TOROS ÜNİVERSİTESİ

Faculty Of Engıneerıng
Electrıcal And Electronıcs Engıneerıng (Englısh)

Course Information

SIGNALS AND SYSTEMS					
Code	**Semester**	**Theoretical**	**Practice**	**National Credit**	**ECTS Credit**
		Hour / Week			
EEE319	Fall	2	2	3	5

Prerequisites and co-requisites	MAT205 Complex Calculus
Language of instruction	English
Type	Required
Level of Course	Bachelor's
Lecturer	Asst. Prof. Cevher AK
Mode of Delivery	Face to Face
Suggested Subject	
Professional practise (internship)	Available
Objectives of the Course	Signals and systems are two basic components of engineering.This course provides analysis and description methods of continuous-time (analog) signals and systems.
Contents of the Course	Introduction: Definition of signals and systems. Transformation of independent variable. Properties of signals and systems. Linear, time-invariant systems. Convolution. Properties of linear, time-invariant (LTI) systems. Systems represented by differential equations. State-space analysis of LTI-causal systems described by differential equations. Fourier series. Fourier transform. Properties of Fourier series and Fourier transform. Filtering. Continuous-time modulation. Demonstration of amplitude modulation. The Laplace transform. Analysis of systems by using Fourier and Laplace transform. Continuous-time second-order systems. Butterworth filters. Feedback. Sampling. Interpolation.

Learning Outcomes of Course

#	Learning Outcomes
1	Getting knowledge about the definitions and basic properties of both signals and systems
2	Getting knowledge about the role of convolution in the analysis of linear time invariant systems, and use convolution to determine the response of linear systems to arbitrary inputs.
3	Getting knowledge about Transform signals in their Fourier Series Expansion forms
4	Getting knowledge about Use Continuous Time Fourier transform to analyze and synthesize continuous time signals and systems
5	Getting knowledge about Use Discrete Time Fourier transform to analyze and synthesize discrete time signals and systems
6	Getting knowledge about Analyze discrete time systems using unilateral Z-transform.
7	Getting knowledge about Analyze continuous time systems using unilateral Laplace transform
8	Getting knowledge about Use mathematical software like MATLAB to analyze and simulate signals and LTI systems.

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Introduction: Definition of signals and systems. Transformation of independent variable. Properties of signals and systems.	lecture
2	Linear, time-invariant systems. Convolution Integral.	lecture
3	Properties of linear, time-invariant (LTI) systems. Systems represented by differential equations.	lecture

4	State-space analysis of LTI-causal systems described by differential equations.	lecture
5	Fourier series.	lecture
6	Fourier transform. Fourier transform properties	lecture
7	Filtering.	lecture
8	Midterm Exam	exam
9	Continuous-time modulation. Demonstration of amplitude modulation.	lecture
10	The Laplace transform Laplace transform properties.	lecture
11	Analysis of systems by using Fourier and Laplace transform.	lecture
12	Continuous-time second-order systems.	lecture
13	Z-transform of discrete time signals	lecture
14	Butterworth filters, Feedback systems.	lecture
15	Sampling. Interpolation.	lecture
16	Final Exam	exam

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	"Signals and Systems. Alan V. Oppenheim. 1997. Prentice Hall. Linear Systems and Signals. B. P. Lathi. 2005. Oxford University Press."		
2	Linear Systems and Signals. B. P. Lathi. 2005. Oxford University Press.		
3	Lecture Notes.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Getting knowledge about the definitions and basic properties of both signals and systems	1	1,2
2	Getting knowledge about the role of convolution in the analysis of linear time invariant systems, and use convolution to determine the response of linear systems to arbitrary inputs.	2	1,2
3	Getting knowledge about Transform signals in their Fourier Series Expansion forms	2,3	1,2
4	Getting knowledge about Use Continuous Time Fourier transform to analyze and synthesize continuous time signals and systems	3	1,2
5	Getting knowledge about Use Discrete Time Fourier transform to analyze and synthesize discrete time signals and systems	3	1,2
6	Getting knowledge about Analyze discrete time systems using unilateral Z-transform.	4	1,2
7	Getting knowledge about Analyze continuous time systems using unilateral Laplace transform	4	1,2
8	Getting knowledge about Use mathematical software like MATLAB to analyze and simulate signals and LTI systems.	5	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time	Work

			(Hour)	Load
1	Course Duration	14	4	56
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	4	56
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	1	1
8	Midterm Exam	1	5	5
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	2	2
16	Final Exam	1	30	30
				150