



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MTH 2310 Linear Algebra
3 Semester Credit Hours

Student Learning Outcomes and Enabling Objectives

1. Perform vector operations.
 - a. Determine the dot product of vectors.
 - b. Determine whether vectors are orthogonal.
 - c. Multiply a scalar and a vector.
 - d. Interpret vectors geometrically.
 - e. Perform addition and subtraction of vectors.
 - f. Find the norm of a vector.
 - g. Find the projection of one vector onto another.
 - h. Answer practical questions using vectors.

2. Solve linear systems.
 - a. Create the augmented matrix from a system of equations.
 - b. Solve a system of linear equations by using elementary row operations.
 - c. Solve a system of linear equations by using Cramer's Rule.

3. Use matrices to solve systems of linear equations.
 - a. Use matrix operations
 - b. Use matrix algebra
 - c. Find the determinant.
 - d. Find the inverse of a matrix.
 - e. Determine if a matrix has an inverse by using the determinant.
 - f. Solve a system of equations by using Gaussian elimination.

4. Apply properties of eigenvalues and eigenvectors in real-world scenarios.
 - a. Define eigenvalues and eigenvectors.
 - b. Perform matrix operations to find the eigenvalues and eigenvectors of a matrix.

5. Describe vector spaces.

- a. Determine if a set of vectors is linearly independent.
 - b. Identify properties of vector spaces.
 - c. Determine if a vector space is a subspace.
 - d. Determine the basis and dimension of a vector space.
6. Apply linear transformations to practical situations.
- a. Define different transformations (e.g., translations, rotations, composition, reflection, inverse).
 - b. Write the matrix that represents each transformation (e.g., translations, rotations, composition, reflection, inverse).
 - c. Determine the kernel and range of a linear transformation.

Big Ideas and Essential Questions

Big Ideas

- Vectors
- Linear Systems
- Matrix Operations
- Eigenvalues and eigenvectors
- Vector Spaces
- Linear Transformations

Essential Questions

1. How can vectors be used to describe a practical situation?
2. How do you solve systems of linear equations?
3. How do you perform arithmetic operations with matrices?
4. What are eigenvalues and eigenvectors?
5. What is the definition of a vector space?
6. How can linear transformations be used to solve practical situations?

These SLOs are not approved for experiential credit.

Effective: Fall 2024