



COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Slope stability	

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: Gintaras Žaržojus Other(s):	Faculty of Chemistry and Geosciences, Vilnius University Institute of Geosciences Department of Hydrogeology and Engineering Geology

Study cycle	Type of the course unit (module)
Second	Compulsory

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Face-to-face (classroom)	3 rd semester	Lithuanian / English

Requirements for students	
Prerequisites: Engineering geology, Soil mechanics, Rock mechanics, Geotechnical engineering	Additional requirements (if any): Hydrogeology

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	133	80	53

Purpose of the course unit (module): programme competences to be developed		
To develop: ability to work in group with colleagues from a variety of backgrounds and to take the initiative; ability to learn and to teach, to increase knowledge, to search for new or missing information in various databases; ability to apply the knowledge and understanding in practice; ability to understand and explain the principles of the quarry engineering, dynamic processes in soil strata; ability to design experiments, to analyze, critically evaluate data and to present research findings both in writing and orally.		
Learning outcomes of the course unit (module)	Teaching and learning methods	Assessment methods
Will be able to solve the tasks related with mining and exploitation of quarry	Active lectures, simulation of situations	Home work Presentation Exam
Will be able to design the quarry, predict and assess the potential consequences of quarry design	Active lectures, simulation of situations	Home work Presentation Exam
Will be able motivate and accept design solutions of mining and quarry.	Active lectures, simulation of situations	Home work Presentation Exam
Will be able to write the scientific and practical reports and provide competent suggestions.	Active lectures, simulation of situations	Home work Presentation Exam
Will know where and how to find necessary information by means of modern technology	Finding and reading of review and scientific papers, seminar preparation, project preparation	Presentation
Will be able to analyze and systemize information	Reading of review and scientific papers, seminar preparation, project preparation	Presentation

Content: breakdown of the topics	Contact hours						Self-study work: time and assignments		
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	Contact hours	Self-study hours	Assignments
1. Introduction to slope stability: The concept of slope stability; The definition and notions; The interceptions with related disciplines Historical background	4						4	11	Readings of references
2. The Earth pressure: Pressure at rest; The lateral Earth pressure; The Earth pressure of Rankin; The Earth pressure of Coulomb; The other theories of Earth pressure.	15			4			19	12	Readings of references, homework
3. The earth pressure in cohesion soils: The active pressure of the earth; The passive pressure of the earth.	15			4			19	12	Readings of references, homework
4. Slope stability: The nature of slopes; The methods of evaluations of slopes stability; The causes of loses of slope stability; The requirements of slope stability analysis; The sliding surfaces of slope; Slope stability analysis methods.	15			4			19	12	Readings of references, homework
5. Soil liquefaction	15			4			19	12	Readings of references, homework
Total	64			16			48	59	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Home work	30	During semester	3 points. Thoroughly done homework. All answers is correct. 2 points. Homework include small number of mistakes. Greater part of answers is correct. 1 point. Homework include mistakes. Some answers is correct. 0 point. Homework was not submitted.
Written examination (may be in two parts: at the middle of semester and at the end)	70	January	7 points. Excellent knowledge and ability. 6 points. Well knowledge and ability, but answers is non-exhaustive. 5 points. Well knowledge and ability, answers has non-essential mistakes. 4 points. Moderate knowledge and ability, the answers non-exhaustive. 3 points. Moderate knowledge and ability, answers with errors. 2 points. Knowledge and ability below the average, the mistakes is essential. 1 point. Knowledge and ability satisfy the minimum requirements. 0 points. Knowledge and ability does not satisfy the minimum requirements.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsary reading				
James K. Mitchell Kenichi Soga	2005	Fundamentals of soil behaviour 3 rd ed.	-	Hoboken, New Jersey, USA, Published by John Wiley & Sons, Inc.
Laurence D. Wesley	2010	Fundamentals of soil mechanics for sedimentary and residual soil	-	Hoboken, New Jersey, USA, Published by John Wiley & Sons, Inc.
Lee W. Abramson Thomas S. Lee Sunil Sharma Glen M. Boyce	2002	Slope stability and stabilisations methods	-	New Jersey, USA, Published by John Wiley & Sons, Inc.
Optional reading				
Rimvydas Tarvydas	1995	Gravitacinio šlaito uolienu slinkimo gamtinės sąlygos ir dinamika (Šlaitų deformacijos) Metodiniai nurodymai	-	Vilnius, Vilnius university
Robin Chowdhury	2010	Geotechnical slope analysis	-	London, UK, CRC Press, Taylor & Francis Group
E. M. Lee D. K. C. Jones	2004	Landslide risk assessment	-	London, UK, Published by Thomas Telford, Ltd.