EK102 (A2): Introduction to Linear Algebra for Engineers

Spring 2011

Instructor: Pirooz Vakili
Mechanical Engineering Dept. & Division of Systems Engineering
15 St. Mary's Street, Room 126
Telephone : (617) 353 - 2839
Email: vakili@bu.edu

Class: Tuesdays 2-4 pm; **Location:** GCB 204

Discussion section B5: Fridays 9-10 am**; Location:** GCB 206

Office hours: Tuesdays 1-2 pm or by appointment

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

Homework: Homework will be assigned weekly. It is due at the beginning of the following class. Collaboration in solving homework problems is acceptable. However you need to turn in your own work.

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 1 (in class)

Midterm 2: April 12 (in class)

AD account (important): Some class material (e.g., notes and homework solutions) will be placed in a folder on AD server. To access the material you need to have an Active Directory (AD) account. To request such an account, go to the following link and follow directions. **http://www.bu.edu/computing/accounts/ad/eng**

Course learning objectives: At the end of this course, students will be familiar with basic concepts in linear algebra, such as matrices and matrix operations, linear systems and their solutions, vector spaces, inner products, eigenvalue, eigenvectors and their application.

SYLLABUS

1. *Linear Equations and Matrices* (Chapter 1): System of linear equations; Matrices; Matrix operations & special matrices. (**January 18 & January 25**)

2. *Solving Linear Systems* (Chapter 2): Solving linear systems; Inverse of a matrix. (**February 1, February 8**)

3. *Determinants* (Chapter 3): Determinants and their properties (**February 15**)

4. *Real Vector Spaces* (Chapter 4): Vector spaces; Subspace & span; Linear independence, basis & dimension; Coordinates & isomorphisms (**March 1, March 8, March 22**)

5. *Inner Product Spaces* (Chapter 5): Inner product spaces, length, & angle; Orthogonal vectors & Gram-Schmidt Process (**March 29, April 5**)

6. *Linear Transformations and Matrices* (Chapter 6): Linear Transformations & range and kernel; Matrix of a linear transformation & similarity (**April 12, April 19**)

7. *Eigenvalues and Eigenvectors* (Chapter 7): Eigenvalues and eigenvectors & diagonalization of matrices (**April 26, May 3**)