ENG EK 102: Introduction to Linear Algebra for Engineers

Section G1

Lecturer: Armin Ataei
8 Saint Mary's St, Room 422
Phone: (617)358-5803
Email: ataei@bu.edu

Teaching Fellow: Steve Wang
Email: swang62@bu.edu

Lectures: Wednesday, 8:00–10:00am, PHO 210

Discussion Sections: **G2:** Monday, 11:00-12:00pm, COM 111
G3: Tuesday, 2:00–3:00pm, PSY 212
G4: Friday, 2:00pm–3:00pm, PSY B36
G5: Thursday, 3:00pm–4:00pm, PSY B36

Office Hours: Thursday, 1:00–3:00pm, or by appointment

Textbook: David C. Lay, *Linear Algebra and Its Applications*, 4^{th} Edition, Pearson, 2011

Homework: Weekly homework will be assigned. Each homework is due at the beginning of the following class. No late homework will be accepted under any circumstances. However, in calculating the overall homework grade, the lowest grade will be dropped.

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

- Homework: 25%
- Midterm Exam: 35%
- Final Exam: 40%

Midterm Exam: October 22, 8:00–10:00am in class

Final Exam: There will be a final exam scheduled by the registrar during the final exam period. The exam will cover *ALL* the material.

Course Website: A website will be setup on learn.bu.edu (Blackboard). All course

materials (e.g. assignments, exams, solutions) will be disseminated there.

Course Learning Objective: 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, eigenspaces and their application.

Syllabus (tentative)**:**

1. *Linear Equations in Linear Algebra* (Chapter 1): System of linear equations, matrices, linear transformations
2. *Matrix Algebra* (Chapter 2): Matrix operations, Inverse of a matrix, Matrix factorization
3. *Determinant* (Chapter 3): Determinants and their properties
4. *Vector Spaces* (Chapter 4): Vector spaces and subspaces, null spaces, linear independence, Rank, Change of basis
5. *Eigenvalues and Eigenvectors* (Chapter 5): Eigenvalues and eigenvectors, Characteristic equation, Diagonalization
6. *Orthogonality and Least Squares* (Chapter 6): Inner product, length and orthogonality, Gram-Schmidt process, Least-squares problems
7. *Symmetric Matrices and Quadratic Forms* (Chapter 7): Diagonalization of symmetric matrices, Quadratic forms, Singular value decomposition