



Subject card

Subject name and code	Methodology of scientific research, PG_00031934						
Field of study	Technical Physics						
Date of commencement of studies	February 2027	Academic year of realisation of subject			2027/2028		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study Humanistic-social subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Atomic Physics and Luminescence -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Mateusz Zawadzki					
	Teachers						
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	Acquainting students with principles of scientific research.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W05] understands the physical principles underlying the operation of scientific equipment and the processes occurring throughout its life cycle.	The student understands the theoretical principles behind the functioning of scientific physical instruments used in experimental research. They are able to explain how selected measurement devices work and assess their suitability for specific research objectives. The student recognizes the importance of choosing appropriate measurement methods and equipment in the context of the reliability and accuracy of the obtained results.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W07] understands economic, legal and ethical determinants, as well as the social and environmental implications of physics-based technologies; is familiar with principles of intellectual property protection and entrepreneurship.	The student knows the basic principles and methods of conducting scientific research, including experiment planning, data analysis methods, and the principles of formulating research hypotheses. They understand the importance of reliability and reproducibility of scientific results and are familiar with the basics of research ethics. The student is able to independently plan and carry out scientific research using appropriate methods and analytical tools. They can critically evaluate the results of their own research as well as literature studies, and prepare scientific reports and presentations. The student understands the need for continuous development of scientific competencies and can work collaboratively in a research team. They demonstrate awareness of scientific responsibility and adhere to ethical principles in scientific work.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_W06] possesses advanced knowledge of experimental methods and techniques in physics, as well as occupational health and safety principles enabling independent work at research or measurement workstations.	The student demonstrates an advanced understanding of experimental methods and techniques used in physics, particularly in the context of scientific research methodology. They are able to select appropriate experimental approaches, analyze measurement uncertainties, and apply analytical, numerical, or experimental methods to solve complex problems. The student is also familiar with health and safety regulations, enabling responsible and independent work in a research or measurement environment.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_K03] demonstrates readiness to perform professional roles responsibly and actively in accordance with societal needs, while adhering to ethical standards and ensuring workplace safety.	The student is prepared to conduct scientific research in a responsible and ethical manner, with particular emphasis on research ethics and health and safety regulations in measurement environments. They understand the importance of following procedures, maintaining scientific integrity, and taking responsibility for experimental results and the use of instrumentation.	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work

Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none"> 1. What is science and what is not science? 2. Scientific career in Poland vs. in other countries. 3. Ethics in science and engineering. 4. Principles of using scientific literature and scientific information databases. 5. Principles of scientific writing and publishing. 6. Principles of preparations of oral presentations. 								
Prerequisites and co-requisites									
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 651 786 678">Subject passing criteria</th> <th data-bbox="799 651 1142 678">Passing threshold</th> <th data-bbox="1155 651 1469 678">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 685 786 734">Grade of an essay on a prescribed subject</td> <td data-bbox="799 685 1142 734">100.0%</td> <td data-bbox="1155 685 1469 734">100.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Grade of an essay on a prescribed subject	100.0%	100.0%		
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Grade of an essay on a prescribed subject	100.0%	100.0%							
Recommended reading	Basic literature	A. F. Chalmers, What is this thing called Science?, 2nd ed., University of Queensland Press, St. Lucia, 1982							
	Supplementary literature	<ol style="list-style-type: none"> 1. Ustawa o stopniach naukowych i tytule naukowym oraz o stopniach i tytule w zakresie sztuki 2. Rozporządzenie w sprawie kryteriów oceny osiągnięć osoby ubiegającej się o nadanie stopnia doktora habilitowanego 3. Rozporządzenie w sprawie szczegółowego trybu i warunków przeprowadzania czynności w przewodach doktorskich, w postępowaniu habilitacyjnym oraz w postępowaniu o nadanie tytułu profesora 4. M. Mazur, Historia naturalna polskiego naukowca, PIW, Warszawa, 1970 5. CRA-W Career Mentoring Workshops Booklet 6. Opracowanie "Rzetelność w badaniach naukowych oraz poszanowanie własności intelektualnej" 7. Kodeks Etyki Pracownika Naukowego 8. "Dobre obyczaje w nauce" - zbiór zasad i wytycznych 9. Opracowanie "Dobra praktyka naukowa" 10. Z. Cywiński, O nową filozofię budownictwa, Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2009 (wyd. 1), 2010 (wyd. 2) 							
	eResources addresses								
Example issues/ example questions/ tasks being completed	Essay "Plagiarism".								
Practical activities within the subject	Not applicable								