COURSE DESCRIPTION FORM	
Course Code and Name	CENG365 SIGNALS AND SYSTEMS (TECH.ELECT.)
Course Semester	5
Catalogue Data of the Course (*Course Content*)	Introduction to analog and digital signal processing, a topic that forms an integral part of engineering systems in many diverse areas, including seismic data processing, communications, speech processing, image processing, defense electronics, consumer electronics, and consumer products.
Course Textbooks	Signals and Systems (2nd Edition) by Alan V. Oppenheim (Author), Alan S. Willsky (Author), with S. Hamid (Author), Pearson, 1996
Supplementary Textbooks	Schaum's Outline of Signals and Systems, 3rd Edition (Schaum's Outlines), McGraw-Hill Education, 2013 Computer Organization and Design MIPS Edition: The Hardware/Software Interface 5th Edition by David A. Patterson (Author), John L. Hennessy (Author),Morgan Kaufmann, 2013
Credit (*ECTS*)	6
Prerequisites for the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course
Course Type	Elective
Language of Instruction	English
Course Objectives	Presents and integrates the basic concepts for both continuous-time and discrete-time signals and systems.
Course Learning Outcomes	1. Analog and digital signal processing 2. General information about modern communication and measurements 3. Basic concepts for continuous and discrete-time signals 4. Applications for current and future robots 5. Fourier transforms related to time and frequency
Instruction Method *(Face-to-face, Distance education etc.)*	The mode of delivery of this course is Face to face.
Weekly Schedule of the Course	1. INTRODUCTION: Definitions of signals and systems, classification, importance in engineering, applications examples. 2. BASIC CONCEPTS: Transformations, basic continuous and discrete-time signals 3. BASIC CONCEPTS: Continuous and discrete-time systems and properties 4. LTI SYSTEMS: Modeling, impulse response and concepts of convolution. 5. CONVOLUTION: Determination of systems responses by convolution summation or integral. 6. DIFFERENTIAL EQUATIONS: Classical or transform techniques for the analysis of continuous time LTI systems defined by differential equations. 7. DIFFERENCE EQUATIONS: Modeling of discrete-time LTI systems by difference equations and analysis techniques 8. FOURIER SERIES: Importance of Fourier series expansions and its use in system analysis. 9. FOURIER TRANSFORM: Application of Fourier transform technique in system analysis. 10.FOURIER TRANSFORM: Application of Fourier transform technique in system analysis. 11.FREQUENCY DOMAIN: Analysis of LTI systems in the frequency domain, modulation, sampling. 12. Z TRANSFORM: Introduction to the method of Z transform in the analysis and synthesis of discrete-time systems 13. TRANSFER FUNCTION: Representation of systems by transfer functions and their properties. 14. TRANSFER FUNCTION: Representation of systems by transfer functions and their properties.
Teaching Activities	Weekly theoretical course hours: 3

(The time spent for the activities listed here will determine the amount of credit required)	Reading activities Internet search and library work Designing and implementing materials Midterm and revision for midterm Final exam and revision for final exam

Assessment Criteria

	Number(s)	Weight (%)
Midterm exam	1	30
Assignment	0	0
Application	0	0
Project	1	30
Practice	0	0
Quiz	0	0
Final exam	1	40
Total	3	100

Workload of the Course

Activity	Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload
Weekly theoretical course hours	14	3	42
Weekly practical course hours	0	0	0
Reading activities	8	4	32
Internet search and library work	9	4	36
Designing and implementing materials	12	1	12
Making a report			
Preparing and making presentations			
Midterm and revision for midterm	1	13	13
Final exam and revision for final exam	1	15	15
Total workload			150
Total workload/ 25			6
Course Credit (ECTS)			6

Contribution Level between Course Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.					X
2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.					X
3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.			X		
4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.				X	
5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing				X	

	experiments, conducting experiments, collecting data, analyzing and interpreting results.						
6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.						X
7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.						
8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).						
9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).						
10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.						
11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.						

Lecturer(s) and Contact Information	Lecturer Dr. Muhammet ÜNAL muhunal@gazi.edu.tr