	UČNI NAČRT PREDMETA/COURSE SYLLABUS
Predmet	**Sanacija okoljske škode**
Course title	**Remediation of Environmental Damage**

Študijski program in stopnja Study programme and level	**Študijska smer Study field**	**Letnik Academic year**	**Semester Semester**
Poslovna ekonomija in upravljanje	Upravljanje z okoljem	2.	3.
Business Economics and Management	Environmental Management	2nd	3rd

Vrsta predmeta/Course type	izbirni / elective

Univerzitetna koda predmeta/University course code	3_PEU_IP_UN6_UO

Predavanja Lectures	**Seminar Seminar**	**Sem. vaje Tutorial**	**Lab. vaje Laboratory work**	**Teren. vaje Field work**	**Samost. delo Individ. work**	**ECTS**
15	10				425	15

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:**
• Pogoj za vključitev v delo je vpis v drugi letnik študijskega programa. • Študent mora pred izpitom pripraviti in predstaviti raziskovalno nalogo.	• The condition for inclusion is entry in the second year of study. • Student has to prepare, present and defend a research paper before the exam.

Vsebina:	**Content (Syllabus outline):**
Sanacija okoljske škode obravnava tradicionalne, sodobne in inovativne metode, postopke in posege pri saniranju različnih vrst okoljske škode, ki so lahko posledica naravnih nesreč (plazovi, hudourniške poplave, rečne poplave, potresi itd) ali netrajnostnega razvoja v preteklosti. Obravnava različne načine naravne sanacije (npr. fitoremedicaija odlagališč odpadkov, naravno (fito)utrjevanje usekov in brežin) pa vse do zahtevnejših infrastrukturnih sanacijskih posegov (npr.	**Remediation of environmental damage** addresses traditional, modern and innovative methods, procedures and interventions in remediation of various types of environmental damage that may result from natural disasters (landslides, torrential floods, river floods, earthquakes, etc.) or unsustainable development in the past. It deals with various methods of natural remediation (eg phytoremediation of landfills, natural (phyto) consolidation of cuts and banks) all the way to more

ekološki in hidrološki posegi v vodna telesa, sanacije plazov, gradbeni posegi v okolje). Natančneje se posveča analizi preteklih in sodobnih sanacij okolja v Sloveniji in v tujini ter kritično ovrednoti njihovo uspešnost upoštevajoč gospodarski, družbeni in okoljski vidik. • *Uvod* (Opredelitev pojmov okoljska škoda, družbena škoda, gospodarska škoda, naravna nesreča, degradacija, sanacija, revitalizacija, reaktivacija, ekoremediacija, fitoremediacija). • *Paradigme in metode sanacije* (Paradigme, metode in postopki za oživljanje degradiranih območij glede na tip okoljske škode: fitoremediacija, reklamacija, sanacija, reaktivacija - vzpostavitev prvotne rabe, gradbeni posegi, kulturna industrija, itd; pregled primerov dobrih prakse sanacije v Sloveniji in v tujini). • *Sanacija okoljske škode v biosferi* (sanacija vegetacije in biosfere, bioremediacija, biomonitoring) • *Sanacija okoljske škode v hidrosferi* (površinska in podzemna vodna telesa, kraški vodonosniki, itd). • *Sanacija okoljske škode v reliefu / geosferi* (sanacija odprtih kopov, sanacija onesnaženih prsti, odlaganje odpadkov). • *Družbena in ekonomska percepcija okoljske škode* (družbeni spomin na okoljske škode, razlikovanje med naravnimi procesi in naravnimi nesrečami, vrednotenje okoljske škode, preventiva pred okoljskimi škodami, finančno zavarovanje škode). • *Ideološki in teoretsko-filozofski pogledi na raziskovanje okoljske škode in sanacije v različnih okoljih* (ekosistemski in drugi pristopi k raziskovanju okoljske škode v mestih, na podeželju, v mokriščih, zavarovanih območjih, v gozdu, v visokogorju, v vodnih ekosistemih itd).	demanding infrastructural remediation interventions (eg ecological and hydrological interventions in water bodies, landslide remediation, construction interventions in the environment). It focuses in more detail on the analysis of past and modern environmental remediation in Slovenia and abroad and critically evaluates their success taking into account the economic, social and environmental aspects. • *Introduction* (Definition of environmental damage, social damage, economic damage, natural disaster, degradation, rehabilitation, revitalization, reactivation, ecoremediation, phytoremediation etc). • *Paradigms and methods of remediation* (Paradigms, methods and procedures for revitalization of degraded sites according to the type of environmental damage: phytoremediation, reclamation, remediation, reactivation - restoration of original use, construction interventions, cultural industry, etc .; review of examples of good remediation practices in Slovenia and in abroad). • *Remediation of environmental damage in the biosphere* (remediation of vegetation and biosphere, bioremediation, biomonitoring) • *Remediation of environmental damage in the hydrosphere* (surface and groundwater bodies, karst aquifers, etc.). • *Remediation of environmental damage in the relief / geosphere* (remediation of open pits, remediation of contaminated soils, waste disposal). • *Social and economic perception of environmental damage* (social memory of environmental damage, distinction between natural processes and natural disasters, evaluation of environmental damage, prevention of environmental damage, financial insurance of damage). • *Ideological and theoretical-philosophical views on environmental damage research and remediation in*

	different environments (ecosystem and other approaches to environmental damage research in cities, rural areas, wetlands, protected areas, forests, highlands, aquatic ecosystems, etc.).

Temeljna literatura in viri/Readings:

Temeljna literatura/Basic

- 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, https://link.springer.com/content/pdf/10.1007%2F978-3-030-14066-3_20.pdf.
- The Human Cost of Weather Related Disasters 1995–2015. Bruselj: CRED, 2015
- Natek, K. (2002). Ogroženost zaradi naravnih procesov kot strukturni element slovenskih pokrajin. Dela 18, str. 61–74.

Priporočljiva literatura/Recommended literature

- 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: 117-126.
- Plut, D. (2014). Sonaravni razvoj Slovenije. GeograFF 13. Ljubljana: Znanstvena založba Filozofske fakultete Univerze v Ljubljani.
- Mikoš, M. (2014). Naravna nesreča, naravna katastrofa in naravna kataklizma. Ujma 28, str. 306–310.
- Ciglič, R., Zorn, M., Komac, B. (2013). Največje naravne nesreče leta 2012 glede na povzročeno škodo in žrtve. Ujma 27, str. 141–147.
- Bokwa, A. (2013). Natural hazards. V: Encyclopedia of Natural-Hazards. Dordrecht: Springer, str. 711–718.

Cilji in kompetence:	**Objectives and competences:**
Učna enota prispeva predvsem k razvoju naslednjih splošnih in specifičnih kompetenc: • celovito kritično mišljenje, sposobnost analize, sinteze in predvidevanje rešitev s področja okoljskih, naravoslovnih, ekoloških, pravnih, inovacijskih, ekonomskih in poslovnih ved ter njihovo interdisciplinarno povezovanje in uporabo, • poznavanje in uporabo raziskovalne metodologije (metod, postopkov, procesov in tehnologije), • poglobljeno znanje upravljanja sanacije okoljske škode, • usposobljenost za prepoznavanje vplivov tehnološkega razvoja na varstvo okolja,	*The learning unit mainly contributes to the development of the following general and specific competences:* • comprehensive critical thinking, the ability to analyze, synthesize and anticipate solutions in the field of environmental, natural, ecological, legal, innovative, economic and business sciences and their interdisciplinary integration and application, • knowledge and application of research methodology (methods, procedures, processes and technology), • in-depth knowledge of environmental damage and site remediation management,

• sposobnost za samostojno načrtovanje in izvedbo raziskovalnega dela, analizo in interpretacijo podatkov, oblikovanje in utemeljitev mnenj, stališč in predlogov ter pripravo raziskovalnega poročila, • temeljito poznavanje standardov in meril za pisanje znanstvenih člankov in prispevkov.	• ability to identify the impacts of technological development on environmental protection, • ability to independently plan and carry out research work, analyze and interpret data, formulate and substantiate opinions, positions and proposals, and prepare a research report, • thorough knowledge of standards and criteria for writing scientific articles and papers.

Predvideni študijski rezultati:	Intended learning outcomes:
Študent/študentka: • pozna najsodobnejše pristope in metode pri preučevanju sanacije okoljske škode, • pozna 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 okoljsko škodo in izbira ustrezen način okoljske sanacije, • razvije praktična znanja in izkušnje o kritičnem prepoznavanju, vrednotenju in načrtovanju trajnostnih posegov v naravno in grajeno okolje.	*Students:* • know the most of advanced approaches and methods in the field remediation of environmental damage, • know the environment and the consequences of human activities in environment, • understand the space/environment as a non-renewable natural resource, • be able of using/applying the most appropriate methodological approaches as decision support to redevelopment of degraded lands, • qualifies to integrate and interdisciplinary evaluate environmental damage and select appropriate environmental remediation method, • develop practical knowledge and experiences in the field of critical recognition, evaluation and planning of sustainable interventions in to natural and built environment.

Metode poučevanja in učenja:	Learning and teaching methods:
• predavanja z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov), • projektni seminar, • individualne in skupinske konzultacije (diskusija, dodatna razlaga, obravnava specifičnih vprašanj),	• lectures with active student participation (explanation, discussion, questions, examples, problem solving, field trip), • project work seminar, • individual and group consultations (discussion, further explanation, addressing specific issues), • directing, self-observation, self-regulation, reflection, self-assessment.

• usmerjanje, samoopazovanje, samouravnavanje, refleksija, samoocenjevanje.	

Načini ocenjevanja:	Delež (v %) Weight (in %)	**Assessment:**
Načini: • temeljna ali aplikativna raziskovalna naloga z zagovorom (obseg 30.000 znakov). Ocenjevalna lestvica: uspešno, neuspešno.	100 %	Types: • fundamental or applicative research paper with defence (30,000 characters). Grading scheme: successful, unsuccessful.