Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Izbrana poglavja v analizni kemiji
Course title:	Selected topics in analytical chemistry

Študijski program in stopnja **Study programme and level**	**Študijska smer** **Study field**	**Letnik** **Academic year**	**Semester** **Semester**
Enovit magistrski študijski program druge stopnje Predmetni učitelj	**/**	**2.**	**Poletni** **Spring**
Five-year master's degree program Subject Teacher	**/**		

Vrsta predmeta / Course type	Izbirni / Elective
Univerzitetna koda predmeta / University course code:	

Predavanja **Lectures**	**Seminar** **Seminar**	**Vaje** **Tutorial**	**Lab. vaje** **Laboratory work**	**Terenske vaje** **Field work**	**Samost. delo** **Individ. work**	**ECTS**
15			15		60	**3**

Nosilec predmeta / Lecturer:	Mitja Kolar

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Potrebno je predhodno osnovno znanje analizne kemije in instrumentalnih metod v analizni kemiji.	Basic knowledge of analytical chemistry and instrumental methods in analytical chemistry.

Vsebina:

- Pregled izbranih analiznih metod in postopkov ter njihova uporabnost za analizo realnih vzorcev.
- Vzorčenje kot del analitskega postopka (vzorčenje, hranjenje, stabilnost...)
- Analitika živil: uvod v osnovno sestavo kmetijskih in živilskih izdelkov (določanje osnovnih kakovostnih parametrov v živilskih izdelkih in določanje dovoljenih ter nedovoljenih dodatkov v živilske izdelke).
- Pristnost v povezavi s kmetijskimi in živilskimi izdelki, zakonsko ozadje v povezavi s pristnostjo kmetijskih in živilskih izdelkov (uporaba analiznih metodologij za preverjanje pristnosti kmetijskih in živilskih proizvodov).
- Analitika v farmacevtski in fitofarmacevtski industriji v povezavi z okoljem (določanje ostankov in metabolitov zdravil ter fitofarmacevtskih sredstev v okolju, živalih in ljudeh).

Content (Syllabus outline):

- Overview of selected analytical methods and other analytical procedures for real samples analysis.
- Sampling as a part of the analytical procedure (sampling, storing, stability...).
- Food analysis: introduction to basic composition of agricultural and food products (determination of basic quality parameters of food products and determination of permitted and prohibited additives in food products.
- Authenticity in connection with agricultural and food products, legislative connected with authenticity of agricultural and food products (application of analytical methodologies for checking the authenticity of agricultural and food products).
- Analytical chemistry in pharmaceutical and phytopharmaceutical industry (analysis of drugs, their metabolites and phytopharmaceutical residues in environment, animals and humans).

Temeljni literatura in viri / Readings:

1. Principles of Instrumental Analysis, Skoog D.A., Leary J.J., Saunders College Publishing, 2005.
2. Food Additive Users Handbook, J. Smith, Kluwer Academic Pub, 06/01/1991.
3. Food Chemistry, H.D. Belitz, D. Belitz, Springer-Verlag, Berlin, 1999.
4. Pesticide, veterinary and other residues in food, David H. Watson (Editor) CRC Press, 2004.

Cilji in kompetence:

Cilj predmeta je seznaniti študente s:

- uporabnostjo različnih analiznih tehnik in postopkov za analizo realnih vzorcev.
- vzorčenje, princip, pomen in napake pri vzorčenju,
- teoretskimi osnovami pomembnimi za vrednotenje kakovosti in varnosti kmetijskih in živilskih izdelkih z uporabnostjo različnih metodoloških pristopov za ugotavljanja pristnosti kmetijskih in živilskih izdelkov,
- možnostmi prisotnost zdravju škodljivih snovi v kmetijskih in živilskih izdelkih.
- uporabnostjo sodobnih analiznih metod v povezevi z farmacevtsko in fitofarmacevtsko industrijo in okoljem.

Objectives and competences:

The aim of the subject is:

- application of different analytical methods and other analytical procedures for real samples analysis.
- sampling, principles and errors connected with real samples.
- theory and principles important for evaluation of quality and safety of food and agricultural products and application of different methodologies for determination of the authenticity of agricultural and food products,
- possibilities of presence of health hazardous compounds in agricultural and food products.
- application of analytical chemistry in pharmaceutical and phytopharmaceutical industry.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: - pravilna izbira analiznih metod in postopkov glede na vrsto realnega vzorca. - razumevanje problematike povezane s pristnostjo kmetijskih in živilskih izdelkov, - kompleksnosti uporabe različnih analiznih metodologij za ugotavljanje varnosti in kakovosti živilskih izdelkov, zdravil in fitofarmacevtskih sredstev.	Knowledge and Understanding: - selection of appropriate analytical methods for real samples analysis. - understanding of problems connected with the authenticity of agricultural and food products, - complexity of the use of different analytical methodologies for determination of safety and quality of agricultural and food, pharmaceutical and phytopharmaceutical products.
Prenesljive/ključne spretnosti in drugi atributi: Predmet se dopolnjuje s predmeti, ki vsebujejo analitske vsebine (instrumentalne metode, okolje, kemometrija, itd.).	Transferable/Key Skills and other attributes: The subject is related to subjects that include analtical chemistry (instrumental methods, environment, chemometrics, etc.).

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja v učilnici, ki je opremljena z osnovnimi avdio-vizualnimi pripomočki.	Lectures in lecture room, equipped with basic audio-visual equipment.
Individualna priprava seminarskih nalog s predstavitvijo in diskusijo.	Individual preparation of seminars and their presentation with discussion.
Laboratorijske vaje.	Lab course.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način ocenjevanja (izpraševanje - ustni izpit, seminarska naloga):	60	Type (examination, oral, coursework, project):
- ustni izpit:	30	- oral examination:
- seminarska naloga:	10	- seminar - coursework:
- vaje		- Lab work

Reference nosilca / Lecturer's references:

1. BRGLEZ, Polonca, HOLOBAR, Andrej, PIVEC, Aleksandra, BELŠAK, Nataša, KOLAR, Mitja. Determination of oxygen by means of a biogas and gas - interference study using an optical tris (4,7-diphenyl-1,10-phenanthroline) ruthenium(II) dichloride complex sensor. *Acta chim. slov.*.

[Tiskana izd.], 2012, vol. 59, no. 1, str. 50-58, graf. prikazi. http://acta.chem-soc.si/59/59-1-50.pdf. [COBISS.SI-ID 15889686]

2. PIVEC, Tanja, PERŠIN, Zdenka, HRIBERNIK, Silvo, MAVER, Tina, KOLAR, Mitja, STANA-KLEINSCHEK, Karin. Binding silver nano-particles onto viscose non-woven using different commercial sol-gel procedures = Vezava srebrovih nano-delcev na viskozno kopreno z različnimi komercialnimi sol-geli. *Mater. tehnol.*, 2012, vol. 46, no. 1, str. 75-80. http://mit.imt.si/Revija/izvodi/mit121/pivec.htm. [COBISS.SI-ID 15775510]
3. ZAJŠEK, Katja, KOLAR, Mitja, GORŠEK, Andreja. Characterisation of the exopolysaccharide kefiran produced by lactic acid bacteria entrapped within natural kefir grains. *Int. j. dairy technol.*, 2011, vol. 64, issue 4, str. 544-548, doi: 10.1111/j.1471-0307.2011.00704.x. [COBISS.SI-ID 15278870]
4. KOŠIR, Iztok Jože, KOLAR, Mitja. Use of aromatic profiles as a tool for determining the authenticity of fruit juices = Uporaba aromatskih profilov kot orodja za določanje pristnosti sadnih sokov. *Hmelj. bilt.*, 2010, letn. 17, str. 83-90. [COBISS.SI-ID 542348]