



Subject card

Subject name and code	Physics, PG_00055440						
Field of study	Mechatronics						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2022/2023		
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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			9.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Małgorzata Śmiałek-Telega				
	Teachers		dr inż. Joanna Grzelak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	15.0	15.0	0.0	0.0	75
	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	75		39.0		111.0	225
Subject objectives	To expand knowledge of selected sections of classical physics and modern physics. To acquire the ability to solve tasks using integral and differential calculus. To learn techniques and methods of measuring selected physical quantities.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U01] is able to acquire information from literature, databases and other, properly chosen sources, integrate this information, interpret them, draw conclusions and formulate opinions	Student is able to obtain information from various sources: literature, databases, and others. Student is able to integrate obtained information, interpret it, as well as draw conclusions and formulate and justify opinions.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W02] has a knowledge in terms of physics that includes mechanics, thermodynamics, optics, electricity, magnetism, atomic physics, nuclear physics, solid state physics, including the knowledge necessary to understand basic phenomena occurring in mechatronic elements and systems and its surroundings	Student has knowledge of physics: mechanics, thermodynamics, optics, electricity and magnetism, atomic physics, nuclear physics, solid state physics, including the knowledge necessary to understand basic phenomena in the environment.			[SW1] Assessment of factual knowledge		
[K6_U03] has self-learning skills	The student has the ability to self-educate.			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools			

Subject contents	<p>1. General mechanics: kinematics, dynamics, statics, rigid body mechanics;2. Fluid mechanics;3. Thermodynamics;4. Acoustics;4. Electrodynamics (electricity and magnetism);5. Optics;6. Particle physics, nuclear, atomic and molecular physics, solid state physics, fluid physics;7. Theoretical mechanics (classical, Lagrange, Hamiltonian, quantum (relativistic), statistical, special theory of relativity);8. Elements of astronomy and astrophysics.</p>														
Prerequisites and co-requisites	<p>Basic knowledge of general physics.Basic mathematical knowledge, basic knowledge of differential calculus and vector analysis.</p>														
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Laboratory</td> <td>50.0%</td> <td>30.0%</td> </tr> <tr> <td>Exercises</td> <td>50.0%</td> <td>35.0%</td> </tr> <tr> <td>Lecture</td> <td>50.0%</td> <td>35.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	50.0%	30.0%	Exercises	50.0%	35.0%	Lecture	50.0%	35.0%		
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Recommended reading	<p>Basic literature</p>	<p>J. Massalski, M. Massalska, Physics for Engineers, vol. 1 and 2, Warsaw 2013 (as well as any other edition);J. Orear, Physics, volumes 1 and 2, Warsaw 2004;David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics. Vol. 1-5, Scientific Publishing House PWN, 2012 (as well as any other edition);I.W. Savelyev, Lectures in Physics, Vol. 1, 2 and 3, Scientific Publishing House PWN, Warsaw, 2003</p>													
	<p>Supplementary literature</p>	<p>A. Januszajtis, Physics for Polytechnics, vol. 1-3, Warsaw 1991;Paul A. Tipler, Ralph A. Llewellyn, Modern physics, Scientific Publishing House PWN, Warsaw 2012</p>													
	<p>eResources addresses</p>	<p>Podstawowe</p> <p>https://openstax.org/details/books/fizyka-dla-szk%C3%B3w%C5%82-wy%C5%BCszych-tom-2 - The textbook emphasizes the links between theory and practical applications, explaining physical issues in an interesting and understandable way, but with the necessary mathematical rigor.</p> <p>https://openstax.org/details/books/fizyka-dla-szk%C3%B3w%C5%82-wy%C5%BCszych-tom-1 - The textbook emphasizes the links between theory and practical applications, explaining physical issues in an interesting and understandable way, but with the necessary mathematical rigor.</p> <p>https://openstax.org/details/books/fizyka-dla-szk%C3%B3w%C5%82-wy%C5%BCszych-tom-3 - The textbook emphasizes the links between theory and practical applications, explaining physical issues in an interesting and understandable way, but with the necessary mathematical rigor.</p> <p>Adresy na platformie eNauczanie:</p>													

Example issues/ example questions/ tasks being completed	State Newton's second principle of dynamics and the conclusions drawn from it. Explain why does an airplane fly? Give and explain the formula for the Lorentz force. How does the return of the force change depending on the signs of the charge (draw)? State Heisenberg's indeterminacy principle.
Work placement	Not applicable