

## COURSE OF DOCTORAL STUDIES

Course title	Field of science (branch) code	University / Faculty	Institute / Department
Applied Climatology	Natural Sciences, (Physical Geography) N006	Vilnius University / Faculty of Chemistry and Geosciences	Institute of Geosciences / Department of Hydrology and Climatology
Study methods	Number of credits allocated	Study methods	Number of credits allocated
Lectures		Consultations	1
Individual	8	Seminars	1
Course annotation			
<p>The course aim is to study the methods of application of climatic and meteorological information in agriculture, energy production, engineering, transport system and recreation.</p> <p>Content. Definitions and branches of Applied Climatology and Applied Meteorology. The importance of climate for agriculture. Methods and problems in agrometeorology and agroclimatology Relationship between plant development and productivity with agrometeorological conditions. Agrometeorological factors of yield quality. Climate and livestock. Meteorological phenomena unfavorable to agriculture. Weather dependence of plant pests and diseases. Agrometeorological forecasts. Mathematical modeling of production processes in plants. Agroclimatic justification of crop yields. General and special agro-climatic zoning. Impact of climate change on agriculture. Impact of climate on energy production. Assessment of solar and wind energy resources. Definition and tasks of engineering meteorology. Assessment of climatic factors influencing the durability of buildings and its exploitation, indoor microclimate and design decision making. Urban meso- and microclimate, its optimization methods. Microclimatic peculiarities of pollutant dispersion in the urban environment. Atmospheric corrosion of building materials. Influence of climatic and meteorological factors on air, water, rail and road transport. Influence of climate and weather on recreation and tourism. Impact of climate change on tourism and recreation.</p>			
Required readings			
Bonan G. 2016. Ecological Climatology. Third edition. Cambridge University Press.			
Burroughs W. J. 2007. Climate Change: A multidisciplinary Approach. 2 <sup>nd</sup> Edition. Cambridge University Press.			
Geiger. R., Aron R. H., Todhunter P. 2009. The Climate Near the Ground. Rowman & Littlefield Publishers.			
Harpal S. Mavi, Graeme J. Tupper. 2004. Agrometeorology: Principles and Applications of Climate Studies in Agriculture. Food Products Press.			
Keissl J. 2013. Solar energy forecasting and resource assesment. Elsevier.			
Consulting lecturers name surname	Degree	The most important works in the field of science (branch) have been published during the last 5 years	
Arūnas Bukantis	Dr. (HP)	<p>Šarauskienė, D., Akstinas, V., Kriaučiūnienė, J., Jakimavičius, D., <b>Bukantis, A.</b>, Kažys, J., Povilaitis, A., Ložys, L., Kesminas, V., Virbickas, T., Pliūraitė, V. 2017. Projection of Lithuanian river runoff, temperature and their extremes under climate change. <i>Hydrology Research</i> 49(2), 344-362.</p> <p>Stonevičius, E., Rimkus, E., Kažys, J., <b>Bukantis, A.</b>, Kriaučiūnienė, J., Akstinas, V., Jakimavičius, D., Povilaitis, A., Ložys, L., Kesminas, V., Virbickas, T., Pliūraitė, V. 2018. Recent aridity trends and future projections in the Nemunas River basin. <i>Climate Research</i> 75(2), 143–154.</p> <p>Povilaitis, A., Widén-Nilsson, E., Šarauskienė, D., Kriaučiūnienė, J., Jakimavičius, D., <b>Bukantis, A.</b>, Kažys, J., Ložys, L., Kesminas, V., Virbickas, T., Pliūraitė, V. 2018. Potential impact of climate change on nutrient loads in Lithuanian rivers. <i>Environmental engineering and management journal</i>. 17 (9), 2229-2240.</p> <p>Kriaučiūnienė, J., Virbickas T., Šarauskienė, D., . Jakimavičius, D., Kažys, J., <b>Bukantis, A.</b>, Kesminas, V., Povilaitis, A., Dainys, J., Akstinas, V., Jurgelėnaitė, A., Meilutytė-Lukauskienė, D., Tomkevičienė, A. 2019. Fish assemblages under climate change in Lithuanian rivers. <i>Science of The Total Environment</i>. 661, 563-574.</p> <p>Dainys, J., Jakubavičiūtė, E., Gorfine, H., Pūtys, Ž., Virbickas, T., Jakimavičius, D., Šarauskienė, D., Meilutytė-Lukauskienė, D., Povilaitis, A., <b>Bukantis, A.</b>, Kažys, J., Ložys, L. 2019. Predicted Climate Change Effects on European Perch (<i>Perca Fluviatilis</i> L.) - A Case Study from the Curonian Lagoon, South-eastern Baltic. <i>Estuarine, Coastal and Shelf Science</i> 221 (2019), 83-89.</p>	
Egidijus Rimkus	Dr.	Stonevičius, E., <b>Rimkus, E.</b> , Štaras, A., Kažys, J., Valiuškevičius, G.	

	<p>2017. Climate change impact on the Nemunas River basin hydrology in the 21st century. <i>Boreal Environment Research</i>, 22, 49–65.</p> <p><b>Rimkus, E.</b> Stonevičius, E, Kilpys, J., Mačiulytė, V., Valiukas, D. 2017. Drought identification in the eastern Baltic region using NDVI. <i>Earth System Dynamics</i>, 8(3), 627-637.</p> <p>Jaagus, J., Briede, A., <b>Rimkus, E.</b>, Sepp, M. 2018. Changes in precipitation regime in the Baltic countries in 1966–2015. <i>Theoretical and Applied Climatology</i>, 131 (1-2), 433-443.</p> <p>Stonevičius, E., <b>Rimkus, E.</b>, Kažys, J., Bukantis, A., Kriaučiūnienė, J., Akstinas, V., Jakimavičius, D., Povilaitis, A., Ložys, L., Kesminas, V., Virbickas, T., Pliūraitė, V. 2018. Recent aridity trends and future projections in the Nemunas River basin. <i>Climate Research</i>, 75, 143-154.</p> <p>Stonevičius, E., Stankūnavičius, G., <b>Rimkus, E.</b> 2018. Continentality and Oceanicity in the Mid and High Latitudes of the Northern Hemisphere and Their Links to Atmospheric Circulation, <i>Advances in Meteorology</i>, Article ID 5746191, pp 12. <a href="https://doi.org/10.1155/2018/5746191/">https://doi.org/10.1155/2018/5746191/</a>.</p> <p><b>Rimkus, E.</b>, Briede, A., Jaagus, J., Stonevičius, E., Kilpys, J., Viru, B. 2018. Snow-cover regime in Lithuania, Latvia and Estonia and its relationship to climatic and geographical factors in 1961–2015, <i>Boreal Environment Research</i>, 2, 193-208.</p> <p><b>Rimkus, E.</b>, Edvardsson, J., Kažys, J., Pukiene, R., Lukosiunaite, S., Linkeviciene, R., Stoffel, M., Corona, C. 2019. Scots pine radial growth response to climate and future projections at peat and mineral soils in the boreo-nemoral zone. <i>Theoretical and Applied Climatology</i>, 136 (1-2), 639–650.</p> <p>Kilpys, J., Pipiraitė-Januškienė, S., <b>Rimkus E.</b> 2020. Snow climatology in Lithuania based on the cloud-free moderate resolution imaging spectroradiometer snow cover product, <i>International Journal of Climatology</i>, 40(10), 4690-4706.</p> <p><b>Rimkus, E.</b>, Mačiulytė, V., Stonevičius, E., Valiukas, D. 2020. A revised agricultural drought index in Lithuania, <i>Agricultural and food sciences</i>, 29 (4), 359–371.</p>
Approved by the Doctoral Committee for Physical Geography (N006) on 9 <sup>th</sup> of March 2021, protocol no. (4.20 E) 610000-KT-24	
Committee Chairman assoc. prof. dr. D. Pupienis	