



**ESOGU ELECTRICAL-ELECTRONICS ENGINEERING DEPARTMENT
COURSE INFORMATION FORM**

Course Title	Course Code
DSP SYSTEM DESIGN	151228544

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
8	3	2	7

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	X			

Language of Instruction	Course Level	Course Type
English	Undergraduate	Technical Elective

Prerequisite	Introduction to Microcomputers, Signals and Systems, Computer Programming
Objectives of the Course	The aim of the course is to teach DSP hardware, the use of the integrated development environment (IDE), and the implementation of algorithms in the DSP.
Brief Course Content	Real-time DSP processing, DSP processors, program development tool and DSK, input and outputs, interrupts, analog to digital converter, multichannel serial port, numerical representations, DSP fundamentals, FIR filters, circular buffers, IIR filters, fast Fourier transform, IQ math library.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Students will learn DSP hardware and software.	1.c	1,3	A,B
2 Students will know fixed- and floating point number representations, and overflow handling.	1.c	1	A,B
3 Students learn how to implement an algorithm in fixed-point format	1.c	1,3	A,B
4 Students will learn some important DSP peripherals (digital I/O, ADC, timer, interrupt, PWM) and use them in basic applications.	4.a	1,3	A,B
5 Students learns how to implement DSP algorithm in a DSK platform	4.a	3	I
6 The student will learn to work in a team to complete a project assignment, prepare reports, and make presentations.	6.b, 7.c, 7.d	12,14,15	E,G,J
7			

*Teaching Methods 1:Lecture, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Assessment Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	Dale Grover, John Deller, Digital signal processing and the microcontroller, Grover, Prentice Hall, 2015.
Supplementary Resources	1. Rulph Chassaing, Digital Signal Processing and Applications with C6713 and C6416 DSK, John Willey and Sons, Inc., 2005 2. Steven A. Tretter, "Communication system design using DSP algorithms: with laboratory experiments for the TMS320C6700", Kluwer Academic Publishers, March 2003.
Necessary Course Material	-

Course Weekly Schedule	
1	Introduction to real-time DSP processing

2	Architecture of DSP processors
3	Program development tools and DSK
4	Digital Input and Outputs
5	Interrupts and Timers
6	Pulse width modulator (PWM)
7	Analog digital converter (ADC)
8	Mid-Term Exams
9	Multichannel buffered serial port (McBSP)
10	Numerical representations and arithmetic
11	DSP fundamentals
12	Circular buffers and FIR filter design
13	IIR filter design
14	Fast Fourier transform (FFT)
15	IQ math library
16,17	Final Exams

Calculation of Course Workload			
Activities	Count	Time (Hour)	Total Workload (Hour)
Weekly classroom time	14	3	42
Weekly study time (review, reinforcing, preparation)	14	3	42
Homework			
Taking a quiz	3	1	3
Studying for a quiz	3	4	12
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)			
Project (Preparation and presentation time included)	1	31	32
Presentation (Preparation time included)			
	8	2	16
	8	2	16
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	12	12
Final Exam	1	2	2
Studying for Final Exam	1	16	16
Toplam iş yükü			195
Toplam iş yükü / 30			6,5
Dersin AKTS Kredisi			7

Assessment	
Activity Type	%
Mid-term	15
Quiz	15
Experimental Skill	30
Project	10
Final Exam	30
Total	100

COURSE CONTRIBUTION TO THE PROGRAM OUTCOMES

(5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)

NO	PROGRAM OUTCOMES	Contribution
1	a. Sufficient knowledge of mathematics	
	b. Sufficient knowledge of basic sciences	
	c. Sufficient basic engineering and Electrical-Electronics engineering knowledge	
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	
2	Skill of defining, identifying, formulating and solving the complicated problems in Electrical-Electronics engineering and related areas by applying appropriate analysis and modelling methods.	4
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	4
4	To analyze and solve the complicated engineering problems:	4
	a. skill of developing, selecting and applying the required techniques and devices	4
5	b. skill of using information technologies effectively	4
	To study the complicated on the complicated Electrical-Electronics engineering problems and research subjects:	
6	a. skill of experimental design	
	b. skill of performing the experiments, collecting the data and analyzing and interpreting the results	
7	a. Skill of performing individual studies	
	b. Skill of performing intra and interdisciplinary and multidisciplinary teamwork and studies	3
	c. Skill of effective oral and written communication in Turkish and English	
	d. Skill of improving and using foreign language knowledge	
8	c. Skill of effective reporting, understanding the reports and preparing the design and production reports	3
	d. Skill of effective presentation and giving and getting clear and understandable instructions.	4
9	Awareness of the necessity of life-long learning and skill of accessing to information and following the improvements in contemporary science and technology	
10	a. Awareness of necessity of behaving in accordance with the ethical principles and awareness of the importance of having professional ethical responsibilities	
	b. Knowledge about legal regulations and standards of engineering	
11	a. Knowledge about project management, risk management and change management	
	b. Awareness of the significance of entrepreneurship and innovation	
	c. Knowledge about sustainable development	
12	Knowledge about the effects of engineering applications and practices on the global and social health, ecology and safety, knowledge about the current problems in relation to the working areas of Electrical-Electronics engineering; and awareness of the legal issues resulting from engineering solutions	
12	Knowledge about modern problems in local and universal scale	

INSTRUCTORS

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Date:12/07/2024