COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Rock mechanic	**IGME 711**

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)	1st semester	Lithuanian / English

Requirements for students	
Prerequisites: Engineering geology, Soil mechanic.	**Additional requirements (if any):** Hydrogeology, Mathematics, Physics

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	133	64	69

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 rock features and problems of karst	Active lectures, simulation of situations	Home work Presentation Exam
Will be able to planning and carry out investigations of rock mass in regions of karst	Active lectures, simulation of situations	Home work Presentation Exam
Will be able motivate and accept design solutions of geomechanics tasks.	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 rock mechanic: The concept of rock mechanic; The definition and notions; The interceptions with related disciplines Historical background	3						**3**	**9**	Readings of references
2. Rock mass classification to geotechnical purpose: RQD Terzaghi classification RMR Q	10			1			**11**	**12**	Readings of references, homework
3. Index properties of rock	10			4			**14**	**12**	Readings of references, homework
4. Geotechnical investigations and test of rock mass	5			2			**7**	**12**	Readings of references, homework
5. Karst processes in Lithuania	20			9			**29**	**12**	Readings of references, homework
Total	**48**			**16**			**64**	**69**	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Home work	30	During semester	3 points. Thoroughly done homework. All answers are correct. 2 points. Homework is done with non-essential mistakes. Some answers are correct. 1 point. Homework is done but include mistakes. More answers are correct. 0 point. Homework 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 are non-exhaustive. 5 points. Well knowledge and ability, answers have 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 are 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				
Vytautas Narbutas Augustinas Linčius Vytautas Marcinkevičius	2001	Devono uolienų karstas ir aplinkosaugos problemos Šiaurės Lietuvoje	-	Vilnius, Agora
LR aplinkos ministerija	2012	STR 1.04.03:2012	-	http://www3.lrs.lt
Europos standartizacijos komitetas	2003	EN ISO 14689-1:2003 Geotechniniai tyrinėjimai ir bandymai	1 dalis	Vilnius, Lietuvos standartizacijos departamentas
Optional reading				
Bhawani Singh R. K. Goel	2011	Engineering Rock Mass Classification, Tunneling, Foundation, and Landslides	-	Waltham, MA, USA, Published by Elsevier, Inc.
J. C. Jaeger N. G. W. Cook R. W. Zimmerman	2007	Fundamentals of Rock Mechanics, 4th ed.	-	Carlton, Victoria, Australia, Blackwell Publishing
Philip E. van Beynen (ed.)	2011	Karst Management	-	London, UK, Springer
Editors: Bartolome Andreo Francisco Carrasco Juan Jose Duran James W. LaMoreaux	2010	Advanced in Research in Karst Media	-	Berlin, DE, Springer