

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
LINEAR ALGEBRA and DIFFERENTIAL EQUATIONS	COE2133840	Fall Semester	4+0	4	8
Prerequisites Courses	GENEL MATEMATİK II; MATEMATİK II				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Closed				
Course Coordinator	Assist.Prof. Cihan Bilge KAYASANDIK				
Name of Lecturer(s)					
Assistant(s)					
Aim	1. To provide the methods of solution of systems of linear equations and the applications of matrix and determinant.2. To introduce the basic concepts required to understand, construct, solve and interpret differential equations and to teach methods to solve differential equations of various types.3. To give an ability to apply knowledge of mathematics on engineering problems				
Course Content	This course contains; Matrices and Systems of Linear Equations,Matrices and Systems of Linear Equations,Determinants,Vector Spaces,Vector Spaces,Eigenvalues and Eigenvectors,Eigenvalues and Eigenvectors,First order differential equations,First order differential equations,Higher order differential equations,Higher order differential equations,Higher order differential equations,Laplace Transform,Laplace Transform.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
5. Solve higher order linear differential equations with constant coefficients and construct all solutions from the linearly independent solutions ; solve initial value problems using the Laplace transform			1, 14, 15	A, C	
4. Solve first order linear equations and nonlinear equations of certain types , interpret the solutions and understand the conditions for the existence and uniqueness of solutions for linear differential equations			1, 14, 15	A, C	
3. Classify differential equations according to certain features			1, 14, 15	A, C	
2. Learn the importance of the concepts of vector space, basis and dimension and evaluate the eigenvalues and the corresponding eigenvectors of the matrix.			1, 14, 15	A, C	
1. Solve the systems of linear equations, provide arithmetic operations with matrices, compute the inverse of matrix, determine the value of determinant of a matrix and use Cramer rule to solve the systems			1, 14, 15	A, C	
Teaching Methods	1: Lecture, 14: Self-Study, 15: Problem solving				
Assessment Methods	A: Written Exam, C: Homework				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Matrices and Systems of Linear Equations				
2	Matrices and Systems of Linear Equations				
3	Determinants				
4	Vector Spaces				
5	Vector Spaces				
6	Eigenvalues and Eigenvectors				
7	Eigenvalues and Eigenvectors				
8	First order differential equations				
9	First order differential equations				
10	Higher order differential equations				
11	Higher order differential equations				
12	Higher order differential equations				
13	Laplace Transform				
14	Laplace Transform				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
Differential Equations & Linear Algebra Third Edition Edition, C.Henry Edwards ; David E. Penney Pearson International Education International,2011.