

UČNI NAČRT PREDMETA/COURSE SYLLABUS

Predmet:	Osnove geologije
Course title:	Introduction to Geology

Študijski programi in stopnja	Študijska smer	Letnik	Semestri
Geologija, prva stopnja, univerzitetni	Ni členitve (študijski program)	1. letnik	Zimski

Univerzitetna koda predmeta/University course code: 890

Predavanja	Seminar	Vaje	Klinične vaje	Druge oblike študija	Samostojno delo	ECTS
60	0	45	0	0	105	7

Nosilec predmeta/Lecturer: Marko 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:

Ni posebnih pogojev.	Prerequisites: None.
----------------------	-----------------------------

Vsebina:

Kamninotvorni minerali. Magmatske, metamorfne in sedimentne kamnine.
Geološki čas: stratigrafija, geološka časovna lestvica, absolutne metode datiranja.
Nastanek Vesolja in snovi, nastanek in diferenciacija Sončevega sistema in Zemlje.
Notranja zgradba Zemlje, seizmologija, fizikalni pogoji v notranjosti Zemlje.
Tektonika plošč, divergentni, konvergentni in transformni robovi, mehanizmi tektonike plošč, nastanek litosfere, tektonika plošč in kamninski krog.
Nastanek in razvoj Zemljine atmosfere in hidrosfere.
Nihanja nivoja morske gladine.
Paleoklimatologija: planetarni oceanski in zračni tokovi, podnebni regulacijski mehanizmi in povratne zanke, podnebne razmere v Zemljini zgodovini.
Razvoj življenja na Zemlji: fosili in evolucija, izvor življenja, pomembni mejniki razvoja življenja v geološki zgodovini, masovna izumrtja.
Geološki naravni viri.
Geohazard.
Geološke strukture, osnovne geometrijske tehnike analize struktur (karte, profili, strukturne izohipse), interpretacija geološke zgodovine ozemlja iz strukture, osnovne meritve z geološkim kompasom.

Content (Syllabus outline):

Rock-forming minerals. Igneous, metamorphic and sedimentary rocks.
Geological time: stratigraphy, geological time scale, absolute dating methods.
Origin of the Universe and matter, evolution and differentiation of the Solar system and the Earth.
Internal structure of the Earth, seismology, physical conditions in the Earth's interior.
Plate tectonics; divergent, convergent and transform margins, mechanisms of plate motion, origin of the lithosphere, plate tectonics and the rock cycle.
The origin and evolution of Earth's atmosphere and hydrosphere. Sea-level changes.
Paleoclimatology: global oceanic and atmospheric circulation, climate regulation and feedbacks, climates in the Earth's history.
Evolution of life on Earth: fossils and evolution, the origin of life, major milestones in development of life, mass extinctions.
Geological resources.
Geohazard.
Geological structures, basic geometrical techniques of structural analysis (maps, cross-sections, structural contours), interpretation of terrain history from structure, basic measurement techniques with geological compass.

Temeljna literatura in viri/Readings:

PLUMMER et al., 2010: Physical geology 13th ed. - McGraw-Hill.
 ROGERS (ed.), 2008: An introduction to our dynamic planet. - Cambridge University Press.
 COCKELL et al., 2008: An introduction to the Earth-Life system. - Cambridge University Press.
 POWELL, 1996: Interpretation of geological structures through maps. – Longman.
 VRABEC, ZUPANČIČ, 2017: Študijska gradiva za predmet Osnove geologije (prosojnice s predavanj in vaj). Univerza v Ljubljani, Naravoslovnotehniška fakulteta.

Cilji in kompetence:

CILJI: študenti v tem uvodnem tečaju dobijo osnovni pregled nad geologijo in sorodnimi vedami o Zemlji. Spoznajo teorijo tektonike plošč kot podlago za razumevanje planetarnih geoloških procesov. Na holističen način so jim predstavljene medsebojne povezave in vplivi med geološkimi procesi in hidrosfero, atmosfero in biosfero.
KOMPETENCE: študenti razumejo prostorsko in časovno dimenzijo, ki jo predstavlja geologija. Poznajo osnovne geološke procese ki delujejo na Zemlji, prepoznajo osnovne minerale in kamnine, znajo brati geološke karte in iz njih interpretirati prostorsko zgradbo in časovni razvoj ozemlja.

Objectives and competences:

OBJECTIVES: In this introductory course, the students get an overview of geology and other geoscientific disciplines. They get acquainted with the plate tectonics theory as the unifying platform for understanding planetary geological processes. They learn, by holistic approach, the mutual interactions and influences between geological processes and the hydrosphere, atmosphere and biosphere.
COMPETENCES: Students understand the spatial and temporal dimension of geoscience. They are familiar with the principal geological processes operating on Earth, and are able to recognize major rock-forming minerals and rock types. They are capable of reading geological maps and using them to interpret the spatial architecture and temporal evolution of a given terrain.

Predvideni študijski rezultati:

Študenti osvojijo osnovno znanje o nastanku, sestavi in notranji zgradbi Zemlje in njenega atmosferskega ovoja. Spoznajo delovanje različnih geoloških procesov in prepoznavanje geoloških dogodkov v stratigrafskem zapisu. Poznajo in razumejo kompleksne medsebojne vplive, ki oblikujejo geološki razvoj Zemlje, globalnega podnebja, živih bitij, ter določajo nastajanje mineralnih surovin in geološko pogojenih tveganj za človeštvo. Pri tem predmetu študenti naredijo prehod iz srednješolskega nivoja razumevanja snovi k znanstvenemu pristopu, saj spoznajo zgodovinski razvoj različnih teorij, argumentacijo za in proti, ter tudi nekatere aktualne kontroverzne teme v geoznanosti. Pridobljeno znanje predstavlja osnovno podlago za strokovne predmete v nadaljevanju študija in jih postavlja v širši kontekst globalne geoznanosti. Pri predmetu pridobijo tudi praktične veščine dela z geološkim kompasom, spoznajo osnovne geometrijske tehnike za prikaz in interpretacijo geoloških podatkov na kartah, ter se naučijo prepoznavati glavne vrste mineralov in kamnin.

Intended learning outcomes:

Students master the fundamental knowledge about the origin, composition and internal structure of the Earth and its atmospheric outer layer. They get acquainted with geological processes operating on Earth and learn to recognize evidence of geological events in the stratigraphic record. They know and understand the complex interactions which control the geological evolution of the planet, the global climate, the evolution of life, and also the formation of mineral deposits and geological hazards which affect the mankind. In this course students progress from high-school level of understanding towards the scientific approach by learning historical development of various theories, pro et contra argumentation, as well as by getting familiar with selected controversies in modern geoscience. The acquired knowledge forms a basic framework for subsequent specialist courses and puts them in the wider context of global geoscience. Students also acquire practical skills for working with geological compass and fundamental geometrical techniques for presenting and interpreting geological data on maps, and learn to recognize major minerals and rock types.

Metode poučevanja in učenja:

Predavanja, kabinetne vaje, terenske vaje.

Learning and teaching methods:

Lectures, lab exercises, fieldwork.

Načini ocenjevanja:**Delež/Weight****Assessment:**

Pisni izpit	65,00 %	Written examination
Praktični preizkus znanja interpretacije geoloških	35,00 %	Test of geological map interpretation skills

kart		
Pozitivno opravljen preizkus prepoznavanja kamnin	0,00 %	Student must pass rock identification quiz

Reference nosilca/Lecturer's references:

TROBEC, Ana, ŠMUC, Andrej, POGLAJEN, Sašo, VRABEC, Marko. Submerged and buried Pleistocene river channels in the Gulf of Trieste (Northern Adriatic Sea) : geomorphic, stratigraphic and tectonic inferences. *Geomorphology*, 2017, vol. 286, str. 110-120.

WEBER, John, VRABEC, Marko, PAVLOVČIČ PREŠEREN, Polona, DIXON, Tim, JIANG, Yan, STOPAR, Bojan. GPS-derived motion of the Adriatic microplate from Istria Peninsula and Po Plain sites and geodynamic implications. *Tectonophysics*, 2010, vol. 483, iss. 3-4, str. 214-222.

VRABEC, Marko, ŠMUC, Andrej, PLENIČAR, Mario, BUSER, Stanko. Geološki razvoj Slovenije - Povzetek = Geological evolution of Slovenia - An Overview. V: PLENIČAR, Mario (ur.), OGORELEC, Bojan (ur.), NOVAK, Matevž (ur.). *Geologija Slovenije*. Ljubljana: Geološki zavod Slovenije, 2009, str. 23-40.