University of Gdańsk

Subject card

Subject name and code	, PG_00210339		
Field of study	Medical Physics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	Master's 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Anna Synak	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	0.0	45

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	45	0.0	30.0	75

Subject objectives

The aim of the course is to provide students with knowledge of the role and responsibilities of a medical physicist in diagnostic imaging and to develop the ability to apply this knowledge in clinical practice. The course familiarizes students with the current duties, rights, and professional responsibilities of medical physicists.

Students will gain knowledge of quality assurance and quality control procedures for X-ray equipment and auxiliary devices, including diagnostic monitors. The course also highlights the distinction between the roles of a medical physicist and a radiation protection officer.

Furthermore, students will acquire practical knowledge regarding radiation doses received by patients and medical staff during X-ray examinations and interventional procedures involving ionizing radiation, as well as methods for monitoring and optimizing radiation exposure.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[FIZMEDMU2_W06] Knows and understands the current directions of development of physics and medical sciences, especially in the field of medical physics, and the fundamental dilemmas of modern civilisation.	Knows and understands current trends and future developments in medical image detection, image processing technologies, and dose optimization strategies aimed at reducing radiation exposure to patients while maintaining high diagnostic image quality.	[SW4] test/exam - oral or written
	[FIZMEDMU2_K03] He is ready to take a scientific approach to the issues being solved, using scientific literature, as well as expert opinions, in case of difficulties in solving the problem on his own.	Is aware of the professional responsibility of a medical physicist for ensuring patient safety in diagnostic imaging. Recognizes the importance of continuous professional development and lifelong learning in the field of radiation protection, dose optimization, and the reduction of radiation exposure to both patients and healthcare personnel.	[SK5] implementation of a problem task
	[FIZMEDMU2_U02] Can plan and conduct an experiment using new or adapt existing methods and tools, and critically analyse the results of measurements, observations or numerical calculations, assessing the accuracy of the results using known methods and tools.	Is able to plan and perform routine quality control tests on X-ray equipment and diagnostic monitors. Is able to calibrate medical display monitors in accordance with quality assurance requirements. Is able to use phantoms and measurement devices to evaluate the results of quality control procedures. Is able to analyze quality control data and draw appropriate conclusions regarding equipment performance and compliance. Is able to calculate and assess radiation doses received by patients and medical staff during diagnostic imaging procedures.	[SU5] implementation of a problem task
	[FIZMEDMU2_W04] Knows and understands in depth the theoretical foundations and principles of operation of measurement systems and research, diagnostic and therapeutic equipment specific to the field of physics and medicine.	Knows and understands the principles of image acquisition and processing by medical imaging detectors. Knows and understands the methods of medical image presentation and display depending on the type of X-ray examination performed. Knows and understands the role and responsibilities of a medical physicist in diagnostic radiology. Knows and understands the methods used to calculate and assess radiation doses received by patients and medical staff. Knows and understands the legal rights, duties, and professional responsibilities of a medical physicist in diagnostic imaging. Knows and understands the differences between the roles of a medical physicist and a radiation protection officer.	[SW4] test/exam - oral or written
	[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.	Knows and understands the role of a medical physicist in diagnostic imaging, as well as the legal framework governing the profession. Understands the rights, responsibilities, and professional obligations associated with the practice of medical physics.	[SW4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>This course presents the role of the medical physicist in diagnostic imaging. It covers the duties, responsibilities, professional rights, and legal framework governing the practice of medical physics. The course includes topics related to the physical principles of medical imaging modalities, operation and quality control of diagnostic imaging equipment, optimization of diagnostic procedures with respect to radiation dose and exposure parameters, and radiation protection of patients and healthcare personnel.

The course also addresses the principles of medical image detection, processing, and analysis. Particular emphasis is placed on the practical aspects of a medical physicist’s work, including routine quality control of equipment that uses ionizing radiation and auxiliary devices used for image display and evaluation.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Completion of a problem-solving task</td><td>51.0%</td><td>20.0%</td></tr>
<tr><td>test</td><td>51.0%</td><td>80.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Witold Skrzyński, Wioletta Ślusarczyk-Kacprzyk, Zespół konsultantów: Paweł Kukołowicz,, Dominika Oborska-Kumaszyńska, Andrzej Orlef, Sylwia Zielińska-Dąbrowska, Testy podstawowe monitorów stosowanych do prezentacji obrazów medycznych Zalecenia Polskiego Towarzystwa Fizyki Medycznej

Materiały własne.</td></tr>
<tr><td>Supplementary literature</td><td>Author's own materials</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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