Topics and scopes of dissertations
within the discipline of forest sciences
offered to candidates for the Doctoral School of Białystok University of Technology in the academic year 2025/2026

No.	Title, academic degree, name and surname of any supervisor(s)	Subject matter	Scope of the doctoral dissertation	Telephone number	E-mail
1	Prof. dr hab. Piotr Banaszuk	Application of brioflora for bioindication of the status of swampy forest ecosystems in the conditions of northeastern Poland	1. Literature studies on the transformation of swamp forest ecosystems in Europe and the bioindicative role of forest mosses and liverworts. 2. Field and laboratory studies of the variation of swamp forest ecosystems: stand features, dead wood resources, light, thermal and water conditions as well as physical and chemical properties of soils. 3. Field studies of the specificity of mosses and liverworts synusia occurring in swamp forest ecosystems under varying soil-habitat and microclimatic conditions. 4. Development of an indicative scale of mosses and liverworts used to assess the condition of swamp forest ecosystems. 5. The concept of protection of mosses and liverworts in swamp forest ecosystems under varying formal and legal conditions.	797 995 949	p.banaszuk@pb.edu.pl
2	Prof. dr hab. inż. Sławomir Bakier	Forest environment as a habitat for bees; characteristics of climatic conditions throughout the year; assessment of food availability and forest environment richness; measurements of contamination of bee products from forest areas with chemical substances; proposals for changes in forest management that improve forest biodiversity and its attractiveness to bees.	1. Literature studies, selection of locations for bee families in the forest environment and their monitoring in terms of development, weather conditions, spatial location. 2. Acquisition of high-resolution remote sensing data from available platforms, e.g. WorldView ESA and Copernicus, regarding mass and energy transport processes in the soil-plant-atmosphere system and factors related to soil quality, condition of forest plants from the study area and adjacent areas. 3. Calculation of remote sensing indicators regarding the state of plant cover and thermal conditions of the surface of the area.	728 912 254	s.bakier@pb.edu.pl

			4. Search for correlations between remote sensing parameters and measurement data of the development of bee families. 5. Studies on the contamination of bee products, mainly bee bread from forest areas. 6. Assessment for bees: selected forest habitats, forest management methods, weather conditions during the year, changes in forest development, possibilities of increasing environmental diversity and improving living conditions. 7. Development of guidelines for changes in forest management that are favourable to bees and biodiversity.		
3	Prof. dr hab. inż.Tomasz Oszako	Assessment of the biodiversity of selected aphyllophthorid fungi on wood in forest ecosystems of north-eastern Poland based on DNA sequencing.	1. Obtaining DNA and amplicons from existing specimens of specimens of the genera Sistotrema, Sistotremastrum, Trechispora at the Bialystok University of Technology herbarium. Determination of the most productive and inexpensive protocol and optimal size of biomaterial. Amplification of one marker - ITS. 2. Obtain ITS sequences and assess their species affiliation/genetic/phylogenetic distance to known sequences using NCBI GenBank. 3. To supplement existing material with specimens collected on wood in five selected reserves. 4. Obtain ITS sequences from the collected material, as well as additional markers (tef1, rpb2) to assess the phylogenetic position of the fungi in detail. Analysis of samples of vegetative mycelium and fruiting bodies without hymenium. 5. Identification of new species for the region, established by molecular methods (publication). Description of morphology and physiology of fungal species new to science. 6. Analysis of the effectiveness of the application of the molecular method to obtain new knowledge of the mycobiota of dead wood.	604849391	t.oszako@pb.edu.pl

4	Prof. Tomasz Oszako	The role of dead wood and dying trees in shaping insect habitats in swamp and riverine ecosystems of lowland Poland	1. Characterization of habitats created by dead wood in river and swamp ecosystems. Documentation of types of dead wood (e.g. fallen trunks, branches, sunken tree fragments, logs in swamps), their distribution and degree of decomposition. Determination of research sites in the valleys of the Lutownia and Utrata rivers and in swamp alder forests, with special attention to dying alders. 2. Occurrence of entomofauna in dying alders and dead wood in water and swamp environments. Conduct inventories of insects associated with dead wood and dying alders (e.g., saproxylic beetles, flies, hymenoptera). Assessing differences between the fauna of flooded, seasonally waterlogged and dry wood. Identification of indicator and specialized species. 3. Analysis of the diversity of insect assemblages depending on the type of habitat and stage of wood decomposition. Comparison of entomofauna colonizing dead wood in rivers, swamps and alder forests. Evaluate the influence of decomposition stage, microclimate, humidity and exposure on the composition of insect communities. 4. Seasonal variability of insect colonization of dead wood and alder. Monitoring of changes in hydrological conditions (e.g., water levels, seasonal flooding) and their impact on insect colonization of wood in different seasons. Assessment of population dynamics and seasonal habitat use strategies. 5. Impact of environmental transformations on the occurrence of saproxylic and aquatic entomofauna. Comparison of insect diversity and abundance in natural (e.g. reserve) and transformed (e.g. Utrata valley) ecosystems. Analysis of the impact of land reclamation, river regulation, removal of dead wood and disappearance of alder forests on the insect fauna.	604849391	t.oszako@pb.edu.pl

			6. The importance of protecting dead wood and dying alders for the biodiversity of wetland ecosystems. Formulation of recommendations for the protection of saproxylic habitats in river valleys and alders. Developing a basis for future conservation or restoration activities with consideration of leaving dead and dying trees.		
5	Prof. dr hab. inż.Tomasz Oszako	Possibilities for the biological control of Scots pine (Pinus sylvestris L.) against Pine mistletoe (Viscum album subsp. austriacum).	1. Assessment of the influence of common pine mistletoe on height and diameter increment as well as the condition of trees in managed forest stands. Measurements of trunk diameter (using a diameter caliper) and height (using a clinometer) in various age classes, along with recording the degree of mistletoe infestation. Statistical analyses (multifactor regressions in R and Statistica) will be carried out to determine the relationship between infestation intensity and the growth and health status of pines, as well as to estimate potential economic losses. 2. Modeling the spread of scattered mistletoe (Viscum album ssp. austriacum) in managed forest stands across Poland and Europe. This will be based on field surveys in selected pine stands in Poland, combined with a review of existing databases and literature from European countries. Predictive modeling (MaxEnt) will be conducted using Representative Concentration Pathways (RCP) scenarios to identify the main environmental and climatic factors facilitating mistletoe expansion and to delineate areas at the highest risk of its occurrence. 3. Analysis of methods for controlling common mistletoe used in forest management conditions, including a critical review of scientific literature and forestry documentation regarding mechanical, chemical, and biological approaches to limiting mistletoe. 4. Comparison of common mistletoe subspecies (V. album ssp. album, ssp. austriacum, ssp. abietis) in terms of chemical composition, using gas chromatography–mass spectrometry	604849391	t.oszako@ibles.waw.pl

			(GC–MS) to determine the content of selected compounds (sterols, terpenes, and phenolic compounds). An analysis of volatile compounds emitted by mistletoe is also planned. Chemical analyses of various plant organs (both mistletoe and pine) collected from diverse habitats will enable the examination of differences among mistletoe subspecies and their host preferences, in relation to the effectiveness of biological protection methods used in forest management. 5. Investigation of the biological diversity (mycobiota) of pine mistletoe, involving the isolation of fungi and their identification using light microscopy, mycological keys, and molecular techniques (PCR, ITS sequencing). Multidimensional statistical and photogrammetric analyses (R, Statistica, MS Excel) will be applied to determine the contribution of individual fungal species to the mycobiota structure and their potential impact on mistletoe development in pines. 6. Evaluation of the feasibility of using previously identified fungal species for the biological protection of pines against pine mistletoe. Planned activities include isolating pathogens from infected mistletoe organs and establishing fungal cultures. Pathogenicity tests are planned to be conducted to determine the potential of each fungal species to suppress the parasite's development.		
6	dr hab. inż. Mikołaj Jalinik, prof. PB	Profitability of forest floor products	1. Analysis of specialized literature. 2. Types of forest floor products most frequently harvested by visitors (wild strawberries, blueberries, blackberries, raspberries, mushrooms, herbs). 3. Organization of collection of forest floor products. 4. Location of collection points for undergrowth products. 5. Methods of calculating the profitability of forest floor products. 6. Economic benefits of forest districts from the sale of forest floor products.	512525396	m.jalinik@pb.edu.pl

7	dr hab. inż. Mikołaj Jalinik, prof. PB	The concept of managing forests not belonging to the State Treasury	1. Analysis of specialized literature. 2. Current status of private forests management. 3. Types of non-treasury forests and their characteristics. 4. Assessment of the effectiveness of the management of non-treasury forests by the offices of Districts Starosty. 5. Problems arising from the management of forests by Districts Starosty. 6. Proposal for changes (model) in the management of non-treasury forests.	512525396	m.jalinik@pb.edu.pl