



MAS109: Introduction to Linear Algebra (Edu 3.0)

🕒 Class Time

MTWTh 9:00 – 13:00

(Begins on July 9th)

📍 Location

To be announced

📖 Credit

3

👤 Instructor

Professor Sang Geun Han(Hahn) (ock@kaist.ac.kr)

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📚 Required Materials

Contemporary Linear Algebra by Howard Anton, Robert C. Busby

(ppt files will be used for the class)

Course Summary

★ Topics covered from the textbook:

CHAPTER 1 Vectors 1 (quick review)

CHAPTER 2 Systems of Linear Equations

- 2.1 Introduction to Systems of Linear Equations
- 2.2 Solving Linear Systems by Row Reduction

CHAPTER 3 Matrices and Matrix Algebra

- 3.1 Operations on Matrices
- 3.2 Inverses; Algebraic Properties of Matrices
- 3.3 Elementary Matrices; A Method for Finding A^{-1}
- 3.4 Subspaces and Linear Independence
- 3.6 Matrices with Special Forms

CHAPTER 4 Determinants

- 4.1 Determinants; Cofactor Expansion
- 4.2 Properties of Determinants
- 4.3 Cramer's Rule; Formula for A^{-1} ; Applications of Determinants
- 4.4 A First Look at Eigenvalues and Eigenvectors

CHAPTER 6 Linear Transformations

- 6.3 Kernel and Range

CHAPTER 7 Dimension and Structure

- 7.1 Basis and Dimension
- 7.2 Properties of Bases
- 7.3 The Fundamental Spaces of a Matrix
- 7.4 The Dimension Theorem and Its Implications
- 7.5 The Rank Theorem and Its Implications
- 7.6 The Pivot Theorem and Its Implications
- 7.7 The Projection Theorem and Its Implications
- 7.8 Best Approximation and Least Squares
- 7.9 Orthonormal Bases and the Gram–Schmidt Process
- 7.11 Coordinates with Respect to a Basis

CHAPTER 8 Diagonalization

- 8.2 Similarity and Diagonalizability
- 8.3 Orthogonal Diagonalizability
- 8.4 Quadratic Forms
- 8.5 Application of Quadratic Forms to Optimization

Course Evaluation

Every Friday there will be short tests lasting 1 hour.
Final letter grade will be given by the sum of three tests.

Minor tuning of the letter grade may be given by student participation, attendance.