

Subject card

Subject name and code	Physics of the Atomic Nuclei and Elementary Particles, PG_00182364						
Field of study	Medical Physics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study 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		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Angelina Łobejko				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	30.0	0.0	0.0	0.0	75
	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	75		0.0		75.0	150
Subject objectives	Deepening and systematising students' knowledge of the structure and properties of atomic nuclei and elementary particles, with particular emphasis on contemporary experimental methods and a small amount of theoretical considerations. Another important element is to show the connections between nuclear and particle physics and other areas of research (astrophysics, condensed matter physics, medical and technological applications).						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMEDMU2_W01] Knows and understands in depth selected issues in the field of physics and medicine, the complex relationships between them, and development trends in the exact and natural sciences, health sciences, and others.	The student has in-depth knowledge of the properties and structure of atomic nuclei, as well as the mechanisms of nuclear interactions and the processes of nuclear decay and reactions. The student has detailed knowledge of the interaction of ionising radiation with matter and its impact on living organisms. In addition, the student understands the relationships between nuclear physics and particle physics, as well as their significance for other fields of science, especially medicine.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
	[FIZMEDMU2_U01] Can apply the scientific method in solving physical and medical problems, carrying out experiments and drawing conclusions in the field of physics, medical physics and other fields, based on in-depth knowledge, appropriate selection of sources, and mathematical and computer science methods and tools.	The student is able to perform both qualitative and quantitative calculations (using appropriate mathematical models, conservation laws, and physical principles) to determine quantities characterizing atomic nuclei, nuclear decays and reactions, as well as nuclear models. The student is able to provide nuclear reaction schemes and apply suitable models to analyze the interactions of ionizing radiation and gamma quanta with matter.	[SU4] test/exam - oral or written [SU5] implementation of a problem task
Subject contents	not applicable		
Prerequisites and co-requisites	A. Formal requirements: Fundamentals of classical physics. Fundamentals of quantum physics. B. Prerequisites: Knowledge of issues related to the structure of the atom. Knowledge of the basics of mechanics and the fundamentals of differential and integral calculus.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	not applicable	51.0%	40.0%
	not applicable	51.0%	60.0%
Recommended reading	Basic literature	not applicable	
	Supplementary literature	not applicable	
	eResources addresses		
Example issues/ example questions/ tasks being completed	not applicable		
Work placement	Not applicable		

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