COURSE CODE	**EENG226/INFE226**	**COURSE LEVEL**	Year Two	
COURSE TITLE	**Signal and Systems**	**COURSE TYPE**	Department Core Course	
CREDIT VALUE	(4,1)4	**ECTS VALUE**		
PREREQUISITE	EENG223/INFE211	**COREQUISITES**	MATH252	
DURATION OF COURSE	15 weeks	**SEMESTER AND YEAR**	Spring	2019-2020

WEB LINK	http://opencourses.emu.edu.tr/course/view.php?id=383			
	Name	**e-mail**	**Office**	**Telephone**
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Assistant	[to be announced]			

CATALOGUE DESCRIPTION

Continuous-time and discrete-time signals and systems. Linear time-invariant (LTI) systems: system properties, convolution sum and the convolution integral representation, system properties, LTI systems described by differential and difference equations. Fourier series: Representation of periodic continuous-time and discrete-time signals and filtering. Continuous time Fourier transform and its properties: Time and frequency shifting, conjugation, differentiation and integration, scaling, convolution, and the Parseval's relation. Representation of aperiodic signals and the Discrete-time Fourier transform. Properties of the discrete-time Fourier transform.

(Prerequisite: EENG 223/INFE221)

AIMS & OBJECTIVES

Understanding the fundamental characteristics of signals and systems. Familiarization with time and frequency domain representations of linear systems and understanding the inter-relationships between the two domains. Understanding how linear systems affect the signals they operate on. Development of the mathematical skills to analyze signals and systems using transform techniques.

GENERAL LEARNING OUTCOMES (COMPETENCES)

1. On successful completion of this course, all students will have developed *knowledge* and *understanding* of:
   - (a) General signals and system properties
   - (b) Linear, time-invariant systems
   - (c) Convolution sum and integral
   - (d) Time and frequency domain representation of linear signals and systems
   - (e) Discrete-time (DT) and continuous-time (CT) Fourier transforms
   - (f) Fourier Transform Properties
   - (g) Filtering of CT and DT signals
2. On successful completion of this course, all students will have developed *their skills in*:
   - (a) Using the laboratory equipment correctly and safely
   - (b) recording and interpreting the results of laboratory experiments
3. On successful completion of this course, all students will have developed their appreciation of and respect for values and attitudes regarding the issues of:
   - (a) carry out directed private study using textbooks, and other provided resources

TEXTBOOK

S. Haykin and B. Van Veen, *Signals and Systems*, 2nd edition, John Wiley & sons, Inc 2003.

COURSE CONTENT AND SCHEDULE		
Week	**Date**	**Topics**
1		Course introduction. Basic CT and DT signals and systems, system properties
2		Elementary complex signals. Unit impulse and unit step functions
3		Periodic signals, fundamental properties of systems. The convolution sum and integral
4		Properties of LTI systems
5		Difference and differential equation basics. Singularity functions
6		Fourier series analysis of CT and DT signals. Properties of CT and DT Fourier series
7		Fourier series and LTI systems, filtering
8		CT Fourier transform. Representation of aperiodic and periodic signals
9		Midterm Exam
10		Properties of the CT Fourier transform
11		Basic Fourier transform pairs
12		DT Fourier transform
13		Representation of aperiodic and periodic signals
14		Properties of the DT Fourier transform
15-17		Final Exam

LABORATORY WORK

Laboratory sessions are organized in parallel to theoretical study given in classrooms. Every week, the students perform computer and simulation experiments using the MATLAB software package.

GRADING POLICE

The performances in homework, laboratory, quizzes, midterm exam, and final exam are to be included in the evaluation. The individual grade is to be assigned according to the overall performance. Note that a satisfactory performance in laboratory is necessary for any passing grade.

Homework	5 %
Quizzes	10 %
Laboratory	15%
Midterm Exam	30%
Final Exam	40 %

NG Policy:

Any student who has an overall failing grade, and who has failed to attend the lectures regularly (below 60%) will be given the NG grade. Note that, a student whose grade is NG will not be given the Resit Exam (by university regulation(s)).

Lab Exemption Policy:

Students who would like to be exempt from the lab should contact their lecturer. Assistants do not have the authority to give exemptions. Only students who scored at least 70% of the lab mark in an earlier semester will be exempted from the lab.

Makeup Policy:

There will be only ONE make-up exam and it will replace either the midterm or the final. Students who failed to attend an exam(s) should provide a report to the Chair's office in the next three working days. Those students whose excuses are approved by the department can then attend the makeup exam at a time the department will announce.

ACADEMIC HONESTY - PLAGIARISM

Cheating is copying from others or providing information, written or oral, to others. Plagiarism is copying without acknowledgement from other people's work. According to university by-laws cheating and plagiarism are serious offences punishable with disciplinary action ranging from simple failure from the exam or project, to more serious action (letter of official warning suspension from the university for up to one semester). Disciplinary action is written in student records and may appear in student transcripts.