



Subject card

Subject name and code	Selected Issues of Human Radiobiology, PG_00050106						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2028/2029	
Education level	first-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				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	5	ECTS credits				1.0	
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						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	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		1.0		9.0	25
Subject objectives	To familiarize students with the issues of radiation interaction with biological matter and with assessment methods and radiobiological models and their application in radiotherapy.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	The student understands the effects of ionizing radiation on matter and its impact on biological systems. The student describes basic radiobiological mechanisms and models and how they are used in radiotherapy and radioprotection.			[SW1] Assessment of factual knowledge		
	[K6_W51] Knows and understands, to an advanced extent, selected aspects of biomedical diagnostics and human anatomy and physiology, constituting general knowledge related to the field of study	The student knows research methods of radiobiology and the effects of ionizing radiation on selected types of cells, tissues and organs (e.g. radiation sickness)			[SW2] Assessment of knowledge contained in presentation		

Subject contents	Course content – lecture 1. Physics and chemistry of radiation absorption 2. Dosimetric quantities 3. Radiological models and radiation protection 4. LET and relative biological effectiveness 5. Molecular mechanisms of DNA and chromosome damage and repair 6. Cell survival curves 7. Radiosensitivity of cells in different developmental phases 8. Fractionated radiation and dose rate 9. Oxygen effect and reoxygenation 10. Acute radiation syndrome 11. The 6 Rs of radiotherapy 12. Radioprotectors and countermeasures against radiation effects								
Prerequisites and co-requisites	No requirements								
Assessment methods and criteria	<table border="1" data-bbox="451 1081 1487 1149"> <thead> <tr> <th data-bbox="451 1081 794 1115">Subject passing criteria</th> <th data-bbox="794 1081 1137 1115">Passing threshold</th> <th data-bbox="1137 1081 1487 1115">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 1115 794 1149">final exam</td> <td data-bbox="794 1115 1137 1149">50.0%</td> <td data-bbox="1137 1115 1487 1149">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	final exam	50.0%	100.0%
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final exam	50.0%	100.0%							
Recommended reading	Basic literature	Radiobiology Textbook, ed Sarah Baatout, Springer 2023 Open Access							
	Supplementary literature	Eric J. Hall, Radiobiology for Radiologists, Wolters Kluwer 2019							
	eResources addresses								
Example issues/ example questions/ tasks being completed	1. LET and Relative Biological Effectiveness 2. Cell Survival Curves 3. The 6 Rs of Radiotherapy								
Practical activities within the subject	Not applicable								

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