

SUBJECT CARD (SYLLABUS)

Description of the subject

Subject code		Subject	Wykład monograficzny I	
BiJPŻ/P/I/NST/43			Monographic lecture I	
Lecture language		Polish		
Academic year		2021/2022		
Field of study		Safety and Quality of Food Production		
Within the scope of		---		
Level of the studies		first cycle		
Profile of the studies		practical		
Form of the studies		part-time		
Semester / semesters		VI		
Membership of the group of classes		B2 Group of directional classes - to choose from		
Status of the subject		Optional		
Forms of realization of didactic classes, assessment, ECTS points		Form of the classes	Number of didactic hours	Number of ECTS points
		Lecture	18 [h]	4 ECTS
		
Connection of the subject	with the profile of the studies	Shapes the practical skills		0 ECTS
	with the entitlements	Its purpose is to acquire engineering competences by the student		2,0 ECTS
	with discipline	Food and nutrition technology Chemical engineering Management and quality sciences		1,0 ECTS 2,0 ECTS 1,0 ECTS
Form of teaching		Traditional - classes organized at the University or classes carried out with the use of distance learning methods and techniques		
Preliminary requirements		-		
University		Faculty of Chemical Engineering and Commodity Science, Department of Management and Product Quality		
Coordinator		dr hab. inż. Małgorzata Kowalska, prof. UTH		
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RESULTS OF STUDYING, PROGRAMME CONTENT, CONDUCT OF DIDACTIC CLASSES, VERIFICATION OF THE RESULTS OF STUDYING

Education aim:	The aim of the course is to familiarize students with the complex participation of heavy metals in the trophic chain, especially with a potential impact on food safety and human health.
Programme content:	Lecture: <ol style="list-style-type: none"> 1. Heavy metals. Basic definitions. Bio-elements and metals that do have no known biological role (1 h) 2. Metal geochemistry. Physical and chemical forms of metals in the environment. Natural and anthropogenic sources of heavy metals emission. Occurrence and migration of metals in the biosphere and

	anthroposphere 3. Biogeochemical cycles of selected metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Sn and Zn) (2 h). 4. Heavy metals in surface waters, soils, and living organisms (plants and animals) (2 h). 5. Ecotoxicity and toxicity to humans. Heavy metal standards in air, soils, waters and consumer goods, including foodstuffs (3h). 6. Analytical methods for examining the heavy metals content. Standardized methods for the determining trace elements in foodstuffs. Speciation analysis and chemical fractionation (4 h). 7. Assessment of human exposure to heavy metals. Examples of human exposure: seafood arsenic, alcohol and lead, kidney cadmium, blood lead level (4 h).
Didactic (education) methods:	Informative lecture supported by multimedia presentations
Pass discipline, evaluation criteria of the achieved learning results, calculation method of the final mark:	The condition for completing the course is achieving all the required learning outcomes specified for the course.

Results of learning a given subject in respect of direction effect and the form of the classes				Methods of verification of the results of learning	
Number of the result of learning	Description of the results of learning for a given subject Student, who passed a given subject knows and understands/ is able to/ is ready to:	Direction effect of learning	Form of classes	Form of verification (passes)	Methods of verification and assessment
W1	The student knows and understands the basic definitions, terms and phenomena concerning the occurrence of heavy metals in the environment, their biological role and properties. He knows standardized analytical methods for examining the content of metals, which are necessary to solve tasks and problems in the area of food safety and quality.	K_WG01 K_WG02	Lecture	Written test	Single-choice test
W2	The student knows and understands the changes taking place in food related to the various chemical forms of heavy metals, which have a potential impact on food safety and human health.	K_WG04	Lecture	Written test	Single-choice test
W3	The student knows the concept of risk and safety risk assessment resulting from the toxicity of heavy metals present in raw materials and food products. He knows the methods of assessing exposure in the field of food quality and safety management.	K_WG05	Lecture	Written test	Single-choice test
W4	The student knows the standards and legal regulations related to the production of food products in the field of food safety and quality, regarding the presence of toxic heavy metals in raw materials and food products.	K_WG06	Lecture	Written test	Single-choice test
W5	He knows and understands development trends in the field of reducing the level of heavy metals in agricultural raw materials to improve food safety and quality, taking into account the idea of sustainable development.	K_WK07	Lecture	Written test	Single-choice test

Literature and scientific support

Basic literature:

- Kabata-Pendias A., Pendias H., Biogeochemia pierwiastków śladowych. PWN, Warszawa 1999.
- Siemiński M., Środowiskowe zagrożenia zdrowia. PWN, Warszawa 2007.
- Wierzbicka M. (red.), Ekotoksykologia, rośliny, gleby, metale. WUW, Warszawa 2015.
- Reilly C., Metal contamination of food. Its significance for food quality and human health. Blackwell Science, UK 2002.
- Świetlik R., Trojanowska M., Dębska P. (2018). Modeling of chemical speciation of iron releasing from commercially available oral iron supplements and iron food fortificants, Journal of Elementology, 23(3), 999-1007.
- Trojanowska M., Świetlik R. (2016). Wpływ palenia papierosów na ryzyko zdrowotne mieszkańców miast wywołane środowiskową ekspozycją inhalacyjną na metale ciężkie (As, Cd, Ni). Medycyna Środowiskowa – Environmental Medicine, 19, 3, 23-30.
- Świetlik R., Trojanowska M. (2014). Specjacja fizyczna metali ciężkich w naparach kawy. Bromatologia i Chemia Toksykologiczna, XLVII(1), 82-88.

8. Świetlik R., Malik I. (2012). Specjacja metali śladowych w wodach mineralnych. Bromatologia i Chemia Toksykologiczna, XLV(4), 1254–1263.

Supplementary literature:

1. Świetlik R., Kowalczyk D., Normatywy i metody badań metali ciężkich w środowisku gruntowym. Analityka, 2005, 4, 35-37.
2. Świetlik R., Kowalczyk D., Normatywy i metody badań metali ciężkich w powietrzu. Analityka, 2006, 2, 19-21.
3. Świetlik R., Kowalczyk D., Normatywy i metody badań metali ciężkich w żywności. Analityka, 2006, 3, 22-25.
4. Świetlik R., Kowalczyk D., Normatywy i metody badań metali ciężkich w materiałach i wyrobach przeznaczonych do kontaktu z żywnością. Analityka, 2007, 2, 15-18.
5. Świetlik R., Kowalczyk D., Normatywy i metody badań metali ciężkich w materiałach i produktach handlowych. Analityka, 2007, 3, 8-10.
6. Świetlik R., Normatywy i metody badań metali ciężkich w wodach powierzchniowych i podziemnych. Analityka, 2009, 4, 15-20.

Amount of student's labour necessary to achieve the assumed effects of learning – ECTS points balance			
Participation in the classes, activity	Student's burden [h]		
	Other contact hours	Classes without teachers - student's own work	Didactic classes
Participation in lectures	X	X	18 [h]
Participation in practical classes	X	X	X
Participation in consultations	10 [h]	X	X
Preparation for the classes Preparation for the pass	X	37 [h]	X
Summary student's workload	10 [h]/ 0,6 ECTS	37[h]/2,3 ECTS	18[h]/ 1,1 ECTS
ECTS points for a subject	4,0 ECTS		

Additional information, notes