EK102 (A1): Introduction to Linear Algebra for Engineers

Fall 2013

Instructor: Pirooz Vakili
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Class: Wednesday 10 am-12pm; **Location:** PHO 210

Discussion sections:

A2: Monday 11am- 12 pm**; Location:** PRB 148
A3: Tuesday 2-3 pm**; Location:** SED 307
A4: Friday 10-11 am**; Location:** ENG 202
A5: Thursday 3-4 pm**; Location:** SED 206

Office hours: Monday 1-3 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 **one midterm exam** and a **final exam**. The final grade for the course will be based on the following allocation.

Homework: 30%
Midterm: 30%
Final Exam: 40%

Midterm: Wednesday October 23, 10 am-12 pm in room CGS 511 (College of General Studies, 871 Common Wealth Ave)**.**

Final Exam: Scheduled during final exam period by the registrar. Final exam will be on ALL material covered in the course.

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. *Introduction to the course*; *Real Vector Spaces* (Chapter 4): Vector spaces; Subspace & span; Linear independence, basis & dimension; (**September 4, September 11**)

2. *Inner Product Spaces* (Chapter 5): Inner product spaces, length, & angle; Orthogonal vectors & Gram-Schmidt Process (**September 18 & September 25**)

3. *Linear Transformations and Matrices* (Chapter 6): Linear Transformations & range and kernel; Matrix of a linear transformation & similarity (**October 2, October 9**)

4. *Linear Equations and Matrices* (Chapter 1): System of linear equations; Matrices; Matrix operations & special matrices. (**October 16**)

   Midterm Exam: October 23

5. *Solving Linear Systems* (Chapter 2): Solving linear systems; Inverse of a matrix. (**October 30**)

6. *Determinants* (Chapter 3): Determinants and their properties (**November 6**)

7. *Eigenvalues and Eigenvectors* (Chapter 7): Eigenvalues and eigenvectors & diagonalization of matrices (**November 13**)

8. *Applications* (Chapter 8): Dominant Eigenvalue & Principal Component Analysis (**November 20, December 4**)

9. *Review* (**December 11**)