Information sheet for the course
Laboratory methods in environment

University: *Alexander Dubček University of Trenčín*

Faculty: *Faculty of Health Care*

Course unit code: *LMŽivP/d*

Course unit title: *Laboratory methods in environment*

Type of course unit: *compulsory*

Planned types, learning activities and teaching methods:
Lecture: 1 hour weekly/13 hours per semester of study; full-time
Seminar: 1 hour weekly/13 hours per semester of study; full-time

Number of credits: *2*

Recommended semester: *4th semester in the 2nd year (full-time)*

Degree of study: *I (bachelor)*

Course prerequisites: *none*

Assessment methods:
To obtain credits for the course, a student must pass an oral or written examination (50 points).
- Active participation at student practical exercises (0-5 points).
- Work out protocols from practical exercises (0-5 points).
- Pass the written test from the problem presented during the lectures (0-80 points).
- *To obtain A, a student must score at least 70 points, to obtain B, a student must score at least 60 points, to obtain C, a student must obtain at least 50 points, to obtain D, a student must obtain at least 40 points, and finally to obtain E, a students must to obtain at least 30 points.*

Learning outcomes of the course:
A student demonstrates the analysis of water and food by employing the methods of volumetric analysis, spectrophotometric methods, potentiometry, atomic absorption spectrophotometry, chromatography, turbidimetry, conductometry and pH metry and is able to use rapid mobile testing in mobile analytics.

Course contents:
Lectures

1. *Water – component of the biosphere, water as a subject of interest to public health (for drinking, bathing, natural and artificial pools). Current legislation.*
2. *Choice of criteria by government regulation on quality of water , Codex Alimentarius and European Union legislation.*
3. *Spectrophotometric determination of indicators in water.*
4. *Instrumental methods in the water analysis, principle and application of methods (potentiometry, AAS, liquid chromatography, gas chromatography).*
5. *Measurement of physical parameters in water.*
6. *Measuring methods for identifying indicators in water.*
7. *Metal analysis in water, the selection of proper method.*
8. *Legislation in the field of food, definition of basic concepts.*
9. *Attachments and contaminants in the food chain.*
10. *Analytic methods in food.*
11. *Analysis of attachments and contaminants – principles of methods.*
12. *Instrumental methods in food analysis, principle and use of methods (potentiometry, AAS, liquid chromatography, gas chromatography).*
13. *Monitoring of contaminants in food and the importance of their monitoring.*

Practical exercises:

1. Preparation of the reagent and standard solutions.
2. Spectrophotometric determination of ammonia in water.
3. Calculation and construction of a calibration line, the measurement samples.
4. Measurement of pH, conductivity, colour and turbidity in water.
5. Measurement of the AAS.
6. Cell tests – mobile analytics.
7. Preparation of accurate solutions.
8. Modification of food samples prior to analysis.
9. Preparation of volumetric sodium thiosulfate solution, determination of its exact concentration.
10. Determination of potassium iodate in the sample of table salt titration.
11. Spectrophotometric determination of potassium ferrocyanide in table salt.
12. Isolation and identification of dyes in food.
13. Identification of dyes by the method of TLC.

Recommended of required reading:

1. *GARAJ, J., BUSTIN, D., HLADKÝ, Z.: Analytická chémia, Alfa/SNTL, Bratislava, 1987*
2. *HOLZBECHER, Z., CHURÁČEK, J. a kol.: Analytická chemie, SNTL/Alfa, Praha, 1987*
3. *HIGSON, P.J.: Analytical chemistry, Oxford, 2004*
4. *ZÝKA, J.: Analytická příručka 1 , SNTL/Alfa, Praha, 1979*
5. *GARAJ, J. a kol.: Fyzikálne a fyzikálnochemické analytické metódy, Alfa, Bratislava, 1977*
6. *ZELENSKÝ, I. a kol.: Seminár a cvičenie z analytickej chémie, PriF UK, Bratislava, 1999*
7. *ČAKRT, M., KRUPČÍK, J., MOCÁK, J. a kol.: Analytická chémia Praktikum 1, SVST, Bratislava, 1981*
8. *Platná legislatíva.*
9. *Manuály k prístrojom.*
10. *Štandardné pracovné postupy laboratória.*

Language: *Slovak*

Remarks:

Evaluation history:
Number of evaluated students: 59

a	b	c	d	e	f
67.80%	28.71%	3.39%	0.00%	0.00%	0.00%

Lectures:
doc. MUDr. Mária Štefkovičová, PhD.

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Supervisor: *doc. MUDr. Jana Slobodníková, CSc.*