

<b>Course title</b> Radiochemia żywności i ochrona radiologiczna / Food radiochemistry and radiation protection		<b>ECTS code</b> 13.3.0848	
<b>Name of unit administrating study</b> Faculty of Chemistry			
<b>Studies</b>			
<b>Field of study</b>	<b>Type</b>	<b>Form</b>	
Chemistry	Bachelor	Full-time studies	
<b>Teaching staff</b> dr hab. Dagmara Strumińska-Parulska, prof. nadzw; dr Grzegorz Olszewski, mgr Aleksandra Moniakowska			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b> 2	
<b>A. Forms of classes, in accordance with the UG Rector's regulations</b> lecture, laboratory classes		classes - 45 h tutorial classes – 2 h student's own work – 3 h	
<b>B. The realization of activities</b> in-class learning		Total: 50 h - 2 ECTS	
<b>C. Number of hours</b> 45 h (15 h lecture, 30 h laboratory classes)			
<b>The academic cycle</b> Third year, winter semester			
<b>Type of course</b> obligatory		<b>Language of instruction</b> Polish	
<b>Teaching methods</b> Lecture with multimedia presentation Laboratory experiments		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
		<b>A. Final evaluation, in accordance with the UG study regulations</b> course completion (with a grade)	
		<b>B. Assessment methods</b> Writing exam Writing test	
		<b>C. The basic criteria for evaluation or exam requirements</b> Writing exam 1. Evaluation criteria in accordance with the UG Studies Regulations; 2. Positive mark from the written exam: 10 open questions and 10 test questions on the basis of the lecture's program 3. Positive mark from the written test: 10 open questions	
<b>Required courses and introductory requirements</b> no requirements			
<b>Aims of education</b> Acquaint the students with radiochemistry and radiation protection			
<b>Course contents</b> A. Lecture Radioactive elements in nature. Ionizing radiation doses. Radiotoxicity and its groups. Sources of radioactive contamination in the natural environment. Human absorption of radionuclides from air, food and water, and assessment of radiation doses. Radiological effects of smoking cigarettes. Impact of catastrophes in the nuclear power plants in Chernobyl and Fukushima on radioactive contamination of food. Radioactivity of building materials. Monitoring of radioactive contamination.  B. Laboratory experiments food samples collecting for $^{210}\text{Po}$ , $^{234}\text{U}$ , $^{238}\text{U}$ and $^{239+240}\text{Pu}$ activities determination			

### **Bibliography of literature**

#### **A. Literature required to pass the course**

- B. Skwarzec, Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002  
J. Sobkowski i M. Jelińska-Każmierczuk, Chemia jądrowa, Wydawnictwo Adamantan, Warszawa, 2006  
A.2. studiowana samodzielnie przez studenta
- B. Skwarzec, Radiochemia środowiska i ochrona radiologiczna, Wydawnictwo DJ s.c, Gdańska, 2002  
J. Sobkowski i M. Jelińska-Każmierczuk, Chemia jądrowa, Wydawnictwo Adamantan, Warszawa, 2006

#### **B. Extracurricular readings**

- W. Szymański, Chemia jądrowa, PWN, Warszawa 1996

### **Knowledge**

1. knows and understands the basic concepts of radiochemistry, radiology and radiotoxicity,
2. has knowledge about the influence of ionizing radiation on living organisms,
3. knows the natural and artificial radioactive elements in the environment and sources of their origin,
4. understands the concept of radiotoxicity and knows its groups,
5. has knowledge about the origin of radionuclides in the human body,
6. understands the radiological effects of the collection of radionuclides by humans as a result of breathing, eating and smoking,
7. knows what are the radiological effects of radionuclides content in building materials,
8. knows the radiological effect of the catastrophes at Chernobyl and Fukushima nuclear power plants,
9. knows the goals and tasks of monitoring environmental radioactive contamination.

### **Skills**

1. understands the basic concepts of radiochemistry and radiotoxicology,
2. recognizes the most important natural and artificial radionuclides contained in man,
3. can assess the radiological consequences of human absorption of radionuclides from the air, water and food and as a result of smoking,
4. is able to assess the impact of building materials on the radiation dose coming from inhalation of radon and sees the need to introduce a radon norm,
5. is able to assess the most important radioactive hazards for humans and knows how to reduce them,
6. is able to assess radiological threats arising as a result of local or global contamination of radioactivity.

### **Social competence**

1. understands the need for further education in the field of monitoring of radiochemical contamination of the environment,
2. demonstrates creativity in limiting the absorption of radionuclides by humans and makes the society aware of the effects of excessive incorporation of radionuclides,
3. can transfer knowledge in the society about sources of radiochemical contamination in building materials,