

Identification	Subject		PHSC 111 - Physics 1 - 6 ECTS credits
	Department		Physics and Electronics
	Program		Undergraduate
	Term		Fall 2023
	Instructor		Dr. Gunel Bahaddinova
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	Phone:		
	Classroom/hours		11:50
	Office hours		
Prerequisites	no		
Language	English		
Compulsory/Elective	Compulsory		
Description	This course covers the principles of mechanics, heat, fluids, oscillations, waves and sound. Emphasis is on conceptual development and numerical problem solving. A detailed schedule of topics can be found later in this syllabus.		
Required textbooks and course materials	Fundamentals of Physics Extended 8th Edition by Halliday, Resnick.		
Course website	Class assignments: www.edmodo.com		
Course outline	This course of physics I provide 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	<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 differentiate each of them. • Students should apply Newton's Laws, can analyzing 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, fluids 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		<input checked="" type="checkbox"/>
	Group discussion		<input checked="" type="checkbox"/>
	Experiential exercise		<input type="checkbox"/>
	Case analysis		<input type="checkbox"/>
	Quiz, Classroom Exams		<input checked="" type="checkbox"/>
	Course paper		<input type="checkbox"/>
	Others		<input checked="" type="checkbox"/>
Evaluation	Methods	Date/deadlines	Methods
	Midterm Exam		30
	Attendance	At each lesson	5
	Quizzes	During the semester	20
	Activity	During the semester	5
	Final Exam		40
	Total		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 relevant problems and cases from the end of the chapter and sample exam questions. • Withdrawal (pass/fail) 		

This course strictly follows grading policy of the School of Humanities, Education and Social sciences. 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, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.

- **Professional behavior guidelines**

The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.

Attendance

Students who attend the whole classes will get 5 marks and for three absence student loses 1 mark.

- **Quizzes**

There will be a quizzes per two weeks. The quizzes will be announced in the classroom two weeks before and will relate to homework.

- **Activity**

Students who will be active during discussion of past lessons will be awarded with one activity mark.

Tentative Schedule			
Week	Date/Day (Tentative)	Topics	Textbook/Assignments
1		<p>Measurement, Motion Along a Straight Line</p> <p>Short description: Measuring Things, The International System of Units, Changing Units, position and Displacement, Average Velocity and Average Speed, Instantaneous Velocity and Speed, Acceleration, Constant Acceleration: A Special Case, Free-Fall Acceleration, vectors and Scalars, Adding Vectors Geometrically, Components of Vectors, Unit Vectors</p> <p>Problem Solving</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 1-2.</p> <p>2. Handnotes given by teacher</p>
2		<p>Vector</p> <p>Short description: Vectors and Scalars, Adding Vectors Geometrically, Components of Vectors, Unit Vectors</p> <p>Problem Solving</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 3.</p> <p>2. Handnotes given by teacher</p>
3		<p>Motion in Two and Three Dimensions.</p> <p>Short description: Position and Displacement, Average Velocity and Instantaneous Velocity, Average Acceleration and Instantaneous, Acceleration, Projectile Motion, Projectile Motion Analyzed, Uniform Circular Motion</p> <p>Quiz</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 4.</p> <p>2. Handnotes given by teacher</p>
4		<p>Force and Motion - I.</p> <p>Short description: Newtonian Mechanics, Newton's First Law, Force, Mass, Newton's Second Law, Some Particular Forces, Newton's Third Law, Applying Newton's Laws. Friction, Properties of Friction, The Drag Force and Terminal Speed.</p> <p>Problem Solving</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 5.</p> <p>2. Handnotes given by teacher</p>
5		<p>Force and Motion - II</p> <p>Short description: Friction, Properties of Friction, The Drag Force and Terminal Speed.</p> <p>Problem Solving</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 6.</p> <p>2. Handnotes given by teacher</p>
6		<p>Kinetic Energy and Work, Potential Energy and Conservation of Energy.</p> <p>Short description: Kinetic Energy, Work, Work and Kinetic Energy, Work Done by the Gravitational Force, Work Done by a Spring Force, Work Done by a General Variable Force, Power, Work and Potential Energy, Path Independence of Conservative Forces, Determining Potential Energy Values, Conservation of Mechanical Energy, reading a Potential Energy Curve, Work Done on a System by External Force, Conservation of Energy</p> <p>Quiz</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 7-8.</p> <p>2. Handnotes given by teacher</p>
7		<p>Center of Mass and Linear Momentum</p> <p>Short description: The Center of Mass, Newton's Second Law for a System of Particles, Linear Momentum, The Linear Momentum of a System of Particles, Collision and Impulse, Conservation of Linear Momentum, Momentum and Kinetic Energy in Collisions, Inelastic Collisions in One Dimension,</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 9.</p> <p>2. Handnotes given by teacher</p>

		Elastic Collisions in One Dimension, Collisions in Two Dimensions Problem Solving	
8		Equilibrium and Elasticity Short description: Equilibrium, The Requirements of Equilibrium, The Center of Gravity, Some Examples of Static Equilibrium, Indeterminate Structures, Elasticity, Problem Solving	1. Fundamentals of Physics by Halliday, Chapter 12. 2. Handnotes given by teacher
9		Gravitation Short description: Newton's Law of Gravitation, Gravitation and the Principle of Superposition, Gravitation Near Earth's Surface, Gravitation Inside Earth, Gravitation Potential Energy, Planets and Satellites: Kepler's Laws Quiz	1. Fundamentals of Physics by Halliday, Chapter 13. 2. Handnotes given by teacher
10		Fluids Short description: What Is a Fluid, Density and Pressure, Fluids at Rest, Measuring Pressure, Pascal's Principle, Archimedes' Principle, Ideal Fluids in Motion, The Equation of Continuity, Bernoulli's Equation. Problem Solving	1. Fundamentals of Physics by Halliday, Chapter 14. 2. Handnotes given by teacher
11		Oscillations. Short description: Simple Harmonic Motion, The Force Law for Simple Harmonic Motion, Energy in Simple Harmonic Motion, An Angular Simple Harmonic Oscillator, Pendulums, Simple Harmonic Motion and Uniform Circular, Damped Simple Harmonic Motion, Forced Oscillations and Resonance. Problem Solving	1. Fundamentals of Physics by Halliday, Chapter 15. 2. Handnotes given by teacher
12		Wave Short description: Types of Waves, Transverse and Longitudinal Waves, Wavelength and Frequency, The Speed of a Traveling Wave, Wave Speed on a Stretched String, Energy and Power of a Wave Traveling Along a String, The Wave Equation, The Principle of Superposition for Waves, Interference of Waves, Phasors, Standing Waves, Standing Waves and Resonance, Sound Waves, The Speed of Sound, Traveling Sound Waves, Interference, Intensity and Sound Level, The Doppler Effect, Supersonic Speeds. Quiz	1. Fundamentals of Physics by Halliday, Chapter 16-17. 2. Handnotes given by teacher
13		Temperature, Heat, and the First Law of Thermodynamics Short description: Temperature, The Zeroth Law of Thermodynamics, Measuring Temperature, The Celsius and Fahrenheit Scales, Thermal Expansion, Temperature and Heat, The Absorption of Heat by Solids and Liquids, A Closer Look at Heat and Work, The First Law of Thermodynamics, Some Special Cases of the First Law of Thermodynamics, Heat Transfer Mechanisms. Problem Solving	1. Fundamentals of Physics by Halliday, Chapter 18. 2. Handnotes given by teacher
14		The Kinetic Theory of Gases	1. Fundamentals of Physics by

		<p>Short description: Avogadro's Number, Idea I Gases, Pressure, Temperature, and RMS Speed, Translational Kinetic Energy, Mean Free Path, The Distribution of Molecular Speeds, The Molar Specific Heats of an Ideal Gas.</p> <p>Problem Solving</p>	<p>Halliday, Chapter 19.</p> <p>2. Handnotes given by teacher</p>
15		<p>Entropy and the Second Law of Thermodynamics</p> <p>Short description: Irreversible Processes and Entropy, A Change in Entropy, The Second Law of Thermodynamics, Entropy in the Real World: Engines</p> <p>Quiz</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 20.</p> <p>2. Handnotes given by teacher</p>
		Final Exam	

