ELEC2501 COURSE CATALOG INFO

Course Code : ELEC2501				Course Name : Signals and Systems				
Semester	**Lecture (Le+T+L)**	**Local Credit**	**ECTS**	**Language**	**Category**	**Instructional Methods**	**Prerequisites**	
4	(4+1+0)	4	7	English	Core	Lecture	MATH2104, MATH1102	

Course Content	Definition and classification of signals. Transformations of independent variable. Exponential and sinusoidal signals. Impulse and step functions. Basic system properties. Linear time-invariant (LTI) systems. Convolution sum. Convolution integral. Continuous-time (CT) Fourier series. Properties of CT Fourier series. Discrete-time (DT) Fourier series. Properties of DT Fourier series. CT Fourier transform for periodic signals. Properties of CT Fourier transform. DT Fourier transform. Properties of DT Fourier Transform. Time and Frequency characterization of signals and systems. Sampling theorem.
Course Outcomes	**CO1.** Characterize mathematical representations and properties of continuous-time and discrete-time signals and systems. **CO2.** Define the impulse response of the Linear Time Invariant (LTI) systems both in continuous-time and discrete-time, and system properties such as stability and causality. **CO3.** Formulate the continuous-time and discrete-time Fourier series representations of the periodic signals. **CO4.** Determine the Fourier transform and its properties for continuous-time and discrete-time signals. **CO5.** Apply the sampling process based on the sampling theorem and reconstruct the signals from their samples.

COURSE PLAN	
W1	Signals and Systems
W2	Signals and Systems
W3	Linear Time Invariant Systems
W4	Linear Time Invariant Systems
W5	Linear Time Invariant Systems
W6	Fourier Series Representation of Periodic Signals
W7	Fourier Series Representation of Periodic Signals
W8	Fourier Series Representation of Periodic Signals
W9	The Continuous Time Fourier Transform

W10	The Continuous Time Fourier Transform
W11	The Discrete Time Fourier Transform
W12	The Discrete Time Fourier Transform
W13	Time and Frequency Characterization of Signals and Systems
W14	Sampling

COURSE ASSESMENT AND ECTS WORK LOAD			
Type of Work	**Count**	**ECTS WORK LOAD**	
		Time (Hour)(Including prep. time)	**Work Load**
Attendance	14	4	56
Final Exam	1	20	20
Quizzes			0
Term project			0
Reports			0
Final Project			0
Seminar			0
Assignments			0
Presentation			0
Midterms		20	20
Project			0
Laboratory			0
Tutorial	14	1	14
Other(Self study, Paper reviews)		65	65
		Total work load	175
		Total work load/25	7

	ECTS Credit	7

COURSE ASSESMENT AND ECTS WORK LOAD

PO	Program Outcomes	CO
1	**1.1.** Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation);	1,3,4
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	2,5
2	**2.1.** Ability to identify, formulate, and solve complex engineering problems;	2,5
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	2,5
3	**3.1.** Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements;	5
	3.2. ability to apply modern design methods.	
4	**4.1.** Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice;	
	4.2. ability to employ information technologies effectively.	
5	**5.1.** Ability to design experiments,	
	5.2. ability to conduct experiments, gather, analyze and interpret data.	
6	**6.1.** Ability to work in intra-disciplinary teams;	
	6.2. ability to work in multi-disciplinary teams;	
	6.3. ability to take individual responsibilities.	
7	**7.1.** Ability to effectively communicate via written and oral means;	
	7.2. knowledge of at least one foreign language;	
	7.3. ability to write effective reports and comprehend written reports;	
	7.4. ability to write design and manufacturing reports	
	7.5. ability to present effectively,	

	7.6. ability to give and follow clear instructions.	
8	**8.1.** Recognition of the need for lifelong learning;	
	8.2. ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	**9.1.** Consciousness to behave according to ethical principles, and about professional and ethical responsibility;	
	9.2. knowledge on standards used in engineering practice.	
10	**10.1.** Knowledge about business life practices such as project management, risk management, and change management;	
	10.2. awareness in entrepreneurship, innovation;	
	10.3. knowledge about sustainable development.	
11	**11.1.** Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering;	
	11.2. awareness of the legal consequences of engineering solutions.	

Revison Date	Prepared by	Approved by
1.9.2019 1.6.2021	Prof.Dr. Ümit Güz	Prof.Dr. Ahmet Aksen