Department of Geomatics Engineering / Department of Civil Engineering / Department of Geomatics Engineering

Course Code	Course Name	Teorical	Practice	Laboratory	Credits	ECTS
MAT208	APPLIED LINEER ALGEBRA	3.00	0.00	0.00	3.00	5.00

Course Detail

Course Language	:	English
Qualification Degree	:	Bachelor
Course Type	:	Compulsory
Preconditions	:	Not
Objectives of the Course	:	This is a basic subject on matrix theory and linear algebra. Emphasis is given to topics that will be useful in other disciplines, including systems of equations, vector spaces, determinants, eigenvalues.
Course Contents	:	Systems of Linear Equations, Row Reduction and Echelon Forms, Vector Equation, The Matrix Equation, Solution Sets of Linear Systems, Linear Independence, Introduction to Linear Transformations, The Matrix of a Linear Transformations, Matrix Operations, The Inverse of a Matrix, Characteriztions of Invertible Matrices, Partitioned Matrices, Introduction to Determinants, Properties, Cramers Rule, Volume, Vector Spaces, Subspaces, Null/Column Spaces, Bases, Coordinate Systems, Dimension, Rank, Change of Basis, Eigenvalues, Eigenvectors, Diagonalization, Inner Product, Orthogonality, The Gram-Schmidt Process, The Least Squares Method, Singular Value Decomposition
Recommended or Required Reading	:	David Lay, Linear Algebra and Its Applications, Pearson 4/E
Planned Learning Activities and Teaching Methods	:	Yüzyüze ve öğrenci merkezli interaktif eğitim
Recommended Optional Programme Components	:	None
Instructors	:	Inst. Dr. Yeşim Çiçek
Instructor's Assistants	:	None
Presentation Of Course	:	Presentation, Face-to-face.
En Son Güncelleme Tarihi:	:	7/22/2024 9:49:30 PM

Course Outcomes

Upon the completion of this course a student :

1 will be able to identify the systems of linear equations, construct the matrix representation of the given systems, apply the row operations in order to translate the given matrices to their row echelon forms, categorize the system as consistent/inconsistent, and find the solution of the consistent system via the back substitution method.

2 will be able to implement the matrix operations, to find the determinant and inverse of a matrix.

3 will be able to identify the concepts of linear dependence and independence, and investigate the linear independence of vectors.

4 will be able to identify vector spaces and their subspaces, create the specific spaces of matrices, describe linear transformations, and create the standard matrices of linear transformations.

5 will be able to compute the eigenvalues of a matrix, find the corresponding eigenvectors, and identify the concepts of inner product and orthogonality.

Preconditions

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Weekly Contents

	Teorical	Practice	Laboratory	Preparation Info	Teaching Methods	Course Learning Outcomes
1.Week	**Lineer Systems, Echelon Forms					
2.Week	*Vectors, Matrix Systems, Solutions of Linear Systems					
3.Week	*Matrix Operations, İnverse of a Matrix					
4.Week	*Characterizations of Reversible Matrices,					
5.Week	*Determinants and Properties, Cramer's Rule					
6.Week	*Linear Independence, Linear Transformations, Matrix Representations of Linear Transformations					
7.Week	*Midterm Exam					
8.Week	**Vector Spaces, Subspaces, Row/Column Spaces, Bases					
9.Week	*Change of Size, Rank, Bases					
10.Week	*Eigen Values, Eigen Vectors, Cayley-Hamilton Theorem					
11.Week	**Diagonalization					
12.Week	**Dot Product, Orthogonality					
13.Week	*Gram-Schmidt Method					
14.Week	**QR Factorization Single Value Decomposition					
15.Week	*Rewiev					

Assesment Methods %

1 Midterms : 50.000

2 Final : 50.000

ECTS Workload

Activities	Count	Time(Hour)	Sum of Workload
Vize / Midterms	1	2.00	2.00
Final / Final	1	2.00	2.00
Derse Katılım / Attending lectures	15	3.00	45.00
Ders Öncesi Biresysel Çalışma / Individual study before lecture	15	2.00	30.00
Ders Sonrası Biresysel Çalışma / Individual study after lecture	15	2.00	30.00
Ara Sınav Hazırlık / Preparation for midterm	1	12.00	12.00
Final Sınavı Hazırlık / Preparation for final	1	16.00	16.00
		Total :	137.00
		Sum of Workload / 30 (Hour) :	5
		ECTS :	5.00

Program And OutcomeRelation

	P.O. 1	P.O. 2	P.O. 3	P.O. 4	P.O. 5	P.O. 6	P.O. 7	P.O. 8	P.O. 9	P.O. 10	P.O. 11
L.O. 1	5	0	0	0	0	0	0	0	0	0	0
L.O. 2	5	0	0	0	0	0	0	0	0	0	0
L.O. 3	5	0	0	0	0	0	0	0	0	0	0
L.O. 4	5	0	0	0	0	0	0	0	0	0	0
L.O. 5	5	0	0	0	0	0	0	0	0	0	0