



## Subject card

Subject name and code	Safety issues in radiation physics , PG_00060255						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-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			blended-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Brygida Mielewska				
	Teachers		dr Brygida Mielewska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	7.0	0.0	0.0	0.0	15
	E-learning hours included: 12.0						
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		0.0		0.0	15
Subject objectives	The aim of the course is to familiarize students with the conditions of safe work with high-energy radiation sources, in particular accelerators, including radiotherapeutic ones						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment		The student learns the specifics of the hazards and conditions of safe work in an environment using accelerators and other advanced medical and industrial devices		[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_W08] Knows and understands, to an increased extent, the fundamental dilemmas of modern civilisation, the main development trends of scientific disciplines relevant to the field of education.		The student develops and discusses selected issues in the field of work safety with accelerators		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	1. Introduction to work safety - risks and hazards in accelerator technology  2. Magnets and cryogenic devices  3. Radio frequencies  4. Lasers  5. Beam hazards and ionizing radiation  6. Electrical safety  7. Mechanical safety  8. Systemic solutions - work safety											
Prerequisites and co-requisites	the knowledge of issues of high energy physics											
Assessment methods and criteria	<table border="1" data-bbox="450 784 1489 882"> <thead> <tr> <th data-bbox="450 784 794 815">Subject passing criteria</th> <th data-bbox="794 784 1139 815">Passing threshold</th> <th data-bbox="1139 784 1489 815">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="450 815 794 846">quizzes</td> <td data-bbox="794 815 1139 846">50.0%</td> <td data-bbox="1139 815 1489 846">50.0%</td> </tr> <tr> <td data-bbox="450 846 794 882">written exam</td> <td data-bbox="794 846 1139 882">50.0%</td> <td data-bbox="1139 846 1489 882">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	quizzes	50.0%	50.0%	written exam	50.0%	50.0%
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quizzes	50.0%	50.0%										
written exam	50.0%	50.0%										
Recommended reading	Basic literature	T. Otto "Safety accelerators" (Springer Open access 2021)										
	Supplementary literature	Radiation at Home, Outdoors and in the Workplace Editors: Dag Brune, Ragnar Hellborg Bertil R. R. Persson, Rauno Pääkkönen, Scandinavian Science Publisher 2001										
	eResources addresses	Adresy na platformie eNauczanie: Zagadnienia bezpieczeństwa w fizyce radiacyjnej 2024 - Moodle ID: 37056 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37056">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37056</a>										
Example issues/ example questions/ tasks being completed	What are the risks associated with the use of the cryogenic technique? Assessment of the risk of working with a laser beam.											
Work placement	Not applicable											