

	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	Okoljske sanacije in prenove
Course title	Environmental Remediation and Land Restoration

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. / 4.
Environmental Management/ 2 nd Cycle	No study field	2 nd year	3 th / 4 th

Vrsta predmeta/Course type izbirni / elective

Univerzitetna koda predmeta/University course code 2_UO_IP_UN1

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

Nosilec predmeta/Lecturer: doc. dr. Mateja Breg Valjavec

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 drugi letnik študijskega programa. • Študent mora pred izpitom pripraviti in predstaviti ter zagovarjati raziskovalno nalogo. <p>Študenti bodo ocenjeni na osnovi izdelave in predstavitve raziskovalne naloge, ki obsega širše poznavanje tematike. Študenti morajo pozitivno opraviti izpit.</p>	<ul style="list-style-type: none"> • 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. <p>Students will be assessed by the preparation and presentation of research paper which will include general knowledge of the subject. Students will be required to pass an examination.</p>
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Vsebina:

Content (Syllabus outline):

<ul style="list-style-type: none"> • <i>Uvod</i> (Opredelitev pojmov sanacija okolja, degradacija okolja, degradirano območje(DO), degradirano urbano območje). • <i>Okoljski problemi naravne degradacije</i> (Naravna degradacija okolja in njeni družbenoekonomski vidiki, tipi naravne degradacije (erozija- 	<ul style="list-style-type: none"> • <i>Introduction</i> (Definition of environmental remediation, environmental degradation, land degradation degraded land (area), brownfield site). • <i>Environmental issues of natural land degradation</i> (Socio-economic aspects of naturally induced land degradation,
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<p>kmetijstvo, žled-gozdarstvo, poplave-poselitev-gospodarstvo, potres-infrastruktura; graviklastični procesi-turizem itd.).</p> <ul style="list-style-type: none"> • <i>Okoljski problemi antropogene degradacije</i> (Tipi antropogene degradacije okolja: pridobivanje mineralnih surovin, industrijska proizvodnja, odlaganje odpadkov, emisije plinov in odpadnih vod; družbenoekonomski vidik). • <i>Ocene vplivov na okolje</i> (Ranljivost različnih okolij, analize metode določanja ranljivosti okolja (relief, prst, vegetacija, vode, zrak), GIS metode, terenske metode določanja in merjenja stopnje ranljivosti). • <i>Paradigme in metode okoljske sanacije in prenove</i> (Paradigme, metode in postopki za oživljanje degradiranih območij glede na tip DO, fitoremediacija, sanacija odlagališča, vzpostavitev prvotne rabe, gradbeni posegi, kulturna industrija, itd.); pregled primerov DO v Sloveniji in po svetu: degradirana urbana območja/DUO, degradirana antropogena območja zunaj mestnih območij, naravno degradirana območja itd.). • <i>Zakonodajni okvir in vključevanje javnosti.</i> 	<p>types of land degradation: soil erosion & agriculture, sleet & forestry, flood & settlement & economy, earthquake & infrastructure, graviclastic processes & tourism etc.).</p> <ul style="list-style-type: none"> • <i>Environmental issues of anthropogenic degradation</i> (Types of anthropogenic degradation: mineral extraction, industry, waste disposal, gas and sewage emissions, etc. Socio-economic aspects of anthropogenic land degradation). • <i>Environmental vulnerability assessment</i> (Environmental vulnerability of different environments, vulnerability of environmental elements (relief, soil, vegetation, water, air), GIS methods in-situ methods to measure vulnerability level). • <i>Paradigms and methods for environmental remediation and land restoration</i> (Paradigms, methods and remediation/restoration methods considering the type of environmental degradation: phytoremediation, landfill remediation, land use improvement, construction measures, cultural industries etc.); examples of good practises from Slovenia and abroad: urban brownfields, rural brownfields, naturally degraded land). • <i>Legislative framework and public participation.</i>
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Temeljna literatura in viri/Readings:

Temeljna literatura/Basic literature

- Chabay I. Frick M., Helgeson J. (2015). Land Restoration: Reclaiming Landscapes for a Sustainable Future. Elsevier. <https://doi.org/10.1016/C2013-0-18711-9>.

Priporočljiva literatura/Recommended literature

- Breg Valjavec, M. (2013). *Nekdanja odlagališča odpadkov v vrtačah in gramoznicah*. Geografija Slovenije 26. Ljubljana: Založba ZRC. <https://zalozba.zrc-sazu.si/sl/publikacije/nekdanja-odlagalisca-odpadkov-v-vrtacah-in-gramoznicah#v>
- Breg Valjavec, M., Smrekar, A., Polajnar Horvat, K. (2020). Human-induced degradation in Slovenia. The geography of Slovenia : small but diverse, Cham: Springer Nature: 303-312,

- Zorn, M., Tiran, J., Breg Valjavec, M. (2020). Pokrajinska preobrazba Velenjske kotline zaradi pridobivanja lignita. Velenje, industrijsko mesto v preobrazbi, Capacities 1. Ljubljana: Založba ZRC, str. 199-212.
- Breg Valjavec, Janža, M., Smrekar, A. (2018). Environmental risk resulting from historical land degradation in alluvial plains considered for dam planning. Land degradation & development <https://onlinelibrary.wiley.com/doi/pdf/10.1002/ldr.3168>, doi: 10.1002/ldr.3168.
- Breg Valjavec, M., Zorn, M., Čarni, A. (2018). Bioindication of human-induced soil degradation in enclosed karst depressions (dolines) using Ellenberg indicator values (Classical Karst, Slovenia). Science of the total environment 640/641, str. 117-126.
- Breg Valjavec, Zorn, M., Čarni, A. (2018). Human-induced land degradation and biodiversity of Classical Karst landscape : on the example of enclosed karst depressions (dolines). Land degradation & development 29(10): 3823-3835. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/ldr.3116>.
- Breg Valjavec, M., Ribeiro, D., Čarni, A. (2017). Vegetation as the bioindicator of human-induced degradation in karst landscape : case study of waste-filled dolines = Vegetacija kot bioindikator antropogene degradacije kraške pokrajine : primer z odpadki zapolnjene vrtače. Acta Carsologica 46 (1), str. 95-110.

Cilji in kompetence:

Glavni cilj je študenta seznaniti z najpogostejšimi oblikami degradacije v okolju ter ga usposobiti za strokovno in samostojno delo na različnih področjih, kjer je potrebno izvajati odločitve in ukrepe v zvezi s sanacijo, upravljanjem, razvojem in ponovnim oživljanjem različnih tipov degradiranih območij. Študent pridobi s predmetom naslednje kompetence:

- je sposoben prepoznati in razločevati območja naravne in antropogene degradacije v okolju,
- zna določiti naravne ali družbene procese, ki so povzročili degradacijo okolja,
- zna kritično prepoznati vpliv degradacije na posamezne okoljske prvine,
- pozna obstoječe načine prenove degradiranih območij in lahko kritično sodeluje pri odločanju o razvoju degradiranih območij,
- pozna različne terenske metode za določanje stopnje degradacije (npr. vzorčenje prsti, merjenje električne upornosti tal, fitopopis itd.).

Objectives and competences:

The main goal of the course is to familiarise the student with the most common types of land degradation and to train him/her to work professionally and independently at various levels of remediation, planning and management levels, taking into account brownfield lands and other environmentally vulnerable areas. During the course the student will acquire the following knowledge and competences:

- can identify and separate the areas of natural and anthropogenic environmental degradation,
- can identify natural and social processes that are causing land degradation,
- can identify the effects of land degradation on different natural elements of the environment (relief, soil, vegetation, water, air),
- is familiar with all available types of reactivation of degraded land and can critically engage in decision-making processes regarding further development of degraded land,
- is familiar with different field methods for determining and assessing the degree of degradation (soil sampling, electrical resistance measurements, ecological assessment etc.).

Predvideni študijski rezultati:	Intended learning outcomes:
<p>Študent/študentka:</p> <ul style="list-style-type: none"> • pozna in ovrednoti najsodobnejše pristope in metode pri preučevanju degradacije in sanacije okolja, • analizira stanje okolja in posledice človekovega delovanja v okolju, • razume prostor kot neobnovljiv naravni vir, • se usposobi za uporabo najprimernejših metodoloških pristopov pri odločanju o ponovnem razvoju posameznega degradiranega območja, • celostno in interdisciplinarno vrednoti degradacijo in njene učinke na okolje, družbo in gospodarstvo, in izbira ustrezen način okoljske sanacije, • razvije praktična znanja in izkušnje o kritičnem prepoznavanju, vrednotenju in načrtovanju trajnostnih posegov v degradirano okolje. 	<p>Students:</p> <ul style="list-style-type: none"> • know and evaluate the most advanced approaches and methods in the field of land degradation and remediation, • analyze the environment and the consequences of human activities in the environment, • understand space/environment as a non-renewable natural resource, • are able to use and apply the most appropriate methodological approaches as decision support for redevelopment of degraded land, • are able to assess environmental degradation and its impact on the environment, society and the economy in an integrative and interdisciplinary manner and select appropriate methods for environmental remediation, • develop practical knowledge and experience in the field of critical recognition, assessment and planning of sustainable interventions in the degraded environment.

Metode poučevanja in učenja:	Learning and teaching methods:
<ul style="list-style-type: none"> • <i>predavanja</i> z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov), • <i>seminarske vaje</i>: priprava, predstavitev in uspešen zagovor raziskovalne naloge, portfolio (reševanje problemov, študije primera, kritično presojanje, diskusija, refleksija izkušenj, vrednotenje, projektno delo, timsko delo). 	<ul style="list-style-type: none"> • <i>lectures</i> with active student participation (explanation, discussion, questions, examples, problem solving), • <i>seminar tutorial</i>: preparation, presentation and a successful defence of a research paper, portfolio (problem solving, case studies, methods of critical thinking, discussion, reflection of experience, evaluation, project work, team work).

Načini ocenjevanja:	Delež (v %) Weight (in %)	Assessment:
<p>Načini:</p> <ul style="list-style-type: none"> • 100 % udeležba na predavanjih in vajah ter priprava, predstavitev in zagovor raziskovalne naloge, • če študent ni 100 % udeležen na predavanjih in vajah: 	100	<p>Types:</p> <ul style="list-style-type: none"> • 100% attendance in lectures and tutorial including preparation, presentation and defence of a research paper,

<ul style="list-style-type: none"> - izpit, - priprava, predstavitev in zagovor raziskovalne naloge. <p>Ocenjevalna lestvica: ECTS.</p>	<p>60 40</p>	<ul style="list-style-type: none"> • if the student has not attended lectures and tutorial in full (100%): <ul style="list-style-type: none"> - examination, - preparation, presentation and defence of a research paper. <p>Grading scheme: ECTS.</p>
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