GDAŃSK UNIVERSITY OF TECHNOLOGY

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	Katedra Fizyki Teoretycznej i Informatyki Kwant. -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej		
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 concetpts 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.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>presentation</td><td>25.0%</td><td>25.0%</td></tr>
<tr><td>exam</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>quiz tests</td><td>25.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Cz. Bobrowski, Fizyka
2. W. Rubinowicz, W. Królikowski, Mechanika teoretyczna
3. J. F. 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
• L.D. Landau, J.M. Lifszyc, Mechanika</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Mechanika klasyczna i optyka geometryczna - Moodle ID: 30494
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30494</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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