



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

Course Title	Course Code
COMMUNICATIONS	151226356

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
6	3	0	6

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
	6			

Language of Instruction	Course Level	Course Type
English	Undergraduate	Required

Prerequisite	151224299 SIGNALS AND SYSTEMS
Objectives of the Course	Learn the coding/modulation/demodulation techniques in electronic communications
Brief Course Content	Starting with basic information theory/source coding and reminders on Fourier/ spectrum/ linearity/ random-processes, simple analog modulation/demodulation techniques like AM/FM/PM are evaluated. Digital baseband transmitter/receiver structures along with the effects of noise in the communication are followed by digital passband techniques like M-ary ASK/FSK/PSK/QAM. After discussions on spread spectrum techniques including OFDM, course is concluded by channel coding

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Learning what information and data are	1	1,2	A
2 Learning how data is handled/formatted/transmitted over the communication channels	1,2	1,2	A
3 Awareness of differences in electronic communication channels	1,2,9,4	1,2	A
4			
5			
6			
7			
8			

*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	E. Seke, Sayısal Haberleşmeye Giriş, Seçkin Yayıncılık, 2015
Supplementary Resources	1) B. Sklar, Digital Communications, Fundamentals and Applications, Prentice Hall, 2000 2) J. G. Proakis, M. Salehi, Communication Systems Engineering, Prentice Hall, 2002
Necessary Course Material	

Course Weekly Schedule	
1	Introduction to Information, source coding and representation
2	Signals, Fourier series/transform, spectrum, power and energy
3	Noise, linearity, convolution, correlation
4	Analog modulation, AM, FM, PM
5	Analog modulation, AM, FM, PM, stereo, basic radio receiver
6	Digital baseband communication, receiver considerations
7	Effects of noise, ML/MAP decision criteria.
8	Mid-Term Exams
9	Sampling/quantization, spectrum of sampled signal, frequency-up/down-conversions
10	Digital modulation, ASK, FSK, PSK, QAM and their spectrums
11	Effects of noise in passband communication
12	Spread spectrum, Multiple access
13	OFDM
14	IEEE-802.11 standard
15	Channel coding
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	4	56
Homework	14	3	42
Taking a quiz			
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	16	16
Final Exam	1	2	2
Studying for Final Exam	1	20	20
		Total workload	180
		Total workload / 30	6.0
		Course ECTS Credit	6

Assessment	
Activity Type	%
Mid-term	40
Quiz	
Homework	
Final Exam	60
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	1
	b. Sufficient knowledge of basic sciences	1
	c. Sufficient basic engineering and Electrical-Electronics engineering knowledge	5
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	2
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.	3
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	1
4	To analyze and solve the complicated engineering problems:	1
	a. skill of developing, selecting and applying the required techniques and devices	1
5	b. skill of using information technologies effectively	1
	To study the complicated Electrical-Electronics engineering problems and research subjects:	1
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	
	c. Skill of effective oral and writing communication in Turkish	
	d. Skill of improving and using foreign language knowledge	
8	a. Skill of effective reporting, understanding the reports and preparing the design and production reports	
	b. Skill of effective presentation and giving and getting clear and understandable instructions.	
	c. Skill of accessing to information and following the improvements in contemporary science and technology	1
	d. Awareness of the necessity of life-long learning and skill of accessing to information and following the improvements in contemporary science and technology	1
9	a. Awareness of necessity of behaving in accordance with the ethical principles and awareness of the importance of having professional ethical responsibilities	1
	b. Knowledge about legal regulations and standards of engineering	2
10	a. Knowledge about project management, risk management and change management	
	b. Awareness of the significance of entrepreneurship and innovation	
	c. Knowledge about sustainable development	
11	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	1
12	Knowledge about modern problems in local and universal scale	

INSTRUCTORS

Prepared by	Erol Seke			
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Date:06.07.2024