

Identification	Subject	PHSC 111 - Physics -1, 6 ECTS credits	
	Department	Physics and Electronics	
	Program (Undergraduate, Graduate)	Undergraduate	
	Term	Fall 2026	
	Instructor	Sevinj Guluzade	
	Email:	Sevinj.guluzada@khazar.org	
	Classroom/hours	Monday, 09:00-18:00	
Prerequisites	None		
Language	English		
Compulsory/Elective	Compulsory		
Textbooks and course materials	Fundamentals of Physics Extended 10 th Edition by Halliday and Resnick		
Course description	This course provides an in-depth exploration of the fundamental principles of physics, covering key topics such as mechanics, heat, fluids, oscillations, waves, and sound. The course is designed to foster a solid conceptual understanding while also emphasizing the importance of numerical problem-solving. Through a balanced approach of theory and application, students will gain a comprehensive foundation in physics that will prepare them for more advanced studies in science and engineering.		
Course objectives	To enhance students' understanding of core physics principles. To develop students’ abilities to apply physics concepts to real-world scenarios. To strengthen numerical and analytical problem-solving skills. To foster an appreciation of the role of physics in everyday life and modern technology		
Learning Outcomes	Students should describe the types of motion, such as motion in one-dimension, projectile motion, circular motion, and also differentiate each of them. Students should apply Newton’s Laws, analyze contact and field forces, also should know about simple harmonic motion, pendulum, temperature, pressure, Archimedes principle, Buoyant force, work and energy, the types of energy, fluid dynamics. Students should solve each problem relating to these topics and answer the questions easily and correctly, pass the quizzes and midterm or final exam successfully.		
Teaching methods	Case analysis		x
	Group discussion		x
	Lecture		x
	Simulation		x
Evaluation Criteria	Methods	Date/deadlines	Percentage (%)
	Midterm Exam	TBA	30
	Quizzes	Four quizzes during the semester	20
	Practical Assignments		-
	Activity	During the semester	5

	Attendance	At each lesson	5
	Final Exam	TBA	40
	Total		100
Class Policy	Preparation for class The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work on relevant problems and cases from the end of the chapter and sample exam questions. Withdrawal (pass/fail) This course strictly follows the grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Midterm, and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0) without consideration. Professional behavior guidelines The students shall behave in a way to create a favorable academic and professional environment during class hours. Unauthorized discussions and unethical behavior are strictly prohibited. Attendance Students who attend the whole class will get 5 marks. for three absences student loses 1 mark. Activity Students who will be active during the discussion of past lessons and who will solve homework problems in a seminar will be awarded one activity mark. Quizzes There will be 4 quizzes during the semester. The quizzes will be announced in the classroom two weeks before. The quiz is based on homework problems. The homework problems will be selected from questions and problems at the end of each chapter. The number of homework problems will be announced after finishing each chapter. 20 percent of the average score of all the quizzes will be added to the final exam scores. Guidelines for using AI AI may be used to translate problems assigned as homework, as well as to translate or explain unclear sections of the textbook. However, the use of AI is strictly prohibited during quizzes and major examinations, as well as while solving problems during class.		

Tentative Schedule			
Week	Date/Day (tentative)	Topics	Textbook/Assignments
1	16.09.2026 18.09.2026	Measurement and Vectors. Short description: Units of measure. Concepts of vectors and action with them. Scalar and vectorial quantities	1. Fundamentals of Physics by Halliday, Chapters 1 and 3. 2. Handnotes given by a teacher
2	21.09.2026 23.09.2026 25.09.2026	Motion along a straight line. Short description: Position, displacement, and average velocity. Apply the relationship between a particle's average speed, the total distance it moves, and the time interval for the motion.	1. Fundamentals of Physics by Halliday, Chapter 2. 2. Handnotes given by a teacher
3	28.09.2026 30.09.2026 02.10.2026	Quiz 1. (first 45 min.) Motion in two and three dimensions. (second 45 min.) Short description: Quiz 1- covers measurement and vectors, motion along a straight line. Description of projectile motion, uniform circular motion, and relative motion in one and two dimensions	1. Fundamentals of Physics by Halliday, Chapter 4. 2. Handnotes given by a teacher
4	05.10.2026 07.10.2026 09.10.2026	Force and motion-1 Force and motion-2 Gravitation Short description: Concept of force. Description of Newtonian mechanics and application of Newton's laws. Types of force, drag force and terminal speed, uniform circular motion. Measuring the Gravitational Constant. Gravitational force. Kepler's Law and the motion of planets. The Gravitational field.	1. Fundamentals of Physics by Halliday, Chapters 5,6 and 13 2. Handnotes given by a teacher
5	12.10.2026 14.10.2026 16.10.2026	Kinetic energy and work, Potential energy and conservation of energy Short description: Kinetic energy, work, and kinetic energy, work done by gravitational force, work done by a spring force, work	1. Fundamentals of Physics by Halliday, Chapters 7 and 8. 2. Handnotes given by a teacher

		done by a general variable force and power, potential energy, conservation of mechanical energy	
6	19.10.2026 21.10.2026 23.10.2026	Quiz 2 (first 45 min.) Center of mass and linear momentum (second 45 min.) Short description: Center of mass, linear momentum, collision and impulse, conservation of linear momentum, momentum and kinetic energy in collisions, elastic collisions in one and two dimensions, and system in varying mass	1. Fundamentals of Physics by Halliday, Chapters 9. 2. Handnotes given by a teacher
7	26.10.2026 28.10.2026 30.10.2026	Rotation, Rolling, torque, and angular momentum Short description: Rotational variables, rotation with constant angular acceleration, calculation of rotational inertia, torque, and rotational inertia, Rolling as translation and rotation combined, angular momentum, conservation of angular momentum, precision of a gyroscope	1. Fundamentals of Physics by Halliday, Chapters 10 and 11. 2. Handnotes given by a teacher
8	02.11.2026	Midterm Exam Problem-solving	The midterm exam will cover Chapters 1-10 and 13
9	04.11.2026 06.11.2026	Equilibrium and elasticity Short description: Equilibrium, elasticity, and static equilibrium	1. Fundamentals of Physics by Halliday, Chapter 12. 2. Handnotes given by a teacher
10	09.11.2026 11.11.2026 13.11.2026	Oscillations and waves Short description: Simple harmonic motion energy in simple harmonic motion, transverse wave, interference of wave, standing waves, and resonance	1. Fundamentals of Physics by Halliday, Chapter 15,16. 2. Handnotes given by a teacher
11	16.11.2026 18.11.2026 20.11.2026	Quiz 3 (first 45 min.) Waves (second 45 min.) Short description: The quiz will cover chapters 15,16,17.	1. Fundamentals of Physics by Halliday, Chapter 17. 2. Handnotes given by a teacher

		Speed of sound, traveling sound waves, intensity and sound level, beats, the Doppler effect	
12	23.11.2026 25.11.2026 27.11.2026	Fluids Short description: Measuring pressure, Pascal's principle, Archimedes' principle, Bernoulli's Equation, and other applications of fluid	1. Fundamentals of Physics by Halliday, Chapter 14. 2. Handnotes given by a teacher
13	02.12.2026 04.12.2026 07.12.2026	The kinetic theory of gases Short description: Kinetic theory of ideal gases. Distributions of molecular speed and adiabatic expansion of an ideal gas	1. Fundamentals of Physics by Halliday, Chapter 19. 2. Handnotes given by a teacher
14	09.12.2026 11.12.2026 14.12.2026	Quiz 4 (first 45 min.) Temperature heat and the first law of Thermodynamics (second 45 min.) Short description: The quiz will cover chapters 14,19 Thermal expansion, the first law of thermodynamics, and the Celsius and Fahrenheit scales	1. Fundamentals of Physics by Halliday, Chapter 18. 2. Handnotes given by a teacher
15	16.12.2026 18.12.2026 21.12.2026	Entropy and the second law of thermodynamics Short description: Inversible process and entropy, change in entropy, and the second law of thermodynamics	1. Fundamentals of Physics by Halliday, Chapter 20. 2. Handnotes given by a teacher
		Final exam	

