



MATH 2318.101CL
Linear Algebra
Spring 2024
11:00 AM - 12:20 PM T Th, STEAM 105

Instructor Information: Jason Duvall (jduvall3@com.edu)

Student hours and location: 3:00 PM – 4:00 PM, location TBA

Required Textbook/Materials:

The textbook used in this course is *Linear Algebra and its Applications*, 6th edition, by Lay, Lay, McDonald, published by Pearson. The homework and quizzes as well as the e-text and videos for this course are online at mymathlab.com, which you can access through Brightspace.

Course Description:

Introduces and provides models for application of the concepts of vector algebra. Topics include finite dimensional vector spaces and their geometric significance; representing and solving systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; matrices; determinants; linear transformations; quadratic forms; eigenvalues and eigenvector; and applications in science and engineering. Prerequisite: MATH 2414 with grade of "C" or better.

Course requirements:

Technology: A scientific calculator is needed for this course. Either a TI30XIIS or a TI84 plus are recommended. You will need access to the internet to use MyMathLab. If you do not have a computer and/or dependable internet access, contact your professor immediately so that you can discuss any options that may be available to you either through the college or the community.

Homework Assignments on MyMathLab: There is a homework assignment for each unit covered. These are listed on the course outline in the syllabus and on the list of assignments on MyMathLab. Each day's homework assignments must be completed by 11:59 pm on the due date shown on both the course outline and on the list of assignments on MyMathLab. You should do the assignments as soon as possible after participating in the lecture, reading the appropriate section in the textbook, and watching the associated video(s) on MyMathLab. Although the homework is online at mymathlab.com, and the answers are entered online, you should write your work on paper, neatly showing all steps, and keep it in your notebook with your notes for future reference, both as an aid for preparing for quizzes and exams, and as a place to begin when seeking assistance from your peers, your professor, or the college tutoring center. The student has a limit of three attempts to answer a question correctly on the homework assignments. **Quizzes on MyMathLab:** Four quizzes which relate to the student learning outcomes, will be taken on MyMathLab. Like the homework assignments, the due dates are shown on both the course outline in this syllabus and on the assignment list on MyMathLab.

Unlike the homework assignments, the quizzes must be taken in one sitting, they are timed, and the student gets only one attempt to answer each question. The quizzes may be retaken one time. The higher of the two grades will be used to determine the student's quiz average.

Chapter Exams: There are four exams which cover the chapters in the textbook. The exams are taken in class on the due dates shown on the course outline in the syllabus. The student has one hour and twenty minutes to take each exam. Exams may not be retaken. However, if the grade on the final exam is higher than the lowest chapter exam grade, the final exam grade will replace the lowest chapter exam grade.

Comprehensive Final Exam: The final exam is taken in class on the due date shown on the course outline in the syllabus. The student has one hour and twenty minutes to take the final exam. The final exam may not be retaken.

Determination of Course Grade/Detailed Grading Formula:

Comprehensive Final Exam 20%

Average of Chapter Exams 60%

Homework Average 10%

Quiz Average 10%

Late Work, Make-Up, and Extra-Credit Policy:

Late homework will be penalized 25%. There are no make-up exams or quizzes and no extra credit.

Attendance Policy:

Students at COM are expected to attend and participate in every session of all classes for which they are registered. College of the Mainland recognizes no excused absences other than those prescribed by law. Students with excessive absences will be referred to Student Services. Students should consult information provided in My Math Lab and the course calendar when it becomes necessary to miss a class in order to be prepared when they return to class. They are still responsible for work that is assigned during an absence and due dates still hold. A student is tardy if they enter the classroom after class begins. Punctuality is a matter of consideration for other people. When a student arrives to class late or leaves early, they create a distraction to their peers and the professor, delaying or disrupting the learning process. Students who repeatedly arrive late or leave early will be referred to Student Services.

Communicating with your instructor:

ALL electronic communication with the instructor must be through your COM email. Due to FERPA restrictions, faculty cannot share any information about performance in the class through other electronic means. The preferred method of communication in this course is in person. If that is not possible, an email or phone call will be satisfactory. Be sure to include your name, the course in which you are enrolled, and state your question completely. I do not reply to text messages, so do not bother with them.

Student Learner Outcome	Maps to Core Objective	Assessed via this Assignment
1. Identify homogeneous equations, homogeneous equations with constant coefficients, and exact and linear differential equations.	Communication Skills	Exam
2. Solve ordinary differential equations and systems of equations using direct integration, separation of variables, reduction of order, methods of undetermined coefficients and variation of parameters, series solutions, operator methods for finding particular solutions, and Laplace transform methods.	Empirical and Quantitative Skills	Exam
3. Determine particular solutions to differential equations with given boundary conditions or initial conditions.	Empirical and Quantitative Skills	Exam
4. Analyze real-world problems in fields such as Biology, Chemistry, Economics, Engineering, and Physics, including problems related to population dynamics, mixtures, growth and decay, heating and cooling, electronic circuits, and Newtonian mechanics.	Critical Thinking Skills	Exam

Academic Dishonesty:

College of the Mainland is committed to a high standard of academic integrity. All students are responsible for honesty and independent effort. Incidents of academic and scholastic dishonesty (including cheating, plagiarism, and collusion) will be dealt with in a manner that is consistent with College Policy and the Student Handbook. Any student found to have been academically dishonest on an assignment, quiz or exam will receive a zero for that assignment, quiz or exam and he or she will be referred to the Office of Student Conduct for further disciplinary action. Please read the sections of Standards of Student Conduct and Discipline and Penalties in the on-line Student Handbook.

Student Concerns:

If you have any questions or concerns about any aspect of this course, please contact me using the contact information previously provided. If, after discussing your concern with me, you continue to have questions, please contact Mr. Leslie Richardson, Math Department Chair, at 409-933-8329 or lrichardson@com.edu.

Course outline:

Week	Sections Covered	Due Date
1	1.1 Systems of Linear Equations	1/20
	1.2 Row Reduction and Echelon Forms	1/20
	1.3 Vector Equations	1/20

2	1.4 The Matrix Equation $Ax=b$	1/25
	1.5 Solution Sets of Linear Systems	1/25
	1.7 Linear Independence	1/25
3	1.8 Introduction to Linear Transforms	1/27
	1.9 The Matrix of a Linear Transform	1/27
4	2.1 Matrix Operations	2/1
	2.2 The Inverse of a Matrix	2/1
	2.3 Characterizations of Invertible Matrices	2/3
	2.4 Partitioned Matrices	2/8
5	2.5 Matrix Factorizations	2/10
	2.8 Subspaces of	2/15
	2.9 Dimension and Rank	2/17
6	3.1 Introduction to Determinants	2/22
	3.2 Properties of Determinants	2/24
7	3.3 Cramer's Rule, Volume, and Linear Transformations	3/1
	4.1 Vector Spaces and Subspaces	3/3
8	4.2 Null Spaces, Column Spaces, Row Spaces, and Linear Transformations	3/8
	4.3 Linearly Independent Sets; Bases	3/10
	4.4 Coordinate Systems	3/22
9	4.5 The Dimension of a Vector Space	3/24
	4.6 Change of Basis	3/29
10	5.1 Eigenvectors and Eigenvalues	3/31
	5.2 The Characteristic Equation	4/5
11	5.3 Diagonalization	4/7
	5.4 Eigenvectors and Linear Transformations	4/12
12	6.1 Inner Product, Length, and Orthogonality	4/14
	6.2 Orthogonal Sets	4/19
13	6.3 Orthogonal Projections	4/21
	6.4 The Gram- Schmidt Process	4/26
14	6.5 Least-Squares Problems	5/3
	7.1 Diagonalization of Symmetric Matrices	5/5
15	7.2 Quadratic Forms	5/10
	7.4 The Singular Value Decomposition	5/12
16	Final Review and Final Exam	

Institutional Policies and Guidelines

Grade Appeal Process:

Concerns about the accuracy of grades should first be discussed with the instructor. A request for a change of grade is a formal request and must be made within six months of the grade assignment. Directions for filing an appeal can be found in the student handbook [Student Handbook 2023-2024 v2.pdf](#). *An appeal will not be considered because of general dissatisfaction with a grade, penalty, or outcome of a course. Disagreement with the instructor's*

professional judgment of the quality of the student's work and performance is also not an admissible basis for a grade appeal.

Academic Success & Support Services:

College of the Mainland is committed to providing students the necessary support and tools for success in their college careers. Support is offered through our Tutoring Services, Library, Counseling, and through Student Services. Please discuss any concerns with your faculty or an advisor.

ADA Statement:

Any student with a documented disability needing academic accommodations is requested to contact Kimberly Lachney at 409-933-8919 or klachney@com.edu. The Office of Services for Students with Disabilities is located in the Student Success Center.

Textbook Purchasing Statement:

A student attending College of the Mainland is not under any obligation to purchase a textbook from the college-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

Withdrawal Policy:

Students may withdraw from this course for any reason prior to the last eligible day for a “W” grade. Before withdrawing students should speak with the instructor and consult an advisor. Students are permitted to withdraw only six times during their college career by state law. The last date to withdraw from the 1st 8-week session is March 1. The last date to withdraw from the 16-week session is April 24. The last date to withdraw for the 2nd 8-week session is May 3.

FN Grading:

The FN grade is issued in cases of *failure due to a lack of attendance*, as determined by the instructor. The FN grade may be issued for cases in which the student ceases or fails to attend class, submit assignments, or participate in required capacities, and for which the student has failed to withdraw. The issuing of the FN grade is at the discretion of the instructor. The last date of attendance should be documented for submission of an FN grade.

Early Alert Program:

The Student Success Center at College of the Mainland has implemented an Early Alert Program because student success and retention are very important to us. I have been asked to refer students to the program throughout the semester if they are having difficulty completing assignments or have poor attendance. If you are referred to the Early Alert Program you will be contacted by someone in the Student Success Center who will schedule a meeting with you to see what assistance they can offer in order for you to meet your academic goals.

Resources to Help with Stress:

If you are experiencing stress or anxiety about your daily living needs including food, housing or just feel you could benefit from free resources to help you through a difficult time, please click

here: <https://www.com.edu/community-resource-center/>. College of the Mainland has partnered with free community resources to help you stay on track with your schoolwork, by addressing life issues that get in the way of doing your best in school. All services are private and confidential. You may also contact the Dean of Students office at deanofstudents@com.edu or communityresources@com.edu.