

COURSE OF DOCTORAL STUDIES

Course title	Field of science (branch) code	University / Faculty	Institute / Department
Facies	Natural Sciences (Geology) N 005	Vilnius University / Faculty of Chemistry and Geosciences	Institute of Geosciences /
Study methods	Number of credits allocated	Study methods	Number of credits allocated
Lectures		Seminars	
Individual work	11	Consultations	
Course annotation			
<p>The aim of the course is to help doctoral students acquire the skills of facies analysis of sedimentary successions. They must learn to determine the conditions and composition of the primary sediments of paleobasins, as well as the course of subsequent changes based on the established physical and chemical properties of rocks, rock structures, textures, and regularities of stratigraphic conditions.</p> <p>Course tasks - get to know:</p> <ol style="list-style-type: none"> 1) Walter's law (of geographic and stratigraphic continuity of facies), application of the principles of actualism, methodologies of comparison of current environments and paleoenvironments. 2) continental facies groups (eluvial, gravity, proluvial, alluvial, limnic, aeolian, volcanic); 3) marine facies groups (terrigenous, carbonate, siliceous, phosphatic, metal oxide and sulphide rich, volcanogenic); 4) intermediate groups of facies (evaporitic lagoons, playa and epicontinental seas, blue lagoons and seas, coastal plains, periglacial etc.); 5) macroenvironments/regimes of sedimentary basins: platform, passive continental margins, active continental margins, deep-sea pelagic settings, atolls and ocean plateaus; 6) diagenetic, epigenetic, catagenetic processes, methods of determining the paragenesis of authigenic minerals. <p>The doctoral student will be able to independently determine the distribution of different facies in a stratigraphic section, create a geological facies paleoprofile, be able to classify facies, understand the course of facies change during the development of basins in different tectonic environments. The goals of paleogeographic research and methods of paleogeographic mapping are explained separately.</p> <p>The PhD student reports by giving a half-hour oral presentation on a chosen topic in facies science, examining the latest scientific developments in the studied topic.</p>			
Required readings			
Reading, Harold G. (ed.). 2009. Sedimentary environments: processes, facies and stratigraphy. John Wiley & Sons, 704 p.			
Flügel, E. and Flügel, E., 2010. Microfacies of carbonate rocks: analysis, interpretation and application. Springer Science & Business Media, 1007 p.			
James, N.P. and Jones, B., 2015. Origin of carbonate sedimentary rocks. John Wiley & Sons, 464 p.			
Miall, A.D., 2013. The geology of fluvial deposits: sedimentary facies, basin analysis, and petroleum geology. Springer, 598 p.			
Consulting lecturers Name, surname	Degree	The most important works in the field of science (branch) have been published during the last 5 years	
Andrej Spiridonov	Dr.	Spiridonov A , Balakauskas L, Lovejoy S. 2022. Longitudinal expansion fitness of brachiopod genera controlled by the Wilson cycle. Global and Planetary Change, 103926 Spiridonov A. , Lovejoy S. 2022. Life rather than climate influences diversity at	

		<p>scales greater than 40 million years. <i>Nature</i>, 607, 307–312</p> <p>Spiridonov A, Stankevič R, Gečas T, Brazauskas A, Kaminskas D, Musteikis P, Kaveckas T, Meidla T, Bičkauskas G, Ainsaar L, Radzevičius S. 2020. Ultra-high resolution multivariate record and multiscale causal analysis of Pridoli (late Silurian): implications for global stratigraphy, turnover events, and climate-biota interactions. <i>Gondwana Research</i>, Volume 86, 222-249</p> <p>Spiridonov A., Samsonė J, Brazauskas A, Stankevič R, Meidla T, Ainsaar L, Radzevičius S. 2020. Quantifying the community turnover of the uppermost Wenlock and Ludlow (Silurian) conodonts in the Baltic Basin. <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i>, Volume 549, 109128</p> <p>Spiridonov A, Balakauskas L, Stankevič R, Kluczynska G, Gedminienė L, Stančikaitė M. 2019. Holocene vegetation patterns in the southern Lithuania indicate astronomical forcing on the millennial and centennial time scales. <i>Scientific Reports</i>, 9, 14711</p>
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Sigitas Radzevičius	Dr.	<p>Grendaitė, M., Michelevičius, D. and Radzevičius, S., 2023. Insights into the structural geology and sedimentary succession of the Baltic Basin, Western Lithuania. <i>Marine and Petroleum Geology</i>, 147, p.106009.</p> <p>Meidla, T., Ainsaar, L., Hints, O. and Radzevičius, S., 2023. Ordovician of the Eastern Baltic palaeobasin and the Tornquist Sea margin of Baltica. Geological Society, London, Special Publications, 532(1), pp.SP532-2022.</p> <p>Cichon-Pupienis, A., Littke, R., Lazauskienė, J., Baniasad, A., Pupienis, D., Radzevičius, S. and Šiliauskas, L., 2021. Geochemical and sedimentary facies study–Implication for driving mechanisms of organic matter enrichment in the lower Silurian fine-grained mudstones in the Baltic Basin (W Lithuania). <i>International Journal of Coal Geology</i>, 244, p.103815.</p> <p>Radzevičius, S. Raczyński, P., Whittingham, M. 2020. The Lower Homerian (Silurian) <i>Pristiograptus</i> from Zdanów section of Bardo Mountains (Sudetes, Poland) and its palaeobiogeographic implications. <i>Bulletin of Geosciences</i> 95(2): 231–242.</p> <p>Radzevičius, S., Raczyński, P., Užomeckas, M., Norkus, A., Spiridonov, A. 2019. Graptolite turnover and $\delta^{13}\text{C}_{\text{org}}$ excursion in the upper Wenlock shales (Silurian) of the Holy Cross Mountains (Poland). <i>Geologica Carpathica</i>, 70(3): 209–221.</p>
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Approved by the doctoral committee of Geology (N 005) on 1st of December 2022 (No. (7.17 E) 15600-KT-467).

Committee Chairman prof. dr. Sigitas Radzevičius