ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151222148 - 151242148   **COURSE TITLE:** Linear Algebra

Semester	Weekly Hours		COURSE				
	Theoretical	**Practical**	**Credits**	**ECTS**	**Type**		**Language**
2	3	0	3	4	Compulsory (x) Elective ( )		Turkish ( ) English (X)

Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).			
Math and Basic Science	**Electrical Engineering** [mark (√) if there is high design content]	**General Education**	**Humanities**
	( )		

Assessment		THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
Midterm		**Type**	**Number**	**%**	**Activity Type**	**Number**	**%**
		Midterm	1	30	Quiz		
		Quiz	3	30	Lab performance		
		Homework			Report		
		Project			Oral exam		
		Other (………)			Other (………)		
Final			1	40			
Makeup exam (Oral/Written)		Written					

Prerequisites	None
Brief content of the course	Linear equations and matrices, solving linear systems, vector spaces, inner product spaces, linear transformations, determinants, eigenvalues and eigenvectors
Objectives of the course	To be able to use matrices and vectors, to apply basic methods to solve linear systems, to make matrix and vector operations in n-dimensional space, to be able to make eigen-decomposition.
Contribution of the course towards professional education	In this course students learn how to use matrices and vectors in order to solve related basic engineering problems. Also this course is necessary to understand the important topics taught in the other Electrical and Electronics engineering classes.
Outcomes of the course	1) Students can find the solution of linear equation and system. 2) Students can use matrices and vectors in confidence. 3) Students can easily find a vector sets spanning different real vector spaces. 4) Students can make eigen-decomposition on matrix.
Textbook of the course	B. Kolman, D. R. Hill, *Elementary Linear Algebra*, Prentice Hall, 8th edition, 2004.
Other reference books	1) D. C Lay, *Linear Algebra and Its Applications*, Addison Wesley Longman, Inc., 2n edition 1997. 2) D. Poole, *Linear Algebra - a Modern Introduction*, Thomson Brooks/Cole, 2006
Required material for the course	

WEEKLY PLAN OF THE COURSE	
Week	**Topics**
1	Linear systems and matrices
2	Solving linear systems
3	Special matrices and finding inverses
4	LU decomposition
5	Vector Spaces
6	Subspaces and linear independence
7	Span and linear independence
8	Midterm
9	Midterm
10	Homogeneous systems
11	Inner product spaces
12	Linear Transformations and transformation matrices
13	Determinants
14	Eigenvalues and eigenvectors
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering		x		
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.	x			
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.				
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.				
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering				
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.		x		
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.				
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing		x		
9	Understanding of professional and ethical responsibility				
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				

Scale for assessing the contribution of the course to the program outcomes:

4: High   **3: Medium**   **2: Low**   **1:None**

Name of Instructor(s):

Signature(s):

                                                                                Date: