

## COURSE OF DOCTORAL STUDIES

| Course title   | Field of science (branch) code                  | University / Faculty  | Institute / Department  |
|--|---|---|---|
| Telmatology  | Natural Sciences, (Physical Geography)<br>N 006 | Vilnius University,<br>Faculty of Chemistry and Geosciences<br><br>Nature research centre | Institute of Geosciences /<br>Department of Hydrology and Climatology<br><br>Laboratory of climate and water research |
| Study methods  | Number of credits allocated                     | Study methods   | Number of credits allocated   |
| Lectures   |   | Consultations   | 1   |
| Individual work  | 9   | Seminars  |   |
| Course annotation  |   |   |   |
| <p><i>The objective of the course is to acquaint doctoral students with various types of wetlands in the world, classifications, hydrological regime of wetlands, biogeochemical cycles, flora and fauna, ecological role of wetlands in the landscape, aspects of their biological, economic and social value, main wetland research methods.</i></p> <p><u>Main content:</u></p> <p><b>The concept and types of wetlands.</b> Historical development of the concept of wetlands. The main features that allow the identification of wetlands. Wetland classification possibilities. Ramsar Convention: classification and its basic principles. Wetlands characteristic of the area of excess moisture in the Northern hemisphere. The concept of the wetland in Lithuania. Classification of Lithuanian bogs and wetlands.</p> <p><b>Wetland formation and geographical distribution.</b> Influence of climatic factors on wetland and peatland formation. Effects of soil properties. Terrain and landscape effects. Effects of vegetation. Wetland distribution in the world and its determining factors. Human impact on wetlands and geographical distribution of Lithuanian wetlands and mires.</p> <p><b>Mire hydrology.</b> The concept of mire hydroperiod, the conditions determining it. Effects of groundwater level fluctuation on mires. Effect of water balance element ratio on mires genesis. Water balance of wetland: water bodies, mires and wet soils. Hydraulic and hydrological properties of peat. Hydrographic activity of different types of wetlands. Hydrographic network structure of the mires of the Northern hemisphere excess moisture area. Impact of mires on the water regime of the area.</p> <p><b>Wetland biogeochemistry.</b> Wet soils and their types. Types of peat. Influence of soil-forming rocks on the properties and development of mires and wet soils. Peat formation process and its importance for the change of relief, formation of natural resources, general development of the ecosystem of the territory. Retention and transformation of substances in wetlands.</p> <p><b>Wetland ecosystems.</b> Ecosystems of wet soils and mires. Lotic and lentic ecosystems. Diversity of wetland and mires flora and fauna and the abiotic factors that determine it. Flora and fauna specifics of lotic ecosystems and their determinants. Specifics of flora and fauna of lentic ecosystems and their determining factors.</p> <p><b>Wetland functions - biological, ecological, economic and social value of wetlands.</b> Flood and erosion reduction. Water purification. Sediment retention. Reducing of nutrients. Groundwater replenishment and groundwater discharge. Food and other wetland products. Recreation and aesthetic significance.</p> <p><b>Specifics of wetland research.</b> Hydrometeorological methods of wetland research. Geochemical methods of wetland research. Dendrological methods of wetland research: environmental factors determining tree growth, biological bases of tree groove formation, environmental influence on groove formation, influence of hydrology on tree growth dynamics.</p> |   |   |   |
| Required readings  |   |   |   |
| Joosten H., Tenneberger F., Moem A. (eds.), 2018. Mires and peatlands of Europe. Status, distribution and conservation. Schweizerbart Science Publishers. 780 p.   |   |   |   |
| Taminskas, J., Pileckas, M., Šimanauskienė, R., Linkevičienė, R. 2012. Wetland classification and inventory in Lithuania. <i>Baltica</i> . Vol. 25 (1), p. 33–44   |   |   |   |
| Taminskas, J., Pileckas, M., Šimanauskienė, R., Linkevičienė, R. 2011. Lithuanian wetlands: classification and distribution. <i>Baltica</i> . SI 24, 151–162.  |   |   |   |
| Mitsch W. J., Gosselink J.G., 2007. <i>Wetlands</i> . Hoboken: John Wiley & Sons.  |   |   |   |
| Wieder R.K, Vitt D.H, (eds) 2001. <i>Boreal Peatland Ecosystems</i> , 2001. Springer, 435 p.   |   |   |   |

| Consulting lecturers name, surname  | Degree | The most important works in the field of science (branch) have been published during the last 5 years   |
|---|--------|---|
| Julius Taminskas  | dr.    | <p><b>Taminskas, J.</b>, Šimanauskienė, R., Linkevičienė, R., Volungevičius, J., Slavinskienė, G., Povilanskas, R., Satkūnas, J. 2020. Impact of hydro-climatic changes on coastal dunes landscape according to normalized difference vegetation index (The case study of Curonian Spit). <i>Water</i>, 12 (11): art. no. 3234</p> <p><b>Taminskas, J.</b>, Edvardsson, J., Linkevičienė, R., Stoffel, M., Corona, C., Tamkevičiūtė, M. 2019. Combining multiple proxies to investigate water table fluctuations in wetlands: A case study from the Rėkyva wetland complex, Lithuania. <i>Palaeogeography, Palaeoclimatology, Palaeoecology</i>. Vol.514, p. 453-463.</p> <p>Edvardsson, J., Baužienė, I., Lamentowicz, M., Šimanauskienė, R., Tamkevičiūtė, M., <b>Taminskas, J.</b>, Linkevičienė, R., Skuratovič, Ž., Corona, C., Stoffel, M. 2019. A multi-proxy reconstruction of moisture dynamics in a peatland ecosystem: A case study from Cepkeliai, Lithuania. <i>Ecological Indicators</i>. 106: art. no. UNSP 105484.</p> <p>Tamkevičiūtė M., Edvardsson J., Pukienė R., <b>Taminskas J.</b>, Stoffel M., Corona C., Kibirkštis G., 2018. Scots pine (<i>Pinus sylvestris</i> L.) based reconstruction of 130 years of water table fluctuations in a peatland and its relevance for moisture variability assessments. <i>Journal of Hydrology</i>. Vol. 558, p. 509-519.</p> <p><b>Taminskas J.</b>, Linkevičienė R., Šimanauskienė R., Jukna L., Kibirkštis G., Tamkevičiūtė M., 2018. Climate change and water table fluctuation: Implications for raised bog surface variability. <i>Geomorphology</i>. Vol. 304, p. 40-49.</p> |
| Gintaras Valiuškevičius   | Dr.    | <p><b>Valiuškevičius, G.</b>, Stonevičius, E., Stankūnavičius, G., Brastovickytė-Stankevič, J. 2018. Severe floods in Nemunas River Delta. <i>Baltica</i>, 31(2),</p> <p>Stonevičius, E., <b>Valiuškevičius, G.</b> 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., <b>Valiuškevičius, G.</b> 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>Valiuškevičius, G.</b> 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 <sup>th</sup> of March 2021, protocol no. (4.20 E) 610000-KT-24 |        |   |
| Committee Chairman assoc. prof. dr. D. Pupienis   |        |   |