

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	SEDIMENTARNA GEOLOGIJA KARBONATOV
Course title:	CARBONATE SEDIMENTARY 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	Paleobiologija in sedimentarna geologija	2	1
Earth and environmental sciences, Master study 2nd level	Palaeobiology and Sedimentary geology	2	1

Vrsta predmeta / Course type

Obvezni/Mandatory

Univerzitetna koda predmeta / University course code:

MTPO3

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45	15	45			120	9

Nosilec predmeta / Lecturer:

Andrea Martín Pérez

Sodelavci predmeta / coworkers:

tehn. sod. Filip Litera

Jeziki /

Predavanja/ Lectures:

Slovenščina, angleščina/Slovene, English

Languages:

Vaje / Tutorial:

Slovenščina, angleščina/Slovene, English

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:

- Uvod: zgodovina karbonatne geoznanosti in trendi v sodobni sedimentologiji
- Karbonatni sedimenti in kamnine: komponente in zgradba
- Klasifikacija apnencev in dolomitov
- Karbonatna produkcija, transport in akumulacija sedimenta
- Recentna karbonatna okolja
- Morska depozicijska okolja karbonatov

Content (Syllabus outline):

- Introduction: history of carbonate geoscience and trends in modern sedimentology
- Carbonate sediments and rocks: constituents and fabrics
- Carbonate mineralogy and chemistry
- Limestone and dolomite classification
- Controls in carbonate production, transport and accumulation
- Modern carbonate environments

<ul style="list-style-type: none"> • Karbonatne platforme: geometrijski kontinuum • Sekvenčna stratigrafija • Kontinentalni karbonati • Faciesni modeli: faciesne asociacije, mozaiki in sukcesije • Karbonatna mineralogija in kemija • Ključni koncepti biomineralizacije • Diageneza • Dolomiti in modeli dolomitizacije • Karbonati v geološki zgodovini • Uporabna karbonatna sedimentologija 	<ul style="list-style-type: none"> • Marine carbonate depositional environments • Carbonate platforms: continuum in geometry • Sequence stratigraphy • Continental carbonates • Facies models: facies associations, mosaics and successions • Key concepts of biomineralisation • Diagenesis • Dolomites and dolomitisation models • Geological history of carbonates • Applied carbonate sedimentology
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Temeljni literatura in viri / Readings:

Izbrana poglavja in članki/Selected chapters and papers:

- Flügel, E., 2010: *Microfacies of Carbonate Rocks, Analysis, Interpretation, and Application*, Springer, 2nd ed., 1- 984.
- James, N.P. and Dalrymple, R.W., 2010: *Facies Models 4*, Geological Society of Canada, GeoText 6, 3, 323-576.
- James, N.P., and Jones, B., 2016: *Origin of Carbonate Sedimentary Rocks*. Wiley, 1-446.
- McIlreath, I.A. & Morrow, D.W., 1990: *Diagenesis*.- Geoscience Canada Reprint Series 4, Geological Association of Canada, pp. 338, Ottawa, Canada, 1-125, 277-316.
- Reading, H.G. 1986: *Sedimentary environments: Processes, Facies and stratigraphy* (3rd Edition). Blackwell Science Ltd., Oxford, 1-35, 83-124, 325-394.
- Schlager, W., 2005: *Carbonate Sedimentology and Sequence Stratigraphy*, SEPM Concepts in Sedimentology and Paleontology, #8, 1-200.
- Scholle, P.A., D.G. Bebout, and C.H. Moore (eds.), 1983: *Carbonate Depositional Environments*: AAPG Memoir 33, 1-708.
- Scholle, P.A. & Ulmer-Scholle, D.S., 2003: *A Color Guide to the Petrography of Carbonate Rocks: Grains, textures, porosity, diagenesis*.- Memoir 77, American Association of Petroleum Geologists, Tulsa, OK, 1-474.
- Tucker, M. E., 2001: *Sedimentary Petrology*: Oxford, Blackwell Science, 1-6, 110-165.
- Tucker, M.E. & Wright, V.P., 1990: *Carbonate Sedimentology*.- Blackwell Scientific Publications, Oxford, 1-482.
- Warren, J., 2000, Dolomite: occurrence, evolution and economically important associations: *Earth-Science Reviews*, v. 52, 1-81.

Cilji in kompetence:

Cilj predmeta je predstaviti širok pregled in ključne koncepte sedimentologije in stratigrafije karbonatov. Predmet bo kombinacija predavanj, terenskega študija karbonatnih zaporedij (niz kratkih ekskurzij na posamezne primere karbonatnih zaporedij v širši okolici Ljubljane) in petrografske analize vzorcev s terenskih

Objectives and competences:

The objective of this course is to provide a broad overview of key concepts in sedimentology and stratigraphy of carbonates. The course will combine lectures, field examination of carbonate successions (series of short, daily trips from Ljubljana dealing with particular topic) and petrographical analysis of corresponding samples in the lab. The first

primerov. Prvi del je namenjen pregledu mineralogije in petrografije karbonatov, prepoznavanju gradbenih elementov karbonatnih kamnin, tekstur in interpretaciji nastanka. Drugi del se ukvarja z interpretacijo karbonatnih depozicijskih okolij, v zadnjem delu pa predmet obravnava diagenetske procese in okolja s posebnim poudarkom na dolomitizaciji ter aplikativnih vidikih.

part of the course will deal with carbonate mineralogy and petrography, identification of the components, recognition of fabrics and their origin. Second part will cover the interpretation of depositional environments of carbonate sediments. Finally, the course will tackle diagenetic processes and environments with special stress on dolomitisation and applied aspects.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Poznavanje petrografskih značilnosti karbonatov in zmožnost interpretacije nastanka kamnin.
- Razumevanje osnovnih procesov produkcije, transporta in akumulacije karbonatnih sedimentov.
- Sposobnost opisovanja, identifikacije in klasifikacije različnih tipov apnenca na terenu in v zbruskih.
- Sposobnost interpretirati in razlikovati depozicijske in diagenetske značilnosti.
- Razlikovati glavne tipe karbonatnih platform in njihovo variabilnost.
- Dobiti izkušnje pri zbiranju in analiziranju terenskih podatkov.

Intended learning outcomes:

Knowledge and understanding:

- Knowledge of the petrographic characteristics of carbonates and their genetic implications.
- Understanding the main processes involved in carbonate production, transport and accumulation.
- Ability to describe, identify and classify different types of limestone in hand specimen, thin section, and in the field.
- Ability to distinguish depositional and diagenetic features.
- Distinguish the main types of carbonate platform geometries and their variability.
- Gain experience collecting and analysing field data.

Metode poučevanja in učenja:

- predavanja
- terenske vaje
- laboratorijske vaje: petrografija in faciesna analiza

Learning and teaching methods:

- Lectures
- Field work
- Laboratory practicals: petrography and facies analysis

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
<ul style="list-style-type: none"> • Pisni izpit 	40	<ul style="list-style-type: none"> • Written exam
<ul style="list-style-type: none"> • Laboratorijske in terenske vaje 	30	<ul style="list-style-type: none"> • Laboratory and field assignments
<ul style="list-style-type: none"> • Pisno poročilo 	30	<ul style="list-style-type: none"> • Written reports

Reference nosilca / Lecturer's references:

1. Alonso-Zarza, A. M., Rodríguez-Berriguete, Á., Martín-Pérez, A., Martín-García, R., Menéndez, I., Mangas-Viñuela, J. 2020: Unravelling calcrete environmental controls in volcanic islands, Gran Canaria Island, Spain. *Palaeogeography, palaeoclimatology, palaeoecology*, 554, DOI: 10.1016/j.palaeo.2020.109797.

2. Martín-Pérez, A., Košir, A. & Otoničar, B., 2015, Dolomite in speleothems of Snežna Jama, Slovenia: *Acta Carsologica*, v. 44, p. 81-100.
3. Martín-Pérez, A., Martín-García, R. & Alonso-Zarza, A.M., 2012, Diagenesis of a drapery speleothem from Castañar Cave: from dissolution to dolomitization: *International Journal of Speleology*, v. 41, p. 251-266.
4. Alonso-Zarza, A.M., Meléndez, A., Martín-García, R., Herrero, M.J. & Martín-Pérez, A., 2012, Discriminating between tectonism and climate signatures in palustrine deposits: Lessons from the Miocene of the Teruel Graben, NE Spain: *Earth-Science Reviews*, v. 113, p. 141-160.
5. Alonso-Zarza, A.M. & Martín-Pérez, A., 2008, Dolomite in caves: Recent dolomite formation in oxic, non-sulfate environments. Castañar Cave, Spain: *Sedimentary Geology*, v. 205, p. 160-164.