



## 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 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	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	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: 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		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_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		
	[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		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		

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="451 779 1487 884"> <thead> <tr> <th data-bbox="451 779 794 817">Subject passing criteria</th> <th data-bbox="794 779 1137 817">Passing threshold</th> <th data-bbox="1137 779 1487 817">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 817 794 851">written exam</td> <td data-bbox="794 817 1137 851">50.0%</td> <td data-bbox="1137 817 1487 851">50.0%</td> </tr> <tr> <td data-bbox="451 851 794 884">quizzes</td> <td data-bbox="794 851 1137 884">50.0%</td> <td data-bbox="1137 851 1487 884">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	written exam	50.0%	50.0%	quizzes	50.0%	50.0%
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quizzes	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 - Moodle ID: 30553 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30553">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30553</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											