GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Physics of electronic collisions, PG_00021073		
Field of study	Technical Physics		
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Electron Collisions Physics -> Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Paweł Możejko	
	Teachers	dr hab. Paweł Możejko	

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	0.0	30

E-learning hours included: 0.0

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=946

Moodle ID: 946 Fizyka zderzeń elektronowych
https://enauczanie.pg.edu.pl/2025/course/view.php?id=946

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	30	2.0	18.0	50

Subject objectives

Fundamentals of the physics of electron collisions. Review of the basic experimental and theoretical methods used in the study of electron scattering on atoms and molecules.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U09	Knowledge of the latest trends in the study of electron-matter interactions.	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
K6_W02	Knowledge of the theoretical description of electron scattering from atoms and molecules. Ability to choose an experimental method to study a given collisional process.	[SW1] Assessment of factual knowledge

Subject contents

1) Collisional processes 2) Total cross section and differential cross section 3) Linear transmission method - total cross-sections measurements 4) Basic methods of generating and monoenergizing electron beams 5) Theoretical description of the collision process 6) Elastic scattering of two identical spin-less particles in the Born approximation 7) Partial wave analysis

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	65.0%	100.0%

Recommended reading	Basic literature	1) S.P. Khare "Introduction to the Theory of Collisions of Electrons with Atoms and Molecules" Springer DOI 10.1007/978-1-4615-0611-9 2) I. Shimamura, K. Takayanagi "Electron-Molecule Collisions" Springer DOI: 10.1007/978-1-4613-2357-0
	Supplementary literature	H. Massey "Zderzenia atomowe i cząsteczkowe" PWN 1982
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Present the assumptions of the linear transmission method. 2. Define the total and differential cross section.	
Work placement	Not applicable	

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