

# Math 15a – Linear Algebra with Applications

## Spring 2008

**Instructor:** Prof. Ivan Horozov  
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**Office:** Goldsmith 205  
**Phone:** 6-3056  
**Class schedule:** Mon, Wed, Thu 10.10 a.m. – 11.00a.m.  
**Office hours:** Mon (11-12), Wed (11-12), Thu (12-1pm).  
**Textbook:** Linear Algebra with Applications by O. Bretscher,  
Third edition ( ISBN 0-13-145334-3)

### Syllabus:

Linear systems. Elementary row operations. Linear transformations and matrices. Product of matrices. Elementary row operation as a matrix. Inverse matrix. Projections. Vector space. Image and kernel of a linear transformation. Linear independence. Basis. Dimension. Orthogonal projections. Orthogonal bases. Gram-Schmidt process and QR factorization. Orthogonal transformations and orthogonal matrices. Least squares and data fitting. Determinants. Cramer's rule. Eigenvalues. Eigenvectors. Diagonalization. Raising a matrix to a high power. Exponentiation of a matrix. Application to linear differential equations.

**Class announcements:** The LATTE system will be used for communication with the entire class including reminders for the weekly assignments.

### Homework:

Homework will be assigned and collected every week, graded and returned to you regularly. For more details please check «the calendar» on my web site.

### Grading formula:

Your grade will be based on the homework, midterm and final exams.  
All the homework make 40% of your grade,  
the midterm exam - 20% and  
final exam – 40%.

**Students with disabilities:** If you are student with a documented disability on record at Brandeis University and wish to have a reasonable accommodation made for you in 15a class, please see me as soon as possible.

Please, do not hesitate to send/ask me any questions you have.