	Course unit (module) title						Code				
Glacial geology			-			-					
Lect		Department(s) where the course unit (module) is delivered									
Coordinator: Prof. Petras Šinkūnas			and	Department of Geology and Mineralogy, Faculty of Chemistry and Geosciences, Vilnius University, M. K. Čiurlionio str. 21/27, LT-03101 Vilnius							
Stu	1,1,1,1	Type of the course unit (module)									
Full-time studies (2 nd s			(Optional							
Mode of delivery Period w			when the course unit La						nguage(s) of instruction		
				ule) is delivered Lithuan					ian		
Face-to-face Autumn sen					r stu	lonte	LI	lan			
Prerequisites: Physical Geology; Quaternary geology and Geomorphology; Sedimentary Petrography										ension	
Course (module) volume in credits	Total stuc worklo			Contact hours				Self-study hours			
5	133			48 (32 – lectures; 16 – seminars and tutorials)				s)	85		
	e of the course										
To deepen knowledge and skills in different aspects of Quaternary Geology related to geological processes											
occurred during Quate											
glacial environments,	related processes	and proc	iucts,	to ana	iyse tl	ie stru	icture	e and	archit	ecture of glacigenic	
sediment sequences.	an of the commo			Taaak	•	مالم	••	~			
Learning outcom	es of the course odule)	unit		Teach	metl		irnin	g	Assessment methods		
		elated to	Le	tures			ased		Evaluation of the activeness		
<i>Knowledge:</i> Processes and products related to the continental glaciations, structure and composition of the Quaternary sediment sequences. <i>Cognitive skills:</i> Recognise and understand the nature and evolution of glacial geological processes and phenomena in systemic way; analyse and define their regularities in space and time. <i>Practical skills:</i> Analysis of reference scientific literature sources and the other publications, efficient search of geological information. <i>Transferable skills:</i> Ability to find the scientific and the other geological information in primary and secondary sources (including internet and digital databases), skills to collect the required data in the integral information flow.				Lectures, problem based learning; seminar, tutorials, self-study of reference material.					writ	minars and self-study grial presentation, final ten-oral exam.	
				Contact hours					Self-study work: time and assignments		
						work	work	ours	hours		
Content: breakdo	wn of the topics	setutoe	Tutorials	Seminars	Exercises	Laboratory work	Internship/	Contact h	Self-study	Assignments	
1. Introduction: aim,	content, work pl	I echimes	Tutorials	Seminars	Exercises	Laboratory	Internship/work	Contact hours	– Self-study hours	Bennett, Glasser, 2009,	
 Introduction: aim, assessment, literat Chronology, feature 	content, work pl ure res and climate o	an, 2	Tutorials	1 Seminars	Exercises	Laboratory	Internship/ nlacement	•		Bennett, Glasser, 2009, 1-6. Chapman et al., 2000,	
 Introduction: aim, assessment, literat 	content, work pl ure res and climate o riod	an, 2	Tutorials		Exercises	Laboratory	Internship/ placement	2	1	Bennett, Glasser, 2009, 1-6.	

Ice Flow											41-79.
5. Glacier hydrology			2		1				3	6	Bennett, Glasser, 2009,
	1 '		2		1				5	0	81-107.
6. Processes of glacia			2		1				3	5	Bennett, Glasser, 2009, 109-134.
7. Landforms of glaci	al erosion		2		1				3	6	Bennett, Glasser, 2009, 135-184.
 Glacial debris entrainment and transport Direct closicle adjustmentation on land 					1				3	6	Bennett, Glasser, 2009, 185-206.
9. Direct glacial sedimentation on land			2		1				3	5	Bennett, Glasser, 2009. 207-235.
10. Glaciofluvial sedimentation on land					1				3	6	Bennett, Glasser, 2009, 235-246.
11. Ice marginal moraines and subglacial landforms					1				3	5	Bennett, Glasser, 2009, 247-289.
12. Glaciofluvial ice-m subglacial landform			2		1				3	6	Bennett, Glasser, 2009, 289-304.
13. Glacial sedimentati			2		1				3	6	Bennett, Glasser, 2009, 305-325.
14. Landforms of glaci water	al deposition i	n	2		1				3	5	Bennett, Glasser, 2009, 329-345.
15. Palaeoglaciology	water 15. Palaeoglaciology				1				3	6	Bennett, Glasser, 2009, 348-375; Chapman et al., 2000, 43-47.
16. Structure of glacial	16. Structure of glacial deposit sequences				1				3	5	Self-study of reference material
Preparing to the exam.	Preparing to the exam.								2		
	1	Total	32	2	14				48	85	
Assessment strategy	Weight, %	Dead	lline	Ass	essm	ent c	riteri	ia			
Activeness in	10%	D ·									
	10%0	Durin	ıg	1	point	ac	tive	in th	ne di	scuss	ions, asking questions,
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	-		erm ng	disp 0 p 1 p the	olayin oints: oints chose	ig kno do no – pro en top	owled ot par wides oic;	lge; ticipat an in	te acti forma	ively. ative i	llustrated presentation on
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Optional reading							
Chapman J.A.,	2000	The Great Ice Age:		Taylor & Francis Group			
Drury S.A., Wilson		Climate Change and					
R.C.L.		Life.					
Goudie A. and	2007	Global Environments		Oxford Univ. Press			
Stokes S.		Through the					
		Quaternary. Exploring					
		Environmental Change.					
Ehlers, J., Gibbard,	2011	Quaternary Glaciations	Devel. in	Elsevier Ltd.			
P.L., Hughes P.D.		- Extent and	Quatern. Sc.				
(Eds)		Chronology. A closer	15				
		look.					
Ehlers, J. & Gibbard,	2004	Quaternary Glaciations		Elsevier			
P.L (eds)		– Extent and					
		Chronology, Part I:					
		Europe.					
Menzies J.	2002	Modern and Past		Butterworth-Heinemann,			
		Glacial Environments.		Elsevier group			