Identification	Subject (Code, title, credits)	PHSC150, Physics 1, 6 ECTS
	Department	Physics and Electronics
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Aytaj Iskandarova
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	Phone:	
	Classroom/hours	408 Elshan Mehdiyev str. (Bakikhanov campus)
	Office hours	
Prerequisites	-	
Language	English	
Compulsory/ Elective	Compulsory	
Required textbooks and course materials	Textbooks: [1] - Fundamentals of Physics, Extended (10th ed.), Wiley - Halliday, D., Resnick, R., and Walker, J. - 2013 [2] - Physics for Scientists and Engineers with Modern Physics (10th ed.), Cengage Learning - Serway, R. A., and Jewett, J. W. Jr. - 2018 [3] - University Physics with Modern Physics (15th ed.), Pearson - Young, H. D., Freedman, R. A. - 2018 [4] - University Physics Volume 1. OpenStax - Ling, S. J., Sanny, J., and Moebs, W. - 2016	
Course description	This course provides a conceptually grounded introduction to the fundamental principles governing the physical world. It examines the core processes underlying motion, forces, energy, heat, and thermodynamics, offering students a comprehensive framework for understanding physical phenomena. The course integrates theoretical foundations with systematic problem-solving approaches, enabling students to analyze physical systems and apply fundamental principles to real-world situations. Covered topics include kinematics, Newton's laws of motion, work and energy, momentum, rotational dynamics, oscillatory motion, and the laws of thermodynamics, thereby establishing a solid foundation in classical mechanics and molecular physics/thermodynamics.	
Course objectives	• Develop a solid understanding of the basic laws of classical physics and the physical phenomena they describe, forming the foundation for further studies in science and engineering. • Analyze one-dimensional and two-dimensional motion quantitatively and apply Newton's Laws of Motion to solve problems related to real-life physical systems. • Gain the ability to describe and analyze forces, work, energy, momentum, and their conservation in mechanical systems. • Improve critical thinking and problem-solving abilities through mathematical modeling of physical processes and interpretation of experimental data. • Acquire fundamental knowledge necessary for advanced courses in physics, electronics, mechanics, and related engineering disciplines.	
Learning outcomes	By the end of the course, students will be able to:	

	• Describe, differentiate, and mathematically model varied motion profiles, including linear (one-dimensional), projectile, and uniform circular motion. • Synthesize Newton's Laws of Motion to evaluate both contact and field forces. • Explain the mechanical behavior of Simple Harmonic Motion (SHM) and oscillatory systems, such as pendulums. • Quantify variables of state, specifically temperature and pressure. • Apply Archimedes' Principle and the concept of buoyant force to static fluids. • Analyze the conservation of energy through the study of work-energy theorems, potential/kinetic energy types, and fluid dynamics. • Demonstrate advanced problem-solving capabilities by resolving complex theoretical and practical scenarios. • Validate academic proficiency through rigorous assessment, including structured quizzes, a comprehensive midterm, and final examination.		

Teaching methods	**Case analysis**		x
	Group discussion		x
	Lecture		x
	Simulation		x

Evaluation Criteria	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Attendance	At each lesson	5
	Quiz	Four quizzes during the semester	20
	Activity	During the semester	5
	Final Exam		40
	Total		100

Class Policy	• **Preparation for class** The pedagogical structure of this course necessitates diligent individual study and external preparation. Course sessions are designed to emphasize the primary theoretical frameworks introduced in the text. Pre-class engagement with assigned chapters is essential to facilitate a comprehensive understanding of the material. Subsequent to each session, students should synthesize their notes and resolve pertinent problems, case studies, and sample examination questions located at the conclusion of each chapter. • **Withdrawal (pass/fail)** This course strictly adheres to the grading ordinances of the School of Science and Engineering. Consequently, students are required to achieve a minimum threshold of 60% to secure a passing grade. In the event of an unsatisfactory result, the student will be mandated to repeat the course in the following academic term or year. • **Cheating/plagiarism** Any instance of academic dishonesty or plagiarism during Quizzes, Midterms, or Final Examinations will result in the immediate nullification of the assessment. In such cases, the student will automatically be assigned a score of zero (0) without further consideration. • **Professional behavior guidelines** Students are expected to conduct themselves in a manner that fosters a constructive academic and professional environment during instructional hours.

Unauthorized discourse and unethical behavior are strictly prohibited.

- **Attendance**

  Students who maintain full attendance for the duration of the course will be awarded 5 marks. Conversely, for every three absences recorded, the student will incur a deduction of 1 mark.

- **Quizzes**

  Four quizzes will be administered throughout the semester, with formal announcements made in class two weeks prior to the assessment date. The content of each quiz is based on assigned homework problems, which are curated from the questions and problems at the end of each chapter.

- **Activity**

  Students who demonstrate active engagement during the review of previous lessons and proficiently solve problems during seminar sessions will be awarded one activity mark.

Tentative Schedule			
Weeks	Date/Day	Topics	Reference to textbooks
1.	16-02-26	Measurement, vectors. Motion along a straight line Problem solving	[1]–p. 1-8, 13-31 [2]–p. 1-16
2.	23-02-26	Motion in two and three dimensions Problem solving	[1]–p. 62-82 [2]–p. 68-89
3.	02-03-26	Force and motion, Newton's law of motion Quiz 1 – Lecture 1, Lecture 2	[1]–p. 94-114 [4]–Ch. 5
4.	09-03-26	Friction. The Drag force and terminal speed Problem solving	[1]–p.124-138 [4]–Ch. 6
5.	16-03-26	Kinetic energy and work Problem solving	[1]–p.149-168
6.	23-03-26	Potential energy and energy conservation Quiz 2 – Lecture 3, Lecture 4, Lecture 5	[1]–p.177-200
7.	30-03-26	Linear momentum, impulse and collisions Problem solving	[1]–p.214-244 [3]–p.237-262
8.	06-04-26	Midterm exam	
9.	13-04-26	Rotation of rigid bodies Problem solving	[1]–p.257-285 [2]–p.287-297
10.	20-04-26	Equilibrium and elasticity Problem solving	[1]–p.327-343
11.	27-04-26	Gravitation Quiz 3 - Lecture 9, Lecture 10	[1]–p.354-377 [4]–Ch. 13
12.	04-05-26	Fluids Problem solving	[1]–p.386-405 [4]–Ch. 14
13.	11-05-26	Oscillations Problem solving	[1]–p.413-434
14.	18-05-26	Temperature, heat, the first law of thermodynamics. The kinetic theory of gases Quiz 4 - Lecture 12, Lecture 13	[1]–p. 514-539, 549-576

15.	25-05-26	Entropy and the second law of thermodynamics Problem solving	[1]–p.583-603
	TBC	Final exam	

This syllabus is a guide for the course and any modifications to it will be announced in advance.