

## SYLLABUS

|  |   |  |                    |
|--|---|--|--------------------|
| <b>General information</b>                     | <b>Title and code of subject, number of credits</b>   | ETR 346: Telecommunication Networks (6 ECTS)                     |                    |
|  | <b>Department</b>   | Physics and Electronics  |                    |
|  | <b>Program</b>  | Bachelor   |                    |
|  | <b>Academic semester</b>  | 2019 fall  |                    |
|  | <b>Lecturer</b>   | Behnam Kiani   |                    |
|  | <b>E-mail:</b>  | bkiani@khazar.org  |                    |
|  | <b>Phone number:</b>  | (+994 12) 421-10-93  |                    |
|  | <b>Lecture room/Schedule</b>  | 11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftechilar campus), |                    |
|  | <b>Consultations</b>  | Monday 10:00-11:00   |                    |
| <b>Course language</b>                         | English   |  |                    |
| <b>Prerequisites</b>                           | MATH 101  |  |                    |
| <b>Type of the subject</b>                     | Major   |  |                    |
| <b>Textbooks and additional materials</b>      | <p><i>Textbooks:</i></p> <ol style="list-style-type: none"> <li>1. Telecom 101. by Eric Coll, 2016</li> <li>2. Telecommunication Networks by Iannone, Eugenio, 2011</li> <li>3. Computer Networks: A Systems Approach, Larry L. Peterson, Bruce S. Davie, 2011</li> </ol>   |  |                    |
| <b>Teaching methods</b>                        | <b>Lecture</b>  | +  |                    |
|  | <b>Group discussions at seminars</b>  | +  |                    |
| <b>Assessment</b>                              | <b>Components</b>   | <b>Date/ Deadline</b>  | <b>Percent (%)</b> |
|  | <b>Assignment and quizzes</b>   | During the semester, 4quiz X<br>2.5 points for each              | 10                 |
|  | <b>Active participation</b>   | At each lesson   | 5                  |
|  | <b>Individual research papers and presentations</b>   | At the end of the semester                                       | 10                 |
|  | <b>Attendance</b>   | At each lesson   | 5                  |
|  | <b>Midterm exam</b>   |  | 30                 |
|  | <b>Final exam</b>   |  | 40                 |
|  | <b>Final</b>  |  | <b>100</b>         |
| <b>Course description</b>                      | <p>This course introduces fundamental concepts of telecommunication networks. Telecommunication Network is most important for infrastructures. This course provides a comprehensive treatment of telecommunication networks engineering and discusses the technological applications. It demonstrates how system components interact and details the relationship between the system and its environment, to discuss the systems aspects such as techniques enabling equipment. Topics in the course include: OSI layers, packet switch, frame relay, internet protocols, local area networks, digital networks, world area networks, telephone networks and signaling systems.</p>   |  |                    |
| <b>Course objectives</b>                       | <p>Understand general concepts and technology of communication network, to develop and understanding of theory and practice of telecommunication, the course will be taught in the internet perspective, understand network protocols, architectures and applications.</p>  |  |                    |
| <b>Learning outcomes</b>                       | <p>What students should know by the end of the course:</p> <ol style="list-style-type: none"> <li>1. Independently understand basic Telecommunication Network technology.</li> <li>2. Identify the difference types of network topologies and protocols.</li> <li>3. List the layers of OSI model and TCP/IP</li> <li>4. Identify the different types of network devices and their functions within a network.</li> </ol>   |  |                    |
| <b>Rules (Educational policy and behavior)</b> | <p>Lesson organization<br/>           General information on the subject will be provided for the students during lectures.<br/>           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 orally and in written forms before midterm and final exams. Submission of the individual works by the end of course is obligatory.<br/>           Attendance<br/>           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.<br/>           Tests<br/>           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.<br/>           Exams<br/>           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.<br/>           Violation of the rules of the exams</p> |  |                    |

|  |  |
|--|--|
|  | <p>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).</p> <p>The rule for completing the course</p> <p>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.</p> <p>Rules of conduct for Students</p> <p>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.</p> |
|--|--|

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

| <b>Week</b> | <b>Dates (planned)</b> | <b>Subject topics</b>   | <b>Textbook/ Assignments</b>    |
|-------------|------------------------|---|---------------------------------|
| <b>1</b>    | 16.09.2019             | <b><i>Introduction to Telecommunication Networks</i></b>  | Telecom 101. by Eric Coll, 2016 |
|             | 19.09.2019             | <b><i>Introduction to Telecommunication Networks</i></b>  |                                 |
| <b>2</b>    | 23.09.2019             | <b><i>Telephone Networks</i></b><br><br><b><i>a) Network hierarchy</i></b><br><b><i>b) Signalling systems</i></b>   | Telecom 101. by Eric Coll, 2016 |
|             | 26.09.2019             | <b><i>Telephone Networks</i></b><br><br><b><i>a) Network hierarchy</i></b><br><b><i>b) Signalling systems</i></b>   |                                 |
| <b>3</b>    | 30.09.2019             | <b><i>Telephone Networks</i></b><br><br><b><i>a) Network hierarchy (Review)</i></b><br><b><i>b) Signalling systems (Review)</i></b><br><b><i>c) Switching systems</i></b> | Telecom 101. by Eric Coll, 2016 |
|             | 03.10.2019             | <b><i>Telephone Networks</i></b><br><br><b><i>a) Network hierarchy (Review)</i></b><br><b><i>b) Signalling systems (Review)</i></b><br><b><i>c) Switching systems</i></b> |                                 |
| <b>4</b>    | 07.10.2019             | <b><i>Quiz 1</i></b>  |                                 |
| <b>5</b>    | 10.10.2019             | <b><i>OSI Layers</i></b><br><br><b><i>a) Physical layer</i></b><br><b><i>b) Data Link layer</i></b><br><b><i>c) Network layer</i></b>                                     | Telecom 101. by Eric Coll, 2016 |
|             | 14.10.2019             | <b><i>OSI Layers</i></b><br><br><b><i>a) Physical layer</i></b><br><b><i>b) Data Link layer</i></b><br><b><i>c) Network layer</i></b>                                     |                                 |

|           |            |  |                                       |
|-----------|------------|--|---------------------------------------|
| <b>6</b>  | 17.10.2019 | <b>OSI Layers</b><br><i>d)Transport layer</i><br><i>e) Session layer</i><br><i>f) Presentation layer</i><br><i>g)Application layer</i> | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 21.10.2019 | <b>OSI Layers</b><br><i>d)Transport layer</i><br><i>e) Session layer</i><br><i>f) Presentation layer</i><br><i>g)Application layer</i> |                                       |
|           |            | <i>Midterm</i>   |                                       |
| <b>7</b>  | 24.10.2019 | <b>Local Area Networks</b><br><i>a) ALOHA</i><br><i>b) Ethernet</i><br><i>c)Token ring</i><br><i>d)FDDI</i>                            | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 28.10.2019 | <b>Local Area Networks</b><br><i>a) ALOHA</i><br><i>b) Ethernet</i><br><i>c)Token ring</i><br><i>d)FDDI</i>                            |                                       |
| <b>8</b>  | 31.10.2019 | <b>Local Area Networks</b><br><i>c)Token ring</i><br><i>d)FDDI</i>   | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 04.11.2019 | <b>Local Area Networks</b><br><i>c)Token ring</i><br><i>d)FDDI</i>   |                                       |
| <b>9</b>  | 07.11.2019 | <b>Internet &amp; Routing</b><br><i>a)TCP/IP</i>   | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 11.11.2019 | <b>Internet &amp; Routing</b><br><i>a)TCP/IP</i>   |                                       |
| <b>10</b> | 14.11.2019 | <b>Internet &amp; Routing</b><br><i>b)routing protocols</i>  |                                       |
|           | 18.11.2019 | <b>Internet &amp; Routing</b><br><i>b)routing protocols</i>  |                                       |

|           |            |   |                                       |
|-----------|------------|---|---------------------------------------|
|           | 21.11.2019 | <i>Quiz2</i>                              |                                       |
| <b>11</b> | 25.11.2019 | <i>Integrated Networks</i><br><i>ISDN</i> | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 28.11.2019 | <i>Integrated Networks</i><br><i>ISDN</i> |                                       |
| <b>12</b> | 02.12.2019 | Integrated Networks<br>ATM                | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 05.12.2019 | <i>Integrated Networks</i><br><i>ATM</i>  |                                       |
| <b>13</b> | 09.12.2019 | <i>Performance evaluation techniques</i>  | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 12.12.2019 | <i>Performance evaluation techniques</i>  |                                       |
| <b>14</b> | 16.12.2019 | <i>Simulation</i>                         | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 19.12.2019 | <i>Simulation</i>                         |                                       |
| <b>15</b> | 23.12.2019 | <i>Elementary Queueing theory concept</i> | Telecom 101.<br>by Eric Coll,<br>2016 |
|           | 26.12.2019 | <i>Elementary Queueing theory concept</i> |                                       |
|           |            | <i>Final Exam</i>                         |                                       |