

Subject card

Subject name and code	Fundamentals of Research Methodology, PG_00207544						
Field of study	Medical Physics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. n. med. Przemysław Rutkowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	0.0	0.0	0.0	0.0	10
	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	10		0.0		15.0	25
Subject objectives	The goal is to understand the aims of science, what distinguishes scientific work from other types of work, what the rigors of scientific research are, and to learn the principles and methods of scientific work necessary for preparing a diploma thesis. The goal is to understand the purposefulness of the rigors applied to scientific research and to grasp the essence of statistical inference. The goal is to acquire the skills necessary for preparing a diploma thesis in accordance with the methodological principles of scientific research.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMEDL3_K01] He is ready for a critical evaluation of his own knowledge and the information he receives, and understands the need for further education and for improving professional and personal competencies.	The student differentiates between conducting scientific research and conducting research without the rigours of scientific methodology. The student is prepared to draw conclusions and critically discuss the results obtained.	[SK2] presentation/project/paper/report
	[FIZMEDL3_K02] He is ready to constantly update his knowledge in physics and medical physics to solve cognitive and practical problems independently and to use the opinions and assistance of experts.	The student: Is ready to use the opinions and help of experts, understanding that scientific work often requires interdisciplinary collaboration and verification from other specialists. Shows a responsible attitude for the integrity of their research and its results, as well as for adhering to the principles of scientific ethics, including avoiding plagiarism and respecting copyright.	[SK2] presentation/project/paper/report
	[FIZMEDL3_U08] Can prepare a written paper or presentation in Polish or English using specialised terminology in the field of physics and medical physics.	The student is able to: develop a formal research design, articulate the distinctions between scientific inquiry and investigations conducted without methodological rigor, formulate research problems and hypotheses, adapt research instruments for original studies, select appropriate methodologies, systematize and aggregate collected data, derive evidence-based conclusions, and engage in a critical discussion of the research findings	[SU2] presentation/project/paper/report
	[FIZMEDL3_W13] Knows and understands the legal and ethical considerations associated with scientific work and the practice of medical physics.	The student: Knows the main concepts, stages of research procedure, and the structure of both theoretical and empirical scientific work. Is familiar with the fundamental principles and methods of scientific work required for preparing a diploma thesis. Knows the rules for conducting scientific research in medical disciplines. Is familiar with research methods and techniques, including the fundamentals of statistical methods, data collection and organisation, and the principles of constructing a scientific paper. Knows the criteria for selecting relevant literature for a research topic and its usefulness for the work. Understands what plagiarism is and is aware of the legal aspects of copyright protection.	[SW2] presentation/project/paper/report
Subject contents	The role of deduction and induction in scientific knowledge. The principle of falsifiability, paradigm theory, methods of scientific research. Planning and conducting the research process for a selected problem, defining the research problem and research hypothesis. Choosing appropriate research methods. Developing and presenting research results. The role of statistical inference in scientific knowledge. The problem of plagiarism. Copyright. Citation rules. Rules for publishing and giving presentations.		
Prerequisites and co-requisites	The student's ability to think logically, connect facts, and remember key information.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	presentation	51.0%	100.0%
Recommended reading	Basic literature	not applicable	
	Supplementary literature	Niegiel B., Pope D., Stanistreet D.: Quantitative Methods for Health Research	
	eResources addresses		
Example issues/ example questions/ tasks being completed	not applicable		
Work placement	Not applicable		

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