COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Managing Climate Change	

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: Justas Kažys **Other(s):**	Institute of Geosciences Faculty of Chemistry and Geosciences

Study cycle	Type of the course unit (module)
First	Compulsory for students of Meteorology and Hydrology program (passed from 2018 and upwards) Optional for students of Meteorology and Hydrology program (passed in 2016 and 2017) and for students of other study programs in Institute of Geosciences

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Face-to-face	Spring (8th semester)	English

Requirements for students	
Prerequisites: no	**Additional requirements (if any):** no

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	133	48	85

Purpose of the course unit (module)		
To master the context of climate change past lessons, today challenges and future solutions and to identify interconnections between political, historical and scientific information. Students will be able to apply the knowledge in a complex way, to contribute implementing of UN sustainability goals, to work in a team finding best transdisciplinary solutions, and to communicate actively with representatives from other fields.		
Learning outcomes of the course unit (module)	**Teaching and learning methods**	**Assessment methods**
- Students will comprehend diversity and extent of climate change topicality and will be able to define climate change challenges from different counties perspective	Lectures, self-study.	Final exam
- ... will perceive the importance of energy consumption, as the main factor of greenhouse gasses emissions, from historical context of global energy infrastructure and will be able to evaluate the role of technological solutions reducing the emissions	Lectures, self-study, discussion, group practice.	Seminar, final exam
- ... will be able to clarify and to evaluate climate change threats to human wellbeing and wild nature and to value the adaptation measures which could help to reduce the consequences	Lectures, self-study, discussion, group practice.	Seminar, final exam
- ... will be able to assess good and bad practice fighting climate change on national and international levels in the past and will suggest planning and managing guidelines of climate change in the future	Lectures, self-study, discussion.	Seminar, final exam
- ... will recognize the importance of climate change communication between science and	Lectures, self-study, discussion.	Seminar, final exam

policy making, will be able to present the examples of gains and failures for such communication		

Content: breakdown of the topics	Contact hours								Self-study work: time and assignments	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work placement	E-learning	**Contact hours**	**Self-study hours**	**Assignments**
1. Climate change topicality. Short climate change history and evolution of perception. Natural vs. anthropogenic climate change processes. Climate change mitigation vs. adaptation. Definitions of uncertainty, vulnerability, sensibility. The role of IPCC. The limits of greenhouse gases. World's "carbon footprint".	3							**3**	**5**	
2. Climate change policy, law and economy. Global, regional and local levels of policymaking. The role of EU and Lithuania in climate change policy. UN climate change convention. Conferences of the Parties (COP) and agreements. UN sustainability goals (17). Financial mechanism of climate change actions. Climate change law in EU and Lithuania. Human right and climate change. Climate change justice. Economical assessment of climate change. Cost benefit analysis. Predictions of global warming impact on economy.	9		5					**14**	**22**	
3. Climate change mitigation, adaptation and planning. Global potential of climate change mitigation and adaptation. Mitigation and adaptation strategies. Greenhouse gas emissions quotes, trading and tax policy. Definition of sustainable energy. Alternative energy sources and technologies. Methodology of vulnerability assessment. Identification and choosing of adaptation measures. Climate change action planning. The role of international, national and sectoral (ministries) institutions in climate change planning. International climate change mitigation and adaptation initiatives. Climate change planning in Lithuania.	11		8					**19**	**32**	
4. Climate change information, sociology and psychology. The role of information and education in climate change awareness and perception. Information availability and reliability. The role of media, science, government, NGOs, social networks and pop culture. Cultural differences in climate change believes and cognition. Geography of	7		5					**12**	**24**	

climate change perception. Individual response and the origins of impacts. Diversity of attitudes and social impacts. Climate change denial and scepticism. Environmental and climate change social movements. Climate change information in Lithuania.										
Total	**30**		**18**					**48**	**83**	

Assessment strategy	Weight, %	Deadline	Assessment criteria
Oral presentation (15-30 min.) for every student and open discussion during seminars	10	During the semester	Maximum for oral presentation is 1 point. 6 seminars are planned, only one presentation per student required. Attendance no less than 75% of all seminars.
Continuous seminar (oral and written form). 3 continuous seminars for student groups (2-4 people), Students preparing (written form) and presenting (15 min. oral presentation) the climate change adaptation project.	40	During the semester	Maximum for the project is 4 points. 1 point for every continuous part of the project (3 times) and 1 point for the final version of the project. Attendance no less than 75% of all seminars.
Final exam (written form) with 3 open (short) and 20 test questions	50	During the session	Maximum for final exam is 5 points. Every open question value is 1 point. Every test question value is 0.1 points. Exam only then seminars (oral presentation and the project) are passed. Final marked constructed from the points of the oral presentation, the project and the final exam.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsory reading				
Dessler A.	2012	Introduction to modern climate change		New York: Cambridge University Press
IPCC	2014	Summary for policymakers. In: Climate Change 2014: Impacts,Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]	IPCC AR5	http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf
IPCC	2014	Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I.	IPCC AR5	http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf

		Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]		
Metz B.	2010	Controlling Climate Change		Cambridge University Press, New York http://controllingclimatechange.net/book/Controlling_Climate_Change_by_Bert_Metz.pdf
OECD	2015	The Economic Consequences of Climate Change		http://espas.eu/orbis/sites/default/files/generated/document/en/OECD%20Climate%20Change.pdf
Reisinger A.	2009	Climate Change 101: An Educational Resource		https://www.victoria.ac.nz/sgees/research-centres/documents/climate-change-101-about-author.pdf
Stern N.	2007	The economics of climate change : the Stern review on the economics of climate change		New York: Cambridge University Press
Optional reading				
Arustienė J. ir kt.	2012	Klimato kaita Klaipėdos mieste ir rajone: poveikis, sąnaudos ir prisitaikymas		Vilnius : Vilniaus universiteto leidykla
Bukantis A. ir kt.	2007	Klimato kaita: prisitaikymas prie jos poveikio Lietuvos pajūryje		Vilnius : Vilniaus universiteto leidykla
Bukantis A. ir kt.	2015	Studijos, nustatančios atskirų sektorių jautrumą klimato kaitos poveikiui, rizikos vertinimą ir galimybes prisitaikyti prie klimato kaitos, veiksmingiausias prisitaikymo prie klimato kaitos priemones ir vertinimo kriterijus, parengimas.		Vilnius: VšĮ Gamtos paveldo fondas
Bukantis A., Kažys J., Rimkus E., Žalakevičiu M.	2017	100 klausimų apie klimato kaitą		Vilnius : Mokslo ir enciklopedijų leidybos centras
European Environment Agency	2015	Overview of climate change adaptation platforms in Europe	EEA Technical report No 5/2015	Luxembourg: Publications Office of the European Union
Europos Komisija. Komunikacijos generalinis direktoratas	2006	Klimato kaita – kas tai?		https://ec.europa.eu/clima/sites/campaign/pdf/cl

				imate_change_youth_lt.pdf
Europos Komisija. Komunikacijos generalinis direktoratas	2008	Kova su klimato kaita : ES rodo pavyzdį		https://publications.europa.eu/en/publication-detail/-/publication/aad43ef3-a821-4eb5-a38e-1c8aaa1b9dd1/language-lt
Europos Komisija. Komunikacijos generalinis direktoratas	2017	Climate change	Special Eurobarometer report 459	https://publications.europa.eu/en/publication-detail/-/publication/5f03345d-9f43-11e7-b92d-01aa75ed71a1/language-en/format-PDF/source-67010687
Helm D.	2005	Climate Change Policy		New York : Oxford University Press
Henderson R. M., Reinert S. A., Dekhtyar P., Migdal A.	2016	Climate Change in 2017: Implications for Business	Harvard Business School Background Note 317-032	http://www.hbs.edu/environment/Documents/Climate_Change_2017.pdf
Jenkins A. L.	2011	Climate Change Adaptation: Ecology, Mitigation and Management		https://ebookcentral.proquest.com/lib/viluniv-ebooks/detail.action?docID=3018172#goto_toc
Kažys J. ir kt.	2012	**Prisitaikymas prie klimato kaitos žemės ūkyje: projekto „BalticClimate“ pamokos**		Vilnius: Aplinkos vertinimo projektai
Kilpys J., Pauša K., Jurkus N.	2017	Klimato kaitos švelninimo ir prisitaikymo prie klimato kaitos gairės savivaldybėms		http://www.krea.lt/images/angle180/klimato-kaita-gaires-savivaldybems.pdf
Knieling J.	2016	Climate Adaptation Governance in Cities and Regions: Theoretical Fundamentals and Practical Evidence		Chichester: John Wiley & Sons, Ltd,
LR Seimas	2012	Nacionalinę klimato kaitos valdymo politikos strategija		https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.437284
LR Vyriausybė	2013	Nacionalinės klimato kaitos valdymo politikos strategijos tikslų ir uždavinių įgyvendinimo tarpinstitucinį veiklos planas		https://www.e-tar.lt/portal/lt/legalAct/TAR.A277513E33EB/luIjTHgpmL
McMichael A. J. ir kt.	2006	Climate change and human health - risks and responses		http://www.who.int/globalchang

				e/publications/cchhbook/en/index.html
Moosmann, L., Neier, H., Mandl, N. and Radunsky, K.	2017	Implementing the Paris Agreement: New challenges in view of the COP 23 climate change conference		https://publications.europa.eu/en/publication-detail/-/publication/98a4497f-bac0-11e7-a7f8-01aa75ed71a1/language-en/format-PDF/source-67012216
Schmidt-Thome P., Klein J.	2013	Climate Change Adaptation in Practice: From Strategy Development to Implementation		Chichester: John Wiley & Sons, Ltd,
UNICEF Office of Research	2014	The Challenges of Climate Change: Children on the front line		https://www.unicef-irc.org/publications/pdf/ccc_final_2014.pdf