great free PDF snapshot app for Android phones is Cam Scanner, tutorials are on YouTube. You can get Cam-Scanner from your app store for free. I-Phones are already equipped with an app to create PDFs from documents.
4. Time and dedication. This is a challenging course and will require at least 4-5 hours of work a week. It will require work almost every day.
5. Students are fully responsible for all information posted on canvas under this course.
6. Students may be required to meet me live via a video conferencing software to discuss performance in the class, or for other reasons related to maintaining the learning environment.

Ethics Statement:

We are all in this course with the purpose of learning. Understanding the concepts well will make this course enjoyable and go a long way in making your future courses easier and more satisfying. So it is important that we work as a community and hold ourselves to the highest ethical standards. It is very important that students who have worked hard and played by the rules are not at a disadvantage. If I find that your work is not yours, I will report you to the Dean of your college in addition to other suitable penalties. Given the online nature of this course, you will be allowed to refer to any course notes, review sheets, slides provided in the course. You can refer to the textbook and the lectures as well. However, you are not allowed to seek or receive any help from any external sources, websites, tutors once an exam or quiz has been released. If it is determined that you have sought any help or used any unfair means, I will report you the Dean immediately. Posting any exam problems on Chegg or similar websites is not acceptable. Searching for solutions there is also not acceptable. We will request all records from these sites if needed. If there is any doubt about your work, I may ask for face-to-face verbal interviews before assigning grades on any quiz or exam. Also, I may randomly ask for face-to-face verbal interviews to test the adherence to the above policy.

Assignments:

For every chapter, a corresponding assignment will be assigned and will be posted on Canvas (under assignments). Those assignments will be collected via canvas according to specified due dates. You scan each assignment and submit it on canvas as a single pdf file (only pdf file). I will give more assignments on WebWork, and those WebWork assignments must be done and submitted online according to specific due dates as I will explain that with more details during class. It is your responsibility to ask questions on those problems that you do not understand. Note please: WebWork is a free online program and WebWork assignments can be accessed through canvas under Assignments.

Attendance:

In this class, you may be absent only on rare occasions, this means up to 4 times. You can miss no more than four lectures and still receive 100% on attendance; Otherwise, you will receive zero on attendance.

Examinations:

There will be two tests and a cumulative final exam. Scheduled date of the final exam is provided below. A missed test can only be made up if it's due for an extreme reason that is well documented, and if you contact me on the day of the test or before and as soon as possible after you find out you must miss the test. A make-up test may be different and more difficult than the original test. Tentative dates of tests 1 and 2 will be available on the course homepage of canvas. Dates of tests will be confirmed at least on week in advance via canvas. All examinations will be given online. More detail will be given during class.

NO MAKE-UP FINAL EXAM

Final Exam is scheduled to be

Grading Distribution:

- The weight of Test #1: (28%)
- The weight of Test #2: (28%)
- The weight of the assignments (Webwork and textbook): (14%)
- The weight of attendance: (2%)
- The weight of the Final Exam: (28%)

Remark: A final grade additional policy states that the percentage score you earn on the final exam **will also** be used to replace the lowest percentage score of your first two tests (even if that lowest score is zero %); That is, the final exam score will be used **twice**, once for the final exam portion and once again to replace the lowest score of the first two tests. If the score you earn on the final exam is less than or equal to the lowest score on the first two tests, then this additional policy does not hold in your case.

Grading Scale:

I will compute a weighted average based on the percentages above, and I will then round your weighted average to the nearest percent. Your course grade will then be based on this table:

Percent	Grade
90% or more	A
85 – 89%	B+
80 – 84%	B
75 – 79%	C+
69 – 74%	C
55 – 68%	D
0 – 54%	E

Core Course Topics – Textbook Coverage

Chapter 1	Sections 1.1-1.9
Chapter 2	Sections 2.1-2.3
Chapter 3	Sections 3.1-3.3
Chapter 4	Sections 4.1-4.7
Chapter 5	Sections 5.1-5.5
Chapter 6	Sections 6.1-6.6

Incompletes: I will generally not grant temporary grades of ‘I’ (incomplete). In the rare exception, at least 70% of the coursework (including the first two Exams) must be completed, and the student’s overall average must be 70% or higher. Documentation of the extreme reason for the request must be provided with the request. If the request is granted, the student must complete all work without further instructor assistance.

University-wide Policies or Statements Relevant to Courses:

University Attendance Policy:

A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. It is the student’s responsibility to be aware of this policy. The instructor makes the final decision

to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester.

Academic Integrity Policy:

The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct (<http://catalog.umd.umich.edu/academic-policies-campus/academic-code-of-conduct/>), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University.

Food Pantry:

The pantry exists to support individuals on their journey as they work toward achieving their goals. We are committed to increasing access to food as a key to success, by assisting any student in need! If you need access or have questions, please contact the Office of Student Life by phone at 313-593-5390, by email at umdearbornpantry@umich.edu.

Disability Statement:

The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Counseling & Disability Services (DS) every semester they are enrolled. DS is located in 2157 UC (http://www.umd.umich.edu/cs_disability/). To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DS as described above and notify your professor.

Safety:

All students are encouraged to program 911 and UM-Dearborn's University Police phone number (313) 593-5333 into personal cell phones. In case of emergency, first dial 911 and then if the situation allows call University Police.

The Emergency Alert Notification (EAN) system is the official process for notifying the campus community for emergency events. All students are strongly encouraged to register in the campus EAN, for communications during an emergency. The following link includes information on registering as well as safety and emergency procedures information: <http://umdearborn.edu/emergencyalert/>.

If you hear a fire alarm, class will be immediately suspended, and you must evacuate the building by using the nearest exit. Please proceed outdoors to the assembly area and away from the building. Do not use elevators. It is highly recommended that you do not head to your vehicle or leave campus since it is necessary to account for all persons and to ensure that first responders can access the campus.

If the class is notified of a shelter-in-place requirement for a tornado warning or severe weather warning, your instructor will suspend class and shelter the class in the lowest level of this building away from windows and doors.

If notified of an active threat (shooter) you will Run (get out), Hide (find a safe place to stay) or Fight (with anything available). Your response will be dictated by the specific circumstances of the encounter.

Harassment, Sexual Violence, Bias, and Discrimination:

The University of Michigan-Dearborn recognizes that students have a right to study in a safe atmosphere free of sexual violence, harassment, bias and discrimination. Should you wish to report an incident of sexual assault, harassment, bias and discrimination, visit <https://umdearborn.edu/offices/enrollment-management-student-life/incident-and-complaint-reporting>.

“Instructor has the right to alternate the syllabus as necessary”