EK102: Introduction to Linear Algebra for Engineers
Secs. C1 and E1

Spring 2015

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
Mechanical Engineering Dept. & Division of Systems Engineering
110 Cummington Street, Room 414
Telephone : (617) 353 - 9586
Email: cbelta@bu.edu

Office hours: M 2-3

Tutorial: M 4-5

Textbook: *Linear Algebra and its Applications, (**4th edition**), David C. Lay, Pearson.*

Homework: Homework will be assigned weekly.

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

Homework: 20%
Quiz: 10%
Midterm 1: 30%
Final Exam: 40%

Blackboard: All class material (e.g., lecture notes, assignments, exams, solutions) will be made available in the BU blackboard (see learn.bu.edu)

SYLLABUS

1. *Solving Linear Systems*: Systems of linear equations, Row echelon forms

2. *Matrices*: Matrix operations, Matrix properties, Partitioned matrices, Elementary matrices, Inverse of a matrix

3. *Determinants*: Definition, Co-factor expansions

4. *Linear Independence:* Linear combinations, Geometrical interpretation for solutions of linear systems

5. *Vector spaces*: Bases, Coordinates, Dimension, Null and column spaces,

6. *Rank:* Rank theorem

7. *Inner Product Spaces*: Inner product spaces, length, angle, Orthogonality, Gram-Schmidt process.

8. *Eigenvalues and Eigenvectors*: Eigenvalues and eigenvectors, Diagonalization of matrices.