

## SYLLABUS

<b>General information</b>	<b>Title and code of subject, number of credits</b>	EENG 250 Electrical Engineering – 6 ECTS credits	
	<b>Department</b>	Department of Physics and Electronics	
	<b>Program</b>	Bachelor	
	<b>Academic semester</b>	2019 fall	
	<b>Lecturer</b>	Master of Science (Electronics Engineering) Sabuhi Ganiyev	
	<b>E-mail:</b>	<a href="mailto:s.ganiyev@gmail.com">s.ganiyev@gmail.com</a>	
	<b>Phone number:</b>	+99477 520 73 50	
	<b>Lecture room/Schedule</b>	11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), room	
	<b>Consultations</b>	Saturday 09:00 – 10:00	
<b>Prerequisites</b>	MATH 101		
<b>Course language</b>	English		
<b>Type of the subject</b>	Major		
<b>Textbooks and additional materials</b>	<p><b>Textbooks:</b></p> <ol style="list-style-type: none"> <li>1. Electrical engineering concepts and applications, S. A. Reza Zekavat, 2013.</li> <li>2. Electronic devices: electron flow version, Thomas L. Floyd, 9th Edition, 2012.</li> <li>3. Fundamentals of electric circuits, Charles K. Alexander, Matthew N. O. Sadiku, 5th Edition, 2013</li> </ol> <p>Optional Reference Texts:</p> <ol style="list-style-type: none"> <li>4. Electrical Engineering: Principles and Applications, Allan R. Hambley, 5th Edition, 2011</li> </ol> <p>Additional Resource Texts:</p> <ol style="list-style-type: none"> <li>5. Principles and Applications of Electrical Engineering, Giorgio Rizzoni, 5th Edition, 2014</li> </ol> <p><b>Auxiliary Web sources:</b></p> <p><a href="https://www.youtube.com/watch?v=ZRLXDiiUv8Q&amp;list=PLSQI0a2vh4HCLqA-rhMi_Z_WnBkD3wUka">https://www.youtube.com/watch?v=ZRLXDiiUv8Q&amp;list=PLSQI0a2vh4HCLqA-rhMi_Z_WnBkD3wUka</a></p> <p><a href="https://www.youtube.com/watch?v=VfXGWWyJPmQ">https://www.youtube.com/watch?v=VfXGWWyJPmQ</a></p> <p><a href="https://www.youtube.com/watch?v=iOSbNTYrc1s">https://www.youtube.com/watch?v=iOSbNTYrc1s</a></p> <p><a href="https://www.youtube.com/watch?v=P54hVuje4Dg">https://www.youtube.com/watch?v=P54hVuje4Dg</a></p> <p><a href="https://www.youtube.com/watch?v=58PzPrjGsG8">https://www.youtube.com/watch?v=58PzPrjGsG8</a></p> <p><a href="https://www.youtube.com/watch?v=paDs-Hnmklo">https://www.youtube.com/watch?v=paDs-Hnmklo</a></p> <p><a href="https://www.youtube.com/watch?v=Rgl4OAm9tnU">https://www.youtube.com/watch?v=Rgl4OAm9tnU</a></p>		
<b>Teaching methods</b>	<b>Lecture</b>		15
	<b>Group discussions at seminars</b>		15
<b>Assessment</b>	<b>Components</b>	<b>Date/ Deadline</b>	<b>Percent (%)</b>
	<b>Active participation</b>	At each lesson	5
	<b>Quizzes</b>	During the semester	20
	<b>Attendance</b>		5
	<b>Midterm exam</b>		30
	<b>Final exam</b>		40
	<b>Final</b>		<b>100</b>
<b>Course description</b>	<p>The purpose of this course is to teach underground students the fundamentals of electrical engineering. This course mainly covers topics that are related to direct current circuits. Generally, the course consists of the following sections. The first section covers basic concepts and basic laws of electric circuits. The second section analyzes operation principles of filters. The third part studies electronic components such as diodes, capacitors, inductors, transistors, operational amplifiers and their application. The last sections talk about magnetically coupled circuits, electric machines and logic circuits. Moreover, along with this course students will be introduced to Multisim schematic capture and simulation software that make it easier to design and analyze electrical circuits.</p>		
<b>Course</b>	The main objectives of this course is to introduce the main concepts of electrical engineering, and to		

<b>objectives</b>	teach fundamentals of electronic circuit design.
<b>Learning outcomes</b>	<p>What students should know by the end of the course:</p> <ul style="list-style-type: none"> <li>• Basic concepts of electric circuits.</li> <li>• Basic laws of electric circuits.</li> <li>• Fundamentals of electronic circuit design.</li> <li>• Operation principles of resistors, diodes, capacitors, inductors, transistors, amplifiers, active filters, transformers, DC motors, DC generators and logic gates.</li> <li>• Design and analyze of electric circuits using Multisim software.</li> </ul>
<b>Rules (Educational policy and behavior)</b>	<p>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 means 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.</p> <p>Attendance  Participation of students at all classes 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.</p> <p>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.</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>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.</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>	17.09 19.09	<i>Fundamentals of Electric Circuit:</i> Systems of units. Charge and current. Voltage. Power and energy. Circuit elements. Applications. <i>Questions and Exercises</i>	[1],[3]
<b>2</b>	23.09 26.09	<i>Resistive Circuits:</i> Ohm's law. Nodes, branches, and loops. Kirchhoff's laws. Series resistors and voltage division. Parallel resistors and current division. Nodal and Mesh Analysis. <i>Questions and Exercises</i>	[1],[3]
<b>3</b>	08.10 10.10	<i>Capacitance and inductances:</i> Capacitors. Series and parallel capacitors. Inductors. Series and parallel inductors. Practical inductors Mutual inductance. Applications. <i>Questions and Exercises</i>	[1],[2]
<b>4</b>	15.10 17.10	<i>Frequency Analysis:</i> First-Order Filters, Transfer Functions, Low-Pass Filters, High-Pass Filters, Second-Order Filters, Band-Pass Filters, Band-Stop Filters <i>Questions and Exercises</i>	[1],[2]
<b>5</b>	22.10 24.10	<i>Electronic Circuits:</i> Diodes and applications. Half-wave rectifiers. Full-wave rectifiers. <i>Questions and Exercises, Quiz 1</i>	[1],[2]

<b>6</b>	29.10 31.10	<i>Electronic Circuits:</i> The zener diode. Zener diode applications. The varactor diode. Optical diodes. <i>Questions and Exercises</i>	[2]
<b>7</b>	05.11 07.11	<i>Electronic Circuits:</i> Bipolar junction transistors, BJT amplifiers. Operational amplifiers. <i>Questions and Exercises.</i>	[2]
<b>8</b>	12.11 14.11	<i>Electronic Circuits:</i> Bipolar junction transistors. BJT amplifiers. <i>Questions and Exercises. Quiz 2</i>	[2]
<b>9</b>	19.11 21.11	<b>Mid term exam</b>	
<b>10</b>	26.11 28.11	<i>Electronic Circuits:</i> Operational amplifier. Operational amplifier circuits. <i>Questions and Exercises.</i>	[2]
<b>11</b>	03.12 05.12	<i>Electronic Circuits:</i> Operational amplifier. Operational amplifier circuits. <i>Questions and Exercises.</i>	[2]
<b>12</b>	10.12 12.12	<i>Magnetically Coupled Circuits:</i> Mutual inductance. Energy in a coupled circuit. Transformers. <i>Questions and Exercises Quiz 3</i>	[3] [2]
<b>13</b>	17.12 19.12	<i>Electric Machines:</i> Features of electric machines. Classification of motors.DC motors and their types. DC generators and their types. <i>Questions and Exercises</i>	[1]
<b>14</b>	24.12	<i>Logic Circuits:</i> Number systems. Boolean algebra. Boolean logic gates. <i>Questions and Exercises Quiz 4</i>	[1]
<b>15</b>	26.12	<b>Recap of all covered material</b>	
		<b>Final Exam</b>	

