General information	**Title and code of subject, number of credits**	EENG245 Signals and Systems 3 credits/6 ECTS	
	Department	Physics and electronics	
	Program	Master	
	Academic semester	2022 spring	
	Lecturer	Assosiate Prof Guliyev Mazahim	
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	Phone number:	+994 55567 70 74	
	Lecture room/Schedule	11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), room	
	Consultations	Saturday 13:00 – 14:00	
Course language	English		
Type of the subject	Major		
Textbooks and additional materials	***Textbooks*:** 1. A. V. Oppenheim, A. S. Willsky with S. Hamid Nawab; *Signals and Systems*, Prentice Hall,1997 (2nd edition). 2. Mohammed Ferdjallah: Introduction to Digital Systems, 2011 3. John Wakerly: Digital design, Principles and practices, 2000 4. J.H. McClellan, R.W. Schafer, MMA. Yoder, "Signal Processing First", 2nd Edition, Pearson/Prentice Hall, 2003		
Teaching methods	**Lecture**		15
	Group discussions at seminars		15
Assessment	**Components**	**Date/ Deadline**	**Percent (%)**
	Active participation	At each lesson	5
	Quizzes	During the semester	20
	Attendance		5
	Midterm exam		30
	Final exam		40
	Final		**100**
Course description	The purpose of this course is to teach undergraund students the features of signals and systems. The Students must know the Continuous-time and discrete-time signals and systems, Linear time-invariant systems: impulse response, convolution, Fourier series, Continuous-time Fourier transform, Discrete-time Fourier transform, Sampling theory, and z-transform.		
Course objectives	This course aims to introduce the fundamentals of the signals, linear time invariant systems, and Fourier transform of the signals.		
Learning outcomes (LO)	Having successfully completed this course, students will be able to: LO-1: Define continuous-time and discrete-time signals and systems. LO-2: Identify linear time-invariant systems. LO-3: Calculate impulse response and convolution. LO-4: Calculate Fourier series coefficients. LO-5: Define and calculate continuous-time Fourier transform. LO-6: Define and calculate discrete-time Fourier transform. LO-7: Express sampling theory. LO-8: Calculate z-transform		
Rules (Educational policy and behavior)	Lesson organization General information on the subject will be provided for the students during lectures. Student's knowledge on the previous topics will be evaluated and new topic will be explained by mins of visual aids during seminars. Student's knowledge level will be tested oraly and in written forms before midterm and final exams. Submission of the individual works by the end of course is obligatory. Attendance Participation of students at all classis is important. Students should inform dean's office about missing lessons for particular reasons (illness, family issues and etc.). Students, missing more than 25% of lessons, are not allowed to take the exam. Lates		

	Those students who are late for lessons for more than 15 minutes are not allowed to participate at the lesson. Despite this, the student is allowed to take part in the second part of the lesson. Quizzes Those students who have informed the teacher and the dean's office about missing the quiz in advance for particular reasons, are allowed to take the quiz next week. Exams All the issues related to the participation and admission to the exam are regulated by the faculty dean. Topics of midterm and final exams are provided for the students before the exams. The questions of midterm exam are not repeated in the final exam. Violation of the rules of the exams Disrupting the quiz and taking copy during midterm and final exams is forbidden. Quiz papers of the student who do not follow these rules are canceled and the students are expelled from the quiz by getting 0 (zero). The rule for completing the course In accordance with the University rules the overall success rate to complete the course should be 60% or above. The students who failed the exam would be to take this subject next semester or next year. Rules of conduct for Students Disruption of the lesson and not following ethical norms during the lesson, as well as conduction of the discussions by the students without permission and using mobile phones is forbidden.

This program reflects the comprehensive information about the subject and information about any changes will be provided in advance.

Week	Dates (planned)	Subject topics	Textbook/ Assignments
1		*Classification of Signals and Systems:* Standard signals.Step, Ramp, Pulse. Impulse. Real and Complex exponentials and Sinusoids	[2] p. 2-16
2		*Classification of Signals and Systems:* Classification of Signals- Continuous Time (CT) and Doscrete Time(DT) signals, Periodic and Aperiodic signals .	[1] p. 4-20 [1] p.30-52 [1] p. 24-28 [1] p. 67-81
3		*Classification of Signals and Systems:* Deterministic and Random signals. Energy and Power signals	[2] p. 31-57 [2] p. 76-85
4		*Classification of Systems:* CT systems and DT systems. Linear and non- Linear Time variant and Time-invariant. Causal and Non-causal . Stable and Unstable	[2] p. 113-146 [2] p. 153-155
5		*Analysis of Continuous Signals:* Fourier series for periodic signals. Fourier Transform.	[1] p. 216-240 [3] p. 124-148
		Quiz 1(Lec1-Lec4)	[1] p. 242-251
6		***Public holiday***	
7		*Analysis of Continuous Signals:* Properties. Laplace Transforms and properties	[2] p. 173-198 [2] p. 201-208 [2] p. 201-208
8		*Linear Time Invariant Continuous Time Systems:* Impulse response Convolution Integrals Differential equations ***Quiz 2(Lec5-Lec6)***	[2] p. 271-300 [2] p. 310-314
9		***Mid term exam***	

10		*Linear Time Invariant Continuous Time Systems:* Fourier and Laplace transforms in Analysis of CT systems Systems connected in series	[2] p. 384-422 [2] p. 425-427
11		*Analysis of discrete time signals* Baseband Signal Sampling Fourier Transform of discrete time signals (DTFT)	[2] p. 565-588 [2] p. 596-600
12		*Analysis of discrete time signals* Proporties of DTFT Z Transform and properties ***Quiz 3(Lec9-Lec10)***	[2] p. 602-635 [2] p. 667-693 [2] p. 636-638 [2] p. 694-698
13		*Linear Time Invariant- Discrete Time Systems* Impulse response- Difference equations Convolution Sum Discrete Fourier Transform	[2] p. 764-788 [2] p. 801-805
14		*Linear Time Invariant- Discrete Time Systems* Z transform analysis of Recursive and Non-recursive systems DT system connected in series and parallel	[2] p. 807-825 [2] p. 845-850
15		***Recap of all covered material*** ***Quiz 4(Lec11-Lec13)***	
		Final Exam