

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	PREISKOVALNE METODE IN TEHNIKE (ANALITIČNI PAKET)
Course title:	RESEARCH METHODS AND TECHNIQUES (ANALYTICAL PACKAGE)

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

Vrsta predmeta / Course type Obvezni/ Mandatory

Univerzitetna koda predmeta / University course code: MTP01

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15		20			40	3

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:

Pregled sodobnih preiskovalnih metod v sedimentologiji in paleontologiji:

- osnove terenskega vzorčevanja
- izdelava kamninskih preparatov
- mikropaleontološke tehnike
- vrstična elektronska mikroskopija z elektronsko-disperzno rentgensko spektroskopijo (SEM/EDS)

Content (Syllabus outline):

Overview of modern analytical methods in sedimentology and palaeontology:

- Basic field techniques
- Preparation of thin sections
- Micropalaeontological techniques
- Scanning electron microscopy with electron-dispersive X-ray spectroscopy (SEM / EDS)
- Transmission electron microscopy (TEM)

<ul style="list-style-type: none"> • transmisijska elektronska mikroskopija (TEM) • rentgenska difrakcijska analiza (XRD) • katodna luminiscenca • mikrotomografija • analiza stabilnih izotopov • FTIR in Ramanska spektroskopija • analiza poroznosti in permeabilnosti 	<ul style="list-style-type: none"> • X-ray diffraction analysis (XRD) • Cathodoluminescence • Microtomography • Stable isotopes analysis • FTIR and Raman spectroscopy • Poroperm analysis
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Temeljni literatura in viri / Readings:

Izbrana poglavja in članki /Selected chapters and papers

- Tucker, M.E. (ed.) 1988 Techniques in Sedimentology. Blackwell Scientific, 1-394.
- Goldstein, J.I. [et al.], 2003: Scanning electron microscopy and X-ray microanalysis, 3rd Edition. Springer, 1-673.
- Jenkins, R. & Snyder, R.L., 1996. X-Ray powder diffractometry,. Wiley & Sons, 1-95- 231-286, 319-387.
- Martin, R.E. 2000. Environmental micropaleontology. Springer, 1-481.
- Coe, A.L. (ed.) 2010: Geological Field Techniques. Wiley-Blackwell,1-137, 206-260.

Cilji in kompetence:

Študent je sposoben izbrati in uporabiti ustrezne analitske metode glede na preiskovani material in problem. Rezultate analiz zna ovrednotiti in interpretirati.

Objectives and competences:

The student is able to select and apply appropriate analytical methods depending on the material and the problem investigated. He is capable to evaluate and interpret the results of the analyses.

Predvideni študijski rezultati:

Znanje in razumevanje:
Študent obvlada osnovne kemične in fizikalne principe, na katerih temeljijo različne analitske tehnike. Za vsako od tehnik ve, za kakšne vzorce in za reševanje katerih problemov, je primerna in kako lahko rezultate uporabi pri reševanju posameznega primera. Pozna osnove načine priprave vzorca ter zahteve in omejitve posamezne tehnike. Analize na posameznih inštrumentih zna samostojno izvesti ter rezultate interpretirati.

Intended learning outcomes:

Knowledge and understanding:
The student is familiar with basic chemical and physical principles underlying the various analytical techniques. He knows for what kind of samples and problems each of the techniques is appropriate and how the results can be applied. He knows the principles of sample preparation and the requirements and limitations of each technique. He is able to perform analyses with individual instruments and interpret the results.

Metode poučevanja in učenja:

- Predavanja (0.5 ECTS)
- Praktične vaje (5 metod x 0.5) ECTS

Learning and teaching methods:

- Lectures (0.5 ECTS)
- Practical training (5 methods x 0.5 ECTS)

Načini ocenjevanja:

Delež (v %) /

Weight (in %) **Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt) <ul style="list-style-type: none"> • Ustni izpit • Pisna poročila 	50 50	Type (examination, oral, coursework, project): <ul style="list-style-type: none"> • Oral exam • Written reports
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Reference nosilca / Lecturer's references:

<ol style="list-style-type: none"> 1. Huerta, P., Martín-Pérez, A., Martín-García, R., Rodríguez-Berriguete, Á., La Iglesia Fernández, Á., Alonso-Zarza, A. M. 2019: Gypsum speleothems in lava tubes from Lanzarote (Canary Islands) : ion sources and pathways. <i>Sedimentary Geology</i>, 383, 136-147. 2. Alonso-Zarza, A.M., Genise, J.F., Cabrera, M.C., Mangas, J., Martín-Pérez, A., Valdeolmillos, A., Dorado-Valiño, M., 2008. Megarhizoliths in Pleistocene aeolian deposits from Gran Canaria (Spain): Ichnological and palaeoenvironmental significance. <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i> 265, 39-51. 3. Martín-García, R., Alonso-Zarza, A.M., Martín-Pérez, A., 2009. Loss of primary texture and geochemical signatures in speleothems due to diagenesis: Evidences from Castañar Cave, Spain. <i>Sedimentary Geology</i> 221, 141-149. 4. Alonso-Zarza, A.M., Martín-Pérez, A., Martín-García, R., Gil-Peña, I., Meléndez, A., Martínez-Flores, E., Hellstrom, J., Muñoz-Barco, P., 2011. Structural and host rock controls on the distribution, morphology and mineralogy of speleothems in the Castañar Cave (Spain). <i>Geological Magazine</i> 148, 211-225. 2. Herrero, M.J., Martín-Pérez, A., Alonso-Zarza, A.M., Gil-Peña, I., Meléndez, A., Martín-García, R., 2011. Petrography and geochemistry of the magnesites and dolostones of the Ediacaran Ibor Group (635 to 542 Ma), Western Spain: Evidences of their hydrothermal origin. <i>Sedimentary Geology</i> 240, 71-84. 1. Huerta, P., Rodríguez-Berriguete, Á., Martín-García, R., Martín-Pérez, A., La Iglesia Fernández, Á., Alonso-Zarza, A.M., 2015. The role of climate and aeolian dust input in calcrete formation in volcanic islands (Lanzarote and Fuerteventura, Spain). <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i> 417, 66-79.
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