



Subject card

Subject name and code	Introduction to special relativity, PG_00069209						
Field of study	Wstęp do szczególnej teorii względności						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Dampc				
	Teachers		dr inż. Marcin Dampc				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	-A presentation and discussion of the postulates of special relativity and the foundations of general relativity. The foundations of special relativity are derived from classical electrodynamics and its problems at the turn of the 20th century. The course aims to deepen the understanding of electromagnetic forces and the idea of describing them through fields, as well as to understand the implications of special relativity for the concepts of time and space.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U07		Has in-depth knowledge of STW and is familiar with the non-intuitive phenomena and paradoxes associated with it.		[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi		
	K6_W02		-Understands the relationship between electromagnetism and mechanics. Understands the concept of unification of interactions.		[SW1] Ocena wiedzy faktograficznej		
	K6_U08		-Is able to present the postulates and phenomena of STW and analyze and discuss them.		[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi		
	K6_K05		-Can independently find solutions to physical problems and discuss them		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce [SK4] Ocena umiejętności komunikacji, w tym poprawności językowej		
	K6_U10		-Recognizes the connections between individual branches of physics and is able to develop his/her interests based on knowledge from other branches.		[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi		

Subject contents	Course content – lecture 1. Inertial and non-inertial reference frames. 2. Maxwell's equations, electromagnetic waves. 3. The speed of light, the interference phenomenon, the Michelson-Morley experiment. 4. The postulates of special relativity, non-simultaneity of events. 5. The phenomena of time dilation and relativistic contraction, the paradoxes of special relativity. 6. Magnetic interactions in special relativity. 7. Basics of special relativity.		
Prerequisites and co-requisites	Electrodynamics, mechanics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	-	50.0%	100.0%
Recommended reading	Basic literature	Feynman Richard P., Leighton Robert B., Matthew Sands, Wykłady z fizyki Tom 1, PWN 2014 Sokołowski Leszek M. Szczególna teoria względności. Notatki z wykładu	
	Supplementary literature	Hartle James B. Grawitacja. Wprowadzenie do ogólnej teorii względności Einsteina Wydawnictwa Uniwersytetu Warszawskiego 201	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. State and explain the twin paradox. 2. Describe and explain the procedure and results of the Michelson-Morley experiment.		
Practical activities within the subject	Not applicable		

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