Fakulteta za industrijski inženiring
Faculty of Industrial Engineering

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Kemija goriv in polimerov
Course title:	Chemistry of fuels and polymers

Študijski program Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Inženiring in avtomobilska industrija Magistrski študij	program nima smeri	prvi	-
Engineering and Automotive Industry Master degree study	The program has no study fields	First	-

Vrsta predmeta / Course type	Izbirni / Optional
Univerzitetna koda predmeta / University course code:	**MAG_21022**

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45	**-**	**45**	**-**	**-**	**150**	**8**

Nosilec predmeta / Lecturer:	**Doc. dr. Igor Simonič**

Jeziki / Languages:	**Predavanja / Lectures:**	Slovenski / Slovenian
	Vaje / Tutorial:	Slovenski / Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
– Vpis v 1. letnik magisterskega študija.	– Enrollment in the first year of master degree study.

Vsebina:	**Content (Syllabus outline):**
– Viri goriv. – Les: sestava in postopki predelave lesa v plinska ali tekoča goriva. – Premogi in postopki predelave premogov: ○ nastanek, sestava, vrste premogov,	– Sources of fuels. – Wood: composition and processes of wood transformations to gaseous or liquid fuels. – Coals and processing of coals: ○ formation, composition, types of coals, ○ types of coals processing; manufacturing of coke, coal gasification and liquification

○ postopki predelave premogov: koksanje, uplinjanje, utekočinjanje (DCL in FT procesi). – Nafta (zemeljsko olje) in postopki predelave nafte: ○ nastanek, sestava, vrste nafte, ○ postopki predelave nafte: frakcionirna destilacija, kreking, reforming. – Tekoča goriva za vozila: ○ vrste, sestava, analitika goriv (oktanovo in cetanovo število, energetska vsebnost, nečistote itd.). – Maziva in tenzidi. – Ekološki vidiki fosilnih goriv. – Biogoriva: vrste in generacije biogoriv, sestava, postopki pridobivanja, prihodnost biogoriv. – Polimerni materiali: zgodovina, sestava, vrste in uporaba posameznih vrst polimerov, ○ postopki pridobivanja polimerov, ○ analitika polimerov, ○ polimeri prihodnosti: karbonska vlakna, kompoziti, ogljikove nanocevke, ○ Ekološki vidiki uporabe polimernih materialov.	(DCL and FT processes) – Earth oil and processing of crude oil:. – formation, composition, types of earth oil – oil processing: fractionating, crecking, reforming – Liquid fuels for vehicles: ○ types, composition, fuels analytics (octane and cetane number, energy content, impurities, etc.). – Lubricants and tensides. – Ecological aspects of fossil fuels. – Biofuels: types and generations of biofuels, composition, production processes, trends in biofuels. – Polymer materials: ○ history, composition, types and use in technic, ○ production processes of polymer materials, ○ analytics of polymers, ○ polymers of future: carbon fiber reinforced polymer, composites, carbon nanotubes, ○ ecological aspects of polymer materials use.

Temeljna literatura in viri / Readings:

– A. Kornhauser, Les, premog, nafta, plin, Državna založba Slovenije, Ljubljana, 1984
– M. Vrtačnik, N. Zupančič Brouwer, Organska kemija, Tehniška založba Slovenije, 2003
– F. Premerl, Kemija in tehnologija premoga in nafte, Univerza v Ljubljani, Ljubljana, 1970
– M. Žigon, Uvod v polimere, Kemijski inštitut, Ljubljana, 2006

Priporočljiva literatura / Recomended Textbooks

– R. O. Ebewele, Polymer Science and technology, CRC Press LLC, Boca Raton, 2000
– e-gradivo na naslovu: http://www.substech.com/dokuwiki/doku.php?id=carbon_fiber_reinforced_polymer_composites
– J. M. Corum et al, Basic properties of Reference Crossply Carbon-Fiber Composite, ORNL, 2000, dostopno na http://web.ornl.gov/~webworks/cpr/v823/rpt/106099.pdf

Cilji in kompetence:	**Objectives and competences:**
Cilji	***Objectives***
– Usvojiti znanje o kemiji goriv in tehničnih polimerov, vrstah, sestavi, pripravi, uporabi, kontroli kvalitete in ekoloških vidikih uporabe. – Spoznati temeljno izrazoslovje področja kemije goriv in polimernih materialov – Spoznati nekatera orodja in pristope za izbiro primernosti posameznih goriv in polimernih materialov pri razvoju novih izdelkov.	– Achive knowlidge on chemistry of fuels and technical polymers, types, composition, production processes, use in technic, quality control and ecological aspects of its use – To learn fundamental nomenclature of chemistry of fuels and polymers – Recognize some of the tools and approaches for the selection of the suitability of the fuel and polymer materials in the development of new products.
Kompetence	***Competences***
– Sposobnost uporabe pridobljenega teoretičnega znanja s področja goriv in polimernih materialov v praksi. – Sposobnost oblikovanja in implementacije izvirnih znanstvenih in tehničnih rešitev danih problemov in priložnosti na področju tehnike.	– Ability to use theoretical knowledge in the field of fuel and polymer materials in practice. – Ability of design and implementation of original scientific and technical solutions of problems and possibilities in the field of technic.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: – Razvoj novih veščin in sposobnosti v uporabi znanja na svojem konkretnem raziskovalnem področju. – Avtonomnost pri raziskovalnem in strokovnem delu na področju tehnike. – Sposobnost predstavitve pridobljenih znanstvenih izsledkov v obliki publikacij v mednarodni znanstveni periodiki. – Zavezanost profesionalni etiki.	Knowledge and understanding: – Development of new skills and the ability to use knowledge in a specific field of research. – Autonomy in research and professional work in the field of art. – Ability public presentation of scientific results in the form of publications in international scientific journals. – Commitment to professional ethics.

Metode poučevanja in učenja:	**Learning and teaching methods:**
– predavanja – individualno in skupinsko delo s študenti v obliki konzultacij – projektna naloga s praktičnim primerom	– lectures – individual and group work with students in the form of consultations – project work with a practical example

Načini ocenjevanja:	Delež (v %) / Weight (in%)	Assessment:
– projektna naloga – ustni izpit – končna ocena izpita je povprečje vsote ocen posameznih deležev z upoštevanjem uteži	50 50	– project work – oral examination – the final grade of the exam is the average of both grades

Reference nosilca / Lecturer's references:

- STANOVNIK, Branko, SVETE, Jurij, TIŠLER, Miha, ŽORŽ, Lilijana, HVALA, Aleš, SIMONIČ, Igor. Transformation of amines and N-heterorylformamidines into esters of substituted [beta]-amino-[alpha],[beta]dehydro-[alpha]-amino acids. Heterocycles, 1988, vol. 27, no. 4, str. 903-909. [COBISS.SI-ID 19499269]
- HVALA, Aleš, SIMONIČ, Igor, STANOVNIK, Branko, SVETE, Jurij, TIHI, Jaroslav, TIŠLER, Miha. Methyl 2-benzoylamino-3-dimethylaminopropenoate, a versatile reagent in organic synthesis. The transformation of various heterocyclic amines into methyl 2-benzoylamino-3-heteroarylaminopropenoates. Vestn. Slov. kem. druš., 1989, let. 36, št. 3, str.305-323. [COBISS.SI-ID 11185410]
- STANOVNIK, Branko, BOVENKAMP, Henry van der, SVETE, Jurij, HVALA, Aleš, SIMONIČ, Igor, TIŠLER, Miha. Methyl 2-benzoylamino-3-dimethylaminopropenoate in the synthesis of heterocyclic sistems. An attempt to prepare benzoylamino substituted azolo- and azinopyrimidines with a bridgehead nitrogen atom. J. heterocycl. chem., February 1990, vol. 27, no. 2, str. 359-361. [COBISS.SI-ID 19424261]
- SIMONIČ, Igor. Synthesis of some new potential biologically active 1,4-dihydropyridines. Acta chim. slov.. [Tiskana izd.], 1997, 44, 1, str. 95-104. [COBISS.SI-ID 19403269]
- SIMONIČ, Igor, STANOVNIK, Branko. The synthesis of some dialkyl 4-(3-substituted amino)phenyl-1,4-dihydro-2,6-dimethylpyridine 3, 5-dicarboxylates. J. heterocycl. chem., 1997, letn. 34, št. 6, str. 1725-1730. [COBISS.SI-ID 9464537]
- SIMONIČ, Igor. Hantzscheva sinteza dihidropiridinov. Kem. šoli, oktober 1999, letn. 11, št. 3, str. 17-21. [COBISS.SI-ID 3262025]
- SIMONIČ, Igor, ZUPANČIČ, Silvo, GOLIČ, Ljubo, STANOVNIK, Branko. Fotokemična pretvorba dietil (E)-4-[2-[2-(tert-butoksikarbonil)vinil]fenil]-2,6-dimetil-1,4-dihidropirid in-3,5-dikarboksilata. V: GLAVIČ, Peter (ur.), BRODNJAK-VONČINA, Darinka (ur.). Slovenski kemijski dnevi 2001, Maribor, 20. in 21. september 2001. Zbornik referatov s posvetovanja. Maribor: Slovensko kemijsko društvo, 2001, str. 339-342. [COBISS.SI-ID 23838469]
- SIMONIČ, Igor, ZUPANČIČ, Silvo, GOLOBIČ, Amalija, GOLIČ, Ljubo, STANOVNIK, Branko. The crystal structure of lacidipine phototransformation product. Acta chim. slov.. [Tiskana izd.], 2008, vol. 55, no. 2, str. 458-461. [COBISS.SI-ID 29570053]
- ZUPANČIČ, Vinko, SMRKOLJ, Matej, BENKIČ, Primož, SIMONIČ, Igor, PLEVNIK, Miha, RITLOP, Gregor, KRISTL, Albin, VREČER, Franc. Preformulation investigation of some clopidogrel addition salts. Acta chim. slov.. [Tiskana izd.], 2010, vol. 57, no. 2, str. 376-385. [COBISS.SI-ID 2822769]
- 10. SIMONIČ, Igor. Izvajanje uredbe CLP v farmacevtski industriji : Primerjava razvrščanja in označevanja nekaterih farmacevtskih učinkovin = The Implementation of CLP in the

pharmaceutical industry : Comparison of classification and labelling of certain pharmaceutical ingredients. V: GORENC ZORAN, Annmarie (ur.). Tehnologija v dobi trajnostnega razvoja : zbornik povzetkov = Technology in the era of sustainable development : conference proceedings abstracts. Novo mesto: Fakulteta za industrijski inženiring, 2016, str. 25-26. http://rii.fini-unm.si/wp-content/uploads/2016/04/Zbornik-povzetkov-konference_FINAL-WEB.pdf. [COBISS.SI-ID 1181942]