

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	BIOKRONOLOGIJA IN STRATIGRAFSKA KORELACIJA
Course title:	BIOCHRONOLOGY AND STRATIGRAPHIC CORRELATION

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Okoljske in regionalne študije, doktorski študij 3. stopnje	Paleobiologija in sedimentarna geologija		
Environmental and Regional Studies, doctoral study 3 rd level	Palaeobiology and Sedimentary geology		

Vrsta predmeta / Course type

Izbirni/Elective

Univerzitetna koda predmeta / University course code:

DIP01

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	30	30			180	9

Nosilec predmeta / Lecturer:

Doc. dr. Špela Goričan

Jeziki /

Languages:

Predavanja / Lectures:

Vaje / Tutorial:

slovenščina, angleščina / Slovene, English

slovenščina, angleščina / Slovene, English

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

Vpis v 1. letnik.

Prerequisite:

Inscription to the 1st academic year.

Vsebina:

- Zgodovinski razvoj stratigrafije.
- Nezveznost fosilnega zapisa.
- Biokronologija in biostratigrafija (definicija).
- Tipi biocon (Opplove cone, cone razpona taksona, cone prekrivanja več taksonov, intervalne cone, cone abundanc itd.).
- Lastnosti biokronoloških lestvic (zvezne in nezvezne (diskretne) lestvice).
- Deterministične in probabilistične metode za izdelavo biokronoloških lestvic.
- Metoda unitarnih asociacij in uporaba računalniškega programa UAgaph na konkretnem primeru.

Content (Syllabus outline):

- Historical development of stratigraphy
- Discontinuous nature of the fossil record
- Biochronology and biostratigraphy (definition)
- Types of biozones (Oppel zone, taxon-range zone, concurrent-range zone, interval zone, abundance zone etc.)
- Properties of biochronologic scales (continuous vs. discrete scales)
- Deterministic vs. probabilistic methods to construct a biochronologic scale
- Unitary Association Method and application of UAgaph computer programme on a case study

<ul style="list-style-type: none"> ● Uskladitev biokronoloških lestvic s kronostratigrafskimi enotami v kombinaciji z drugimi stratigrafskimi metodami (sekvenčno stratigrafijo, kemostratigrafijo, magnetostratigrafijo). ● Koncept globalnih stratotipov (Global Boundary Stratotype Section and Point – GSSP); pogoji in postopki za formalno definicijo kronostratigrafskih enot. 	<ul style="list-style-type: none"> ● Calibration of biochronologic scales against chronostratigraphic units; integration of other stratigraphic methods (sequence stratigraphy, chemostratigraphy, magnetostratigraphy) ● Concept of Global Boundary Stratotype Section and Point (GSSP); requirements and procedure for formal definition of a stage boundary
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Temeljna literatura in viri / Readings:

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

- Guex J. (1991). *Biochronological Correlations*, 1-252, Springer.
- Guex J., Galster F., Hammer O. (2016). *Discrete Biochronological Time Scales*, 1- 160, Springer.
- McGowran B. (2005). *Biostratigraphy: Microfossils and Geological Time*. Cambridge University Press. (izbrana poglavja/selected chapters)
- Agterberg F., Gradstein F.M., Cheng Q., Liu G. (2013). The RASC and CASC programs for ranking, scaling and correlation of biostratigraphic events. *Computers and Geosciences* 54, 279–292.
- Gradstein FM, Ogg JG, Schmitz MD, Ogg GM (2012). *The Geological Time Scale 2012*, 1-585, Elsevier.

Cilji in kompetence:

Namen predmeta je razviti kritično razumevanje lokalnih in globalnih biokronoloških lestvic. Študenti se bodo naučili, kako oceniti kvaliteto podatkov za izdelavo teh lestvic. Osvojili bodo znanje o empiričnih in matematičnih metodah za izdelavo in testiranje lestvic in za interpretacijo njihove biokronološke natančnosti. Poglobili bodo znanje o drugih metodah stratigrafske korelacije. Z vodenim individualnim delom na konkretnem primeru bodo pridobili praktične izkušnje. Predmet je zato še posebej priporočljiv za študente, ki bodo kot primer za izdelavo conacije lahko uporabili podatke, pridobljene v okviru raziskav za doktorsko disertacijo.

Objectives and competences:

The purpose of the course is to develop critical understanding of local and global biochronologic scales. Students will learn how to evaluate the quality of the dataset upon which a scale is established. They will acquire sufficient knowledge on empirical and mathematical methods to construct and test a range chart, and to interpret its biochronologic precision. They will be stimulated to combine biochronology with other methods of stratigraphic correlation. The course includes practical experience (supervised individual study) and is particularly recommended for students, who can use fossil collections of their PhD research for case studies.

Predvideni študijski rezultati:

Znanje in razumevanje:
Študent zna izdelati in interpretirati biokronološko lestvico. Zaveda se prednosti, pomanjkljivosti in omejitev različnih metod izdelave in zna kritično oceniti uporabnost objavljenih conacij. Obvlada različne

Intended learning outcomes:

Knowledge and understanding:
The student is able to construct and interpret a biochronologic scale. He is aware of advantages/limitations of different construction methods and can critically evaluate the published zonations. He is

stratigrafske pristope in jih zna uporabiti za kalibracijo biokronoloških lestvic s kronostratigrafskimi enotami. Razume pomen GSSP-jev.

familiar with different stratigraphic approaches to calibrate biochronologic scales against chronostratigraphic units and understands the significance of GSSPs.

Metode poučevanja in učenja:

- Predavanja
- e-učenje
- Seminarji
- Praktične vaje

Learning and teaching methods:

- Lectures
- e-learning
- Seminars
- Practical training

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)	Delež (v %) / Weight (in %)	Assessment: Type (examination, oral, coursework, project):
<ul style="list-style-type: none"> ● Pisni ali ustni izpit ● Seminarska naloga 	50	<ul style="list-style-type: none"> ● Written or oral exam
	50	<ul style="list-style-type: none"> ● Written paper

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](https://doi.org/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](https://doi.org/10.1016/j.revmic.2018.08.001).
3. O'Dogherty, L., **Goričan, Š.**, Gawlick, H.-J. 2017: Middle and Late Jurassic radiolarians from the Neotethys suture in the Eastern Alps. *Journal of Paleontology*, 91/1, 25-72.
4. **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.
5. 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.