UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Petrologija magmatskih in metamorfnih kamnin
Course title:	Igneous and Metamorphic Petrology

Študijski programi in stopnja	**Študijska smer**	**Letnik**	**Semestri**
Geologija, prva stopnja, univerzitetni	Ni členitve (študijski program)	2. letnik	Zimski

Univerzitetna koda predmeta/University course code: 956

Predavanja	**Seminar**	**Vaje**	**Klinične vaje**	**Druge oblike študija**	**Samostojno delo**	**ECTS**
60	0	60	0	30	150	10

Nosilec predmeta/Lecturer: Matej Dolenec, Mirijam Vrabec

Vrsta predmeta/Course type: Obvezni / Compulsory

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Pogoji za vključitev v delo je vpis v 2. letnik študija geologije ter obvezno opravljeni izpiti iz Osnov geologije, Kristalografije in Mineralogije za pristop k izpitu.	Condition for inclusion in the work is inscription to the 2nd academic year, and passed exams in Introduction to Geology, Crystallography and Mineralogy to take an exam.

Vsebina:	**Content (Syllabus outline):**
Vsebina predmeta je razdeljena na: teoretsko petrologijo (osnove geneze magmatskih in metamorfnih kamnin, splošna problematika njihove mineralne in kemične sestave, kristalizacija osnovnih dvokomponentnih in trokomponentnih sistemov, diferenciacija magme ter zaporedje izločanja mineralov za posamezne važnejše magme, fizikalno-kemična načela metamorfizma in mehanizem nastanka mineralov v metamorfnih kamninah ter vrste metamorfizma) sistematska petrologija (različne klasifikacije magmatskih in metamorfnih kamnin, nastopanje magmatskih in metamorfnih kamnin na območju Slovenije) makroskopsko in mikroskosko prepoznavanje mineralne sestave magmatskih in metamorfnih kamnin teksturne in strukturne značilnosti glavnih tipov magmatskih in metamorfnih kamnin uporaba različnih diagramov za klasifikacijo magmatskih in metamorfnih kamnin prepoznavanje magmatskih in metamorfnih kamnin na terenu kartiranje magmatskih in metamorfnih kamnin	Content of the Syllabus is divided into: theoretical petrology (basic genesis of igneous and metamorphic rocks, the general problems of their mineral and chemical composition, crystallization of basic binary and ternary systems, magma differentiation and mineral crystallization sequence of different types of magmas, mepamorphic physicochemical principles and mechanism of minerals in metamorphic rocks and the nature of metamorphism) systematic petrology (different classifications of igneous and metamorphic rocks, igneous and metamorphic rock occurrence in Slovenia) macroscopic and microscopic identification of mineral composition of igneous and metamorphic rocks structural and textural characteristics of the main types of igneous and metamorphic rocks use of different diagrams for the classification of igneous and metamorphic rocks identification of igneous and metamorphic rocks in the field mapping of igneous and metamorphic rocks

Temeljna literatura in viri/Readings:

DOLENEC, M. Študijsko gradivo za predmet Petrologija magmatskih in metamorfnih kamnin : 1. letnik bolonjskega študija : prosojnice s predavanj. Ljubljana: NTF, Oddelek za geologijo, 2010. ilustr., priloge.
DOLENEC, T., DOLENEC, M. Študijsko gradivo s predmeta Petrologija magmatskih in metamorfnih kamnin : [vprašanja in odgovori]. Prva izd. Ljubljana: UL, NTF, Odd. za geologijo, feb. 2009. 234 str., ilustr.
DOLENEC M., DOLENEC, T.: Priročnik za vaje iz petrologije magmatskih in metamorfnih kamnin. Ljubljana: NTF, Oddelek za geologijo, 2001. 244 str., ilustr., graf. prikazi.
BLATT, H., TRACY, R., OWENS, B. Petrology: igneous, sedimentary, and metamorphic. WH Freeman, 2005.
RAYMOND, L.A. Petrology: the study of igneous, sedimentary and metamorphic rocks. Dubuque, IA: Wm. C. Brown, 1995.
RAGLAND, P.C. Basic analytical petrology. New York: Oxford University Press, 1989.
YARDLEY, B.W.D.: Introduction to Metamorphic Petrology. (Eds. J. Zussman and W.S. McKenzie), Longman Earth Science Series, John Wiley & Sons, Inc., New York, USA 248 str., 1989.
BARD, J.P.: Microtextures of Igneous and Metamorphic Rocks. D.Reidl Publishing Company, Dordrecht, Holland. 264 str., 1986.
VRABEC, M.: Gradiva za predmet dostopna preko elektronskega sistema VIS. / Materials for the subject are accessible via the VIS electronic system.

Cilji in kompetence:	**Objectives and competences:**
CILJI: Slušatelj pridobi osnovno znanje o značilnostih in pogojih nastanka magmatskih in metamorfnih kamnin, njihovi sestavi in okoljih nastopanja. KOMPETENCE: Slušatelj je usposobljen za prepoznavanje kamninotvornih mineralov magmatskih in metamorfnih kamnin pod mikroskopom; sposoben je določiti in klasificirati ter določiti značilnosti in pogojev nastanka magmatskih in metamorfnih kamnin. Na terenu je sposoben samostojnega dela in kartiranja magmatskih in metamorfnih kamnin.	OBJECTIVES: Students learn about the characteristics and conditions of formation of igneous and metamorphic rocks, their composition and occurrences. COMPETENCES: The student is able to identify igneous and metamorphic rock forming minerals under the microscope, to identify and classify and define the characteristics and conditions of igneous and metamorfic rocks formation. The student is able of individual field work and mapping of igneous and metamorphic rocks.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Študent razume in prepozna značilnosti in pogoje nastanka magmatskih in metamorfnih kamnin. Sposoben je klasificirati tako magmatske kot metamorfne kamnine, glede na najnovejše veljavne klasifikacije. Nauči se uporabljati tudi računalniške programe za interpretacijo geokemičnih značilnosti magmatskih in metamorfnih kamnin. Na podlagi pridobljenega znanja je študent sposoben oceniti tudi uporabnost posameznih kamnin za arhitektonske potrebe in izdelati elaborat o kakovosti posamezne kamnine z vidika njene mineralne sestave. Študent je sposoben razumevanja teoretičnega znanja iz petrogeneze in njegove uporabe pri izvajanju laboratorijskih simulacij z različnimi talinami. Pri delu je sposoben sodelovati s strokovnjaki iz ostalih področij (gradbeniki, arheologi,...), uporabljati domačo in tujo strokovno in znanstveno literaturo ter je sposoben pisati znanstvene članke za objavo v domači ali tuji reviji.	The student understands and recognizes the characteristics and conditions of igneous and metamorphic rocks formation. He is able to classify both igneous and metamorphic rocks, according to the latest applicable classification. He knows and understands to use the computer programs for the interpretation of geochemical characteristics of igneous and metamorphic rocks. Based on the knowledge the student is able to assess the usefulness of various rocks for architectural needs and create a detailed report on the quality of individual rocks in terms of its mineral composition. The student is able to understand the theoretical knowledge petrogenesis and its use in laboratory simulations with different melts. At work he is able to work with professionals from other fields (civil engineers, archaeologists ...), using domsetic and foreign professionals and scientific literature and is able to write scientific articles for publication in magazine.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja, vaje v mikroskopirnici in predavalnici (mikroskopiranje preparatov najbolj tipičnih magmatskih in metamorfnih kamnin in njihovo makroskopsko prepoznavanje), 4 dni terenskega dela. V okviru vaj študenti izdelajo poročilo o mikroskopskem opisu izbrane kamnine in terensko poročilo.	Lectures, practical work in the microscope laboratory and classroom (microscopy of most typical igneous, volcanic and metamorphic rocks in thinsections), 4 days of fieldwork. Within the practical work students will prepare a report of microscopic description of selected rock and create fieldwork report.

Načini ocenjevanja:	Delež/Weight	Assessment:
Pisni izpit ali oddane domače naloge	60,00 %	Written exam or given homework
Ustno preverjanje mikroskopskega in makroskopskega prepoznavanja kamnin	25,00 %	Oral exam of microscopic and macrocsopic identification of rocks
Poročilo terenskega dela	10,00 %	Fieldwork report
Aktivno sodelovanje pri predavanjih	5,00 %	Active participation in lectures

Reference nosilca/Lecturer's references:

DOLENEC, Matej, SERAFIMOVSKI, Todor, DANEU, Nina, DOLENEC, Tadej, ROGAN Å MUC, Nastja, VRHOVNIK, Petra, LOJEN, Sonja. The case of the carbonatite-like dyke of the Madenska River complex at the Kriva Lakavica section in the Republic of Macedonia : oxygen and carbon isotopic constraints. Turkish journal of earth sciences, ISSN 1300-0985, 2015, vol. 24, no. 6, str. 627-639, doi: 10.3906/yer-1502-28.

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.

SERAFIMOVSKI, Todor, DOLENEC, Tadej, TASEV, Goran, ROGAN, Nastja, DOLENEC, Matej. The composition of major minerals from the Buchim porphyry copper deposit, Republic of Macedonia. Geol. Maced., 2008, vol. 22, str. 17-26.

VRABEC, Mirijam, JANÁK, Marian, FROITZHEIM, Nikolaus, DE HOOG, J.C.M. Phase relations during peak metamorphism and decompression of the UHP kyanite eclogites, Pohorje Mountains (Eastern Alps, Slovenia). Lithos, 2012, vol. 144-145, str. 40-55, doi: dx.doi.org/10.1016/j.lithos.2012.04.004.

JANÁK, Marian, CORNELL, David, FROITZHEIM, Nikolaus, HOOG, J.C.M. De, BROSKA, Igor, VRABEC, Mirijam, HURAI, Vratislav. Eclogite-hosting metapelites from the Pohorje Mountains (Eastern Alps): P-T evolution, zircon geochronology and tectonic implications. European journal of mineralogy, 2009, vol. 21, no. 6, str. 1191-1212, doi: 10.1127/0935-1221/2009/0021-1966.

JANÁK, Marian, FROITZHEIM, Nikolaus, VRABEC, Mirijam, KROGH RAVNA, Erling J., HOOG, J.C.M. De. Ultrahigh-pressure metamorphism and exhumation of garnet peridotite in Pohorje, Eastern Alps. J. metamorph. geol., 2006, vol. 24, no. 1, str. 19-31.