



## Subject card

Subject name and code	Physics, PG_00054677						
Field of study	Biotechnology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
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			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Spektroskopii Układów Złożonych -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Waldemar Stampor					
	Teachers						
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		6.0		49.0	100
Subject objectives	Student knows and describes natural phenomena.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W01	Student knows fundamentals of classical mechanics, electricity and magnetism as well as geometric optics.			[SW1] Assessment of factual knowledge		
	K6_U01	Student learns by himself, can prepare experiments, has an ability to verify facts and to draw the conclusions			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

## 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 and Damping 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 Lorenz Force
23. Moving Charge in B-field
24. Biot-Savart Law and Ampere's Law
25. Electromagnetic Induction

	<p>26. Magnetic Materials</p> <p>27. Wave Nature of Light</p> <p>28. Geometric Optics</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	50.0%	65.0%
	2 tests during exercises	50.0%	35.0%
Recommended reading	Basic literature	<p>D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 8th Edition, Wiley 2008.</p> <p>•J. Jędrzejewski, W. Kruczek, A. Kujawski, Zbiór zadań z fizyki. Tom I i II dla uczniów szkół średnich i kandydatów na studia WT 2013</p>	
	Supplementary literature	<p>•P.G. Hewitt, Fizyka wokół nas, PWN 2016</p> <p>•K. Chyla, Zbiór prostych zadań z fizyki dla uczniów szkół średnich</p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>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?</p>		
Work placement	Not applicable		