GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2026	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	
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	Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Brygida Mielewska	
	Teachers	dr Brygida Mielewska	

Lesson types

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_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

<table>
<tr><td>Subject contents</td><td>Course content – lecture
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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>the konowledge of issues of high energy physics</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>quizzes</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>written exam</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>T. Otto "Safety accelerators" (Springer Open access 2021)</td></tr>
<tr><td>Supplementary literature</td><td>Radiation at Home, Outdoors and in the Workplace Editors: Dag Brune, Ragnar HellborgBertil R. R. Persson, Rauno Pääkkönen, Scandinavian Science Publisher 2001</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>What are the risks associated with the use of the cryogenic technique? Assessment of the risk of working with a laser beam.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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