



## Subject card

Subject name and code	Classical mechanics and optical geometry, PG_00030016						
Field of study	Mathematics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			5.0		
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		60.0	125
Subject objectives	Teaching geometrical optics and classical mechanics.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_K02] Can precisely formulate 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.	Can precisely formulate questions and use additional sources of knowledge. Is able to prepare a presentation in Polish on the basic applications of mathematics in classical mechanics and optics.			[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness		
	[K7_W04] Has enhanced knowledge of a selected branch of mathematics, theoretical or applied.	Knows and understands concepts and theorems related to the application of mathematics in particle mechanics, systems of particles and optics			[SW1] Assessment of factual knowledge		
	[K7_U12] Recognizes mathematical structures (e.g. algebraic, geometric) in physical theories	Uses acquired knowledge to solve practical tasks related to classical mechanics and geometric optics			[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		
Subject contents	1. Basic geometrical optics.  2. Classical mechanics.						
Prerequisites and co-requisites	Completed all other subjects of the study.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	presentation	25.0%			25.0%		
	exam	50.0%			50.0%		
	quiz tests	25.0%			25.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Cz. Bobrowski, Fizyka</li> <li>2. W. Rubinowicz, W. Królikowski, Mechanika teoretyczna</li> <li>3. J. F. Taylor, Mechanika klasyczna</li> </ol>
	Supplementary literature	<ul style="list-style-type: none"> <li>• A. Wojtowicz, <a href="http://www.phys.uni.torun.pl/~andywojt">http://www.phys.uni.torun.pl/~andywojt</a></li> <li>• D. Halliday, R. Resnick, J. Walker, Podstawy fizyki</li> <li>• G. Białkowski, Mechanika klasyczna</li> <li>• L.D. Landau, J.M. Lifszyc, Mechanika</li> </ul>
	eResources addresses	<p>Adresy na platformie eNauczenie:</p> <p>Mechanika klasyczna i optyka geometryczna - Moodle ID: 30494  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30494">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30494</a></p>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Derive the principle of conservation of energy of the point particle. Describe the conditions of its application.</li> <li>2. Derive Lagrange's equations of the second kind from D'Alembert's principle.</li> </ol>	
Work placement	Not applicable	