Korea University International Winter Campus (KU IWC) 2019~2020

Choose Your Winter in Seoul - one of the most exciting cities in the world

December 27, 2019 ~ January 16, 2020
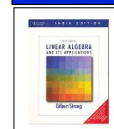
IWC112 – Linear Algebra

Ⅰ. Instructor

Professor	:	Hongjoong Kim
E-mail	:	hongjoong@korea.ac.kr
Home Institution	:	Korea University (Department of Mathematics)
Office	:	TBA
Office Hours	:	M/Tu/W/Th 12:30-1:00

Ⅱ. Textbook

Required Textbook	:	Linear Algebra and its Applications, 5th edition by D. Lay, S. Lay and J. McDonald ISBN-13: 978-0321982384
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 of matrices, orthogonality and least squares.

Audience : This course is aimed at students who want to employ basic linear algebra theories, especially those of matrices or 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

Attendance   :   10%
Midterm Exam   :   30%
Final Exam   :   30%
Quiz   :   30%

Ⅴ. Class Outline

Date	Topic	Chapter	Remarks
Dec 27 (Fri)	Systems of linear equations, Echelon forms	1	
Dec 28 (Sat)	Matrix equations, Solution sets of linear systems	1	
Dec 30 (Mon)	Linear independence, Linear transformations	1	
Dec 31 (Tue)	Matrix operations, Inverse	2	Quiz
Jan 1 (Wed)	New Year's Day (National Holiday, No class)		
Jan 2 (Thu)	Matrix factorizations	2	
Jan 3 (Fri)	Determinants and their properties	3	
Jan 6 (Mon)	**Midterm**		**Ch 1-3**
Jan 7 (Tue)	Vector spaces, Subspaces, Null spaces, Column spaces	4	
Jan 8 (Wed)	Bases, Coordinate systems	4	
Jan 9 (Thu)	Dimension of a vector space, Rank, Change of basis	4	
Jan 10 (Fri)	Eigenvectors, Eigenvalues, Diagonalization	5	Quiz
Jan 13 (Mon)	Linear transformations, Discrete dynamical systems	5	
Jan 14 (Tue)	Inner product, Orthogonality, Orthogonal Projections	6	
Jan 15 (Wed)	Gram-Schmidt process, Least-Squares problems	6	
Jan 16 (Thu)	**Final Exam**		**Ch 4-6**

Note

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact me. I will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with me. For procedures and information, please call or email me.