MEĐIMURJE POLYTECHNIC IN ČAKOVAC

POLYTECHNIC OF MEĐIMURJE AND ČAKOVEC

SYLLABUS COURSE

ACADEMIC YEAR:	2020/2021

1. GENERAL INFORMATION ABOUT THE COURSE

1.1. Course title	**Geotechnics**			
1.2. Study program (s)	Undergraduate professional study Sustainable Development			
1.3. Course status (O, I)	Mandatory	**1.6. Teaching methods (number of hours)**	**Lectures**	30
1.4. Course code			**Exercises**	30
I.5. Course abbreviation	GT		**Seminar**	
IV	IV		**E-learning**	
1.7. Credit value (ECTS)	5	**1.7. Place and time of classes**	Premises of the Polytechnic of Međimurje in Čakovec, according to the schedule published on the website	

2. TEACHING STAFF

2.1. Carrier	mr. sc. Vladimir Križaić, Dražen Hranj	**2.4. Assistant (s)**	Dražen Hranj
2.2. Calling	v. lecturer lecturer	**2.5. Title (s)**	lecturer
2.3. Contact	vkrizaic @ mev.hr dhranj @ mev.hr	**2.9. Contact / s**	dhranj @ mev.hr

3. COURSE DESCRIPTION

3.1. Course objectives	Acquisition of basic knowledge in geotechnics and me Hanika soil with a focus on the needs of the construction as a basis to monitor the teaching of vocational subjects.
3.2. Requirements for enrollment and taking the course	Passed the course Mechanics and Resistance of Structures
3.3. Learning outcomes	**After successfully completing the course, students will be able to:** 1. Analyze the basic physical laws of conservation in nature 2. Determine the equilibrium state of the material point and the soil 3. Classify soils and geotechnical results in construction 4. Predict the sliding surfaces in the ground of the foundation of the building 5. Select and determine the foundations of less demanding facilities.

	6. Analyze the stress state and deformation field required for mechanical safety and stability of the foundation
3.4. Course content	The course presents contents related to classical and modern technology of construction projects

3.5. Types of teaching

x	Lectures	x	Exercises		Blended e-learning	x	Independent tasks		Laboratory
	Seminars and workshops		Distance education		Field work	x	Multimedia and network		Mentoring work
	Other:								

. Performance language	Croatian

3.7. Monitoring student work (enter the number of ECTS credits for each activity so that the total number of ECTS credits corresponds to the credit value of the course, 1 ECTS = 30 hours)

2,0	Class attendance	0,5	Seminar paper		Essay
0,5	Teaching activity		Project		Report
1,0	Colloquia		Practical work		Continuous assessment
1,0	Written exam		Experimental work		
1,0	Oral exam		Research		

Seminar paper = colloquium 1

3.8. Assessment and evaluation of student work during classes and at the final exam

Activity specification	Percentage%	points
Evaluation during classes		
Class attendance	8%	8
Teaching activity	2%	2
Practical work	18%	18
Colloquium 1	36 %	36
Colloquium 2	36 %	36
Evaluation of exam work for students who did not take the colloquium		
Written exam	*90 %*	*9 0*
In total:	**100%**	*100*

3.9. Evaluation criteria - elaboration by outcomes

	Class attendance	Teaching activity	Colloquium 1	Colloquium 2	Practical work	In total
Outcome 1			10	5		1 5
Outcome 2			10	5		15
Outcome 3			10	5		15
Outcome 4			10	5		15
Outcome 5				1 5		1 5
Outcome 6				1 5		1 5
Outside the outcome	8	2				10
In total	**8**	**2**	**40**	**50**	**0**	**100**

Scoring outcomes (in order to pass the colloquium / exam the student must achieve at least 50% points for each learning outcome)
 Rating Points
89 - 100 Excellent (5)
76 - 88 Very good (4)
63 - 75 Good (3)
5 1 - 62 Sufficient (2)

	0 - 49 Insufficient (1)
3.10. Specifics related to taking the course	If a student collects 50% of the points of each outcome, he / she directly takes the exam . If a student does not achieve a sufficient number of points on the midterm exam, he / she cannot take the next midterm exam. Once achieved points in intermediate exams for each learning outcome are no longer deleted unless the student decides to correct the result for a particular learning outcome, whereby the points won until then are deleted and newly achieved points for that learning outcome are entered. The final grade is obtained on the exam period and is the sum of points earned during classes. Students who did not take the colloquium access the written part of the exam where all learning outcomes are checked .
3.11. Student obligations	Full-time students are required to attend at least 70% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. Part-time students are required to attend at least 30% of the total number of hours of lectures and exercises in order to exercise the right to take the exam. If the student has not fulfilled all the obligations provided by the course, he is obliged to attend the lectures again and meet the conditions for taking the exam. Attendance can be offset by online consultations, organized webinars and added assignments given by teachers. One lesson lasts 45 minutes, and several hours form a teaching unit. Absence from one teaching unit is counted as one absence. Delays and apologies are recorded separately. In the event that a student is absent from more than 50% of classes, and has a justifiable reason / apology, a request should be submitted to the Department Council, which then decides on the justification of student absences with the obligatory opinion of the course leader.
3.12. Written works	
3.13. Required reading	1. S. Zlatović, Introduction to Soil Mechanics, TVZ, 2005
	2. E. Nonvailler, Soil Mechanics, Building Foundations, Školska knjiga Zagreb, 1981
	3.
	4.
3.14. Supplementary literature	1. T.Roje Bonacci, P.Miščević: Mechanics tla, - script, GF Split / GF Osijek
	2.
	3.

4. ADDITIONAL INFORMATION ABOUT THE COURSE	
4.1. Quality control	The quality of the program, teaching process, teaching skills and level of mastery of the material will be established by conducting a written evaluation based on questionnaires, and in other standardized ways and in accordance with the acts of the Polytechnic of Međimurje in Čakovec.
4.2. Contacting the teacher	Students can contact the teacher during the consultation period and during classes, while for short questions and explanations they can contact any day during

	working hours by coming in person or by landline. It is also possible to ask questions by e-mail, which will be answered in 48 hours at the latest. It is desirable that students come to the consultation as often as possible for any ambiguities.
4.3. Informing about the course	It is the obligation of each student to be regularly informed about the course. All notifications about the holding or possible postponement of classes will be posted on the bulletin board and on the website of the Polytechnic at least 24 hours in advance.
4.4. The contribution of the course to the study program	Apply the basics of geotechnics through creating and designing projects construction

5. DEVELOPMENT OF THEMATIC UNITS (the number of elaborated hours is identical to the number of lectures and exercises of the course)

LECTURES

Hours	Topic and description of the lecture	Method of work • direct teaching (presentation, instruction, pp presentation) • Discovery learning (independent, guided, discussion, debate) • Group / collaborative learning • case study • field teaching…	Lecture learning outcomes	Course learning outcome
1.	Basic physical laws and principles of conservation in nature. Work, strength and energy. Units of measure and friction.	Presentation, pp presentation	Distinguish the laws of the nature of force	I1
2.	Soil material point dynamics . Definitions and representations of forces and moments. Equivalence of the force system. Equilibrium conditions analytically .	Presentation, pp presentation	Distinguish equilibrium conditions	I 1
3.	Soil material point dynamics . Definitions and representations of forces and moments. Equivalence of the force system. Equilibrium conditions graphically .	Presentation, pp presentation	Distinguish equilibrium conditions	I 2
4.	FUNDAMENTALS OF GEOMEHANICS AND GEOTECHNICS .	Presentation, pp presentation	Distinguish geotechnical data	I 2

5.	Introduction to geology Introduction to hydrogeology. The role of engineering geotechnics in construction .	Presentation, pp presentation	Use soil cross-section resistance	I 3
6.	Soil mechanics and soil water	Presentation, pp presentation	Use hydrostatics	I 3
7.	Ground stresses and sliding surface . Main stresses and stress trajectories.	Presentation, pp presentation	Distinguish between internal and external actions - stresses	I 4
8.	Geotechnical investigation works and landslides	Presentation, pp presentation	Distinguish landslides	I 4
9.	Foundation and subsidence of the soil	Presentation, pp presentation	Apply subsidence	I 5
10.	Main bending stresses and stress trajectories. Pure bending. Bending with transverse force.	Presentation, pp presentation	Apply body bending	I 5
11.	Shallow and deep foundations	Presentation, pp presentation	Distinguish foundations	I 5
12.	Construction pits	Presentation, pp presentation	Distinguish pits	I 5
13.	Protection of construction pits and diaphragm	Presentation, pp presentation	Explain the method of pit protection	I 5
14.	Installation of soil materials and soil improvement	Presentation, pp presentation	Explain consolidation	I6
15.	Major stresses and stress stresses of foundations.	Presentation, pp presentation	Explain the basic actions	I 6
EXERCISES / SEMINARS				
Hours	**Topic and description of the lecture**	**Method of work** • direct teaching (presentation, instruction, pp presentation) • Discovery learning (independent, guided, discussion, debate) • Group / collaborative learning • case study • field teaching…	**Lecture learning outcomes**	**Course learning outcome**
1.	Basic physical laws and principles of conservation in nature. Work, strength and energy. Units of measure and friction.	Presentation, presentation of seminar paper	Distinguish the laws of the nature of force	I1

2.	Soil material point dynamics. Definitions and representations of forces and moments. Equivalence of the force system. Equilibrium conditions analytically.	Guided assignment - seminar paper, examples of resistance	Distinguish equilibrium conditions	I1
3.	Soil material point dynamics. Definitions and representations of forces and moments. Equivalence of the force system. Equilibrium conditions graphically.	Guided assignment - seminar paper, modulus of elasticity	Distinguish equilibrium conditions	I2
4.	FUNDAMENTALS OF GEOMEHANICS AND GEOTECHNICS.	Guided assignment - seminar paper, bends and sags	Distinguish geotechnical data	I2
5.	Introduction to geology Introduction to hydrogeology. The role of engineering geotechnics in construction.	Guided assignment - seminar paper, Beam	Use soil cross-section resistance	I3
6.	Soil mechanics and soil water	Guided assignment - seminar paper, Gerber	Use hydrostatics	I3
7.	Ground stresses and sliding surface. Main stresses and stress trajectories.	Guided assignment - seminar paper, sizing	Distinguish between internal and external actions - stresses	I4
8.	colloquium	Guided task - example	To rate	
9.	Geotechnical investigation works and landslides , foundation and subsidence	Guided task - example	Apply subsidence	I5
10.	Main bending stresses and stress trajectories. Pure bending. Bending with transverse force.	Guided task - example	Apply body bending	I5
11.	Shallow and deep foundations	Guided task - example	Distinguish foundations	I5
12.	Construction pits from construction pit pits and diaphragms	Guided task - example	Distinguish pits	I5
13.	Installation of soil materials and soil improvement	Guided task - example	Explain the method of pit protection and consolidation	I5
14.	Major stresses and stress stresses of foundations.	Guided task - example	Explain the trajectories of the foundation	I6
15.	Colloquium	Independent production	To rate	