

**COURSE OF DOCTORAL STUDIES**

Course title	Field of science (branch) code	University / Faculty	Institute / Department
Groundwater Dynamics	Natural Sciences (Geology) N 005	Vilnius University / Faculty of Chemistry and Geosciences	Institute of Geosciences / Hydrogeology and engineering geology
Study methods	Number of credits allocated	Study methods	Number of credits allocated
Lectures		Seminars	
Individual work	<b>11</b>	Consultations	
Course annotation			
<p>Basics of groundwater hydrostatics and flow of a fluid through a porous medium. Aeration zone and saturated zone - characteristics of water flows, properties and structure of water bearing soils. Differential equations for the groundwater flow problems solution, boundary conditions and schemes, methods. Water and mass transport processes, modeling basics. One-dimensional, two-dimensional and three dimensional groundwater flow models. Mathematical flow models features of multi-layer environment. Inverse and direct water flow simulation problems. Moisture transport differential equations in the aeration zone, methods of solution. Recharge and discharge of groundwater. Well hydraulics and flow into a wells in various natural conditions. Determination of geofiltration parameters during pumping tests of steady and unsteady groundwater flow. Introduction to the study of heat transfer. Dispersion of pollution in groundwater and protective measures in solving hydrogeological tasks.</p>			
Required readings			
<p>Todd D. K., Mays L. W. (2005). Groundwater Hydrology. John Wiley&amp;Sons, Inc. NJ. 636 p.</p> <p>C.W. Fetter, University of Wisconsin, Oshkosh. Applied Hydrogeology: Pearson New International Edition, 4th Edition. 2014. Pearson. 610 p.</p>			
Consulting lecturers Name, surname	Degree	The most important works in the field of science (branch) have been published during the last 5 years	
Žana Skuratovič	Dr.	<p>Mažeika, J., Jefanova, O., Petrošius, R., Lujanienė, G., Skuratovič, Ž. (2022). <sup>14</sup>C and other radionuclides in the environment in the border region of Lithuania before the start of the Belarusian nuclear power plant operation. Radiocarbon, 1-14.</p> <p>Jefanova, O., Mažeika, J., Petrošius, R., Skuratovič, Ž., Paškauskas, R., Martma, T., Liblik, T., Ezhova, E. (2020) Baltic Sea water tritium and stable isotopes in 2016-2017*. Isotopes in Environmental and Health Studies, 56 (2): 193–204.</p>	
		<p>Jefanova, O., Baužienė, I., Lujanienė, G., Švedienė, J., Raudonienė, V., Bridžiuvienė, D., Paškevičius, A., Levinskaitė, L., Žvirgždąs, J., Petrošius, R., Skuratovič, Z., Mažeika, J. (2020) Initiation of radioecological monitoring of forest soils and plants at the Lithuanian border region before the start of the Belarusian nuclear power plant operation. Environmental Monitoring and Assessment, 192 (10): art. no. 666.</p>	
Approved by the doctoral committee of Geology (N 005) on 1 <sup>st</sup> of December 2022 (No. (7.17 E) 15600-KT-467).			
Committee Chairman prof. dr. Sigitas Radzevičius			