UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Specialna mineralogija
Course title:	Advanced Mineralogy

Študijski programi in stopnja	Študijska smer	Letnik	Semestri
Geologija, druga stopnja, magistrski	Geookolje in geomateriali (modul)	1. letnik, 2. letnik	Zimski

Univerzitetna koda predmeta/University course code: 738

Predavanja	Seminar	Vaje	Klinične vaje	Druge oblike študija	Samostojno delo	ECTS
45	0	30	0	0	75	5

Nosilec predmeta/Lecturer: Mirijam Vrabec, Sašo Šturm

Vrsta predmeta/Course type: Izbirni / Elective

Jeziki/Languages:		
	Predavanja/Lectures:	Angleščina, Slovenščina
	Vaje/Tutorial:	Angleščina, Slovenščina

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Vpis v drugostopenjski študij. Obveznosti študenta: Opravljen kolokvij iz vaj je pogoj za pristop k pisnemu izpitu.	Enrollment in a second-grade study programme. Obligations of the student: A colloquium from exercises is a condition for entering the written examination.

Vsebina:	**Content (Syllabus outline):**
• Strukturna kristalografija – periodičnost zgradbe, simetrijske operacije (notranje in zunanje), polimorfizem, politipija, klasifikacija struktur • Morfologija kristala – morfogeneza glavnih kamninotvornih mineralov • Kristalna kemija – osnove zgradbe mineralov: sistematika od mineralov prvin do silikatov • Lastnosti mineralov kot posledica strukturnih značilnosti • Dvojčenje, politipi, omejena topnost, trdna raztopina, rekristalizacija, korozija, delno taljenje • Vključki: trdni, tekoči, plinasti. Geneza vključkov. • Določanje pogojev kristalizacije in kemične sestave izvorne raztopine	• Structural crystallography – periodicity of the structure, symmetry operations (internal and external), polymorphism, polytypism, classification of structures • Morphology of crystals – morphogenesis of major rocky minerals • Crystal chemistry – the basis of the mineral structure: systematics from mineral elements to silicates • Characteristics of minerals as a result of a structure • Twinning, polytypes, limited solubility, solid solution, recrystallization, corrosion, partial melting • Inclusions: solid, liquid, gaseous. Genesis inclusions. • Determination of the conditions of crystallization and chemical composition of the source solution

Temeljna literatura in viri/Readings:

NESSE 2004: Introduction to mineralogy, 348pp.
KLEIN, HURLBUT 1999: Manual of mineralogy, 681 pp.
DEER, HOWIE, ZUSSMAN: Rock-Forming Minerals. Book Series. The Geological Society.

Cilji in kompetence:	**Objectives and competences:**
CILJI: Prepoznavanje kristalov glede na njihove morfološke in strukturne lastnosti, ki se jih bo študent	OBJECTIVES: Recognizing the crystals according to their morphological and structural properties, which the

naučil prepoznati z aktualnimi preiskovalnimi tehnikami. KOMPETENCE: Sposobnost risanja kristalov v projekciji, makroskopsko in mikroskopsko prepoznavanje mineralov, karakterizacija morfogeneze, strukturnih značilnosti mineralov in korelacija s fizikalnimi ter kemičnimi lastnostmi.	student will learn to identify with modern investigative techniques. COMPETENCES: Capability of drawing crystals in projection, macroscopic and microscopic recognition of minerals, characterization of morphogenesis, structural characteristics of minerals and correlation with physical and chemical properties.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Razumevanje korelacije med morfologijo in genezo nastanka minerala. Razumevanje koralcije med strukturo in fizikalnimi lastnostmi minerala. Poznavanje temeljnih zakonitosti kristalizacije in rasti kristala. Študent mora biti sposoben iz morfoloških in strurkturnih karakteristik minerala prepoznati razmere ob njegovem nastanku, prepoznati vzroke za njegovo kristalizacijo in rast. Povezava med struturnimi in fizikalnimi lastnostmi minerala ter petrologijo in sedimentologijo kamnin. Sposobnost izbire in uporabe ustrezne tuje in domače literature. Sposobnost komunikacije z drugimi strokami, sposobnost analize podatkov in sinteze.	Understanding the correlation between morphology and the origin of the mineral. Understanding the correlation between the structure and the physical properties of the minerals. Knowledge of the basic laws of crystallization and crystal growth. The student must be able to recognize the conditions at the time of the formation of the mineral based on its morphological and structural characteristics and to identify the causes of its crystallization and growth. Connection between strutural and physical properties of minerals and petrology and sedimentology of rocks. Ability to choose and use appropriate foreign and domestic literature. Ability to communicate with other disciplines, ability to analyze data and synthesis.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja in vaje v mikroskopirnici, različnih laboratorijih ter mineraloški zbirki.	Lectures and exercises in a microscope, various laboratories and a mineralogical collection.

Načini ocenjevanja:	**Delež/Weight**	**Assessment:**
pisni ali ustni izpit	40,00 %	written or oral examination
seminarska naloga	30,00 %	seminar work
ocena iz vaj	30,00 %	assessment from exercises
Ocene: 6-10 (pozitivno;) ob upoštevanju Statuta UL in fakultetnih pravil.		Grades: 6-10 (positive) according to the UL Statute and faculty rules.

Reference nosilca/Lecturer's references:

JANÁK, Marian, UHER, Pavel, KROGH RAVNA, Erling J., KULLERUD, Kåre, VRABEC, Mirijam. Chromium-rich kyanite, magnesiostaurolite and corundum in ultrahigh-pressure eclogites (examples from Pohorje Mountains, Slovenia and Tromsø Nappe, Norway). European journal of mineralogy, 2015, vol. 27, no. 3, str. 377-392, doi: 10.1127/ejm/2015/0027-2436.

ROGAN ŠMUC, Nastja, SERAFIMOVSKI, Todor, DOLENEC, Tadej, DOLENEC, Matej, VRHOVNIK, Petra, VRABEC, Mirijam, JAĆIMOVIĆ, Radojko, LOGAR ZORN, Vesna, KOMAR, Darja. Mineralogical and geochemical study of Lake Dojran sediments (Republic of Macedonia). Journal of geochemical exploration, ISSN 0375-6742. [Print ed.], 2015, vol. 150, str. 73-83, doi: 10.1016/j.gexplo.2014.12.019.

JANÁK, Marian, FROITZHEIM, Nikolaus, YOSHIDA, Kenta, SASINKOVÁ, V., NOSKO, Martin, KOBAYASHI, Tomoyuki, HIRAJIMA, Takao, VRABEC, Mirijam. Diamond in metasedimentary crustal rocks from Pohorje, Eastern Alps: a window to deep continental subduction. Journal of metamorphic geology, ISSN 0263-4929, 2015, vol. 33, str. 495-512, doi: 10.1111/jmg.12130.

YILDIZHAN, Melike Melike, ŠTURM, Sašo, GÜLGÜN, Mehmet Ali. Structural and electronic modifications on TiO[sub]2 anatase by Li, K or Nb doping below and above the solubility limit. Journal of Materials Science, ISSN 0022-2461, 2016, vol. 51, no. 12, str. 5912-5923, doi: 10.1007/s10853-016-9893-8.

MILER, Miloš, AMBROŽIČ, Bojan, MIRTIČ, Breda, GOSAR, Mateja, ŠTURM, Sašo, DOLENEC, Matej, JERŠEK, Miha. Mineral and chemical composition of the Jezersko meteorite - a new chondrite from Slovenia. Meteoritics & planetary science, ISSN 1086-9379, 2014, vol. 49, no. 10, str. 1875-1887, doi: 10.1111/maps.12365.

PEITEADO, Marco, ŠTURM, Sašo, CABALLERO, Amador C., MAKOVEC, Darko. Mn3−xZnxO4 spinel phase in the Zn-Mn-O system. Acta materialia, ISSN 1359-6454. [Print ed.], sep. 2008, vol. 56, iss. 15, str. 4028-4035, ilustr., doi:

10.1016/j.actamat.2008.04.024.