



## Subject card

Subject name and code	Physics I, PG_00055087						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Małgorzata Śmiałek-Telega				
	Teachers		dr hab. inż. Małgorzata Śmiałek-Telega				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		9.0		71.0	125
Subject objectives	Student knows fundamentals of Classical Mechanics, Electricity and Magnetism as well as thermodynamics						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U01		The student can predict the effects of the laws of physics		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		
	K6_W02		The student knows the foundations of classical physics		[SW1] Assessment of factual knowledge		

## Subject contents

1. Units
2. Introduction to Kinematics, Vectors
3. Projectile Motion
4. Uniform Circular Motion
5. Newton's Laws of Motion
6. Frictional Force
7. Work and Energy
8. Simple Harmonic Motion
9. Damped Simple Harmonic Motion, Forced Oscillations and Resonance,
10. Momentum, Conservation of Linear of Momentum
11. Inelastic and Elastic Collisions
12. Rotation of Rigid Body, Angular Momentum, Conservation of Angular Momentum
13. Equilibrium
14. Sound Waves
15. Electric Field and Dipoles
16. Electric Flux and Gauss' Law
17. Electric Potential and Electric Potential Energy
18. Electrostatic Shielding, High-Voltage Breakdown, Capacitors
19. Polarization and Dielectrics
20. Electric Current, Resistance, Ohm's Law
21. Batteries and EMF
22. Magnetic Field and Lorentz Force
23. Moving Charge in B-field
24. Biot-Savart Law and Ampere's Law
25. Electromagnetic Induction

	26. Magnetic Materials		
	27. Physical properties of fluids		
	28 Thermodynamics		
	28. Geometric Optics		
Prerequisites and co-requisites	High school level physics knowledge		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exerciscs	50.0%	50.0%
	Lecture	50.0%	50.0%
Recommended reading	Basic literature	<a href="https://openstax.org/details/books/university-physics-volume-1">https://openstax.org/details/books/university-physics-volume-1</a>	
		<a href="https://openstax.org/details/books/university-physics-volume-2">https://openstax.org/details/books/university-physics-volume-2</a>	
	Supplementary literature	Halliday, David, Robert Resnick, and Jearl Walker. <i>Fundamentals of physics</i> . John Wiley & Sons, 2013.	
	eResources addresses	Adresy na platformie eNauczanie: PG_00055087_ PHYSICS I - DaPE- 2023/24 (PHYS-DaPE - 23/24) - Moodle ID: 33011 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33011">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33011</a>	
Example issues/ example questions/ tasks being completed	A body of mass 2.0 kg makes an elastic collision with another body at rest and continues to move in the original direction but with one-fourth of its original speed. (a) What is the mass of the other body? (b) What is the speed of the two-body center of mass if the initial speed of the 2.0 kg body was 4.0 m/s?		
Work placement	Not applicable		