

ZELENE TEHNOLOGIJE V SODOBNI DRUŽBI

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Zelene tehnologije v sodobni družbi
Course title:	Green Technologies in Modern Society
Članica nosilka/UL	UL FKKT
Member:	

Študijski programi in stopnja	Študijska smer	Letnik	Semestri	Izbirnost
Kemijska tehnologija, prva stopnja, visokošolski strokovni	Ni členitve (študijski program)	2. letnik, 3. letnik	2. semester	izbirni

Univerzitetna koda predmeta/University course code: 0643421

Predavanja /Lectures	Seminar /Seminar	Vaje /Tutorials	Klinične vaje /Clinical tutorials	Druge oblike študija /Other forms of study	Samostojno delo /Individual student work	ECTS
45	30				75	5

Nosilec predmeta/Lecturer: izr. prof. dr. Dan Podjed, izr. prof. dr. Gabriela Kalčikova

Vrsta predmeta/Course type: izbirni strokovni/Elective Professional

Jeziki/Languages: Predavanja/Lectures: Slovenščina
Vaje/Tutorial:

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: Študent mora imeti predmet opredeljen kot študijsko obveznost.
Prerequisites: The course has to be assigned to the student.

Vsebina:

- Uvod v zelene tehnologije in vplivi družbe in tehnike na razvoj zelenih tehnologij.
- Koncept zelenega prehoda v kemijskih in sorodnih tehnoloških procesih iz antropološkega vidika.
- Primerjava obstoječih konceptov in sodobnih zelenih procesov v kemijski in sorodni industriji.
- Tehnološke in procesne smernice za vpeljavo ter integracijo zelenih tehnologij
- Razumevanje prednosti in omejitev zelenega prehoda in njegova implementacija v procesih odločanja znotraj industrijskih sistemov in širše.
- Koncept prehoda od uporabe primarnih virov k sekundarnim ter obnovljivim virom v industrijskih procesih.
- Štirje koraki razvoja trajnostnih tehnologij po meri ljudi in okolja (identifikacija, analiza, interpretacija, testiranje).

Content (Syllabus outline):

- Introduction to green technologies and influence of the development of society and technology on green technologies.
- Concept of green transition in chemical and related technological processes from anthropological point of view.
- Comparison of existing and modern green processes in chemical and related industries.
- Technological and process guidelines for the introduction and integration of green technologies
- Understanding the benefits and limitations of the green transition and its implementation in decision-making processes within industrial systems and beyond.
- The concept of transitioning from the use of primary resources to secondary and renewable resources in industrial processes.
- Four steps to developing sustainable technologies for people and

<ul style="list-style-type: none"> - Pomen družbene in kulturne raznolikosti pri uvajanju zelenih tehnologij. - Družboslovne metode za spoznavanje načinov življenja, kratkoročno vplivanje na vedenje ter dolgoročno spreminjanje navad. 	<p>the environment (identification, analysis, interpretation, testing). - The importance of social and cultural diversity in the adoption of green technologies. - Social science methods for learning about lifestyles, short term influences on behavior, long term influences on habit formation.</p>
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Temeljna literatura in viri/Readings:

<ul style="list-style-type: none"> - A.R. Braden, D.J. Richards. The Greening of Industrial Ecosystems, National Academy Press, 1994. - V. Piemonte, M. De Falco, A. Basile: Sustainable Development of Chemical Engineering Innovative Technologies, Wiley and Sons, 2013. - R. Ehrlich, H. A. Geller, Renewable Energy: A First Course, CRC Press, Taylor & Francis Group, 2017 - D. Podjed idr. Four Steps for the People: People-centred Development Toolkit. Dostopno na: http://people-project.net/wp-content/uploads/2019/12/M2.4_Toolkit.pdf, 2019.

Cilji in kompetence:

<p>Študent spozna sodobne trende, ključne za zeleni prehod v kemijski in sorodnih industrijah. Seznan se z načini vključevanja sodobnih tehnologij v obstoječo ali na novo načrtovano proizvodnjo. Študent je sposoben samostojno uporabiti pridobljena znanja pri reševanju realnih izzivov zelenega prehoda v industriji. Spozna razvoj po meri ljudi in pomen odmika od siceršnje paradigme, tj. strokovnega razvoja v raziskavah in industriji. Seznan se z izdelki in storitvami, ki spodbujajo trajnostne načine življenja.</p>	<h3>Objectives and competences:</h3> <p>The student learns about recent trends that are crucial to the green transition in the chemical and related industries. He/she learns how to integrate modern technologies into existing or newly designed productions. The student is able to independently use the acquired knowledge in solving the challenges of the green transition in industry. He/she learns about development according to people needs and the importance of moving from the usual paradigm, i.e. professional development in research and industry. He/she learns about products and services that support sustainable lifestyles.</p>
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Predvideni študijski rezultati:

<h4>Znanje in razumevanje</h4> <p>Študent pridobi znanja o možnosti uporabe sodobnih tehnologij, ki so ključne pri trajnostnem razvoju in zelenem prehodu. Študent razume možnosti uporabe zelenih tehnologij za različne industrije. To mu omogoča analizo določene problematike in sintezo znanj pri njenem reševanju.</p> <h4>Uporaba</h4> <p>S pridobljenim znanjem je študent sposoben sodelovati pri vpeljavi koncepta zelene tehnologije v industrijski sistem. Sposoben je upoštevati temeljne korake razvoja po meri ljudi in okolja pri razvoju zelenih tehnologij.</p> <h4>Refleksija</h4> <p>Študent kombinira znanje, ki ga pridobi pri predavanjih ter pri pripravi projekta in s tem pridobi kompetence za ovrednotenje podatkov in prenos znanja v raziskovalni in/ali tehnološki proces. Zaveda se družbenega in okoljskega vpliva lastnih odločitev. Razume, kako rešitve, ki nastajajo v industriji, vplivajo na njegovo življenje.</p> <h4>Prenosljive spretnosti</h4> <p>Spretnost uporabe literature in teoretičnega znanja v</p>	<h3>Intended learning outcomes:</h3> <h4>Knowledge and Comprehension</h4> <p>The student acquires knowledge of the ways to use modern technologies that are critical to sustainable development and the green transition. The student understands the opportunities of green technologies for different industries. He/she is able to analyze a specific problem and apply the acquired knowledge to solve the problem.</p> <h4>Application</h4> <p>With the acquired knowledge, the student is able to participate in the implementation of the concept of green technology in the industrial system. He/she will be able to consider the basic development steps in green technologies based on human and environmental needs.</p> <h4>Analysis</h4> <p>The student combines the knowledge acquired during lectures and preparation of a project, thus acquiring skills for evaluation and knowledge transfer in the research and/or technological process. She/he is aware of the social and environmental impact of his own decisions. She/he understands how the solutions created in industry affect her/his daily life.</p>
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praktičnih aplikacijah. Sposobnost kritičnega razmišljanja. Uporaba ustnega in pisnega načina poročanje. Komunikacijske sposobnosti. Sposobnost analize, sinteze in razumevanja tehnoloških rešitev in vplivov na družbo. Etična odgovornost.	Skill-transference Ability Ability to apply literature and theoretical knowledge in practice. Ability to think critically. Application of oral and written reporting methods. Communication skills. Ability to analyse, combine and understand technological solutions and their impact on society. Ethical responsibility.
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Metode poučevanja in učenja: Predavanja, projektno delo.	Learning and teaching methods: Lectures, project.
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Načini ocenjevanja:	Delež/Weight	Assessment:
Pisni izpit	60,00 %	Written exam
Projektno delo (pogoj za pristop k izpitu)	40,00 %	Project (mandatory before exam)

Reference nosilca/Lecturer's references:

- ROZMAN, Ula, **KALČIKOVÁ, Gabriela**, MAROLT, Gregor, SKALAR, Tina, ŽGAJNAR GOTVAJN, Andreja. Potential of waste fungal biomass for lead and cadmium removal : characterization, biosorption kinetic and isotherm studies. Environmental technology & innovation. 2020.
- ŽGAJNAR GOTVAJN, Andreja, **KALČIKOVÁ, Gabriela**. Delamination of plastic-coated waste paper by enzymes of the white rot fungus Dichomitus squalens. Journal of environmental management. 2018.
- **KALČIKOVÁ, Gabriela**, ŽGAJNAR GOTVAJN, Andreja. From dumping to sustainable landfilling : the concept of aerobic landfills. V: JACKSON, Carla H. Landfills and recycling centers : processing systems, impact on the environment and adverse health effects. New York: Nova Science Publishers, 2015.
- ZAVRATNIK, Veronika, **PODJED, Dan**, TRILAR, Jure, HLEBEC, Nina, KOS, Andrej, STOJMENOVA DUH, Emilija. Sustainable and community-centred development of smart cities and villages. Sustainability. 2020, št. 10, 3961, str. 1-17.
- **PODJED, Dan**. Razvoj etnografsko utemeljene tehnološke rešitve. Glasnik Slovenskega etnološkega društva. 2019, 59, št. 1, str. 39-48.
- **PODJED, Dan**. Razvoj rešitev za ravnanje z odpadki po meri ljudi. V: PODJED, Dan (ur.), et al. Nevidno življenje odpadkov. 1. izd. Ljubljana: Založba ZRC, 2022. Str. 125-142.