GAU, Faculty of Engineering

Course Unit Title	Basic Linear Algebra
Course Unit Code	MT104
Type of Course Unit	Compulsory, All engineering students
Level of Course Unit	1st Year BSc
National Credits	3
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	2
Mode of Delivery	Face to Face, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	-
Recommended Optional Programme Components	Basic bacground in mathematics

Objectives of the Course:

- Students should acquire a thorough background in matrix and vector algebra; receive an introduction to the numerical solution of linear systems; be aware of techniques for finding eigenvalues and eigenvectors; appreciate how linear algebra is currently used to solve practical problems.

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Solve the systems of linear equations. Provide arithmetic operations with matrices. Compute the inverse of matrix.	1, 2
2	Determine the value of determinant of a matrix. Use Cramer rule to solve the systems.	1, 2
3	Realize the importance of the concepts of vector space, basis and dimension.	1, 2
4	Compute the matrix representation of a linear transformation.	1, 2
5	Evaluate the eigenvalues and the corresponding eigenvectors of the matrix.	1, 2

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	5
2	Ability to design and conduct experiments as well as to analyze and interpret data	3
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	3
4	Ability to apply systems thinking in problem solving and system design	3
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	3
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	4
7	Ability to express their ideas and findings, in written and oral form	3
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)

Course Contents

Week			Exams
1	Chapter 1	Introduction to linear equations	
2		Linear systems and their soutions	E-Quiz 1
3		Gaussian elimination	E-Quiz 2
4		Matrices and matrix operations, inverse matrix	
5		Tutorial	
6	Chapter 2	Determinants	Class-Quiz 1
7			Midterm
8	Chapter 3	Vectors	
9	Chapter 4	Euclidian vector space	E-Quiz 3
10	Chapter 5	General vector spaces	E-Quiz 4
11	Chapter 6	Inner product spaces	Class-Quiz 2
12	Chapter 7	Eigenvalues, eigenvectors	E-Quiz 5
13	Chapter 8	Linear Transformations	
14		Tutorial	
15			Final

Recommended Sources

Textbook: "Elementary Linear Algebra", Howard Anton and Chris Rorres, John Wiley Publications, 9th.Edn.,2005.

Supplementary Material(s): GAU elearning site (www.http://elearning.gau.edu.tr).

Assessment

Attendance& E-learning	10%	
Laboratory	-	
Midterm Exam (Written)	30%	
Quiz (Written)	20%	
Final Exam (Written)	40%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	2	3	6
Assignments	1	6	6
Project/Presentation/Report Writing	-	-	-
E-learning Activities	5	5	25
Quizzes	2	10	20
Midterm Examination	1	14	14
Final Examination	1	20	20
Self Study	14	3	42
Total Workload			178
Total Workload/30 (h)			5.9
ECTS Credit of the Course			6