MATH D002B

Linear Algebra

Summer 2024

**Instructor:** Fatemeh Yarahmadi

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**Textbook & Required Materials:**
**Optional Text**:
Elementary Linear Algebra, 8th edition, by Ron Larson (Cengage)

**Graphing Calculator:** TI-83/TI-83+/TI-84/TI-84+

**Computer/smartphone** to complete online homework assignments, submit activities on Canvas, and attend required live class meetings.
You should keep a **notebook** where you take notes and work the problems for reference.

**Prerequisite:**
Mathematics 1D with a grade of C or better.

Advisory: English Writing 211 and Reading 211 (or Language Arts 211), or English as a Second Language 272 and 273.

**Attendance:**
Because this is an online class, there are no on-campus meetings. However, this does not mean that you will be able to move through the class at your own speed. A major part of the class involves participation, discussing assignments and problems with your classmates.
Thus, everyone needs to be doing the same work at approximately the same time. You are expected to meet all deadlines for homework, quizzes, and discussions. We are learning a lot of different concepts that build on one another and it is very difficult to catch up if you fall behind. Time management is critical in an online course. You will be considered present if there is evidence of your participation in required course activities including, but not limited to, submitting an assignment, participating in an online discussion, and working in a group.

**Instructor Communication:**
I am looking forward to working closely with you this term, and you can expect me to play an active role in our course. I will hold live lectures, post announcements every week, join you in breakout rooms and class discussions to help you understand course concepts, and provide detailed feedback on assignments within one week of submission. I will also answer questions throughout the term in the Q&A Discussion in Piazza and in our weekly discussions. Please let me know when you need help—that's why I'm here!

**Canvas**:
All class content, assignments and announcements will be on Canvas, which you can access through MyPortal. The course will be divided into weekly modules in Canvas.

**Group Activity:**

There will be required group activities. Even though the problems will be discussed in group, write up your own solutions independently.

- **Every member** of the group will be taking a role.
- Groupwork are done in Google doc.
- Your name and your role should be written at the top of the first page.
- Work must be NEAT and ORGANIZED. Do problems IN ORDER.
- It is important for you to SHOW YOUR WORK! You are graded on the work you show to get the final answer, not just the final answer. Be sure to show your "scratch work" that goes with the problem.

**Discussions**: There will be discussion topics posted throughout the term. The deadline for responding to the topic will be indicated when the assignment is posted. You may not respond to the discussion once the deadline has passed.

**Homework**:

Written sets for submission: During the term, I will send out homework and group activities sets to be discussed, written up, and submitted on Canvas. Homework and group activities is essential in any math class. You cannot expect to pass the class without putting consistent effort into homework and group activities. Show all work and explain any reasoning. You may not submit your assignments once the deadline has passed.

**HW Guidelines:**

The process of solving homework problems reflected in step-by-step solutions. The following are some specific criteria:

Guidelines for homework:

- Your name, class, and section number should be written at the top of the first page.
- Work must be NEAT and ORGANIZED. Write the questions (problems) IN ORDER.
- It is important for you to SHOW YOUR WORK! You are graded on the work you show to get the final answer, not just the final answer. Be sure to show your "scratch work" that goes with the problem.
- Do your work underneath the assigned problem then circle your final answer.
- At the end of each homework assignment, write a brief "Chat" paragraph

  - A key component in learning is thinking about how and what you are learning. What are you doing that is working? What areas could you improve upon? What comes easily for you? Is there a pattern in your homework? At the end of each homework assignment, write a very brief paragraph about what you learned, what you feel you need to review, and any thoughts or feelings you have about the math you're doing. This is also a great opportunity for you to communicate with your instructor! There are no "right" answers. Be honest and use this as a learning process.
- Submit pdf file of your homework on Canvas

**Projects**: Projects will be assigned throughout the term. Project due dates are indicated on Canvas. You may not submit your assignments once the deadline has passed.

**Exam Reviews**: There will be an exam review assigned before each exam. The purpose of the review is to aid the student in studying for the exams. You may not submit your assignments once the deadline has passed.

**Midterm Exams**: There will be 2 midterm exams. Each exam includes handwritten portion which you will upload to Canvas. Each midterm exam will focus the material covered since the previous exam. More details on exam dates and procedures can be found in Canvas. You may not submit your assignments once the deadline has passed.

**Final Exam:** The final exam will cover all material from throughout the term. More details on the final exam will be available on Canvas.

***Grading Policy:***

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|---|---|
| Homework, Group Activities, and Discussion | 200 pts (25%) |
| Projects and Presentation | 100 pts (12.5%) |
| Midterm Reviews/ Midterms | 300 pts (37.5%) |
| Final | 200 pts (25%) |
| **Total** | **800 pts** |

| | | |
|---|---|---|
| A | 100% | to 94.5% |
| A- | < 94.5% | to 89.5% |
| B+ | < 89.5% | to 86.5% |
| B | < 86.5% | to 83.5% |
| B- | < 83.5% | to 79.5% |
| C+ | < 79.5% | to 74.5% |
| C | < 74.5% | to 69.5% |
| D+ | < 69.5% | to 66.5% |
| D | < 66.5% | to 63.5% |
| D- | < 63.5% | to 59.5% |
| F | < 59.5% | to 0% |

**Important Dates and Deadlines:** http://www.deanza.edu/calendar/dates-and-deadlines.html

**De Anza Final exams schedule:** https://www.deanza.edu/calendar/final-exams.html

**For detailed information on Homework, Quizzes, Projects, Discussion please log into your Canvas course page**.

**Academic Integrity:**
All students are expected to exercise high levels of academic integrity throughout the quarter. You are encouraged to work together but you are expected to write up your answers independently. Any instances of cheating or plagiarism will result in disciplinary action, including getting a '0' on the assignment and report to the PSME dean, which may lead to dismissal from the class or the college

**Student Honesty Policy:**
"Students are expected to exercise academic honesty and integrity. Violations such as cheating and plagiarism will result in disciplinary action which may include recommendation for dismissal."

**Disabled Services:**
Students who have been found to be eligible for accommodations by Disability Support Services (DSS), please follow up to ensure that your accommodations have been authorized for the current quarter. If you are not registered with DSS and need accommodations, please go to http://www.deanza.edu/dss.

This syllabus is subject to change at the instructor's discretion. Changes will be announced in class and on Canvas.

**Recipe for Success:**

- If you ever have any questions, Email me! You are welcome to send email to me whenever you need help!
- Visit the Online Tutoring Center.
- Form an online study group.
- Watch all lectures, participate in every discussion, and complete every homework assignment.
- Read the sections to be discussed in class prior to the lecture

Topics

1.1 Introduction to Systems of Linear Equations
1.2 Gaussian Elimination and Gauss-Jordan Elimination
1.3 Applications of Systems of Linear Equations

2.1 Operations with Matrices
2.2 Properties of Matrix Operations
2.3 The Inverse of a Matrix
2.4 Elementary Matrices
2.5 Markov Chains
2.6 More Applications of Matrix Operations

3.1 The Determinant of a Matrix
3.2 Determinants and Elementary Operations
3.3 Properties of Determinants
3.4 Applications of Determinants

4.1 Vectors in Rn
4.2 Vector Spaces
4.3 Subspaces of Vector Spaces
4.4 Spanning Sets and Linear Independence
4.5 Basis and Dimension 186
4.6 Rank of a Matrix and Systems of Linear Equations
4.7 Coordinates and Change of Basis

5.2 Inner Product Spaces
5.3 Orthonormal Bases: Gram-Schmidt Process

6.1 Introduction to Linear Transformations
6.2 The Kernel and Range of a Linear Transformation
6.3 Matrices for Linear Transformations

7.1 Eigenvalues and Eigenvectors
7.2 Diagonalization
7.3 Symmetric Matrices and Orthogonal Diagonalization
7.4 Applications of Eigenvalues and Eigenvectors

**Student Learning Outcome(s):**

• Construct and evaluate linear systems/models to solve application problems.
• Solve problems by deciding upon and applying appropriate algorithms/concepts from linear algebra.
• Apply theoretical principles of linear algebra to define properties of linear transformations, matrices and vector spaces.

**Office Hours:**

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|---|---|---|---|
| F | 10:00 AM | 11:55 AM | Zoom By Appointment |