

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		prvi	
Engineering and automotive industry		First	

Vrsta predmeta / Course type Izbirni / Optional

Univerzitetna kod 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:

Prerequisites:

<ul style="list-style-type: none"> - Vpis v 1. letnik magistrskega študija. 	<ul style="list-style-type: none"> - Enrollment in the first year of master degree study.
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Vsebina:

Content (Syllabus outline):

<ul style="list-style-type: none"> - Viri goriv - Les: sestava in postopki predelave lesa v plinska ali tekoča goriva. - Premogi in postopki predelave premogov <ul style="list-style-type: none"> • nastanek, sestava, vrste premogov • postopki predelave premogov: koksanje, uplinjanje, utekočinjanje • (DCL in FT procesi). 	<ul style="list-style-type: none"> - Sources of fuels. - Wood: composition and processes of wood transformations to gaseous or liquid fuels. - Coals and processing of coals: <ul style="list-style-type: none"> • formation, composition, types of coals • types of coals processing; manufacturing of coke, coal gasification and liquification (DCL and FT processes) - Earth oil and processing of crude oil: formation, composition, types of earth oil oil processing: fractionating, crecking, reforming
<ul style="list-style-type: none"> - 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.). 	<ul style="list-style-type: none"> - 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,

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<ul style="list-style-type: none"> - 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, <ul style="list-style-type: none"> • zgodovina, sestava, vrste in uporaba posameznih vrst polimerov, • proizvodni postopki polimernih materialov, • analitika polimerov, • polimeri prihodnosti: karbonska vlakna, kompoziti, ogljikove nanocevke, • ekološki aspekti uporabe polimernih materialov 	<p>composition, production processes, trends in biofuels.</p> <ul style="list-style-type: none"> - Polymer materials: <ul style="list-style-type: none"> • 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.
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Temeljni literatura in viri / Readings:

<ul style="list-style-type: none"> - 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 - M. Koprivnikar, Pridobivanje biomase [Elektronski vir], Maribor : Biotehniška šola, 2010, dostopno na: http://www.mizs.gov.si/fileadmin/mizs.gov.si/pageuploads/podrocje/ss/Gradiva_ESS/Biotehniška_podrocja_ole_za_zivljenje_in_razvoj/BT_PODROCJA_61NARAVOVARSTVO_Ppridobivanje_Koprivnikar.pdf - E-gradiva predmeta E-Course material

Priporočljiva literatura / Recommended Textbooks

<ul style="list-style-type: none"> - R. O. Ebewele, Polymer Science and technology, CRC Press LLC, Boca Raton, 2000 - D. Kopeliovich, Carbon Fiber Reinforced Polymer Composites, dostopno na: 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
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Cilji in kompetence:

Objectives and competences:

<p>Cilji</p> <ul style="list-style-type: none"> - Usvojiti znanje o gorivih in tehničnih, polimerih, 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. 	<p>Objectives</p> <ul style="list-style-type: none"> - Achieve knowledge 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.
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<p>Kompetence</p> <ul style="list-style-type: none"> - 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. 	<p>Competences</p> <ul style="list-style-type: none"> - 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.
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Predvideni študijski rezultati:

Intended learning outcomes:

<p><i>Študent/študentka:</i></p> <ul style="list-style-type: none"> - 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. 	<p><i>Student:</i></p> <ul style="list-style-type: none"> - 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.
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Metode poučevanja in učenja:

Learning and teaching methods:

<ul style="list-style-type: none"> - Predavanja, - Individualno in skupinsko delo s študenti v obliki konzultacij - projektna naloga s praktičnim primerom <p>Predmet je oblikovan na kombinirani način študija, ki vključuje aktivnosti preko elektronskega (on-line) okolja: te aktivnosti so sestavljene iz samostojnih in skupinskih aktivnosti z uporabo učnega okolja Moodle in drugih elektronskih vsebin. Praviloma vključujejo diskusije v forumih, spletne strani, ogled posnetih predavanj in vaj, preverjanje znanja, odgovori na vprašanja, iskanje po spletu (bazah) itd.</p>	<ul style="list-style-type: none"> - Lectures - individual and group work with students in the form of consultations - project work with a practical example <p>The course is designed as blended learning that includes online activities; Online activities consist of independent and group activities using the LMS Moodle and other electronic or online content. Activities usually include discussions in forums, websites, viewing of recorded lectures and tutorials, assessments, answering questions, searching the web (databases), etc.</p>
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Načini ocenjevanja:

Delež/Weight (%)

Assessment:

<ul style="list-style-type: none"> - projektna naloga - ustni izpit <p>Ocenjevalna lestvica je skladna z ECTS in Pravilnikom o preverjanju in ocenjevanju znanja FINI NM.</p>	<p>50%</p> <p>50%</p>	<ul style="list-style-type: none"> - project work - oral examination <p>Evaluation scale in accordance with ECTS and the Rules on the Evaluation and Assessment of Knowledge FINI NM.</p>
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Reference nosilca / Lecturer's references:

1. 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]
2. 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]
3. STANOVNIK, Branko, BOVENKAMP, Henry van der, SVETE, Jurij, HVALA, Aleš, SIMONIČ, Igor, TIŠLER, Miha. Methyl 2-benzoylamino-3-dimethylaminopropenoate in the synthesis of heterocyclic systems. 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]
4. 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]
5. SIMONIČ, Igor, ZUPANČIČ, Silvo, GOLIC, 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]
6. SIMONIČ, Igor, ZUPANČIČ, Silvo, GOLOBIČ, Amalija, GOLIC, 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]
7. 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]
8. 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. [COBISS.SI-ID 1181942]
9. SIMONIČ, Igor, BENKIČ, Primož, VAJS, Anamarija, KRAMAR, Andrejka, ŠTIMAC, Anton. Process for preparing crystalline form II of orlistat : EP1973893 B1. München: European Patent Office, 2016. [COBISS.SI-ID 4284529]
10. SIMONIČ, Igor, BENKIČ, Primož, ZUPET, Rok, SMRKOLJ, Matej, ŠTUKELJ, Mitja. Process for the synthesis of clopidogrel and new forms of pharmaceutically acceptable salts thereof : EP2078025 B1. München: European Patent Office, 2016. [COBISS.SI-ID 4281969]
11. KOTAR-JORDAN, Berta, SIMONIČ, Igor, ZUPET, Rok, RUŽIČ, Miloš, GRČMAN, Marija, PEČAVAR, Anica. Crystallisation of solid forms of clopidogrel addition salts : EP 1656381 B1 : patent. München: European Patent Office, 2011. [COBISS.SI-ID4281457]