

EK102 (A1): Introduction to Linear Algebra for Engineers

Spring 2011

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.

Instructor: Calin Belta
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Class: Wednesdays 4-6 pm; **Location:** PHO 206

Discussion sections

- **B1:** Mon 9-10 am; **Location:** GCB 206
- **B2:** Tue 9-10 am; **Location:** SOC B61
- **B3:** Wed 9-10 am; **Location:** STH B20
- **B4:** Thu 9-10 am; **Location:** GCB 208

Office hour: Wednesdays 3-4 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%

Midterm 1: March 2 (in class)

Midterm 2: April 13 (in class)

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): System of linear equations; Matrices; Matrix operations & special matrices. (**January 19 & January 26**)
2. *Solving Linear Systems* (Chapter 2): Solving linear systems; Inverse of a matrix. (**February 2, February 9**)
3. *Determinants* (Chapter 3): Determinants and their properties (**February 16**)
4. *Real Vector Spaces* (Chapter 4): Vector spaces; Subspace & span; Linear independence, basis & dimension; Coordinates & isomorphisms (**March 2, March 9, March 23**)
5. *Inner Product Spaces* (Chapter 5): Inner product spaces, length, & angle; Orthogonal vectors & Gram-Schmidt Process (**March 30, April 6**)
6. *Linear Transformations and Matrices* (Chapter 6): Linear Transformations & range and kernel; Matrix of a linear transformation & similarity (**April 13, April 20**)
7. *Eigenvalues and Eigenvectors* (Chapter 7): Eigenvalues and eigenvectors & diagonalization of matrices (**April 27, May 4**)