LINEAR ALGEBRA

1	Course Title:	LINEAR ALGEBRA	
2	Course Code:	MAT1078	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. BASRİ ÇELİK	
15	Course Lecturers:	Doç.Dr. Atilla AKPINAR Doç.Dr. Esen İYİGÜN	
16	Contact information of the Course Coordinator:	basri@uludag.edu.tr 0224.2941762	
17	Website:		
18	Objective of the Course:	To provide a fundamental understanding of linear algebra, especially linear equation systems, matrices, determinant and their usage, solutions of linear equations system.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Acquires an understanding of some fundamental ideas of linear algebra, including vectors, vector spaces, linear independence, bases, dimension and linear transformations, especially in the case of Rn.
		2	Enhances your capability for studying abstraction and producing formal mathematical arguments (proofs).
		3	Learns some important applications of linear algebra in other mathematical disciplines.
		4	Understands the relationship between geometry and linear algebra, including the roles of inner products and orthogonality.
		5	Writes solutions to problems involving linear algebra in a clear, mathematically-correct,and grammatically-correct fashion.
		6	Uses elementary row operations, elementary matrices and matrix algebra to solve systems of equations.
		7	Develops your ability to solve problems involving linear equations, matrices, determinants and vectors.
		8	
		9	
		10	
21	Course Content:		

Course Content:

Week	Theoretical	Practice

1	Contens and description of this course, vectors, vector directions, length of vector, zero vector.	
2	Components of vector, location vector, parallel vectors, point-vector relations, vector sum, vector product, multiplication of vectors by scalars, scalar (dot) product, vector space, lines and planes in space and their applications, subvector spaces.	
3	Inner product spaces, norm of a vector, angle between two vector, projection vector, Schwarz inequality, orthogonal and orthonormal vectors, unit vector, Pythagoras theorem, Bessel inequality.	
4	Linear depence and indepence of vectors, bases and dimension of a vector, Gramm-Schmidt orthogonalization method.	
5	Matrices, row and column of matrices, dimension of matrix, square matrix, zero matrix, addition matrix, multiplication of matrix by scalar, transpose matrix, row matrix, sütun matrix, symmetric and antisymmetric matrix, diagonal matrix.	
6	Multiplication of matrices, unit matrix, scalar matrix, submatrix, inverse matrix, (upper and lower) triangular matrix.	
7	Determinant of order 2, determinant of order 3 and Sarrus Rule, Determinants of order n: Laplace expansion by a row and by a column, properties of determinants.	
8	Feedback	
9	Special determinants, minor and cofactor, adjoint matrix, calculation of inverse matrix.	
10	Information about general linear equations system, matrix form of linear equations system, solutions of some linear systems by inverse matrix method.	
11	Homogen linear equations system and their solutions.	
12	Cramer systems (n=m), linear equations system with n>m and n<m.	
13	Elementary operations, echelon matrices.	
14	Solutions of linear equations system by elementary operations.	

22	Textbooks, References and/or Other Materials:	1) Linear Algebra Lecture Notes (in Turkish), Basri ÇELİK, http://homepage.uludag.edu.tr/~basri/ders/linceb.htm 2)Prof. Dr.H.Hilmi Hacısalihoğlu, 1985, Lineer Cebir, 3.Baskı, Gazi Üniversitesi, Ankara, 765s. 3) Prof. Dr. H.Hilmi Hacısalihoğlu, Doç.Dr. Mustafa Balcı, Yrd.Doç.Dr.Fikri Gökdal, 1986, Temel ve Genel Matematik 2, 3.Baskı, Ankara, 316 s. 4) Erdoğan Esin, H.Hilmi Hacısalihoğlu, Ertuğrul Özdamar, 1987, Çözümlü Lineer Cedir Problemleri, 1.Baskı, Ankara, 1069s.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00

Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	9.00	9.00
Others	14	1.00	14.00
Final Exams	1	13.00	13.00
Total Work Load			120.00
Total work load/ 30 hr			4.00
ECTS Credit of the Course			6.00

25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	3	2	0	3	0	0	0	0	0	0	0	0	0	0
ÖK3	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
ÖK4	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	3	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0
ÖK6	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0
ÖK7	3	3	3	2	3	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**