

Identification	Subject	PHSC 111 Physics-1 6 ECTS
	Department	Physics and Electronics
	Program	Undergraduate
	Term	Spring 2024
	Instructor	Sevinj Guluzade
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	Phone:	0559565615
	Classroom/hours	10:00-15:00
	Office hours	
Prerequisites	no	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, https://drive.google.com/folderview?id=0B2q6eS6QaN-pZXRDQ3VCZ0xQYmM&usp=sharing - Go to this page to download the textbook	
Course website	Class assignments: www.edmodo.com	
Course outline	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 outline	<p>The course is organized into weekly modules, each focusing on a specific area of physics. Detailed schedules of topics can be found later in this syllabus. Students will be introduced to new concepts through lectures, demonstrations, and interactive discussions, followed by problem-solving sessions that reinforce these concepts.</p> <ul style="list-style-type: none"> • Mechanics: Explore the laws of motion, forces, energy, and momentum, and their applications to the physical world. • Heat and Thermodynamics: Understand the principles of energy transfer, temperature, and the behavior of gases. • Fluids: Investigate the properties of liquids and gases, including pressure, buoyancy, and flow. • Oscillations and Waves: Study the motion of oscillating systems and the propagation of waves, including sound waves. • Sound: Delve into the nature of sound waves, frequency, and resonance. 	
Course objectives	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • What students should know by the end of the course: • 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	Lecture	+
	Seminar	+
	Assisted work	x
	Assisted lab work	x

Others		
Evaluation	Methods	Date/deadlines
	Midterm Exam	
	Class Participation and Attendance	At each lesson
	Quizzes	
	Activity	At each lesson
	Final Exam	
	Total	

Evaluation	Percentage (%)
	30
	5
	20
	5
	40
	100

Policy	
	<ul style="list-style-type: none"> ▪ 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. <p>Attendance Students who attend the whole class will get 5 marks. for three absences student loses 1 mark.</p> <ul style="list-style-type: none"> ▪ 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.

Week	Date/Day (Tentative)	Topics	Textbook/Assignments
1	18.09.2024 20.09.2024 23.09.2024	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	25.09.2024 27.09.2024 30.09.2024	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	02.10.2024 04.10.2024 07.10.2024	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	09.10.2024 11.10.2024 14.10.2024	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	16.10.2024 18.10.2024 21.10.2024	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 done by a general variable force and power, potential energy, conservation of mechanical energy	1. Fundamentals of Physics by Halliday, Chapters 7 and 8. 2. Handnotes given by a teacher
6	23.10.2024 25.10.2024 28.10.2024	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	1. Fundamentals of Physics by Halliday, Chapters 9. 2. Handnotes given by a teacher

		momentum, momentum and kinetic energy in collisions, elastic collisions in one and two dimensions, and system in varying mass	
7	30.10.2024 01.11.2024 04.11.2024	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	06.11.2024 10.11.2024	Midterm Exam Problem-solving	The midterm exam will cover Chapters 1-10 and 13
9	15.11.2024	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	18.11.2024 20.11.2024 22.11.2024	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	25.11.2024 27.11.2024 29.12.2024	Quiz 3 (first 45 min.) Waves (second 45 min.) Short description: The quiz will cover chapters 15,16,17. Speed of sound, traveling sound waves, intensity and sound level, beats, the Doppler effect	1. Fundamentals of Physics by Halliday, Chapter 17. 2. Handnotes given by a teacher
12	02.12.2024 04.12.2024 06.12.2024	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	09.12.2024 11.12.2024 13.12.2024	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	16.12.2024 18.12.2024 20.12.2024	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	1. Fundamentals of Physics by Halliday, Chapter 18. 2. Handnotes given by a teacher

		thermodynamics, and the Celsius and Fahrenheit scales	
15	23.12.2024 25.12.2024 27.12.2024	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	

