

MATH 306 Linear Algebra II

1. Catalog Description

MATH 306 Linear Algebra II

4 units

Prerequisite: MATH 206 or MATH 244; MATH 241; and a C- or better in MATH 248, or consent of instructor.

Rigorous development of real and complex vector spaces, including infinite dimensional spaces. Subspaces, bases, products and direct sums. Examples and properties of linear transformations. Similarity, eigenvalues, eigenvectors and diagonalization. Characteristic and minimal polynomials, Cayley-Hamilton Theorem. 4 lectures.

2. Required Background or Experience

Math 206 or Math 244, or Math 241 and a C- or better in Math 248.

3. Learning Objectives

The student should learn the language and methods of linear algebra and some of the most important applications.

4. Text and References

To be chosen by instructor. Suggested texts include:

- Axler, Sheldon, Linear Algebra Done Right
- Friedberg, Stephen et al., Linear Algebra
- Lewis, David, Matrix Theory
- Meyer, Carl, Matrix Analysis and Applied Linear Algebra

5. Minimum Student Materials

Paper, pencils, and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use, and (optionally) computer lab.

7. Content and Method

- a. Vector spaces: include abstract definition, spaces of functions, spaces of linear transformations, and \mathbf{R}^n
- b. Subspaces, linear independence, bases, and sums of subspaces
- c. Linear transformations and matrices.
- d. Determinants
- e. Eigenvalues and eigenvectors of linear transformations
- f. Diagonalization

8. Methods of Assessment

Comprehensive final exam, mid-term exams or quizzes, homework.