

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	OSNOVE KRASOSLOVJA
Course title:	FUNDAMENTALS OF KARSTOLOGY

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Vede o Zemlji in okolju, magistrski študij 2. stopnje	vsi	1	1
Earth and Environmental Sciences, Master study 2nd level	all	1	1

Vrsta predmeta / Course type Obvezni/Mandatory

Univerzitetna koda predmeta / University course code: MT004

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
35	25			30	135	9

Nosilec predmeta / Lecturer: Martin Knez

Jeziki / Predavanja / Lectures: angleščina/English/slovenščina/Slovenian
Languages: Vaje / Tutorial: angleščina/English/slovenščina/Slovenian

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

Končan študijski program 1. stopnje ali dodiplomski študijski program za pridobitev univerzitetne izobrazbe, sprejet pred 11. 6. 2004 s področja naravoslovja.

Prerequisites:

First-cycle Bologna degree or a university degree in the natural sciences.

Vsebina:

Vsebina predmeta zajema spoznavanje značilnosti krasa, Krasa, slovenskega krasoslovja in krasa po svetu. Trirazsežna kraška pokrajina s svojevrstnim površjem, jamami in kraškimi vodami bo predstavljena celostno (kraška geologija, geomorfologija, hidrologija, biologija in ekologija) in razvojno. Skoraj polovica površine Slovenije je zgrajene iz kamnin, ki zakrasevajo. Študent bo podrobneje seznanjen z nastankom in prepevanjem karbonatov ter z njihovimi

Content (Syllabus outline):

The course content encompasses the knowledge of the characteristics of the karst, the Classical Karst, Slovene karstology and karst throughout the world. Students will come to know the complex of three-dimensional landscape (karst geology, geomorphology, hydrology, biology and ecology) with special surface, cave and karst waters. Almost half of the surface area of Slovenia is made up of rocks that karstify. Students will become more thoroughly acquainted with the formation and weathering

splošnimi litostratigrafskimi lastnostmi, sestavo in klasifikacijo. Kras je dinamičen sistem, ki ga v temelju pogojujejo fizikalno-kemični procesi. Spoznal bo, kateri so ti procesi, od česa so odvisni in kakšna je njihova dinamika, seznanil se bo z začetnimi obdobji razvoja jam. Podrobneje bo seznanjen s procesi raztapljanja in izločanja kalcijevega karbonata, transportom snovi v kraškem vodonosniku in osnovami dinamike speleogeneze. Spoznal bo temeljne pojme o značilnostih kraških vodonosnikov in značilnosti pretakanja vode v krasu. Seznanjen bo s povezanostjo med posameznimi komponentami podzemeljskih habitatov ter posledicami delovanja človeka. Spoznal bo podzemlje kot življenjski prostor za podzemeljske organizme ter pomembnost biodiverzitete.

Poglavitne teme:

- slovensko in mednarodno krasoslovje,
- kras v Sloveniji in svetu,
- kraška geologija,
- kraška hidrologija,
- kraške jame,
- raba in varovanje kraškega površja, podzemlja in vod,
- kraška biologija in ekologija podzemeljskih habitatov.

of carbonates and with their general lithostratigraphic properties, structure and classification. Karst is a dynamic system, which is basically caused by physical and chemical processes. Students will come to know these processes, what they depend on and what their dynamics are like; they will also learn about the initial periods of cave evolution. They will become more thoroughly acquainted with the processes of the dissolution and release of calcium carbonate, the transport of substances in the karst aquifer and the basics of the dynamics of speleogenesis. They will learn about the basic concepts regarding the characteristics of karst aquifers and the characteristics of the discharge of water in the karst. They will become acquainted with the connection among individual components of subterranean habitats and the consequences of human activity. They will learn about the underground as a habitat for subterranean organisms and about the importance of biodiversity.

Main topics:

- Slovene and international karstology;
- Karst in Slovenia and throughout the world;
- Karst geology;
- Karst hydrology;
- Karst caves;
- Use and protection of the karst surface, underground and waters;
- Karst biology and ecology of subterranean habitats.

Temeljni literatura in viri / Readings:

- CULVER, D. C., PIPAN, T., 2019: The biology of caves and other subterranean habitats, (Biology of habitats). Oxford University Press, New York, 301 str. (poglavja/chapters: 24-40, 119-146, 206-225).
- FORD, D. C., WILLIAMS, P. 2007: Karst Geomorphology and Hydrology. John Wiley & Sons Ltd, Chichester, 562 str. (poglavja/chapters: 1-77, 103-144, 209-270, 401-440).
- GAMS, I., 2004: Kras v Sloveniji v prostoru in času. Založba ZRC, Ljubljana, 515 str. (poglavja/chapters: 1-206).
- KLIMCHOUK, A. B., FORD, D. C., PALMER, A. N. & DREYBRODT, W. (ur.) 2000: Speleogenesis: Evolution of Karst Aquifers. National Speleological Society, Huntsville AL, 527 str. (poglavja/chapters: 20-123, 224-406).
- TUCKER, M. E. 2001: Sedimentary petrology, An Introduction to the Origin of Sedimentary Rocks. Blackwell Science Ltd., Oxford, 262 str. (poglavja/chapters: 110-165).

*druga literatura bo predstavljena na predavanjih / other literature will be presented in lectures

Cilji in kompetence:

Predmet uvaja študente v spoznavanje trirazsežne kraške pokrajine, Krasa in krasoslovja kot svojevrstnih in pomembnih delov naravne in kulturne dediščine. Cilji predmeta zajemajo mednarodni pomen našega krasoslovja, zgodovino krasoslovja, spoznavanje osnovnih procesov zakrasevanja s primeri iz Slovenije in sveta.

Študenti bodo razvili temeljne kompetence:

- razumevanje osnovnih konceptov znanstvenih izhodišč stroke, ki študenta/-ko usmerjajo k analiziranju in reševanju problemov,
- pregled nad tematskimi sklopi, ki vsak s svojega vidika analizirajo družbeno in prostorsko soodvisnost na lokalni, regionalni, državni, makroregionalni in globalni ravni,
- večino uporabe teoretskih in praktičnih raziskovalnih metod pri razumevanju in usmerjanju soodvisnosti med človekom in njegovem družbenem in naravnem okolju.

Študenti bodo razvili predmetno specifične kompetence:

- znanje in razumevanje značilnosti krasa in pomen slovenskega krasoslovja v svetu,
- sposobnost multidisciplinarnega razumevanja kraških pojavov.

Objectives and competences:

The course introduces students to the knowledge of the three-dimensional karst landscape, of the Classical Karst and of karstology as unique and important parts of natural and cultural heritage. The course objectives encompass the international importance of our karstology, the history of karstology, and the knowledge of the basic processes of karstification, with examples from Slovenia and the world.

Students will develop basic competences:

- Understanding of the basic concepts of the scientific premises of the discipline, which direct students towards analysing and solving problems;
- Review of the thematic sets that analyse social and spatial interdependence on a local, regional, national, macro-regional and global level, each from their own perspective;
- Skill of applying theoretical and practical research methods to understand and direct the interdependence between humans and their social and natural environment.

Students will develop course-specific competences:

- Knowledge and understanding of the characteristics of the karst and the importance of Slovene karstology in the world;
- Ability to understand karst phenomena in a multidisciplinary way.

Predvideni študijski rezultati:

Študent bo spoznal pomen in razvoj krasoslovja v slovenskem prostoru in v svetu. Spoznal bo procese zakrasevanja (fizikalno-kemične procese, geološke osnove zakrasevanja, obdobja razvoja krasa). Seznanil se bo s kraškim vodonosnikom in kraškim ekosistemom. Osvojil bo znanje o uporabnosti temeljnih izsledkov za načrtovanje življenja v občutljivi kraški pokrajini in njeno varovanje. Znanje in razumevanje:

Intended learning outcomes:

Students will come to know the importance and development of karstology in Slovenia and in the world. They will come to know the karstification processes (the physical and chemical processes, geological predispositions of karstification and the stages of karst evolution). They will learn about the karst aquifer and the karst ecosystem. They will acquire knowledge of the applicability of the basic findings for planning life in the delicate karst landscape and for its protection. Knowledge and understanding of:

- razume teoretske osnove krasoslovja in jih zna aplicirati na praktične primere in probleme,
- zastavljene naloge zna reševati po smiselnem zaporedju in zna pripraviti okvirno strokovno oceno določenega področja.

- Students understand the theoretical bases of karstology and are able to apply them to practical examples and problems;
- Are able to solve the set tasks in a logical order and are able to prepare an approximate expert assessment of a specific area.

Metode poučevanja in učenja:

- Predavanja,
- seminarji,
- terensko delo.

Learning and teaching methods:

- Lectures;
- Seminars;
- Field work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment
Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
- izpit,	90	- Exam;
- seminarska naloga.	10	- Written paper.

Reference nosilca / Lecturer's references:

- BLATNIK, M., CULVER, D. C., GABROVŠEK, F., **KNEZ, M.**, KOGOVŠEK, B., KOGOVŠEK, ., LIU, H., MAYAUD, C. I, MIHEVC, A., MULEC, J., ALJANČIČ, M., OTONIČAR, B., PETRIČ, M., PIPAN, T., PRELOVŠEK, M., RAVBAR, N., SHAW, T. R., SLABE, T., ŠEBELA, S., ZUPAN HAJNA, N., **KNEZ, M.** (ur.), OTONIČAR, B. (ur.), PETRIČ, M. (ur.), PIPAN, T. (ur.), SLABE, T. (ur.). Karstology in the classical karst. Cham: Springer, cop. 2020. XII, 222 str., ilustr., zvd., graf. prikazi. Advances in karst science. ISBN 978-3-030-26826-8. ISSN 2511-2066. DOI: 10.1007/978-3-030-26827-5. [COBISS.SI-ID 17912067]
- **KNEZ, M.**, RUGGIERI, R., SLABE, T. Karren above Custonaci (Sicily, Italy). Acta carsologica. [Tiskana izd.]. 2019, letn. 48, št. 1, str. 43-58, ilustr. ISSN 0583-6050. <https://ojs.zrc-sazu.si/carsologica/article/view/7029/6847>, DOI: 10.3986/ac.v48i1.7029. [COBISS.SI-ID 44403245]
- ČERU, T., ŠEGINA, E., **KNEZ, M.**, BENAC, Č., GOSAR, A.. Detecting and characterising unroofed caves by ground penetrating radar. Geomorphology : an international journal of pure and applied geomorphology. [Print ed.]. 2018, vol. 303, str. 524-539, ilustr. ISSN 0169-555X. DOI: 10.1016/j.geomorph.2017.11.004. [COBISS.SI-ID 42204205]
- AUDRA, P., BOSÁK, P., GÁZQUEZ, F., CAILHOL, D., SKÁLA, R., LISÁ, L., JONÁŠOVÁ, Š., FRUMKIN, A., **KNEZ, M.**, SLABE, T., ZUPAN HAJNA, N., AL FARRAJ AL KETBI, A. Bat urea-derived minerals in arid environment : first identification of allantoin, C₄H₆N₄O₃, in Kahf Kharrat Najem Cave, United Arab Emirates. International journal of speleology. Jan. 2017, [vol.] 46, [iss.] 1, str. 81-92, ilustr. ISSN 0392-6672. <http://scholarcommons.usf.edu/ijs/vol46/iss1/9/>, <http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=2001&context=ijs>, DOI: 10.5038/1827-806X.46.1.2001. [COBISS.SI-ID 41188397]
- **KNEZ, M.**, SLABE, T., URUSHIBARA-YOSHINO, K. Lithology, rock relief and karstification of Minamidaito Island (Japan). Acta carsologica. [Tiskana izd.]. 2017, letn. 46, št. 1, str. 47-62, ilustr. ISSN 0583-6050. <https://ojs.zrc-sazu.si/carsologica/article/view/2022/4745>, DOI: 10.3986/ac.v46i1.2022. [COBISS.SI-ID 41879085]

- GABROVŠEK, F., **KNEZ, M.**, KOGOVSŠEK, ., MIHEVC, A., OTONIČAR, B., MULEC, J., PERNE, M., PETRIČ, M., PIPAN, T., PRELOVŠEK, M., SLABE, T., ŠEBELA, S., RAVBAR, N., ZUPAN HAJNA, N.. Development challenges in karst regions : sustainable land use planning in the karst of Slovenia. V: TROFIMOVA, E. (ur.), SALOMON, J.-N. (ur.). Preserving karst environments and karst caves : karst dynamics, environments, usage and restauration : towards an international karst preservation system. Stuttgart: Gebrüder Borntraeger, 2016. Str. 293-318. Zeitschrift für Geomorphologie, Supplementband, N. F., vol. 60, suppl. issue 2. ISSN 0372-8854, ISSN 0044-2798.
https://www.schweizerbart.de/papers/zfg_suppl/detail/60/86496/Development_challenges_in_karst_regions_sustainable_land_use_planning_in_the_karst_of_Slovenia, DOI: 10.1127/zfg_suppl/2016/00309. [COBISS.SI-ID 40073261]
- **KNEZ, M.**, SLABE, T., GABROVŠEK, F., KOGOVSŠEK, J., KRANJC, A., MIHEVC, A., MULEC, J., OTONIČAR, B., PERNE, M., PETRIČ, M., PIPAN, T., PRELOVŠEK, M., RAVBAR, N., ŠEBELA, S., ZUPAN HAJNA, N., BOSÁK, P., PRUNER, P., LIU, H., **KNEZ, M.** (ur.), SLABE, T.j (ur.). Cave exploration in Slovenia : discovering over 350 new caves during motorway construction on classical karst. Cham [etc.]: Springer, cop. 2016. XIII, 324 str., ilustr. Cave and karst systems of the world. ISBN 978-3-319-21202-9. ISSN 2364-4591. DOI: 10.1007/978-3-319-21203-6. [COBISS.SI-ID 38828077]