

Identification	Subject	PHSC 111 - Physics 1 - 3 ECTS credits	
	Department	Physics and Electronics	
	Program	Undergraduate	
	Term	Fall 2024	
	Instructor	Aytaj Iskandarova	
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	Classroom/hours		
	Office hours		
Prerequisites	no		
Language	English		
Compulsory/Elective	Compulsory		
Description	<p>This course provides a comprehensive exploration of fundamental physics principles, including mechanics, thermodynamics, fluid dynamics, oscillations, wave phenomena, and acoustics. It focuses on both conceptual understanding and practical problem-solving skills, equipping students with the tools needed to tackle complex physics challenges. The syllabus includes a detailed timetable of topics, which will be outlined later in this document. The primary objective of this course is to enhance students' foundational knowledge of mechanics and develop their analytical and quantitative reasoning abilities.</p>		
Required textbooks and course materials	<p>Fundamentals of Physics Extended 10th Edition by Halliday, Resnick. Physics for Scientists and Engineers with. Modern Physics, Ninth Edition. Raymond A. Serway and John W. Jewett, Jr. University physics with modern physics 14th edition global edition by Hugh D. Young, Roger A. Freedman, and Lewis A Ford.</p>		
Course website	Class assignments: www.edmodo.com		
Course outline	<p>This course offers a conceptually-based introduction to the fundamental principles and processes governing the physical world. It covers essential topics such as motion, forces, energy, heat, thermodynamics, and wave phenomena. Students will gain a comprehensive understanding of these concepts and learn to apply them to real-world scenarios.</p>		
Course objectives	<p>This course provides students with a foundational understanding of key physical phenomena and major physical laws. It covers fundamental concepts such as the laws of motion, the behavior of solid bodies, and surface phenomena. Students will learn to analyze various types of motion and apply Newton's laws effectively. By the end of the course, students will have a solid grasp of classical physics principles and be equipped to solve problems related to mechanics and molecular physics.</p>		
Learning outcomes	<p>What Students Should Know by the End of the Course:</p> <ul style="list-style-type: none"> • Types of Motion: Students should describe various types of motion, including one-dimensional motion, projectile motion, and circular motion, and differentiate between them. • Application of Newton's Laws and Related Concepts: Students should apply Newton's Laws to analyze contact and field forces. They should also understand and explain concepts such as simple harmonic motion, pendulums temperature, pressure, Archimedes' principle, buoyant force, work and energy, types of energy, and fluid dynamics. • Problem-Solving and Assessments: Students should be capable of solving problems related to these topics and answering questions accurately. They should demonstrate their understanding and skills by successfully passing quizzes, midterms, and the final exam. 		
Teaching methods	Lecture		<input checked="" type="checkbox"/>
	Group discussion		<input 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	4 quizzes during the semester	20
	Activity	At each lesson	5
	Final Exam		40
	Total		100

Policy	<p>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.</p> <p>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.</p> <p>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.</p> <p>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> <p>Attendance Students who attend the whole class will get 5 marks and for three absences student loses 1 mark.</p> <p>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.</p> <p>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.</p>
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Tentative Schedule			
Week	Date/Day (Tentative)	Topics	Textbook/Assignments
1		Measurement, Vectors. Short description: - Measuring Things, Including Lengths - The International System of Units - Vectors and Their Components - Adding Vectors Geometrically - Unit Vectors - Multiplying Vectors Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 1 and Chapter 3. 2. Hand notes given by teacher
2		Motion Along a Straight Line Short description: - Position, Displacement, Average Velocity - Instantaneous Velocity and Speed - Acceleration - Constant Acceleration - Free-Fall Acceleration Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 2. 2. Hand notes given by teacher
3		Motion in Two and Three Dimensions Short description: - Position and Displacement - Average Velocity and Instantaneous Velocity - Average Acceleration and Instantaneous Acceleration - Projectile Motion - Uniform Circular Motion - Relative Motion in One and Two Dimensions Quiz	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 4. 2. Hand notes given by teacher
4		Force and Motion, Newton's Law of Motion Short description: - Force and Interactions - Newton's First Law - Force and Mass - Newton's Second Law - Mass and Weight - Newton's Third Law - Applying Newton's Laws Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 5. 2. Hand notes given by teacher
5		Kinetic Energy and Work Short description: - Kinetic Energy - Work - Work Done by the Gravitational Force - Work Done by a Spring Force - Power Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 7. 2. Hand notes given by teacher

6		Potential Energy and Energy Conservation Short description: <ul style="list-style-type: none"> - Work and Potential Energy - Conservative and Nonconservative Forces - Gravitational Potential Energy - Elastic Potential Energy - Conservation of Mechanical Energy - Work Done on a System by External Force - Conservation of Energy Quizz	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 8. 2. Hand notes given by teacher
7		Linear Momentum, Impulse and Collisions Short description: <ul style="list-style-type: none"> - Center of Mass - Linear Momentum - Impulse - Conservation of Linear Momentum - Collisions Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 9. 2. Hand notes given by teacher
8		Rotation of Rigid Bodies Short description: <ul style="list-style-type: none"> - Angular Velocity and Acceleration - Rotation with Constant Angular Acceleration - Torque - Rigid body - Angular Momentum of Rigid Body - Conservation of Angular Momentum Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 10-11. 2. Hand notes given by teacher
		Midterm Exam	
9		Equilibrium and Elasticity Short description: <ul style="list-style-type: none"> - Equilibrium - The Requirements of Equilibrium - The Center of Gravity - Indeterminate Structures - Elasticity Quizz	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 12. 2. Hand notes given by teacher
10		Gravitation Short description: <ul style="list-style-type: none"> - Newton's Law of Gravitation - Gravitation and the Principle of Superposition - Gravitation Near Earth's Surface - Gravitation Inside Earth - Planets and Satellites: Kepler's Laws - Satellites: Orbits and Energy Problem Solving	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 13. 2. Hand notes given by teacher
11		Fluids Short description: <ul style="list-style-type: none"> - Fluid, Density and Pressure - Fluids at Rest - Measuring Pressure - Pascal's Principle 	1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 14. 2. Hand notes given by teacher

		<ul style="list-style-type: none"> - Archimedes' Principle - Ideal Fluids in Motion - The Equation of Continuity - Bernoulli's Equation <p>Problem Solving</p>	
12		<p>Oscillations</p> <p>Short description:</p> <ul style="list-style-type: none"> - Simple Harmonic Motion - The Force Law for Simple Harmonic Motion - An Angular Simple Harmonic Oscillator - Pendulums - Simple Harmonic Motion and Uniform Circular - Damped Simple Harmonic Motion - Forced Oscillations and Resonance <p>Quizz</p>	<p>1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 15.</p> <p>2. Hand notes given by teacher</p>
13		<p>Mechanical Waves</p> <p>Short description:</p> <ul style="list-style-type: none"> - Types of Waves - Transverse and Longitudinal Waves - Wavelength and Frequency - The Speed of a Traveling Wave - The Wave Equation - The Principle of Superposition for Waves - Interference of Waves - Sound Waves - The Doppler Effect - Supersonic Speeds <p>Problem Solving</p>	<p>1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 16-17.</p> <p>2. Hand notes given by teacher</p>
14		<p>Temperature, Heat, The First Law of Thermodynamics, The Kinetic Theory of Gase</p> <p>Short description:</p> <ul style="list-style-type: none"> - Temperature - The Zeroth Law of Thermodynamics - Temperature and Heat - The First Law of Thermodynamics - Heat Transfer Mechanisms - Avogadro's Number - Ideal Gases - Mean Free Path - The Distribution of Molecular Speeds <p>Problem Solving</p>	<p>1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 18-19.</p> <p>2. Hand notes given by teacher</p>
15		<p>Entropy and the Second Law of Thermodynamics</p> <p>Short description:</p> <ul style="list-style-type: none"> - Entropy - Irreversible Processes - Change in Entropy - The Second Law of Thermodynamics - Entropy in the Real World: Engines <p>Quizz</p>	<p>1. Fundamentals of Physics Extended 10th Edition by Halliday, Resnick, Chapter 20.</p> <p>2. Hand notes given by teacher</p>
		Final Exam	

