ACE² EUROPEAN UNIVERSITY
Applied
Connected
Entrepreneurial &
Engaged

Lietuvos inžinerijos kolegija

# Exploring Innovative Research Topics and Research Structure at LIK

**Assoc. prof. dr. Vilda Grybauskiene**

Virtual Town Hall Meeting 2025 03 31
https://us06web.zoom.us/j/82915105208?pwd=faGI3Z9y1qbNbzMzohBcQciKczBLu9.1

Co-funded by the European Union

SANTARÉM POLYTECHNIC UNIVERSITY · Lietuvos inžinerijos kolegija · LATVIAN ACADEMY OF CULTURE · GOCE DELCEV UNIVERSITY · MEDICAL UNIVERSITY OF GDAŃSK · KÄRNTEN University of Applied Sciences · UFV Universidad Francisco de Vitoria · Technische Hochschule Ingolstadt

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Mission and Vision of the University

Our mission is to be a leader among technical applied sciences universities in the Baltic States, preparing highly qualified specialists in engineering and carrying out advanced development in its region.

Our vision is ... Engineering competencies for the well-being of an innovative society...

We seek to be a leader in technical studies in the Baltic region, actively sharing knowledge and contributing to the development of an advanced society and industry.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# University structure and departments where scientific activities are conducted

**The target for the institution in research area :**

Intensification of applied scientific activities, responding to the needs of Lithuania and foreign countries and producing high-quality scientific output.

**Science and Business Cooperation Center**

FACULTY OF INDUSTRIAL ENGINEERING AND TECHNOLOGY

**Center of research and development**

FACULTY OF ENVIRONMENTAL ENGINEERING

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Innovation Projects

- Development and Implementation of an Adaptive Process for the Reuse and Recycling of Electrical Energy Storage Systems (AdekPro)

  Implemented in collaboration with MB Adscencus
- Development of an Innovative Hybrid Device for Building Management.

  Implemented in collaboration with UAB Energus Battery

- Enhancing Urban Resilience with Climate Adaptive Green Space Planning in Latvia and Lithuania
- New Microgreens Cultivation Technologies and Their Implementation for Sustainable Farming
- Development of a Platform for Groups of Ecological Activity Operators to Promote the Expansion of Organic Production in Small Farms
- Application of Innovative Remote and Contact Methods for Efficient Herd Management and Monitoring of Natural and Cultivated Pastures
- Establishment of Base Collections of Silver Birch (*Betula pendula* Roth) for Each Provenance Region from Clones of Lithuanian Birch Seed Plantations

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Science and Business Cooperation Center

In 2024, a total of 11 contracts were signed with business enterprises for the execution of commissioned activities. These activities include research, analyses, consultations, and commissioned R&D projects.
The total value of these contracts amounted to €483,333.65, with €421,351.90 generated as revenue from ongoing R&D activities.

**SBCC** plays a crucial role in initiating, organizing, and expanding R&D activities, fostering collaboration with industry in the field of research and development, as well as coordinating and administering the College's participation in national and international R&D projects.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Sustainable Forest Management and Ecosystem

**Modelling in management of forest resources and use. Multifunctional forestry.**
We are working towards sustainable forest management models and their use, considering ecological, economic, and social factors equally important.

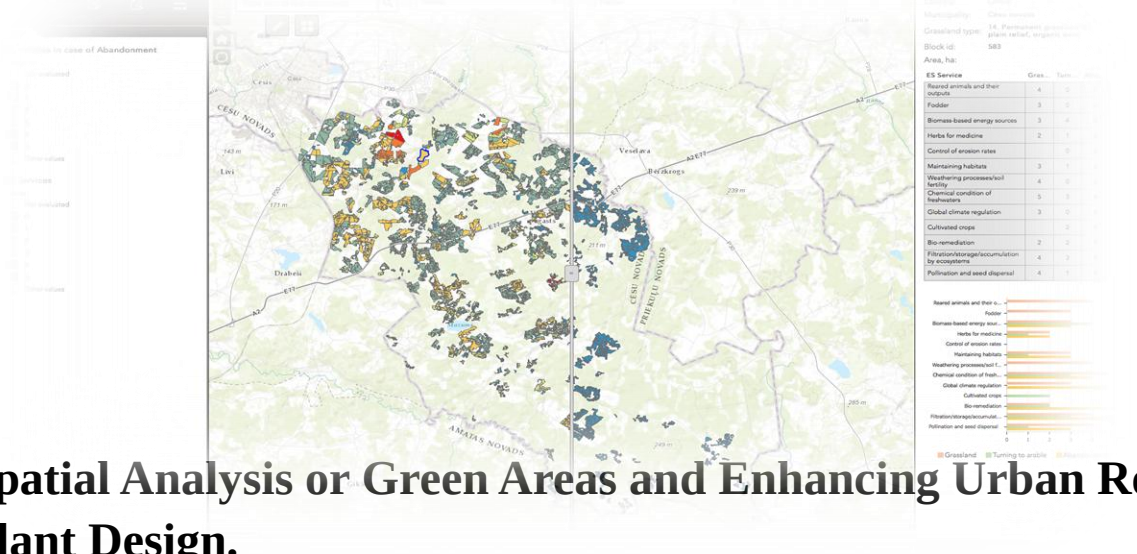
•**Forest plant genetic conservation. Forest tree selection and breeding.**
We are taking snapshots of the genetic diversity of forest trees in genetic reserves and key habitats of Lithuanian forests. It's an initial step in forest genetic monitoring.

•**Forest ecology. Monitoring and control of forest pests and diseases.**
We are looking for effective and sustainable control strategies for the most important forest diseases and pests, including integrated management programs. Currently, the emphasis is on invasive, alien plant diseases and the increased problem of autochthonous bark beetles.

•**Stand growth simulation.**
Stand growth simulation is a very important area of forestry that shows the future of our forests in the context of a changing climate and increasing anthropogenic activities.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Sustainable Urban and Environmental Analysis



This direction encompasses spatial analysis of green areas, enhancing urban resilience with climate-adaptive plant design, and researching innovative solutions for horticulture by applying circular economy principles. Additionally, it includes studies on remote cartography methods, the use of drones for land monitoring, geodetic measurement accuracy assessment, and analysis of land use changes.

**Spatial Analysis or Green Areas and Enhancing Urban Resilience with Climate Adaptive Plant Design.**

**Research on Methodology of Creating Forest Therapy Paths.**

**Research of Innovative Solutions for Horticulture by Applying Circular Economy Principles and Zero-waste Technologies.**

**Remote cartography methods and their applications**
**Assessment of the accuracy of geodesic measurements**

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Innovative Water Resources Management in the Context of Climate Change

***Water resources management using modern hydraulic structures under climate change***

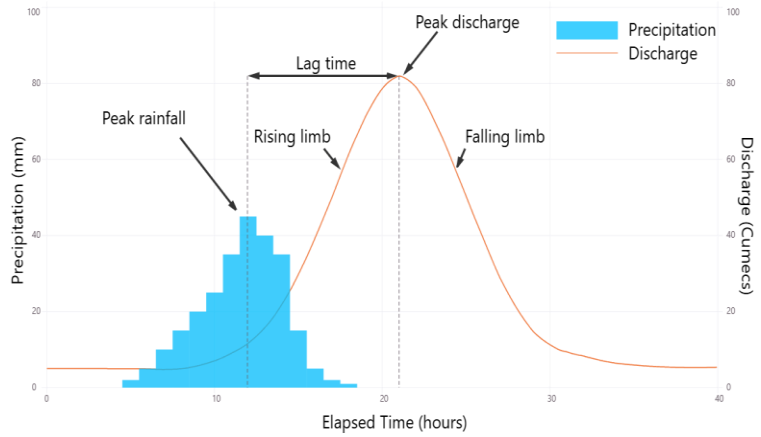
Global rising temperatures due to climate change directly impact the availability and quality of water resources. Changes in rain patterns decreases in snow cover, and prolonged periods of drought are the reasons to look for new and innovative water resource management research.

**Possible theme for cooperation:**

State of dams, dam removal, and reconstruction

Anthropological impact on water resources and their availability under climate change

Climate change impact on dams and hydropower




Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Climate-Resilient Water Resources Management

***Climate change and it's impact on two way soil moisture regulation techniques***

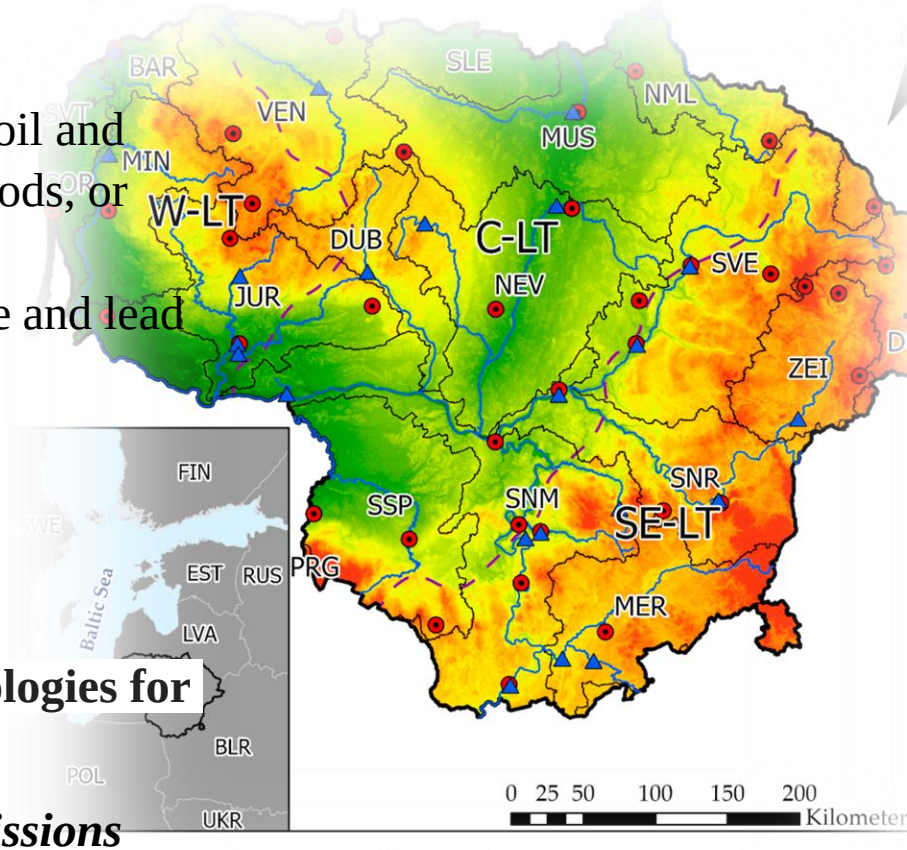
Researchers can already see the effects of climate change globally and in European soil and water resources. That is affected by the number of rains, unpredictable droughts, periods, or the influence of human factors on agriculture or water resources in different regions. Continuing declines in soil moisture can increase the need for irrigation in agriculture and lead to smaller yields and even desertification, with potentially dramatic impacts on food production. Possible thematic for cooperation:

**Soil moisture monitoring and regulation**

**Application of rainwater harversting methods**

**Investigations of the state of drainage systems and the application of new technologies for their renewal**

***Production of biogas from agricultural waste and reduction of greenhouse gas emissions***




Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Advanced Electronic and Mechanical Systems

**Development and research of electronic and electrical engineering systems.**
In this field, research focuses on the development of advanced electronic and electrical engineering systems, including their design, optimization, and efficiency.

**Technological research on eco-friendly vehicles and vehicle systems.**
Research is conducted on the development and optimization of eco-friendly vehicles, including electric and hybrid systems, to reduce environmental impact. Additionally, studies focus on innovative vehicle technologies, such as alternative fuels and energy-efficient designs, to enhance sustainability in transportation.

**Diagnostic studies of the condition of aircraft functional systems and structural components.**
This includes the use of advanced monitoring techniques and analysis methods to detect faults, ensure safety, and enhance the reliability and longevity of aircraft.

**•Studies on workforce training and labor market needs.**

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

# Research Direction - Engineering Technologies for a Sustainable Future

**Engineering Technologies for a Sustainable Future:**

•Efficiency analysis of modern material processing technologies.

•Research on sustainable construction and road engineering solutions.

**Smart Society:**

•Studies on the development of engineering and general competencies within the framework of lifelong learning.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.

Lietuvos inžinerijos kolegija

# Thank you!

**Assoc. Prof. Dr. Vilda Grybauskiene**
**Head of Reserch and development ceneter**
**vilda.grybauskiene@lik.tech**
**+370 699 16524**

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Education and Culture Executive Agency [EACEA]. Neither the European Union nor the granting authority can be held responsible for them. Project 101177596.