GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Classical mechanics and optical geometry, PG_00061294						
Field of study	Mathematics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group		Specialty 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	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Theoretical Physics and Quantum Information -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Ewa Erdmann				
	Teachers		dr inż. Ewa Erdmann				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	30.0	60
	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	60		5.0	35.0		100
Subject objectives	Teaching geometrical optics and classical mechanics.						

Learning outcomes	<table><tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr><tr><td>[K7_U09] constructs mathematical models used in specific advanced applications of mathematics, can use stochastic processes as a tool for modeling phenomena and analyzing their evolution,constructs mathematical models used in specific advanced applications of mathematics, uses stochastic processes as a tool for modeling phenomena and analyzing their evolution, recognizes mathematical structures in physical theories</td><td>The student recognizes mathematical structures in calculation tasks concerning classical mechanics and geometrical optics</td><td>[SU5] Assessment of ability to present the results of task</td></tr><tr><td>[K7_W03] demonstrates knowledge advanced computation techniques, supporting the work of a mathematician and understand their limitations.</td><td>The student knows and understands the concepts, theories and theorems related to the application of mathematics in particle mechanics, particle systems and optics.</td><td>[SW1] Assessment of factual knowledge</td></tr><tr><td>[K7_U03] uses differential and integral calculus, elements of complex analysis, algebraic methods, applies them in typical practical</td><td>The student uses the acquired knowledge in solving calculation tasks concerning classical mechanics and geometrical optics</td><td>[SU3] Assessment of ability to use knowledge gained from the subject</td></tr><tr><td>[K7_K02] formulates questions to deepen own understanding of a given topic or find missing elements of reasoning, understands the need to clearly present selected achievements of higher mathematics to laymen.</td><td>The student is able to formulate precise questions and use appropriate sources of knowledge. He is able to prepare a presentation in Polish on the basic applications of mathematics in classical mechanics and optics</td><td>[SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work</td></tr></table>
Subject contents	1. Basic geometrical optics. 2. Classical mechanics.
Prerequisites and co-requisites	Completed all other subjects of the study.
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>exam</td><td>50.0%</td><td>50.0%</td></tr><tr><td>presentation</td><td>50.0%</td><td>50.0%</td></tr></table>
Recommended reading	<table><tr><td>Basic literature</td><td>Optics 1. Cz. Bobrowski, Fizyka 2. E. Hecht, Optyka Classical Mechanics 1. W. Rubinowicz, W. Królikowski, Mechanika teoretyczna 2. J. Taylor, Mechanika klasyczna</td></tr><tr><td>Supplementary literature</td><td>• A. Wojtowicz, http://www.phys.uni.torun.pl/~andywojt • D. Halliday, R. Resnick, J. Walker, Podstawy fizyki • G. Białkowski, Mechanika klasyczna</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr></table>
Example issues/ example questions/ tasks being completed	1. Derive the principle of conservation of energy of the point particle. Describe the conditions of its application. 2. Derive Lagrange's equations of the second kind from D'Alembert's principle.
Work placement	Not applicable