Korea University International Summer Campus (KU ISC) 2024

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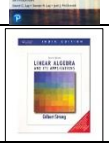
June 26, 2024 - August 1, 2024

ISC112 – [Online] Linear Algebra

Ⅰ. Instructor

Professor	:	Hongjoong Kim
E-mail	:	hongjoong@korea.ac.kr
Home Institution	:	Korea University (Department of Mathematics)
Class Time	:	9:00 am – 11:30 am (KST)
Class Format	:	Online Only
Office	:	TBA
Office Hours	:	TBA

Ⅱ. Textbook

Required Textbook	:	Linear Algebra and its Applications, 6th edition by D. Lay, S. Lay and J. McDonald (ISBN-13: 978-1292351216) 
Recommended Additional Readings	:	Linear Algebra and its Applications, 4th edition by G. Strang (ISBN-13: 978-0030105678) 

Ⅲ. Course Description and Objectives

Linear algebra is an area of mathematics that studies systems of linear equations and the properties of matrices. It has become an indispensable tool in many branches of sciences from mathematics to engineering or economics. In this course we study basic concepts and theorems in Linear Algebra including systems of linear equations and their solutions, determinants, vector spaces, eigenvalues and eigenvectors, diagonalization, orthogonality and least squares.

Audience : This course is aimed at students who want to employ basic linear algebra theories including theorems of vector spaces in their research areas. This includes students from a wide range of majors such as life sciences, economics, humanities, engineering, physics and mathematics. This course does not have pre-requisites.

Objectives: After taking this course, students will be able to

- formulate and solve systems of linear equations
- compute mathematical problems in sciences with matrices
- understand elementary facts about vector spaces
- find the eigenvalues and eigenvectors of a matrix
- perform linear transformations

Ⅳ. Grading

Midterm Exam 1		30 points
Midterm Exam 2	:	30 points
Final Exam	:	30 points
Participation	:	10 points (-1 point per absence)

Ⅴ. Class Outline

Date	Topic	Chapter	Remarks
June 26 (Wed)	Orientation Day (No class)		
June 27 (Thu)	Systems of linear equations, Echelon forms	1.1-2	
June 28 (Fri)	Vector equation, Matrix equation, Solution sets	1.3-5	
July 1 (Mon)	Linear independence, Linear transformations	1.7-9	
July 2 (Tue)	Matrix operations, Inverse of a matrix	2.1-2	
July 3 (Wed)	invertible matrices, Partitioned matrices	2.3-4	Midterm1
July 4 (Thu)	Matrix factorizations, Subspaces, Dimension and Rank	2.5,8,9	
July 5 (Fri)	Determinants, Vector space, Null space, Column space	3.1-3,4.1-2	
July 8 (Mon)	Linear independence, Bases, Coordinates, Dimension	4.3-5	
July 9 (Tue)	Rank, Change of basis, Eigenvectors	4.6-7	
July 10 (Wed)	Eigenvalues, Characteristic equation, Diagonalization	5.1-3	Midterm2
July 11 (Thu)	Eigenvectors and Linear Transformations	5.3-5	
July 15 (Mon)	Inner product, Length, Orthogonality, Projections	6.1-3	
July 16 (Tue)	Gram-Schmidt, Least-Squares, Inner product spaces	6.4,5,7	
July 17 (Wed)	Review		
July 18 (Thu)	Final Exam		Final
July 19 (Fri)	4-week teaching ends		
Aug 1 (Thu)	/ Graduation Day		

Midterm 1 (10:30-11:30 am on July 3) covers what you study between June 27 and July 2.
Midterm 2 (10:30-11:30 am on July 10) July 3 and July 9.
Final (9:00-10:00 am on July 18) July 10 and July 17.