

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	PALEONTOLOGIJA IN GEOBIOLOGIJA
Course title:	PALAEONTOLOGY AND GEOBIOLOGY

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	1	2
Earth and environmental sciences, Master study 2nd level	Palaeobiology and Sedimentary geology	1	2

Vrsta predmeta / Course type Obvezni/ Mandatory

Univerzitetna koda predmeta / University course code: MTP02

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
60	15	30			120	9

Nosilec predmeta / Lecturer: Špela Goričan

Sodelavci predmeta / coworkers: (asist. Tim Cifer)

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:

- Prokarioti, protisti, rastline, nevretenčarji, vretenčarji
- Značilnosti fosilnega zapisa (fosilizacija, tafonomija, (ne)popolnost)
- Biologija, morfologija, funkcionalna morfologija
- Koncepti vrste
- Hitrost in trendi evolucije; diverzitetna nastanek novih vrst in izumiranja

Content (Syllabus outline):

- Procaryotes, protists, plants, invertebrates, vertebrates
- Nature of the fossil record (fossilization, taphonomy, (in)completeness)
- Biology, morphology, functional morphology
- Species concepts
- Evolutionary rates and trends; diversity, origination and extinction

<ul style="list-style-type: none"> ● Biostratigrafija, paleoekologija, paleobiogeografija ● Kaj je geobiologija? ● Procesi biomineralizacije ● Geomikrobiologija ● Živali in rastline kot geološki dejavniki ● Globalni geobiokemični cikli ● Geobiologija stabilnih izotopov 	<ul style="list-style-type: none"> ● Biostratigraphy, palaeoecology, palaeobiogeography ● What is geobiology? ● Biomineralization processes ● Geomicrobiology ● Animals and plants as geological agents ● Global geobiochemical cycles ● Geobiology of stable isotopes
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Temeljni literatura in viri / Readings:

Izbrana poglavja iz knjig ter članki/Selected chapters from books and papers

- Prothero D.R. 2013. Bringing Fossils to Life. An introduction to paleobiology (3rd edition). Columbia University Press, 1-672.
- Benton M.J., Harper D.A.T. 2020. Introduction to Paleobiology and the Fossil Record. 2nd Ed., Wiley-Blackwell, 1-656.
- Jones R.W. 2011. Applications of Palaeontology. Techniques and Case Studies. Cambridge University Press, 1-406.
- Knoll, A.H., Canfield, D.E., Konhauser, K.O. 2012. Fundamentals of Geobiology. Wiley-Blackwell, 1-456.
- Konhauser, K.O. 2007. Introduction to Geomicrobiology. Blackwell Publishing, 1-440.

Cilji in kompetence:

Namen predmeta je študentu ponuditi izčrpen pregled znanja o paleontologiji in geobiologiji. Predavanja bodo pokrivala splošne teme (naravo fosilnega zapisa, principe taksonomije in evolucije, različna področja uporabnosti). Laboratorijske vaje bodo namenjene sistematiki in določanju makro in mikrofosilov (z optičnimi in elektronskimi mikroskopi). Predmet vključuje terenske ekskurzije, da bo študent lažje razumel povezavo med fosilno združbo in zanjo značilnim faciesom oz. depozicijskim okoljem. Kot samostojno delo bo vsak študent napisal predlog raziskovalnega projekta na izbrano temo.

Objectives and competences:

The purpose of the course is to give a comprehensive overview in the field of palaeontology and geobiology. Lectures will cover general topics (nature of the fossil record, principles of taxonomy and evolution, various fields of application). Laboratory work will focus on systematics and identification of macro- and microfossils (using optical microscopes and SEM). Field trips will be organized to enable better understanding of the link between a particular fossil assemblage and its characteristic facies/depositional environment. Individual work of each student will consist of writing a project proposal on a selected topic.

Predvideni študijski rezultati:

Znanje in razumevanje:
Študent je seznanjen s potekom raziskovanja v paleontologiji in geobiologiji. Pozna glavne skupine fosilnih organizmov. Ve, kako uporabiti paleontološke podatke v temeljnih disciplinah (za določanje starosti kamnin, analizo okolja, rekonstrukcijo evolucije) in se zaveda uporabnosti v aplikativnem raziskovanju (npr. za odkrivanje nafte in v okoljskih znanostih). Na področju

Intended learning outcomes:

Knowledge and understanding:
The student knows the process of research in palaeontology/geobiology and is familiar with principal groups of fossil organisms. He knows how to use palaeontological data in academic studies (dating of rocks, palaeoenvironmental analyses, evolutionary studies) and is aware of their use in applied research (e.g. petroleum exploration or environmental science). In the

<p>paleontologije in geobiologije je sposoben napisati predlog raziskovalnega projekta. To pomeni, da zna:</p> <ul style="list-style-type: none"> • definirati vprašanje, ki ga želi rešiti, • pripraviti pregled relevantnih predhodnih raziskav, • določiti material za analizo (v obstoječih zbirkah ali na znanih nahajališčih na terenu) • in izbrati ustrezne analitične metode. 	<p>field of palaeontology/geobiology, he is able to propose a research project, that is,</p> <ul style="list-style-type: none"> • to define the particular question he wants to answer, • to review the previous research, • to identify the material he wants to analyze (in existing collections or in previously known localities in the field), • and to define the adequate analytical methods.
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Metode poučevanja in učenja:

- Predavanja
- Praktične vaje (v laboratoriju in na terenu)

Learning and teaching methods:

- Lectures
- Practical training (laboratory and field work)

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
- Pisni ali ustni izpit	70	- Written or oral exam
- Naloge	30	- Coursework

Reference nosilca / Lecturer's references:

1. Cifer, T., Goričan, Š., Gawlick, H.-J, Auer, M. 2020: Pliensbachian, Early Jurassic radiolarians from Mount Rettenstein in the Northern Calcareous Alps, Austria. *Acta Palaeontologica Polonica*, 65/1, 167-207. DOI: 10.4202/app.00618.2019.
2. Goričan, Š., O'dogherty, L., Baumgartner, P. O., Carter, E. S., Matsuoka, A. 2018: Mesozoic radiolarian biochronology : current status and future directions. *Revue de micropaléontologie*, 61/3-4, 165-189 . DOI: 10.1016/j.revmic.2018.08.001.
3. Goričan, Š., Carter, E.S., Guex, J., O'Dogherty, L., De Wever, P., Dumitrica, P., Hori, R.S., Matsuoka, A., Whalen, P. 2013. Evolutionary patterns and paleobiogeography of Pliensbachian and Toarcian (Early Jurassic) Radiolaria. *Palaeogeography, Palaeoclimatology, Palaeoecology* 386, 620-636.
4. Črne, A. E., Weissert, H., Goričan, Š., Bernasconi, S. M. 2011: A biocalcification crisis at the Triassic-Jurassic boundary recorded in the Budva Basin (Dinarides, Montenegro).- *GSA Bulletin* 123, 40-50.
5. De Wever, P., O'Dogherty, L., Goričan, Š. 2006: The plankton turnover at the Permo-Triassic boundary, emphasis on radiolarians.- *Ecolgae Geologicae Helvetiae*, 99, Supl. 1, 49-62.