MATH 260 Hunter College 4.0 hours, 4.0 credits

Instructor:
Office Hours:
Contact Info:

Text: Linear Algebra, Fifth Editon, Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence.

Prerequisites: MATH 156, MATH 250 (MATH 250 can also be taken concurrently).

Desired Learning Outcomes: The student will assimilate the definitions of basic concepts in Linear Algebra such as a Vector space, Linear Transformation, Linear Independence, Basis, rank, dimension, inner product, determinate, eigenvalues and eigenvectors, diagonalization, linear operators, canonical form (this is not an exhaustive list). The student will learn the statements of a number of fundamental theorems, and will study their proofs. The student will be doing homework problems which will involve some computations as well as proving various facts. The majority of the assessment will consist of written exams similar to the homework problems.

Homework/Exams/Grades: There will be regularly assigned homework, two midterm exams and one final exam. The exams will count for 80% of your course grade, the homework will count for 20%.

Topics: This course is an introduction to Linear Algebra, taught at a fairly abstract and conceptual level, with an emphasis on definitions, theorems, and proofs. The students will be doing proofs in the homework, as well as some computations. Here is a list of topics we will cover, organized by Chapter in the Book.

Chapter 1 Vector Spaces

1.1 Introduction

1.2 Vector Spaces

1.3 Subspaces

1.4 Linear Combinations and Systems of Linear Equations

1.5 Linear Dependence and Linear Indepence

1.6 Bases and Dimension

Chapter 2 Linear Transformations and Matrices

2.1 Linear Transformations, Null Spaces, and Ranges

2.2 The Matrix Representation of a Linear Transformation

2.3 Composition of Linear Transformations and Matrix Multiplication

2.4 Invertibility and Isomorphisms

2.5 The Change of Coordinate Matrix

Chapter 3 Elementary Matrix Operations and Systems of Linear Equations

3.1 Elementary Matrix Operations and Elementary Matrices

3.2 The Rank of a Matrix and Matrix Inverses

3.3 Systems of Linear Equations - Theoretical Aspects

3.4 Systems of Linear Equations - Computational Aspects

Chapter 4 Determinants

4.4 Summary - Important Facts about Determinants

Chapter 5 Diagonalization

5.1 Eigenvalues and Eigenvectors

5.2 Diagonalizability

Chapter 6 Inner Product Spaces

6.1 Inner Products and Norms

6.2 The Gram-Schmidt Orthogonalization Process

6.3 The Adjoint of a Linear Operator

6.4 Norma and Self-Adjoint operators

6.5 Unitary and Orthogonal Operators and their Matrices

6.6 Orthogonal Projections and the Spectral Theorem

Note: P/NC grading is not permitted for this course.

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Changes: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.