

## UČNI NAČRT PREDMETA/COURSE SYLLABUS

<b>Predmet:</b>	Geomehanika
<b>Course title:</b>	Soil Mechanics

<b>Študijski programi in stopnja</b>	<b>Študijska smer</b>	<b>Letnik</b>	<b>Semestri</b>
Geologija, prva stopnja, univerzitetni	Ni členitve (študijski program)	1. letnik	Letni

**Univerzitetna koda predmeta/University course code:** 891

Predavanja	Seminar	Vaje	Klinične vaje	Druge oblike študija	Samostojno delo	ECTS
30	0	15	0	0	45	3

**Nosilec predmeta/Lecturer:** Vojkan Jovičić

**Vrsta predmeta/Course type:** Obvezni / Compulsory

<b>Jeziki/Languages:</b>	<b>Predavanja/Lectures:</b>	Angleščina, Slovenščina
	<b>Vaje/Tutorial:</b>	Angleščina, Slovenščina

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

Vpis v 1. letnik.  
Pred pristopom k izpitu mora imeti študent opravljene izpite iz predmetov Matematika 1, Fizika 1 in Osnove geologije.

### Prerequisites:

Registration to the 1st academic year.  
Before entering the exam the student must have passed exams in Mathematics 1, Physics 1 and Introduction to Geology.

### Vsebina:

Nastanek tal.  
Klasifikacija tal.  
Faze v tleh (trdnina, voda, zrak), odnos med fazami.  
Zbitost tal.  
Geotehnične lastnosti zemljin, načini določanja teh lastnosti z laboratorijskimi preiskavami (stisljivost tal, strižna trdnost tal, konsolidacija tal).  
Določanje zbitosti in vodoprepustnost v laboratoriju, meje plastičnosti in stanja konsistence.  
Trdnost tal.  
Preizkusi v laboratoriju: edometerski preizkus, preizkus direktnega striga, triosni preizkus.  
Aplikacija splošnih izsledkov mehanike in mehanike fluida na zemljine: princip učinkovitih napetosti, kapilarni dvig vode v tleh, sukucija.  
Enodimenzionalno in dvodimenzionalno precejanje vode čez zemljine, proces konsolidacije.

### Content (Syllabus outline):

The origin of soils.  
Soil Classification.  
Phases in soil (soil skeleton, water, air), relationship between phases.  
Soil densification.  
Geotechnical characteristics of soils, determination of characteristics in the laboratory (soil deformability, shear strength, consolidation).  
Determination of density and permeability in the laboratory, limits of plasticity, state of consistency.  
Soil strength.  
Laboratory tests: edometer, direct shear and triaxial tests.  
The application of the general findings of mechanics and mechanics of fluids to soils: the principle of effective stresses, capillary rise of water in soils, suction.  
One dimensional and two dimensional seepage in soils; consolidation process.

### Temeljna literatura in viri/Readings:

ŠUKLJE, L., (1984). Mehanika tal. Univerza v Ljubljani, Fakulteta za arhitekturo, gradbeništvo in geodezijo, Ljubljana, str. 212-235 in 268-312.  
NONVEILLER, E., (1990). Mehanika tla i temeljenje građevina. Školska knjiga, Zagreb, str. 309-400 in 495-768.

MAKSIMOVIĆ, M. (2008). Mehanika tla. AGM knjiga, Beograd, str. 517.  
 MAJES, B. (2006). Skripta za predmet Mehanika tal, Ljubljana (dostopno na spletnem portalu <http://www.fgg.uni-lj.si/kmtal/>)  
 LOGAR, J., MAJES, B. (2006). Skripta za predmet Zemeljska dela, Ljubljana (dostopno na [www.fgg.uni-lj.si/kmtal/](http://www.fgg.uni-lj.si/kmtal/)).

**Cilji in kompetence:**

CILJI: Cilj predmeta je, da bo študent osvojil osnovno znanje iz geomehanike (mehanike tal), kar bo po študiju potreboval za praktično delo pri posegih in gradnji na terenu (temeljenje zgradb, prometnice, sanacija plazov, itd.), različnih zemeljskih delih in geotehničnih gradnjah, kjer sodeluje kot inženirski geolog.  
 KOMPETENCE: Slušatelji pridobijo osnovne sposobnosti za opravljanje del, ki jih opravlja inženirski geolog pri najrazličnejših posegih v teren in pri sodelovanju z gradbeno projektivo in operativno.

**Objectives and competences:**

OBJECTIVES: The aim of the subject is that students gain fundamental knowledge of Soil Mechanics, which would be needed for practical work for the interventions in built environment and construction on the site (foundation of structures, roads and railways construction, landslides stability measures etc.), ground and geotechnical works, in which he/she takes place as engineering geologist.  
 COMPETENCES: The students gain fundamental capabilities for carrying out the work, done by engineering geologist for different interventions in built environment and for collaborating with the Civil Engineering designers and construction engineers.

**Predvideni študijski rezultati:**

Po kursu študent pridobi osnovno znanje iz področja del geomehanike, ki ga rabi pri gradnji različnih tipov objektov (temeljenje zgradb, prometnice, idr.), kjer sodeluje kot geolog; opremljen je za razumevanje osnovnih postopkov povezanih z izvajanjem laboratorijskih raziskav v geomehanskem laboratoriju. Študent je usposobljen za osnovno inženirsko-geološko delo na geoloških, gradbenih, rudarskih in drugih gospodarskih družbah. Sposoben je sodelovanja pri različnih gradbenih posegih v teren in obvlada laboratorijske preiskave za določitev geomehanskih razmer.

**Intended learning outcomes:**

After the course the students gain fundamental knowledge from the areas of Soil Mechanics, which is needed for the construction of different types of structures (foundation of structures, roads and railways construction, landslides stability measures etc.), ground and geotechnical works, in which he/she takes place as engineering geologist. The students are enabled to understand the basic procedures related to the laboratory testing. Students are qualified for basic engineering-geological work on geological, civil engineering, mining and other companies. They are capable of collaborating for different interventions in the built environment and is competent in laboratory testing for determination of geological conditions.

**Metode poučevanja in učenja:**

Predavanja, laboratorijske vaje, računske vaje.

**Learning and teaching methods:**

Lectures, laboratory tutorials, computational tutorials.

**Načini ocenjevanja:**

**Delež/Weight**

**Assessment:**

pisni izpit	50,00 %	written exam
ustni izpit	40,00 %	oral exam
izdelava elaborata računskih vaj	10,00 %	production of the elaborate of the computational tutorials
Oceno sestavljajo: pisni izpit, ustni izpit in izdelava elaborata računskih vaj. Ocena: 6-10 (pozitivno) oz. 1-5 negativno; ob upoštevanju Statuta UL in fakultetnih pravil.		The rating consists of: written exam, oral exam and production of the elaborate of the computational tutorials. The mark: 6-10 (positive); 1-5 (negative); in agreement with Statute UL and the Faculty rules.

**Reference nosilca/Lecturer's references:**

VILHAR, Gregor, JOVIČIĆ, Vojkan, COOP, Matthew. The role of particle breakage in the mechanics of a non-plastic silty sand. Soil found., 2013, vol. 53, no. 1, str. 91-104.  
 JUREČIČ, Nina, ZDRAVKOVIĆ, Lidija, JOVIČIĆ, Vojkan. Predicting ground movements in London Clay. Proc. Inst. Civ. Eng., Geotech. eng.. [Print ed.], 2012, vol. 164, issue 4, str. 1-17, doi: 10.1680/geng.11.00079.  
 JOVIČIĆ, Vojkan, ŠUŠTERŠIČ, Jakob, VUKELIČ, Željko. The application of fibre reinforced shotcrete as primary support for a tunnel in flysch. Tunn. undergr. space technol.. [Print ed.], 2009, vol. 24, no. 6, str. 723-730.

