University of Latvia

RTU/LU Course

General data						
Code	HEP006					
Course title	Radiation safety					
Course status in the programme	Obligatory					
Course level	Doctoral Studies					
Course type	Academic					
Field of study	Medical particle physics					
Responsible instructor	Elina Pajuste					
Volume of the course: parts and credits points	1 part, 1.0 Credit Point, 1.5 ECTS					
Language of instruction	EN					
Possibility of distance learning	Not planned					
Abstract	The course will provide an introduction to the ionizing radiation and related risks in the occupational environment and everyday life, as well as the legislation the EU and the Republic of Latvia. Students will be introduced to the ionizing radiation sources, their properties, radiation interaction with matter and its health effects, basics of the dosimetry and risk assessment					
Goals and objectives of the course in terms of competences and skills	 The goal of the course is to provide an understanding of the ionizing radiation (IR), its safety and the relevant regulatory enactments. Objectives: To provide knowledge about IR, its properties and sources in the occupational environment and everyday life to provide understanding of the basic safety requirements for working with IR based on regulatory enactments and potential risks to provide competence to carry out independent risks assessment and, on the basis of it, to plan protecting measures in the work with IR 					
Structure and tasks of independent studies	Students will be provided with further learning materials in the e-studies platform. Each topic will have online test and practical assignment to be submitted in the e-studies platform. Main task of the independent studies will be in-depth learning of the topic discussed during the contact hours and training to apply obtained theoretical knowledge for solving practical tasks.					
Recommended literature	 Radiation protection of the public and the environment: International Atomic Energy Agency, Vienna, 2018. 51 pp. IAEA safety standards series, no. GSG-8 Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, , International Atomic Energy Agency, Vienna, 2014, 436 pp IAEA Safety Standards Series No. GSR Part 3, Law On Radiation Safety and Nuclear Safety, Latvijas Vēstnesis, 394/395, 07.11.2000. Republic of Latvia Cabinet Regulation No. 149 Regulations for Protection against Ionising Radiation, Latvijas Vēstnesis, 56, 12.04.2002 					
Course prerequisites	Physics					
Courses acquired before	-					

Course contents

Content	Full- and intramura	part-time al studies	Part time extramural studies		
	Contact Hours	Indep. work	Contact Hours	Indep. work	
Ionizing radiation sources, radioactivity, nuclear reactions, accelerated particles	2	6			
Ionizing radiation interaction with matter, basic mechanisms, units	2	6			
Ionizing radiation health effects	2	6			
Ionizing radiation measurements, dosimetry	2	6			
Legislation, risks assessment	2	6			
	10	30			

Learning outcomes and assessment

Learning outcomes	Assessment methods
Knowledge on sources of ionizing radiation, their characteristics, units	Test
Ability to recognize possible sources in the occupational environment and perform calculation on their characteristics	Practical assignment
Knowledge on radiation – matter interactions, their mechanisms and units	Test
Ability to estimate consequences of the interaction of matter and radiation, perform calculation of the	Practical assignment, lab work

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interaction magnitude, ability to apply knowledge to practical tasks related to radiation shielding	
Knowledge on radiation health effects, their mechanisms, consequences, prevention	Test
Knowledge on basic dosimetry and radiation measurement methods	Test
Ability to perform dose calculations from measurement data	Practical assignment, lab work
Knowledge on international and national legislation related to radiation safety	Test
Ability to perform risks assesment	Practical assignment

Evaluation criteria of study results

Criterion	%
Practical assignment on topic 1	5
Practical assignment on topic 2	5
Test on topic 1 and 2	15
Practical assignment on topic 3	5
Lab work report	10
Test on topic 3 and 4	15
Practical assignment on topic 4	5
Practical assignment on topic 5	5
Test of topics 3, 4 and 5	15
Exam (all)	20
Total:	100

Course planning

Part	art Semester			СР	ECTS	Hours per Week			Tests			Tests (free choice)		
	Autumn	Spring	Summer			Lectures	Practical	Lab.	Test	Exam	Work	Test	Exam	Work
1.		*												