

<b>General information</b>	<b>Title and code of subject, number of credits</b>	EENG245 Fundamentals of Computer Programming 4 credits	
	<b>Department</b>	Physics and electronics	
	<b>Program</b>	Bachelor	
	<b>Academic semester</b>	2022 spring	
	<b>Lecturer</b>	Assosiate Prof Guliyev Mazahim	
	<b>E-mail:</b>	<a href="mailto:mazahim.guliyev@gmail.com">mazahim.guliyev@gmail.com</a>	
	<b>Phone number:</b>	+994 55567 70 74	
	<b>Lecture room/Schedule</b>	11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), room	
	<b>Consultations</b>	Saturday 13:00 – 14:00	
<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. C++ Programming: Program Design Including Data Structures, <b>6th</b> Ed. D.S. Malik, Course Technology, 2011</li> <li>2. Fundamentals of Computer programming with C++. Svetlin Nakov 2013</li> <li>3. Introduction to Programming with C++, 3rd Edition by Y. Daniel Liang,,Pearson,2014</li> <li>4. C: The Complete Reference, Herbert Schildt, McGrawHill, 2016</li> </ol>		
<b>Teaching methods</b>	<b>Lecture</b>		X
	<b>Group discussions at seminars</b>		X
<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>This course introduces students to the field of computer science and engineering. An overview of the disciplines within computer science such as networks, AI, robotics, graphics, and computer architecture will be integrated throughout the course. Starting from first principles of computer organization, students will receive a foundation in programming focusing on C/C++. Fundamental programming concepts along with current issues such as parallelism and embedded systems will be covered through relevant programming projects. The course will culminate in a comprehensive programming assignment and/or a team-based robotics project that integrates the concepts taught in the course. A lecture/lab course format will be employed to provide hands-on experience and active learning techniques</p>		
<b>Course objectives</b>	<p>The main objectives of this course is to introduce the programming language and aware the students about programming paradigm. and to focus concept and methodology of programming</p>		
<b>Learning outcomes</b>	<p>Upon completion of this course students will be able to:</p> <ol style="list-style-type: none"> <li>1. Define and discuss the disciplines of computer science with the intention of choosing future courses that are applicable to the student’s personal learning goals.</li> <li>2. Understand the key hardware components in a modern computer system and how software is mapped to the HW.</li> <li>3. Use a computer to solve problems by developing simple algorithms and then implement them using a specific programming language</li> <li>4. Implement key algorithms within the field</li> <li>5. Understand and determine the computational complexity of simple algorithms</li> <li>6. Write computer programs using conditional and iterative structures, functional decomposition, and basic parallelization techniques</li> <li>7. Select an appropriate basic data structure (e.g. arrays) and access methods (e.g. pointers)</li> <li>8. Understand basic object-oriented principles.</li> <li>9. Design non-trivial embedded software to control a robot to navigate and interact within a controlled environment</li> </ol>		
<b>Rules (Educational)</b>	<p>Lesson organization  General information on the subject will be provided for the students during lectures.</p>		

<b>policy and behavior)</b>	<p>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.</p> <p><b>Attendance</b> 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.</p> <p><b>Lates</b> 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.</p> <p><b>Quizzes</b> 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><b>Exams</b> 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><b>Violation of the rules of the exams</b> 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><b>The rule for completing the course</b> 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><b>Rules of conduct for Students</b> 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>
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<b>Week</b>	<b>Dates (planned)</b>	<b>Subject topics</b>	<b>Textbook/ Assignments</b>
1		<i>Introduction</i> Generation and Classification of Computers Basic Organization of a Computer–Number System –Binary – Decimal – Conversion – Problems.	[2] p. 2-16
2		<i>Algorithm</i> Need for logical analysis and thinking Pseudo code Flow Chart. Problem Solving	[1] p. 4-20 [1] p.30-52 [1] p. 24-28 [1] p. 67-81
3		<i>C Programming Basics</i> Problem formulation– Introduction to ‘ C’ programming –fundamentals – structure of a ‘C’ program – compilation and linking processes	[2] p. 31-57 [2] p. 76-85
4		<i>C Programming Basics</i> Constants, Variables – Data Types Expressions using operators in ‘C’	[2] p. 113-146 [2] p. 153-155
5		<i>C Programming Basics</i> Managing Input and Output operations – Decision Making and Branching– solving simple scientific and statistical problems.	[1] p. 216-240 [3] p. 124-148
		<i>Quiz 1(Lec1-Lec4)</i>	[1] p. 242-251
6		<b>Public holiday</b>	
7		<i>C Programming Basics</i> Expressions using operators in ‘C’ – Managing Input and Output operations – Decision Making and Branching– solving simple scientific and statistical problems.	[2] p. 173-198 [2] p. 201-208 [2] p. 201-208
8		<i>Looping statements</i> <i>Quiz 2(Lec5-Lec6)</i>	[2] p. 271-300
9		<i>Mid term exam</i>	

<b>10</b>		<i>Arrays and Strings</i> Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays	[2] p. 384-422 [2] p. 425-427
<b>11</b>		<i>Arrays and Strings</i> String- String operations – String Arrays - Simple programs Sorting- searching – matrix operations	[2] p. 565-588 [2] p. 596-600
<b>12</b>		<i>Functions and Pointers</i> Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion <b>Quiz 3(Lec9-Lec10)</b>	[2] p. 602-635
<b>13</b>		<i>Functions and Pointers</i> Pointers – Definition – Initialization – Pointers arithmetic – Pointers and arrays- Example Problems.	[2] p. 764-788 [2] p. 801-805
<b>14</b>		<i>Structures and Unions</i> Introduction – need for structure data type – structure definition – Structure declaration - Structure within a structure – Union – Programs using structures and Unions – Storage classes, Pre-processor directives	[2] p. 807-825 [2] p. 845-850
<b>15</b>		<b>Recap of all covered material</b> <b>Quiz 4(Lec11-Lec13)</b>	
		<b>Final Exam</b>	