Fakulteta za industrijski inženiring
Faculty of Industrial Engineering

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Ekologija in obnovljivi viri
Course title:	Ecology and renewable energy

Študijski program Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Inženiring in vozila		3 letnik	letni
Engineering and vehicles		3 year	summer

Vrsta predmeta / Course type	obvezni
Univerzitetna koda predmeta / University course code:	**VS_11020**

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45	**-**	**15**	**-**	**-**	**60**	**4**

Nosilec predmeta / Lecturer:	Doc. dr. Damjan Balabanič / Assist. Prof. Damjan Balabanic, PhD
Jeziki / Languages: Predavanja / Lectures:	slovenski/Slovenian
Vaje / Tutorial:	slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Vpis v 3. letnik	Enrolment in third year.

Vsebina:	**Content (Syllabus outline):**

– Osnove ekologije
– Okoljska zakonodaja
– Osnove energije
– Vpliv okolja na zdravje ljudi
– Okoljska onesnaževala
– Obnovljivi viri energije
  ○ sončna energija
  ○ vetrna energija
  ○ energija vode
  ○ biomasa
  ○ geotermalna energija
  ○ energija morja in oceanov
  ○ nuklearna energija
– Globalno segrevanje
– Voda
– Odpadki
  ○ splošno
  ○ izrabljena motorna vozila
	– Fundamentals of ecology
	– Environmental regulations
	– Fundamentals of energy
	– Environment and human health
	– Environmental pollutants
	– Renewable energy sources
	  ○ energy of sun
	  ○ wind turbines
	  ○ water energy
	  ○ biomass
	  ○ geothermal energy
	  ○ ocean energy
	  ○ nuclear energy
	– Global warming
	– Water
	– Wastes
	  ○ general
	  ○ end-of-life vehicles

Temeljna literatura in viri / Readings:

Obvezna literatura / Obligatory literature

- Medved S., Arkar C. 2009. Energija in okolje: obnovljivi viri energije. Zdravstvena fakulteta, Ljubljana
- Botkin D.B., Keller E.A. 2014. Environmental Science: Earth as a Living Planet. John Wiley & Sons. United States of America
- E-gradiva predmeta / E-Course material

Priporočljiva literatura / Recommended literature

- Yuksel I. 2008. Global warming and renewable energy sources for sustainable development in Turkey. Renewable energy, 33: 802-812
- Omer A.M. 2008. Energy, environment and sustainable development. Renewable and Sustainable Energy Reviews, 12: 2265-2300
- Kreith F., Goswami D.Y. 2000. Handbook of Energy Efficiency and Renewable Energy, CRC Press
- Uredba o izrabljenih vozilih (Uradni list, RS, št. 32/11, 45/11, 26/12 in 84/18-ZIURKOE)

Cilji in kompetence:

Cilji

Študenti se:

- seznanijo s problematiko vpliva ekologije in njene pomembnosti.
- seznanijo z regulativami iz tega področja in z osnovnimi načini uporabe ekološko prijaznih tehnologij.
- spoznajo tudi načine rabe obnovljivih virov energije.

*K**ompetence***

- sposobnost evidentiranja problema in njegove analize,
- sposobnost obvladanja standardnih razvojnih metod, postopkov in procesov,
- sposobnost uporabe pridobljenega teoretičnega znanja v praksi,
- avtonomnost v strokovnem delu s področja ekologije in obnovljivih virov,
- sposobnost razumevanja in uporabe sodobnih teorij s področja tehniških, tehnoloških in naravoslovnih ved,
- sposobnost stalne uporabe informacijske in komunikacijske tehnologije na svojem strokovnem področju.

Objectives and competences:

Objectives

Students:

- learn about environmental problems
- learn about importance of environment, environmental legislations, best available environmental technologies and use of renewable energy sources.

Competences

- ability to record the problem and its analysis
- ability to control the development of standard methods, procedures and processes
- autonomy in professional work in the field of ekology and renewable energy
- ability to understand and use modern technologies in the field of technical, technological and natural sciences
- ability to use information and comunication technologies from their professional fields.

Predvideni študijski rezultati:

Študent/študentka:

- Pozna in razume osnovne ekološke problematike
- Razlikuje med okoljsko primernimi metodami pridobivanja energije
- Pozna osnove uporabe alternativnih virov energije

Intended learning outcomes:

Student:

- Get basic knowledge in the field of environmental problems
- distinguishes between environmentally friendly energy source methods
- basic knowledge in the field of renewable energy sources

– Opredeli pri izbiri okolju prijaznih metod, postopkov in procesov	– define the choice of environmentally friendly methods, procedures and processes

Metode poučevanja in učenja: **Learning and teaching methods:**

Avditorna predavanja Študije primerov *Kratka predavanja* z aktivno udeležbo študentov (razlaga snovi, pogovori, vprašanja, primeri, reševanje problemov). *Individualne in skupinske konzultacije* (pogovori, dodatna razlaga, obravnava specifičnih vprašanj).	Frontal lectures Case studies Short lectures with active student participation (discussions, talks, questioning, cases, problem-solving). Individual and group consultations (discussions, additional explanations, discussing specific questions).

Načini ocenjevanja:	**Delež /Weight (%)**	**Assessment:**
- pisni izpit - Seminarska naloga Ocenjevalna lestvica je skladna z ECTS in Pravilnikom o preverjanju in ocenjevanju znanja FINI NM.	75 % 25 %	- Written exam - Seminar paper Evaluation scale in accordance with ECTS and the Rules on the Evaluation and Assessment of Knowledge FINI NM.

Reference nosilca / Lecturer's references:

1.01 Izvirni znanstveni članek

1. BALABANIČ, Damjan, FILIPIČ, Metka, KRIVOGRAD-KLEMENČIČ, Aleksandra, ŽEGURA, Bojana. Raw and biologically treated paper mill wastewater effluents and the recipient surface waters: cytotoxic and genotoxic activity and the presence of endocrine disrupting compounds. Science of the total environment, 2017, vol. 574, str. 78-89

2. KRIVOGRAD-KLEMENČIČ, Aleksandra, KRZYK, Mario, DREV, Darko, BALABANIČ, Damjan, KOMPARE, Boris. Recycling of textile wastewaters treated with various combinations of advanced oxidation processes (AOP) = Recikliranje tekstilnih odpadnih voda očiščenih z različnimi kombinacijami naprednih oksidacijskih postopkov (AOP). Acta hydrotechnica, 2012, 25, 42, str. 31-39

3. BALABANIČ, Damjan, HERMOSILLA, Daphne, MERAYO, Noemi, KRIVOGRAD-KLEMENČIČ, Aleksandra, BLANCO, Angeles. Comparison of different wastewater treatments for removal of selected endocrine-disruptors from paper mill wastewaters. Journal of environmental science and health. Part A, Toxic/hazardous substances & environmental engineering, 2012, vol. 47, no. 10, str. 1350-1363

4. BALABANIČ, Damjan, ŽEGURA, Bojana, KRIVOGRAD-KLEMENČIČ, Aleksandra, FILIPIČ, Metka. Ugotavljanje mutagene/genotoksične aktivnosti odpadnih vod papirne industrije = Determination of mutagenic/genotoxic activity of paper mill wastewaters. Papir : revija Društva inženirjev in tehnikov papirništva, jun. 2012, letn. 40, št. 7, str. 28-31

5. BALABANIČ, Damjan, KRIVOGRAD-KLEMENČIČ, Aleksandra. Presence of phthalates, bisphenol A, and nonylphenol in paper mill wastewaters in Slovenia and efficiency of aerobic and combined aerobic-anaerobic biological wastewater treatment plants for their removal. Fresenius environmental bulletin, 2011, vol. 20, no. 1, str. 86-92

6. KRIVOGRAD-KLEMENČIČ, Aleksandra, BALABANIČ, Damjan. Fitobentos in kakovost vode v mrtvicah reke Mure = Phytobenthos and water quality in the Mura river's oxbows. Natura Sloveniae : revija za terensko biologijo, 2010, letn. 12, št. 2, str. 5-22

7. KRIVOGRAD-KLEMENČIČ, Aleksandra, GRIESSLER BULC, Tjaša, BALABANIČ, Damjan. The effectiveness of chemical-free water treatment system combining fibre filters, ultrasound, and UV for fish farming on algal control. Periodicum biologorum : an interdisciplinary international journal of the Societas Scientarium Naturalium Croatica established 1885, 2010, vol. 112, no. 2, str. 211-217

8. BALABANIČ, Damjan, ZULE, Janja, KRIVOGRAD-KLEMENČIČ, Aleksandra. Ali so biološke čistilne naprave učinkovite za odstranjevanje potencialnih hormonskih motilcev? = Are biological waste water treatment plants efficient for removal of potential endocrine disrupters?. Papir : revija Društva inženirjev in tehnikov papirništva, junij 2009, letn. 37, št. 1, str. 25-28

1.02 Pregledni znanstveni članek

9. BALABANIČ, Damjan. Ocena življenjskega cikla (LCA) papirnih izdelkov = Life cycle assessment (LCA) of paper products. Papir : revija Društva inženirjev in tehnikov papirništva, nov. 2013, letn. 41, št. 10, str. 30-32

10. BALABANIČ, Damjan, RUPNIK, Marjan, KRIVOGRAD-KLEMENČIČ, Aleksandra. Negative impact of endocrine-disrupting compounds on human reproductive health. Reproduction, fertility and development, 2011, vol. 23, no. 3, str. 403-416