# Course Information-Linear Algebra

- [Subject Outline](#)
- [Test Information](#)

**summary**

 The first part of this course is divided into three parts. The first part explains the basic concepts of simultaneous linear equations and matrices, and the second part deals with algebraic structures called vector spaces and linear transformations.Part 3 describes some of the tools of linear algebra that are used in many fields.
Linear algebra gives us the logic to organize our knowledge.But this logical thinking ability should not be simply memorized, but gained during training to understand step by step.This course aims to develop the ability to explore and apply the basic concepts of linear algebra along with the development of such logical thinking skills.

**Medium name**

- Multimedia lesson

**Service schedule**

- Additional updates every Monday during the semester.

**lecture content**

- Multimedia lesson

| Count | Lecture Topic | The details | Textbook Pages | Professor in charge |
|---|---|---|---|---|
| 1 | Linear system of equations | 1.1 Linear System Equation 1.2 Elimination Method 1.3 Application of System Equation | 3-17 | Son Jin-gon |

| Count | Lecture Topic | The details | Textbook Pages | Professor in charge |
|---|---|---|---|---|
| 2 | Matrix and Gaussian Elimination | 2.1 Matrices and Linear Systems Equation 2.2 Basic Row Operations 2.3 Gaussian Elimination 2.4 Gaussian-Jordan Elimination | 19-40 | Son Jin-gon |
| 3 | Matrix operation | 3.1 Basic Concepts 3.2 Sum of Matrices 3.3 Scalar Multiplication of Matrices 3.4 Product of Matrix 3.5 Transpose of Matrix | 43-71 | Son Jin-gon |
| 4 | Inverse | 4.1 Regular and Inverse Matrices 4.2 How to Find Inverse Matrices 4.3 Linear and Equations | 73-100 | Son Jin-gon |
| 5 | Determinant | 5.1 Determinants 5.2 Properties of Determinants 5.3 Matrix Operations and Determinants | 103-130 | Son Jin-gon |
| 6 | Cramer Formula and Inverse Matrix | 6.1 Cramer Formula 6.2 Determinants and Inverses 6.3 Complexity Analysis | 133-149 | Son Jin-gon |
| 7 | Plane vector and space vector | 7.1 Planar vectors 7.2 $R^3$ space vector 7.3 $R^n$ spatial vector 7.4 Inner product of a vector 7.5 Cross product of a vector | 153-192 | Son Jin-gon |
| 8 | Vector space | 8.1 Vector and Vector Space 8.2 Subspace | 195-215 | Son Jin-gon |
| 9 | Basis and Dimension | 9.1 First Coupling 9.2 First Independence of Vectors 9.3 Basis and Dimension of Vector Space | 217-240 | Son Jin-gon |

| Count | Lecture Topic | The details | Textbook Pages | Professor in charge |
|---|---|---|---|---|
| 10 | Linear transformation | 10.1 Linear transformation 10.2 Fundamental properties of linear transformation 10.3 Phase and nucleus | 243-270 | Son Jin-gon |
| 11 | Linear transformation and matrix | 11.1 Coordinate System 11.2 Matrix Representation of Linear Transformations | 273-291 | Son Jin-gon |
| 12 | Eigenvalues and Eigenvectors | 12.1 Eigenvalues and Eigenvectors 12.2 Characteristic Equations | 295-311 | Son Jin-gon |
| 13 | Diagonalization of Matrix | 13.1 Diagonalization possibility of matrix 13.2 Diagonalization of matrix 13.3 Application: Fibonacci Sequence | 313-331 | Son Jin-gon |
| 14 | Orthogonal Vector | 14.1 Internal Space and Orthogonal Vectors 14.2 Orthogonal Matrices 14.3 Orthogonal Transformations | 335-356 | Son Jin-gon |
| 15 | Orthogonalization Process and Least Squares Method | 15.1 Orthogonal Basis 15.2 Gram-Schmidt process 15.3 Orthogonal Vectors 15.4 Least Squares Method | 361-386 | Son Jin-gon |

• Attendance class

| division | Lecture Topic | The details | Textbook Pages | Lecture |
|---|---|---|---|---|
| 1 | Matrix and Gaussian Elimination | -Matrix and linear system of equations-basic row operation-Gaussian elimination-Gaussian-Jordan elimination | Chapter 2 | lecture |
| 2 | Matrix operation | -Basic concepts-sum, scalar times, product-transpose of matrix | Chapter 3 | lecture |

| division | Lecture Topic | The details | Textbook Pages | Lecture |
|---|---|---|---|---|
| 3 | Inverse | -Regular matrix-How to find inverse matrix-Linear system and inverse matrix | Chapter 4 | lecture |
| 4 | Determinant | -Definition of determinants-Properties of determinants-Matrix operations and determinants | Chapter 5 | lecture |
| 5 | Vector space | -Properties of space vectors (Theorem 7.1, 7.2, 7.3)-Vector space-Subspace | Chapter 7, Chapter 8 | lecture |
| 6 | review | -Use this session for the part of lecture that needs additional lecture from lecture 1 to 5 | | lecture |

**Evaluation method and question range**

**Evaluation Type Assessment Methods Scope of question Remarks**

| Attendance class | Short answer | to be announced | |
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**Note: The above information is subject to change, so please refer to the academic bulletin.**

**references**

- No content

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