ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151224299 – 151244299   **COURSE TITLE:** Signals and Systems

Semester	Weekly Hours		COURSE			
	Theoretical	**Practical**	**Credits**	**ECTS**	**Type**	**Language**
4	3	0	3	5	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
1	2	( )	0	0

Assessment		THEORETICAL-PRACTICAL COURSES		LABORATORY COURSES		
Midterm		**Type**	**Number**	**%**	**Activity Type**	**Number**	**%**
		Midterm	1	30	Quiz		
		Quiz	3	15	Lab performance		
		Homework	6	15	Report		
		Project			Oral exam		
		Other (………)			Other (………)		
Final			1	40			
Makeup exam (Oral/Written)		Written					

Prerequisites	None
Brief content of the course	Signals and Systems, Linear Time Invariant Systems, Fourier Series Representation of Periodic Signals, The Continuous-Time Fourier Transform, The Discrete-Time Fourier Transform, Time and Frequency Characterization of Signals and Systems, Sampling, Laplace Transform.
Objectives of the course	To learn continuous-time and discrete-time systems and their properties, to learn linear-time invariant systems and their properties, finding responses of linear time-invariant systems by using convolution, to learn how to find fourier series representation of periodic signals and fourier transforms of non-periodic signals, to describe sampling theorem, to learn how to find Laplace transform of signals.
Contribution of the course towards professional education	In this course students learn characteristics of continuous and discrete-time signals and systems, and they can analyze them in time and frequency domains.
Outcomes of the course	5) Students learn continuous-time and discrete-time signals and sytems. 6) Students can find the responses of linear time-invariant systems to different input signals by using convolution. 7) Students can find the Fourier series representation of periodic signals. 8) Students can determine the responses of LTI systems to periodic signal inputs. 9) Students can find the Fourier transform of non-periodic signals. 10) Students can analyze systems in both time and frequency domains. 11) Students learn the sampling theorem and they can apply it in practical applications. 12) Students can find the Laplace transform of systems and signals and they know characteristics of the Laplace transform.
Textbook of the course	V. Oppenheim and A.S. Willsky, Signals and Systems, Prentice-Hall, Inc. 1997, 2nd edition.
Other reference books	S. Haykin and B. Van Veen, Signals and Systems, John Wiley & Sons, Inc., 2003, 2nd edition.
Required material for the course	

WEEKLY PLAN OF THE COURSE

Week	Topics
1	Introduction and Continuous and Discrete Time Signals and Systems
2	Properties of Continuous and Discrete Time Systems
3	Linear Time Invariant Systems and Convolution
4	Fourier Series for Periodic Signals
5	Continuous-Time Fourier Transform
6	Discrete-Time Fourier Transform
7	Discrete-Time Fourier Transform
8	Midterm
9	Midterm
10	Time and Frequency Characterization of Signals and Systems
11	Sampling
12	Discrete-Time Processing of Continuous-Time Signals
13	Laplace Transform
14	Analysis of LTI Systems Using Laplace Transform
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.			x	
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.			x	
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				x
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.				x
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				x
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				x
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				x

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: