

# Linear Algebra, EE 10810EECS205004

Time: W3W4F3F4 (10:10-12:00, Wednesday and Friday), at Room 217, Delta Hall

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(Dated: Fall, 2019)

- Introduction: Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in engineering, physics, economics and social sciences, and natural sciences. In this class, the foundation of elementary linear algebra is illustrated for students. Various applications of linear algebra in different areas will also be addressed.

- **Text Book:** Gilbert Strang, "Introduction to Linear Algebra," international 5th Edition (Wellesley-Cambridge Press).

- Teaching Method:

In-class lectures with discussions and assignments.

- **Syllabus:**

- **Course Introduction**, Sep. 11th, ~~Sep. 13th~~ (Mid-Autumn Festival)

- **Part I: Vectors and Linear Equations**

- \* Linear Combination, Vectors, and Matrices, Chap. 1

- \* Solving Linear Equations, Elimination, Inverse Matrices, Chap. 2

- \* Vector Space and Rank, Chap. 3.1-3.3

- **Midterm Exam I**

- \* Complete Solutions to  $A\vec{x} = \vec{b}$ , Chap. 3.4

- \* Basis, Dimension, and Subspace, Chap. 3.5-3.6

- \* Orthogonality, Chap. 4

- \* Determinants, Chap. 5

- **Midterm Exam II**

- \* Eigenvalues and Eigenvectors, Chap. 6.1-6.2

- \* Diagonalizing a Matrix, Chap. 6-3

- \* Symmetric, Positive Definite, and Similar Matrices, Chap. 6.4-6.6

- \* Singular Value Decomposition, Chap. 6.7

- \* Linear Transformations, Chap. 7

- \* Applications (optional)

- **Final Exam**

- **Evaluation:**

1. Midterm I: 20%; (Tentatively, on Oct. 25th, Friday)

2. Midterm II: 20%; (Tentatively, on Dec. 6th, Friday)

3. Final Exam: 30% (Tentatively, on Jan. 15th, Wednesday)

4. Homework x 10: 30%;

- **Office hours:**

Tentatively, 1:00-5:00 PM, Wednesday, at R 911, Delta Hall.

Or by appointment.

- **Office hours:**

1. Eric (2nd-year IPT Master student)

2. Rick (Phys/Math honor student)

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