

SUBJECT CARD (SYLLABUS)

Description of the subject

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|---|---------------------------------|---|--------------------------|-----------------------|----------------------------------|
| 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 | | full-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 | 30 [h] | 4 ECTS | |
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| | | ... | ... | | |
| 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 | Chemical engineering Food and nutrition technology Management and quality sciences | | | 2,0 ECTS 1,0 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 | | | |
| Website | | www.wicit.uniwersytetradom.pl | | | |
| E-mail address, coordinator's phone number | | m.kowalska@uthrad.pl | | | |

RESULTS OF STUDYING, PROGRAMME CONTENT, CONDUCT OF DIDACTIC CLASSES, VERIFICATION OF THE RESULTS OF STUDYING

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| 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 |

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| | 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 | 30 [h] |
| Participation in practical classes | X | X | X |
| Participation in consultations | 10 [h] | X | X |
| Preparation for the classes Preparation for the pass | X | 60 [h] | X |
| Summary student's workload | 10 [h]/ 0,4 ECTS | 60[h]/2,4 ECTS | 30[h]/ 1,2 ECTS |
| ECTS points for a subject | 4,0 ECTS | | |

Additional information, notes

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