

	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	Okoljske tehnologije
Course title	Environmental Technologies

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Upravljanje z okoljem/ 2. stopnja	Ni smeri študija	2. letnik	3.
Environmental Management/ 2 nd Cycle	No study field	2 nd year	3 th

Vrsta predmeta/Course type

obvezni/obligatory

Univerzitetna koda predmeta/University course code

2_UO_2_UN3

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30		15			105	6

Nosilec predmeta/Lecturer:

doc. dr. Boštjan Rajh

Jeziki/ Predavanja/Lectures:
Languages:

slovenski/Slovenian

Vaje/Tutorial:

slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisites:

- Vpis v drugi letnik študijskega programa.
- Študent mora pred izpitom pripraviti in predstaviti ter zagovarjati raziskovalno nalogo.

- A prerequisite for inclusion is enrolment in the second year of study.
- Student has to prepare, present and defend a research paper before the examination.

Vsebina:

Content (Syllabus outline):

- *Uvod* (onesnaženost okolja, OZN sonaravni cliji, Zeleni dogovor EU).
- *Čiščenje voda* (voda kot surovina, vzroki in vrste onesnaženja, čiščenje voda: biofiltri, boireaktorji, komunalne čistilne naprave).
- *Čiščenje zraka* (viri onesnaževanja, tehnologije čiščenja: cikloni, filtri, mokri suhi, pralne kolone, kemični postopki sorbcije, adsorpcije).
- *Izboljšanje okolja* (postopki za izboljšanje habitatov: vodnih, poljedeljskih, gozdnih, urbanih).

- *Introduction* (pollution of the environment. UN development goals, EU green deal).
- *Water purification* (water as a raw material, causes and types of pollution, water purification: biofiltration, bioreactors, wastewater treatment plant).
- *Air purification* (sources of pollution, purification technologies: cyclones, wet and dry filtration, chemical reactors (absorption, adsorption)).

<ul style="list-style-type: none"> • <i>Sonaravni inženiring</i> (načela in cilji, primeri v industriji, prometu, urbanizmu). • <i>Obnovljivi viri energije</i> (uvod, prednosti in slabosti, vplivi na okolje). • <i>Učinkovita raba snovi in energije</i> (snovni tokovi, sonaravno rananje z odpadki, redke snovi, okolju neprijazne snovi, nanodelci, učinkovita raba energije). • <i>Zakonodaja in okoljske tehnologije</i> (direktive, zakoni, uredbe, pravilniki). 	<ul style="list-style-type: none"> • <i>Environment remediation</i> (processes for habitat improvement: water, agricultural, forest, urban). • <i>Sustainable engineering</i> (principles and goals, examples in industry, transport and urban planning). • <i>Renewable energy</i> (introduction, advantages/disadvantages, environmental impact). • <i>Material and energy efficiency</i> (material flows, rare materials, environmentally unfriendly materials, nanoparticles, energy efficiency in buildings, industry and transport). • <i>Regulations and environmental technologies</i> (directives, laws, orders, rules).
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Temeljna literatura in viri/Readings:

- Nath, B. in Cholakov, G. (2018). Pollution Control Technologies, eISBN 978-1-84826-116-7; ISBN 978-1-84826-566-0.
- Drev D., čuvan J. (2013). Okoljevarstvene tehnologije. Fit media
- Vrhovšek D., Vovk Korže A. (2007). Ekoremediacije. Maribor : Filozofska fakulteta, Mednarodni center za ekoremediacije; Ljubljana : Limnos.

Priporočljiva literatura/Recommended literature

- Coley D. (2008). Energy and Climate Change: Creating a Sustainable Future. John Wiley & Sons.
- Samec N., Lobnik A. (2009). Okoljsko inženirstvo, učbenik. Maribor : Fakulteta za strojništvo.

Cilji in kompetence:

Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc:

- celovito kritično mišljenje, sposobnost analize, sinteze in predvidevanje rešitev s področja naravoslovnih, tehničnih, ekoloških, upravnih, inovacijskih in ekonomskih problemih v okolju in drugih družbenih ved (interdisciplinarnost),
- avtonomnost in odgovornost pri pripravi rešitev, obravnavi predlogov in odločanju.
- poznavanje in razumevanje naravoslovno-tehničnih, ekoloških, pravnih, inovacijskih in ekonomskih vidikov varstva okolja in trajnostnega razvoja,

Objectives and competences:

The learning unit mainly contributes to the development of the following general and specific competences:

General competences:

- comprehensive critical thinking, ability to analyse, synthesize and anticipate solutions in the fields of natural, technical, ecological, administrative, innovation and economic problems in the environment and other social sciences (interdisciplinarity),
- autonomy and responsibility in finding solutions, discussing proposals and making decisions.
- knowledge and understanding of the scientific-technical, ecological, legal, innovative and economic aspects of environmental protection and sustainable development,

<ul style="list-style-type: none"> • obvladovanje izbranih orodij metodologije okoljskih raziskav za reševanje okoljskih problemov, njihova uporaba ob interdisciplinarnem povezovanju, • sposobnost za reševanje konkretnih problemov v okolju z uporabo analitičnih, raziskovalnih in drugih metod in postopkov, • poznavanje zelene infrastrukture in zelenih sistemov in njihov pomen za zdravje prebivalcev in trajnostno načrtovanje in zmožnost za valorizacijo, razvoj in vključitev v plane in projekte, • sposobnost uporabe okoljskih tehnologij in sistemov na področju upravljanja z okoljem. 	<ul style="list-style-type: none"> • mastery of selected tools of environmental research methodology to solve environmental problems, their application in interdisciplinary integration, • ability to solve specific environmental problems using analytical, research and other methods and procedures, • knowledge of green infrastructure and green systems and their importance to public health and sustainable planning, and the ability to evaluate, develop and integrate them into plans and projects, • ability to apply environmental technologies and systems in the field of environmental management.
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Predvideni študijski rezultati:

Študent/študentka:

- usvoji pomembnost osnovnih procesov za zmanjšanje emisij v vodo in zrak,
- pojasni delovanje naprav za zmanjšanje emisij,
- razvije sposobnost pristopa k novim raziskavam,
- se usposobi za samostojno kritično presojo uporabnosti različnih procesov v praksi, vključno z njihovo kvantitativno in kvalitativno analizo.

Intended learning outcomes:

Students:

- master the importance of the basic principles of mitigation technologies for emissions to water and air,
- explain how mitigation technologies work,
- develop skills in approaching new research
- develop skills for autonomous critical evaluation for practical application of various processes, including their qualitative and quantitative analyses.

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov),
- *seminarske vaje*: priprava, predstavitev in uspešen zagovor individualne raziskovalne naloge, obisk sistema za ravnanje z odpadki Snaga, Ljubljana.

Learning and teaching methods:

- *lectures* with active student participation (explanation, discussion, questions, examples, problem solving),
- *seminar tutorial*: preparation, presentation and a successful defence of a research paper, a visit to the waste management system Snaga, Ljubljana.

Načini ocenjevanja:

- Načini:
- izpit
 - izdelava, predstavitev in zagovor raziskovalne naloge

Delež (v %)
Weight (in%)

60 %
40 %

Assessment:

- Types:
- examination
 - preparation, presentation and defence of the research paper

Ocenjevalna lestvica: ECTS.		Grading scheme: ECTS.
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