

Linear Algebra

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Textbook: *Elementary Linear Algebra*, 9th Ed., Anton, John Wiley & Sons, 2005

Supplemental supplies: Students will need a graphing calculator.(TI-84 preferred), and a spiral binder, composition notebook, or 3 ring binder for Linear Algebra notes and assignments **ONLY**.

Chandler Gilbert Community College credit:

Students may choose to enroll for college credit through Chandler Gilbert Community College. Please see the Dual Enrollment form attached in the welcome announcement on Google Classroom. By successfully completing the entire year, the student can earn college credit for MAT 225 – Elementary Linear Algebra (3 credit hours). The grade obtained in my class will be the grade given for the college transcript. You must have passed MAT 220 with a C or better in order to take this for college credit. The section number needed to register is as follows:

Linear Algebra – MAT 225 – Section #14601

Attendance Policy:

- I will follow the official school policy on absences.
- If you are absent for a review or test day, you will take the test on your first day back.

Grading Policy:

- Tests and quizzes will be worth 90% of the cumulative quarter grade.
- Homework is expected to be done each day, will be checked for completion, and is worth 10% of the grade. It is to be kept in the same notebook as your notes, which will be checked also.
- The grading scale is 90-80-70-60, and grades are updated weekly on Infinite Campus.
- There are no retakes on exams, so ask all questions when reviewing for a test or doing HW.
- Semester grades are calculated with the two quarters counting for 80%, the final worth 20%.

Class Structure:

- Each day I will provide a lesson, and students are expected to take notes and ask questions as needed.
- You will have an assignment sheet for each chapter that shows the sections we are doing and the problems for each that are required.
- Check my Perry website for a calendar of dates for quizzes, tests and assignments.
- If you are absent, you can see what you missed from the assignment sheet and Perry website.
- There will be days where we will be exploring videos and other topics of math, as there is extra time built into the schedule beyond what is required.
- Ask for help as needed. Don't fall behind in the material, I'm here to help. ☺

Linear Algebra – Course Outline

Systems of Linear Equations and Matrices

- Introduction to Systems of Linear Equations
- Gaussian Elimination
- Matrices and Matrix Operations
- Inverses; Rules of Matrix Arithmetic
- Elementary matrices and a Method for Finding A^{-1}
- Further Results on Systems of Equations and Invertibility
- Diagonal, Triangular, and Symmetric Matrices

Determinants

- Determinants by Cofactor Expansion
- Evaluating Determinants by Row Reduction
- Properties of the Determinant Function
- A Combinatorial Approach to Determinants

Vectors in 2-Space and 3-Space

- Introduction to Vectors
- Norm of a Vector; Vector Arithmetic
- Dot Product, Projections
- Cross Product
- Lines and Planes in 3-Space

Euclidean Vector Spaces

- Euclidean n -space
- Linear Transformations from R^n to R^m
- Properties of Linear Transformations from R^n to R^m
- Linear Transformations and Polynomials

General Vector Spaces

- Real Vector Spaces
- Subspaces
- Linear Independence
- Basis and Dimension
- Row Space, Column Space, and Nullspace
- Rank and Nullity

Inner Product Spaces

- Inner Products
- Angle and Orthogonality in Inner Product Spaces
- Orthonormal Bases; Gram-Schmidt Process; QR -Decomposition
- Best Approximation; Least Squares
- Change of Basis
- Orthogonal Matrices

Eigenvalues, Eigenvectors

- Eigenvalues and Eigenvectors
- Diagonalization
- Orthogonal Diagonalization

Linear Transformations

- General Linear Transformations
- Kernel and Range
- Inverse Linear Transformations
- Matrices of General Linear Transformations
- Similarity
- Isomorphism