General information	**Title and code of subject, number of credits**	ETR 487 - Electrical Communication Theory- 6 ECTS credit	
	Department	Physics and Electronics	
	Program	Bachelor	
	Academic semester	2023 spring	
	Lecturer	PhD, Assosiate Professor Shahmardan Amirov	
	E-mail:	phys_med@mail.ru	
	Phone number:		
	Lecture room/Schedule	11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), room Lectures:	
	Consultations		
Course language	English		
Prerequisites	ETR 346 – Telecommunication Networks		
Type of the subject	Major		
Textbooks and additional materials	***Textbooks*:** [1]. *Fundamentals of Electrical Engineering*, by Don H. Johnson, Rice University, Houston, Texas, 2013. [2]. *Communication Systems*, Simon Haykin, 4th Ed. Wiley, 2001, ISBN 0-471-17869-1 ***Additional materials:*** *Introduction to Digital Communication*, by Rodger E. Zeimer and Roger L. Peterson, Second Edition, Prentice Hall, 2001.		
Teaching methods	**Lecture**		x
	Group discussions		X
Assessment	**Components**	**Date/ Deadline**	**Percent (%)**
	Presentation	At the end of the semester	10
	Activity	At each lesson	5
	Quizzes	3 quizzes during the semester	10
	Attendance	At each lesson	5
	Midterm exam		30
	Final exam		40
	Final		**100**
Course description	Communication system, signals, analog and digital communications, noise of DSB, SSB, FM, AM, entropy, block codes, cyclic codes, detection of signals, the prediction and filtering of random processes, the design and analysis of communication systems, the analysis of protocols for communication networks, and statistical processing of images.		
Course objectives	During electrical communication theory students will study the fundamental theory of communication system. Also, they will analyze the structure of common communication system and can build the model of that system, will study both theoretical and practical aspects of information processing. At the end of the course the students understand how build the communication system, and why digital communication has wide used in modern life. They will be able to construct the mathematical model and block diagrams of communication system, to analyze the input and output signals which have important roles for information communication.		
Learning outcomes	What students should know by the end of the course: Describe a suitable model for noise in communications, determine the signal-to-noise ratio (SNR) performance of analog communications systems, determine the probability of error for digital communications systems, understand information theory and its significance in determining system performance, compare the performance of various communications systems.		
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.

Tests

Those students who have informed the teacher and the dean's office about missing the test in advance for particular reasons, are allowed to take the test 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 test and taking copy during midterm and final exams is forbidden. Test papers of the student who do not follow these rules are canceled and the students are expelled from the test 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.

Quizzes

- Quizzes will be held 3 times during the semester The quizzes will be announced in the classroom two weeks before. Quiz is from homework problems.

  The homework problems will be selected from questions and problems in the end.
  of each chapter. The No. of homework problems will be announced after finishing each chapter.

- **Presentation**

  The presentation will be held once at the end semester and will be evaluated with 5 points. The topic is chosen by the teacher and covers the topics covered in the lesson.

- **Attendance**

Students who attend the whole classes will get 5 marks. for two absence student loses 1 mark.

- **Activity**

Students who will be active during discussion of past lessons will be awarded with one activity mark.

Tentative Schedule

Week	Dates (planned)	Subject topics	Textbook/ Assignments
1	***16.02*** ***11.02***	***Lecture №1.*** Introduction to signals and communication, structure of communication systems, fundamental signal. ***Seminar №1.*** *Discussing.*	[1] Pages/ 1-7/
2	***16.02*** ***18.02***	**Lecture *№2.*** Signals and systems ***Seminar №2****Free discussing of communication*	[1] Pages /11-23/
3	***22.02*** ***25.02***	***Lecture №3.*** Communication channels, types of communication channels ***Seminar №3*** *Test for the activity point*	[2] pages /15-19/, [1] pages /196/
4	***02.03*** ***04.03***	***Lecture №4*** Modulation process ***Seminar №4*** *Quizzes 1.*	[2] pages /19-21/
5	***09.03*** ***11.03***	***Lecture №5.*** Analog and digital types of communication ***Seminar №5*** *Discussing*	[2] pages /21-23/

6	***16.03*** ***18.03***	***Lecture №6.*** Noise, noise performance of DSB ***Seminar №6*** *Preparation to midterm exam*	[1] pages /204- 205/, [2] pages /58/
7	***25.03*** ***30.03***	***Lecture №7.*** Noise performance of SSB and AM ***Seminar №7*** *Quizzes 2*	[2] pages /135/
8	***06.04*** ***08.04***	***Lecture №8.*** Noise performance of FM ***Seminar №8 Midterm exam***	[2] pages /142/
9	***13.04*** ***15.04***	***Lecture №9.*** Digital communication problem ***Seminar №9*** *Practical testing for the activity point by multimedia*	[2] pages /24-26/, [1] pages /209/
10	***20.04*** ***22.04***	***Lecture №10.*** Entropy and source coding ***Seminar №10*** *Quizzes 3*	[1] pages /218-220/
11	***27.04*** ***29.04***	***Lecture №11.*** Channel capacity, Shannon's information capacity theorem ***Seminar №11*** *Presentation of student project*	[2] pages /23-34/
12	***04.05*** ***06.05***	***Lecture №12.*** Block codes ***Seminar №12*** *Presentation of student project*	[2] pages /632/
13	***11.05*** ***13.05***	***Lecture №13*** Communication networks ***Seminar №13*** *Presentation of student project*	[1] pages /234-236/
14	***18.05*** ***20.05***	***Lecture №14*** Ethernet, communication protocols ***Seminar №14*** *Test for practical application by using multimedia*	[1] pages /237-240/
15	***25.05*** ***27.05***	***Lecture №15 Discussing final exam material*** ***Seminar №15 Preparing for final exam***	
		Final Exam