

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	GEOLOGIJA KRASA
Course title:	KARST GEOLOGY

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	Krasoslovje	1	2
Earth and Environmental Sciences, Master study 2nd level	Karstology	1	2

Vrsta predmeta / Course type Obvezni/Mandatory

Univerzitetna koda predmeta / University course code: MTK01

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
35	20	10	10	20	130	9

Nosilec predmeta / Lecturer: Martin Knez
(asistentka: Astrid Švara)

Jeziki / Languages: **Predavanja / Lectures:** angleščina/English/slovenščina/Slovenian
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:

- Izrazito topne kraške kamnine (karbonati in evaporiti),
- pogojno topne kamnine (kremenovi peščenjaki, graniti...) in kamnine, ki se pogosto s kraškimi kamninami izmenjujejo,
- diageneza karbonatov,
- karbonatne platforme v času in prostoru,
- paleokras,

Content (Syllabus outline):

- Highly soluble karstic rocks (carbonates and evaporates);
- Conditionally soluble rocks (quartz sandstone, granite...) and rocks that commonly alternate with karstic rocks;
- Carbonate diagenesis;
- Carbonate platforms in time and space;
- Paleokarst;

- pomen različnih kamnin za oblikovanje kraških pojavov in kraških pokrajin,
- tektonske strukture in kraški pojavi.

- Impact of different rocks on development of karstic features and landscapes;
- Tectonic structures and karstic features.

Temeljni literatura in viri / Readings:

- FORD, D. C. & WILLIAMS, P., 2007: Karst Hydrogeology and Geomorphology. John Wiley & Sons Ltd, Chichester, 562 str. (poglavja/chapters: 1-102, 209-320, 401-440).
- PALMER, A. N., 2007: Cave Geology. Cave Books, Dayton OH, 454 str. (poglavja/chapters: 21-87, 113-137, 166-191, 232-302, 364-385).
- GABROVŠEK, F., 2002 (ur.): Evolution of Karst: From Prekarst to Cessation. Založba ZRC, Ljubljana, 448 str. (poglavja/chapters: 235-358).
- TUCKER., M. E. & WRIGHT, V. P., 1990: Carbonate sedimentology. Blackwell Science Ltd, Oxford, 482 str. (poglavja/chapters: 1-100, 314-364).
- INSALCO, E., SKELTON, P. W. & PALMER, P. J., 2000 (ur.): Carbonate platform systems: components and interactions. Geological Society of London, London, Special Publication, 178, 231 str. (poglavja/chapters: 89-108).
- Izbrani članki iz geoloških znanstvenih revij / Selected papers from geological scientific journals

Cilji in kompetence:

Namen predmeta je uvajanje študentov v samostojno prepoznavanje in raziskovanje kamnin, ki zakrasevajo, ter njihovega vpliva na razvoj posameznih kraških oblik in kraške pokrajine kot celote. Seznanili se bodo z osnovnimi koncepti odlaganja, diageneze in zgodnjega zakrasevanja karbonatnih (evaporitnih) zaporedij ter razvoja karbonatnih platform v smislu njihovega geografskega, klimatskega in geotektonskega položaja. Spoznali bodo po čem in zakaj se karbonatne platforme in njihova sedimentna zaporedja med seboj razlikujejo in kakšen je vpliv geotektonskega položaja, v okviru katerega se oblikujejo ter kaj lahko glede na geotektonski položaj karbonatnih platform pričakujemo po obdobju prevladujoče sedimentacije. V tem smislu se bodo seznanili tudi z razvojem in ohranitvenim potencialom paleokrasa ter pomenom paleokrasa pri študiju karbonatnih zaporedij in razvoju recentnih kraških oblik ter aktivnega vodonosnika. Spoznali bodo vplive diagenetsko različno zrelih karbonatnih kamnin in s tem povezane poroznosti na razvoj vodonosnika in krasa. Študenti se bodo seznanili z nekaterimi kamninami, ki zakrasevajo le v posebnih

Objectives and competences:

The purpose of the course is to introduce students to independently identify and explore the karstic rocks and their impact on the development of various karstic features and karst landscape as a whole. They will learn about the basic concepts of deposition, diagenesis and early karstification of carbonate (evaporate) sequences and the development of carbonate platforms in terms of their geographical, climatic and geotectonic position. They will learn how and why the carbonate platforms and their sedimentary sequences differ from each other and what is the influence of geotectonic position, in which are formed and what can according to geotectonic position of the carbonate platform be expected after a period of dominant sedimentation. In this context, they will also examine the development and conservation potential of paleokarst and importance of paleokarst in the study of carbonate sequences and the development of recent karst formations and an active aquifer. They will learn the effects of diagenetically differentially mature carbonate rocks and related porosity on the development of the aquifer and karst. Students will become familiar with some of the rocks that became karstified only in specific

pogojih, pri čemer bodo spoznali tudi osnovne principe njihovega zakrasevanja. Študenti se bodo seznanili s primeri pogojenosti nastanka določenih kraških pojavov v odvisnosti od tektonskih razmer.

conditions and they learn the basic principles of their karstification. Students will become familiar with examples of the occurrence of certain karst phenomena depending on the tectonic conditions.

Predvideni študijski rezultati:

- Sposobnost prepoznavanja in interpretacije kraških kamnin,
- poznavanje konceptov razvoja karbonatnih platform,
- poznavanje pomena vpliva različnih kraških kamnin na oblikovanje kraških pojavov in pokrajin,
- poznavanje povezave med strukturnimi geološkimi elementi in kraškimi pojavi,
- sposobnost vzorčevanja in geološke analize vzorcev v praksi (v laboratoriju).

Intended learning outcomes:

- The ability to identify and interpret the karstic rocks;
- Knowledge of the concepts of development of carbonate platforms;
- Knowing the importance of the impact of various karst rocks on karst features and landscapes;
- Knowing the connection between the structural geological elements and karst phenomena,
- The ability of rock sampling on the field and practical geological analyses of rock samples in laboratory.

Metode poučevanja in učenja:

- Predavanja,
- seminarji,
- seminarske vaje,
- laboratorijske vaje,
- terensko delo.

Learning and teaching methods:

- Lectures;
- Seminars;
- Tutorial;
- Laboratory work;
- 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, J., LIU, H., MAYAUD, C., 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, J., 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. (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]