Antalya Bilim University
Department of Business Administration
BUSI – 251
Algebra

This course covers matrix theory and linear algebra, emphasizing topics useful in other disciplines. Linear algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. Due to its broad range of applications, linear algebra is one of the most widely taught subjects in college-level mathematics (and increasingly in high school).

Course books: Students **DO NOT** have to buy any book or material. Lecturer will provide all the necessary materials for his students by combining the contents of following books:

- Anton, Howard. *Elementary linear algebra*. John Wiley & Sons, 2010.
- David C. Lay, Steven R. Lay, Judi J. McDonald. *Linear Algebra and Its Applications* (5th Edition).

Recommended readings: If you are interested in further/advanced reading about Calculus, you may see the following book:

- Leon, Steven J. *Linear algebra with applications*. New York: Macmillan, 1980.

Academic Honesty and Plagiarism

It is considered cheating when an examinee during exams

- gets unduly help or
- helps another examinee with answers or
- makes use of help other than permitted

Assessment Criteria:

The criteria are listed below:

1) **Attendance & Participation (15%)**: You are strongly advised to participate in the classes.

2) **Assignments (15%)**: Please be careful about the section **Academic Honesty and Plagiarism.**

3) **Midterm (30%):** Midterm examination will be as *"written examination"*.

4) **Final exam (40%):** Final examination will be as *"written examination"*.

Course Schedule

Week 1 **September, 17**	**Systems of Linear Equations and Matrices** (Introduction, Gaussian Elimination, Matrices and Matrix Operations)
Week 2 **September, 24**	**MATLAB Applications** (Introducing a matrix, operations, finding transpose)
Week 3 **October, 1**	**Systems of Linear Equations and Matrices** (Inverses; Algebraic Properties of Matrices, Diagonal, Triangular, and Symmetric Matrices)
Week 4 **October, 8**	**MATLAB Applications** (Introducing a matrix, operations, finding transpose, finding inverses, solving systems)
Week 5 **October, 15**	**Determinants** (Determinants by Cofactor Expansion, Properties of Determinants)
Week 6 **October, 22**	**Euclidean Vector Spaces** (Vectors in Space, Norm, Dot Product, and Distance)
Week 7 **October, 29**	**Euclidean Vector Spaces** (Orthogonality, Cross Product)
Week 8 **November, 5**	**MIDTERM**
Week 9 **November, 12**	SOLUTIONS TO THE MIDTERM
Week 10 **November, 19**	**General Vector Spaces** (Real Vector Spaces, Linear Independence, Coordinates and Basis)
Week 11 **November, 26**	**General Vector Spaces** (Dimension, Row Space, Column Space, and Null Space, Rank)
Week 12 **December, 3**	**Revision of the course and problems**
Week 13 **December, 10**	**Eigenvalues and Eigenvectors (with Matlab applications)**

Week 14 December, 17	Revision of the course and problems