

COURSE OF DOCTORAL STUDIES

Course title	Field of science (branch) code	University / Faculty	Institute / Department
Limnology	Natural Sciences (Physical Geography N 006)	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 work	9	Seminars	
Course annotation			
<p><u>Purpose of the course:</u> provide knowledge on the distribution, origin and type of lakes, understanding of hydrological and ecological processes limnological systems.</p> <p><u>Study topics.</u> Definition of limnology. Lake as a system. Lake as a part of environment. Distribution of lakes in the World and Lithuania. Morphology of lakes and lake basins. Classification of lakes origin. Hydrodynamic and ecological lake zones. Morphometric parameters. Hydrographic connectivity of lakes. Lake water balance, its components and evaluation of balance in different conditions. Water level and its short term, seasonal and multiannual variation. Lake effect on runoff formation. Lake radiation balance, albedo, scattering and absorption of radiation. Optical properties of lake water. Lake energy balance and budget. Vertical stratification in the lakes and its drivers. Lake classification according to seasonal variation in stratification. Ice cover. Horizontal thermal structures. Waves and currents. Chemical processes in lakes. Chemical composition of lake water. Dissolved gasses. Mineralization. Nitrogen and phosphorous cycle in lakes. Organic matter. Tropic levels and ontogenesis. Lake as an ecosystem. Biotic components. Lake biotopes. The eutrophication and driving factors. Sediments. Classification of sediments. Lake restoration methods and feasibility.</p>			
Required readings			
Kilkus K. (2005). <i>Ežerotyra</i> . Vilnius: VU leidykla.			
Wetzel R. G., Likens G. E. (2010). <i>Limnological Analysis</i> . Springer.			
Wetzel R. G. (2001). <i>Limnology. Lake and River Ecosystems</i> . Academic Press.			
Valiuškevičius G. (2007). <i>Mažieji Lietuvos ežerai: ištekliai, genezė, hidrologija</i> . Vilnius: VU leidykla.			
Kostkevičienė J. (2009). <i>Algologija</i> . Vilnius: VU leidykla.			
Consulting lecturers name, surname	Degree	The most important works in the field of science (branch) have been published during the last 5 years	
Edvinas Stonevičius	Dr.	Rimkus, E., Stonevičius, E. ; Kilpys, J.; Mačiulytė, V., Valiukas, D. 2017. Drought identification in the eastern Baltic region using NDVI. <i>Earth system dynamics</i> , 8, 627-637. Stonevičius, E. , Rimkus, E., Štaras, A., Kažys, J., Valiuškevičius, G. 2017. Climate change impact on the Nemunas River basin hydrology in the 21st century. <i>Boreal environment research</i> , 22, 49-65. Stonevičius, E. , Valiuškevičius, G., 2018. Identification of significant flood areas in Lithuania. <i>Water resources</i> . 45(1), 27-33. Stonevičius, E. , Rimkus, E., 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 projectons in the Nemunas River basin. <i>Climate Research</i> . 75(2):143-154. Stonevičius, E. , Stankunavicius, G., Rimkus, E. 2018. Continentality and Oceanity in the Mid and High Latitudes of the Northern Hemisphere and Their Links to Atmospheric Circulation. <i>Advances in Meteorology</i> , vol. 2018, Article ID 5746191, 12. Rimkus, E., Briede, A., Jaagus, J., Stonevičius, E. , Kilpys, J., Viru, B. 2018: Snow-cover regime in Lithuania, Latvia and Estonia and its relationship to	

		<p>climatic and geographical factors in 1961-2015. <i>Boreal Env. Res.</i> 23: 193-208.</p> <p>Valiuškevičius, G., Stonevičius, E., Stankūnavičius, G., Brastovickytė-Stankevič, J. 2018. Severe floods in Nemunas River Delta. <i>Baltica</i>, 31 (2), 89–99.</p> <p>Rimkus, E., Mačiulytė, V., Stonevičius, E., Valiukas, D. 2020. A revised agricultural drought index in Lithuania. <i>Agricultural and Food Science</i>, 29(4), 359–371.</p>
Gintaras Valiuškevičius	Dr	<p>Valiuškevičius, G., Stonevičius, E., Stankūnavičius, G., Brastovickytė-Stankevič, J. 2018. Severe floods in Nemunas River Delta. <i>Baltica</i>, 31(2),</p> <p>Stonevičius, E., Valiuškevičius, G. 2018. Identification of Significant Flood Areas in Lithuania. <i>Water Resources</i>, 45(1), 27–33.</p> <p>Stonevičius, E., Rimkus, E., Štaras, A., Kažys, J., Valiuškevičius, G. 2017. Climate change impact on the Nemunas River basin hydrology in the 21st century. <i>Boreal Environment Research</i>, 22, 49–65.</p> <p>Valiuškevičius, G. 2017. Steponas Kolupaila's contribution to hydrological science development. <i>History of Geo- and Space Sciences</i>, 8, 57–67.</p>
Approved by the Doctoral Committee for Physical Geography (N006) on 9 th of March 2021, protocol no. (4.20 E) 610000-KT-24		
Committee Chairman assoc. prof. dr. D. Pupienis		