

## SYLLABUS

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| General information                     | Title and code of subject, number of credits   | PHCS 111 - Physics I - 6 credits  |             |
|   | Department   | Electronics and Telecommunications  |             |
|   | Program  | Bachelor  |             |
|   | Academic semester  | 2018 fall   |             |
|   | Lecturer   | Ph.D. Associate Professor Sevda N. Garibova                                       |             |
|   | E-mail:  | <a href="mailto:sevda.garibova@khazar.org">sevda.garibova@khazar.org</a>          |             |
|   | Phone number:  | (+994 12) 421-10-93   |             |
|   | Lecture room/Schedule  | 11 Mehseti Street, AZ1096 Baku, Azerbaijan (Neftchilar campus), room<br>Lectures: |             |
|   | Consultations  | Friday 10:00-11:00  |             |
| Course language                         | English  |   |             |
| Type of the subject                     | Major  |   |             |
| Textbooks and additional materials      | <b>Textbooks:</b><br><br>[1]. <i>Fundamental of Physics (Physics). Halliday and Resnick, Jearl Walker. 10-th edition, USA 2010.</i><br><b>Additional materials:</b><br><br><ul style="list-style-type: none"><li>General Physics I : Classical mechanics. Department of Physical Sciences and Engineering Prince George's Community College Largo, Maryland 2014</li></ul>   |   |             |
| Teaching methods                        | Lecture  | x   |             |
|   | Group discussions at seminars  | x   |             |
| Assessment                              | Components   | Date/ Deadline  | Percent (%) |
|   | Tests  |   |             |
|   | Active participation and discussion  | At each lesson  | 10          |
|   | Assignment and quizzes   | During the semester, 5 quizzes  | 20          |
|   | Attendance   | During the semester   |             |
|   | Midterm exam   |   | 30          |
|   | Final exam   |   | 40          |
|   | Final  |   | 100         |
| Course description                      | This course of physics I provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Lectures include basic concepts of motion, forces, energy, heat, Newton's laws, fluids thermodynamics, thermal physics, work and energy, power. Upon completion, students should be able to describe examples and applications of the principles studied.   |   |             |
| Course objectives                       | This course will help students to receive idea of the main physical phenomena and the major physical laws. The course of the general physics will give the chance to students to study motion laws, movement of a solid body, surface phenomena, will be able to analyze the types of motion, Newton's laws. At the end of course the students will be able to understand fundamentals of classical physics, to solve physical problems of mechanics and molecular physics.  |   |             |
| Learning outcomes                       | What students should know by the end of the course:<br>Velocity, acceleration, types of motions, fields, Gravitaion filed, harmonic oscillations, pendulum, temperature, pressure, work and quantity of heat, fluids, the Carnot cycle, entropy, viscosity, Stokes formula, turbulence, Hook's law, simple harmonic oscillator, Doppler effect.  |   |             |
| Rules (Educational policy and behavior) | 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 |   |             |

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|  | <p>lessons, are not allowed to take the exam.</p> <p>Lates</p> <p>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>Tests</p> <p>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.</p> <p>Exams</p> <p>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</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> |
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This program reflects the comprehensive information about the subject and information about any changes will be provided in advance.

| Week | Dates<br>(planned) | Subject topics   | Textbook/<br>Assignments             |
|------|--------------------|--|--------------------------------------|
| 1    | 18.09<br><br>20.09 | <i>Lecture №1.</i> Measurement. Motion along a straight line: position, displacement, and average velocity, instantaneous velocity and speed, acceleration, constant acceleration.<br><i>Seminar 1.</i> Problem solving                                    | [1] p. 1-25<br><br>[1] p. 32-39      |
| 2    | 25.09<br><br>27.09 | <i>Lecture №2.</i> Vectors . Motion in two and three dimensions: average velocity, average acceleration, uniform circular motion, relative motion.<br><i>Seminar 2.</i> Problem solving  | [1] p. 62-80<br><br>[1] p. 84-93     |
| 3    | 02.10<br>04.10     | <i>Lecture №3.</i> Force and motion I: Neewtons first and second laws. Appling Newtons laws.<br><i>Seminar 3.</i> Problem solving. Quizzes 1 ( <i>Lecture №1-2</i> )   | [1] p. 94-112<br><br>[1] p.116-123   |
| 4    | 11.10<br><br>16.10 | <i>Lecture №4.</i> Force and motion II: Friction, uniform circular motion.<br><br><i>Seminar 4.</i> Problem solving for activiry point   | [1] p. 124-133<br><br>[1] p. 140-148 |
| 5    | 18.10<br><br>23.10 | <i>Lecture №5.</i> Kinetic energy and work: work, kinetic energy, work done by the gravitational force, work done by the spring force.<br><i>Seminar 5.</i> Problem solving. Quizzes 2 ( <i>Lecture №4</i> )   | [1] p. 149-159<br><br>[1] p. 170-176 |
| 6    | 25.10<br><br>30.10 | <i>Lecture №6.</i> Potential energy and conservation of energy: work and potential energy, conservation of mechanical energy, work done by external force.<br><br><i>Seminar 6.</i> Problem solving.   | [1] p. 177-195<br><br>[1] p. 202-211 |
| 7    | 01.11<br><br>06.11 | <i>Lecture №7.</i> Center of mass and linear momentum: center of mass, newton second law for system fo particle, liner momentum, collision and impuls.<br><br><i>Seminar 7.</i> Problem solving.   | [1] p. 214-240<br><br>[1] p.246-256  |
| 8    | 08.11<br><br>13.11 | <i>Lecture №8.</i> Rotation: angular position, angular displacement, angular velocity, angular acceleration, relating the linear and angular variables, kinetic energy of rotation.<br><i>Seminar 8.</i> Problem solving. Quizze 3 ( <i>Lecture №6-7</i> ) | [1] p.257- 261<br><br>[1] p.287-294  |

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| <b>9</b>  | <b>15.11</b><br><b>20.11</b> | Mid term exam<br><i>Lecture №9.</i> Rolling, torque and angular momentum  | [1] p. 295-307                                   |
| <b>10</b> | <b>22.11</b><br><b>27.11</b> | <i>Lecture №10.</i> Fluids: density and pressure, Pascal principle, Archimedes principle, Bernoullis equation.<br><i>Seminar 9-10.</i> Problem solving. Quizzes 4 ( <i>Lecture №9</i> ) | [1] p. 386-401<br>[1] p. 406-412                 |
| <b>11</b> | <b>29.11</b><br><b>04.12</b> | <i>Lecture №11.</i> Oscillations. Simple harmonic motion, energy, pendulums.<br><i>Seminar 11.</i> Problem solving for activity point   | [1] p. 413- 432<br>[1] p.436-442                 |
| <b>12</b> | <b>06.12</b><br><b>11.12</b> | <i>Lecture №12.</i> Waves I<br><i>Seminar 12.</i> Problem solving for activity point  | [1] chapter 16<br>p.444-467<br>[1] p.472-477     |
| <b>13</b> | <b>13.12</b><br><b>18.12</b> | <i>Lecture №13.</i> Temperature, heat and the first law of thermodynamics.<br><i>Seminar 13.</i> Quizzes 5 ( <i>Lecture №11-12</i> )  | [1] Chapter 18.<br>p. 514- 531<br>[1] p. 541-543 |
| <b>14</b> | <b>20.12</b><br><b>25.12</b> | <i>Lecture №14</i> The kinetic energy of gases.<br><i>Seminar 14.</i> Problem solving for activity point and exam preparation   | [1] p. 549-570<br>[1] p.577-582                  |
| <b>15</b> | <b>27.12</b><br><b>29.12</b> | <i>Lecture №15.</i> Entropy and the second law of the thermodynamics<br><i>Seminar 15.</i> Exam preparation   | [1] p.583-596<br>[1] p. 604-608                  |
|           |                              | <b>Final Exam</b>   |  |

