Univerza v Mariboru

Fakulteta za kemijo
in kemijsko tehnologijo

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Pregled tehnologij**
Course title:	**Technologies overview**

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna kemija	**/**	**3**	**zimski**
Educational Chemistry	**/**	**3**	**zimski**

Vrsta predmeta / Course type Obvezni_Izbirni / Obligatory_Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
60			**15**		**75**	**5**

Nosilec predmeta / Lecturer: Maja Leitgeb

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Znanje iz anorganske, organske in fizikalne kemije.	Basic knowledge of inorganic, organic and physical chemistry.

Vsebina:

- Osnove kemijske in biokemijske tehnike.
- Energija in goriva (fosilna ter alternativna).
- Proizvodnja biodizla in bioetanola.
- Keramična industrija.
- Druge anorganske tehnologije (proizvodnja žveplove kisline)
- Jedrska industrija.
- Eksplozivi.
- Prehrambena industrija (pridobivanje olja in maščob, sladkorja).
- Organske tehnologije (agrokemična industrija, mila in detergenti).
- Fermentacijska industrija.
- Farmacevtska industrija.
- Pregled novejših tehnologij.
- Laboratorijske vaje v povezavi s proizvodnjo nekaterih produktov.

Content (Syllabus outline):

- Basics of chemical and biochemical engineering.
- Energy and fuels (fossil and alternative fuels).
- Production of biodiesel and bioethanol.
- Ceramic industries.
- Other inorganic technologies (production of sulfuric acid).
- Nuclear industries.
- Explosives.
- Food industries (manufacture of ois and fats, sugar).
- Organic technologies (agrichemical industries, soap and detegents).
- Fermentation industries.
- Pharmaceutical industries.
- Overview of novel technologies.
- Laboratory exercises in the connection with the production of some products.

Temeljni literatura in viri / Readings:

- Shreves Chemical Process Industries, 6th ed., Mcgraw Hill Book Company, New York, 1997.
- Wiley-VCH (ed.), Ullmann's Biotechnology and Biochemical Engineering, 2 Volume Set, Wiley-VCH, Weinheim (Germany), 1st.edition, 2007.
- Gad, Shayne Cox (ed.), Handbook of Pharmaceutical Biotechnology and Pharmaceutical Development, Wiley-VCH, Weinheim (Germany), 1st.edition, 2007.
- P.G. Jessop, W. Leitner, Chemical Synthesis Using Supercritical Fluids, Wiley-VCH, Weinheim, 1999.

Cilji in kompetence:

- Program obsega spoznavanje posameznih vrst tehnologij v kemijski industriji,
- študenti spoznajo poleg »klasičnih« tehnologij tudi novejše tehnologije,
- študenti se soočijo s pomenom biotehnologije.

Objectives and competences:

- The program comprehends some basic technologies in chemical industries,
- students comprehense among classical technologies, novel technologies, as well,
- students confront with the importance of biotechnology.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:	Knowledge and understanding:
• Razumevanje posameznih tehnologij na osnovi komponent, kot so osnovne mehanske in termične operacije ter reakcijski sistemi. **Prenesljive/ključne spretnosti in drugi atributi:** • Vsebina predmetaje osnova za razumevanje vsebine predmeta Strokovni ogledi z varstvom okolja na drugi stopnji.	• Understanding of technologies on the basis of cpompounds, such as unit operations and reaction systems. **Transferable/Key Skills and other attributes:** • The subject is the basis for understanding of the subject Professional excursions with environmental protection.

Metode poučevanja in učenja:	Learning and teaching methods:
• Predavanja • Laboratorijske vaje • Individualno delo	• Lectures • Laboratory excersises • Individual work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
• Laboratorijske vaje • Pisni izpit • Ustno izpraševanje	20 % 40 % 40 %	• Laboratory work • Written examination • Oral examination

Reference nosilca / Lecturer's references:

• KNEZ, Željko, MARKOČIČ, Elena, LEITGEB, Maja, PRIMOŽIČ, Mateja, KNEZ HRNČIČ, Maša, ŠKERGET, Mojca. Industrial applications of supercritical fluids : a review. *Energy*, ISSN 0360-5442. 2014, 1-9, doi: 10.1016/j.energy.2014.07.044. [COBISS.SI-ID 18010134

• ŠULEK, Franja, DROFENIK, Mihael, HABULIN, Maja, KNEZ, Željko. Surface functionalization of silica-coated magnetic nanoparticles for covalent attachment of cholesterol oxidase. J. magn. magn. mater.. [Print ed.], Jan. 2010, vol. 322, iss. 2, str. 179-185, doi: 10.1016/j.jmmm.2009.07.075. [COBISS.SI-ID 13418262]

• LEITGEB, Maja, ČOLNIK, Maja, PRIMOŽIČ, Mateja, ZALAR, Polona, GUNDE-CIMERMAN, Nina, KNEZ, Željko. Activity of cellulase and [alpha]-amylase from *Hortaea werneckii* after cell treatment with supercritical carbon dioxide. *The Journal of supercritical fluids*, ISSN 0896-8446. 2013, 78, 143-148 [COBISS.SI-ID 16864790].

• KAVČIČ, Sabina, KNEZ, Željko, LEITGEB, Maja. Antimicrobial activity of n-butyl lactate obtained via enzymatic esterification of lactic acid with n-butanol in supercritical trifluoromethane. *The Journal of supercritical fluids*, ISSN 0896-8446. 2014, 85, 143-150, doi: 10.1016/j.supflu.2013.11.003. [COBISS.SI-ID 17392406].

• ŠULEK, Franja, PÉREZ FERNÁNDEZ, Daniel, KNEZ, Željko, LEITGEB, Maja, SHELDON, Roger A. Immobilization of horseradish peroxidase as crosslinked enzyme aggregates (CLEAs). *Process biochemistry*, ISSN 1359-5113, 2011, 46 (3), 765-769, doi: 10.1016/j.procbio.2010.12.001. [COBISS.SI-ID 14712598].

Nagrade:
1998 Messer Griesheim Preis (Innovationspreis 1998)
2003 Srebrna plaketa Univerze v Mariboru

Projekti, v katerih je nosilec sodeloval v zadnjih 3 letih oz. trenutno sodeluje:
Uporabna biokataliza
Magnetni delci kot potencialni nosilci bioaktivnih učinkovin