

Linear Algebra 1

Course Name	Course type (credit/hours)	전필(4/5)			Course code	G034
	Target students Division/major/grade	Mathematics/Natural Sciences/Engineering/2			Opening semester	2017 1ST SEMESTER
	Class time and classroom	월8.5(팔311) 월9.5(팔311) 수 13:30~15:00 (팔311) 금 13:30~15:00 (팔311)(팔311)			English Grade	A(100%English)
Reference to this course	Prerequisite courses	Calculus1, Calculus1 2				
	Related basic courses					
	Recommended concurrent courses					
	Related advanced courses	Linear Algebra 2, Modern Algebra 1/2				
Instructor	Name (title/division)		박보람 (조교수/자연과학대학 수학과)			
	Office Room Number	팔달관 613호	Office phone Number	2561	e-mail	
	Office hours			Homepage address		
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

1. Introduction

We study the basic operation of matrices and determinants and apply them to solve a system of linear equations.
We get some related results between vector spaces and linear transformations on them.
Furthermore, we study the eigenvalues and diagonalization of a matrix.

2. Course Objectives

We study systematic methods of representing and solving systems of linear equations via matrices.

We practice the basic operations for a matrix and investigate their properties.

We study the definition of the determinant and find the method of computing it.
We link the meaning of determinant with other properties of matrices.

We study the definition and various examples of vector spaces.

We study the linear independency and dependency of vectors, and also study the properties of the bases of a vector space.

We study the eigenvalues and eigenvectors of a matrix.

3. Class types and activities

Lectures and recitations.

4. Teaching Method

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|--|---|
| <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> discussion and debate |
| <input type="checkbox"/> team project(presentation and case studies) | <input checked="" type="checkbox"/> experiments(role-playing,etc) |
| <input type="checkbox"/> designing and production | <input type="checkbox"/> on-site learning(on-site training) |
| <input type="checkbox"/> others | |

5. Support Systems in Use

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|--|---|---|
| <input checked="" type="checkbox"/> e-class | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture | <input type="checkbox"/> blended learning(combination of online and offline teaching) | |
| <input type="checkbox"/> class behavior analyzing system | <input type="checkbox"/> others | |

6. Teaching Tools

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| <input type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) |
| <input type="checkbox"/> TBL(Team Based Learning) | <input type="checkbox"/> others |

7. Knowledge and ability required for taking this course

Basic knowledges of Calculus 1 and Calculus 2.

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		5	
midterm exam		25	
final exam		28	
quiz	6	10	6번의 퀴즈 중에서 가장 점수가 높은 5회의 성적을 반영함
presentation			
discussion			
homework	6	12	
etc	1	20	Lab수업 참여/성취도
study hours			

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Sub	Elementary Linear Algebra	Anton & Rorres	John Wiley	1994
Sub	Linear Algebra	Steven J. Leon	Prentice Hall	2005
Main	Linear Algebra A Modern Introduction, 3rd edition	David Poole	Brooks/Cole	2006

10. Class system and Class shedule

1. Using elementary operations on a matrix, we get sotutions of a system of linear equations.
2. We introduce the determinant of matrix and study its applications.
3. We define a vetor space and get a basis of a vector space.
4. We study the matrix representation of Linear transformation.
5. We study the eigenvalues and eigenvectors of Matrix and their applications

* language : K-korean, E-English

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	The Geometry and Algebra of Vectors Length and Angle:The Dot Product and etc. Chap 1 Review(at most 1 1/2 classes including 1.4)	E	박보람	Teaching and Lab		
2	Introduction to the Systems of Linear Equations Direct Methods for Solving Linear Systems, page 87-89	E	박보람	Teaching and Lab		
3	Spanning Sets and Linear Independence Applications Iterative Methods for Solving Linear Systems	E	박보람	Teaching and Lab		
4	Matrix Operations Matrix Algebra	E	박보람	Teaching and Lab		
5	Inverse of a Matrix The LU Factorization	E	박보람	Teaching and Lab		
6	Subspaces,Basis,Dimension, and Rank(First Part)	E	박보람	Teaching and test		
7	Subspaces,Basis,Dimension, and Rank(Second Part)	E	박보람	Teaching and Lab		
8	Midterm Exam	E	박보람	Teaching and test		
9	Introduction to Linear Transformations Applications(beginning part)	E	박보람	Teaching and Lab		
10	Applications(Second Part)	E	박보람	Teaching and Lab		
11	Introduction to Eigenvalues and Eigenvectors Determinants	E	박보람	Teaching and Lab		
12	Eigenvalues and Eigenvectors of $n \times n$ Matrices	E	박보람	Teaching and test		
13	Similarity and Diagonalization Iterative Methods for Computing Eigenvalues(First part)	E	박보람	Teaching and Lab		
14	Iterative Methods for Computing Eigenvalues(second Part) Applications and the Perron-Frobenius Theorem-Markov Chains	E	박보람	Teaching and Lab		

< Class Schedule >

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Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
15	Population Growth – Discrete Linear Dynamical Systems	E	박보람	Teaching and Lab		
16	Final Exam	E	박보람	Teaching and test		

11. Other items of notification

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