

EK102: Introduction to Linear Algebra for Engineers

Spring 2012

Course learning objectives: at the end of this course, the students will be familiar with basic concepts in linear algebra, such as matrices, linear equations, vector spaces, inner products, eigenvectors and eigenspaces.

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Office hours: Wednesdays 2-4 pm

Textbook: *Elementary Linear Algebra with Applications*, (9th edition), Bernard Kolman and David R. Hill, Pearson/Prentice Hall, 2008.

Homework: Homework will be assigned weekly.

Grading: There will be **two midterm exams** and a **final exam**. The final grade for the course will be based on the following allocation.

Homework: 20%
Midterm 1: 20%
Midterm 2: 20%
Final Exam: 40%

Blackboard: Some class material (e.g., notes and homework solutions) will be made available in the BU blackboard (see blackboard.bu.edu)

SYLLABUS

1. *Linear Equations and Matrices* (Chapter 1): Systems of linear equations; Matrices; Matrix operations & special matrices.
2. *Solving Linear Systems* (Chapter 2): Solving linear systems; Inverse of a matrix.
3. *Determinants* (Chapter 3): Determinants and their properties.
4. *Real Vector Spaces* (Chapter 4): Vector spaces; Subspace & span; Linear independence, basis & dimension; Coordinates & isomorphisms.
5. *Inner Product Spaces* (Chapter 5): Inner product spaces, length, & angle; Orthogonal vectors & Gram-Schmidt Process.
6. *Linear Transformations and Matrices* (Chapter 6): Linear Transformations & range and kernel; Matrix of a linear transformation & similarity.
7. *Eigenvalues and Eigenvectors* (Chapter 7): Eigenvalues and eigenvectors & diagonalization of matrices.