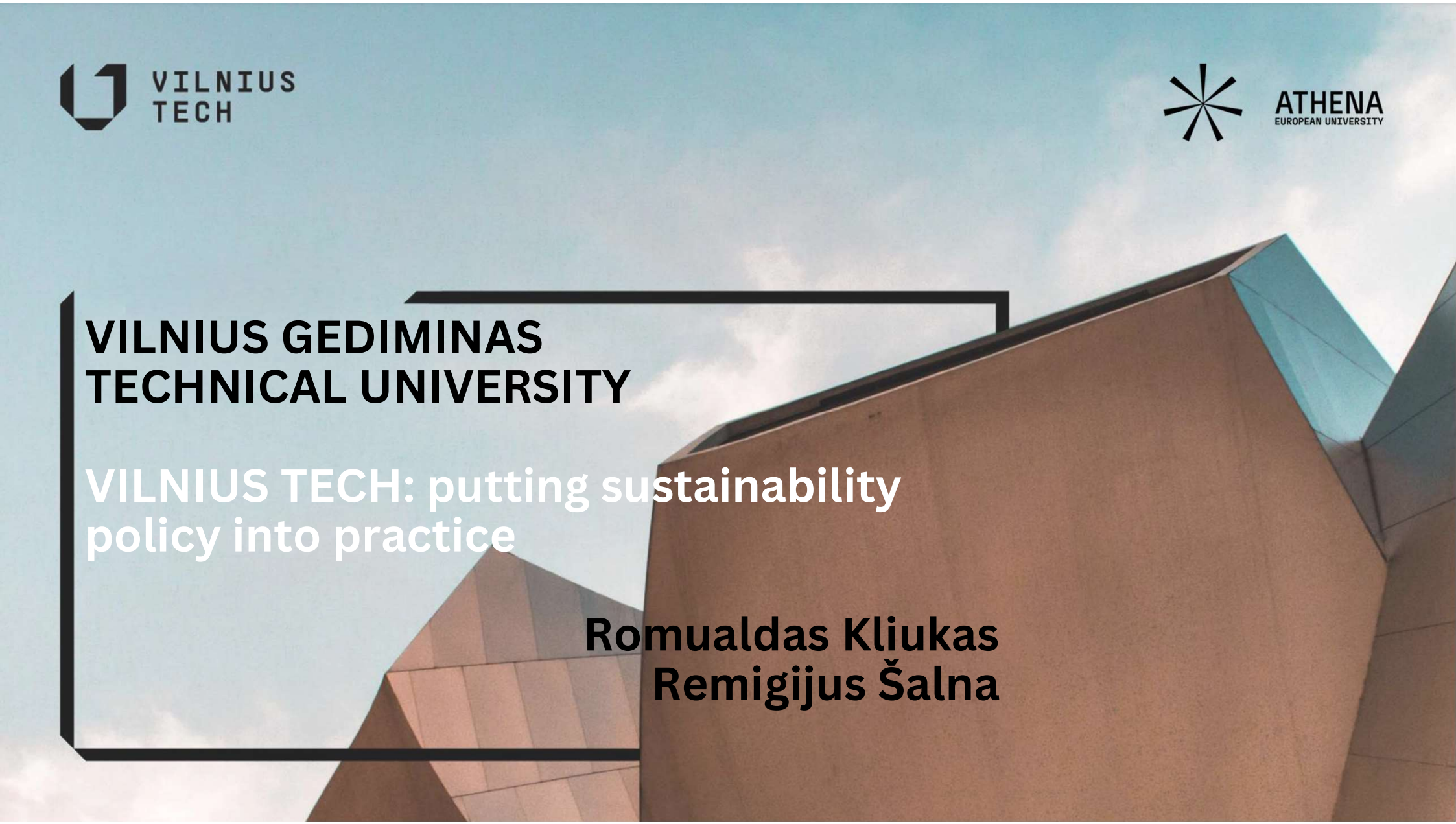
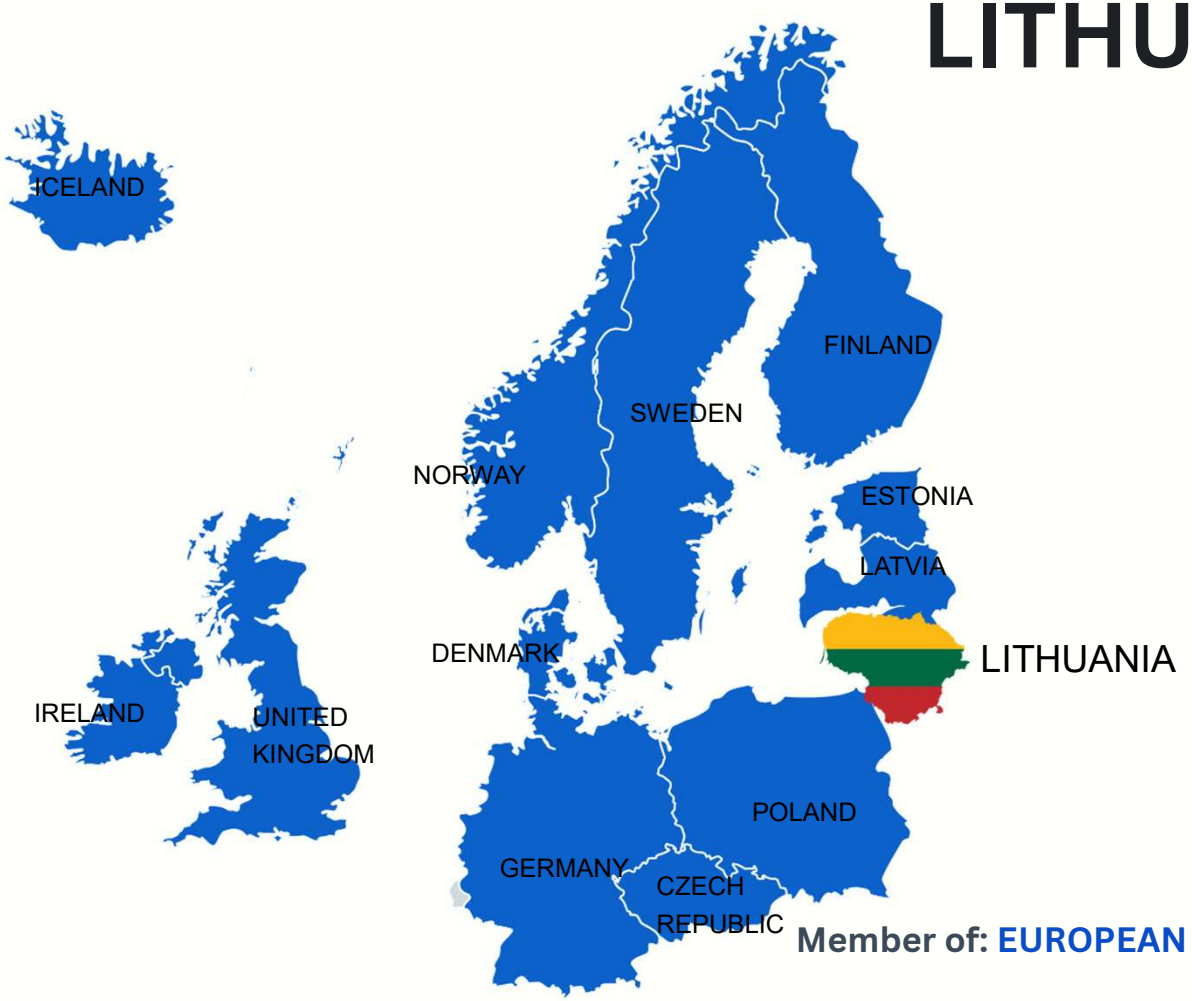


VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

VILNIUS TECH: putting sustainability policy into practice

Romualdas Kliukas
Remigijus Šalna

LITHUANIA – a country in Northern Europe



Capital: VILNIUS

Official Language: LITHUANIAN

Area: 65.300 KM2

Population: ~3 MILLION

President: GITANAS NAUSĖDA

Member of: EUROPEAN UNION, SCHENGEN AREA, NATO, WTO, UN, OSCE

Vilnius

~550 000 inhabitants

46% of green space

Old town - UNESCO world heritage site since 1994

affordable living quality

clean tap water

80% of the youth – English speakers

one of the few European capital cities where hot air balloons are allowed to fly

Facts and figures

Established in 1956

9 000 students

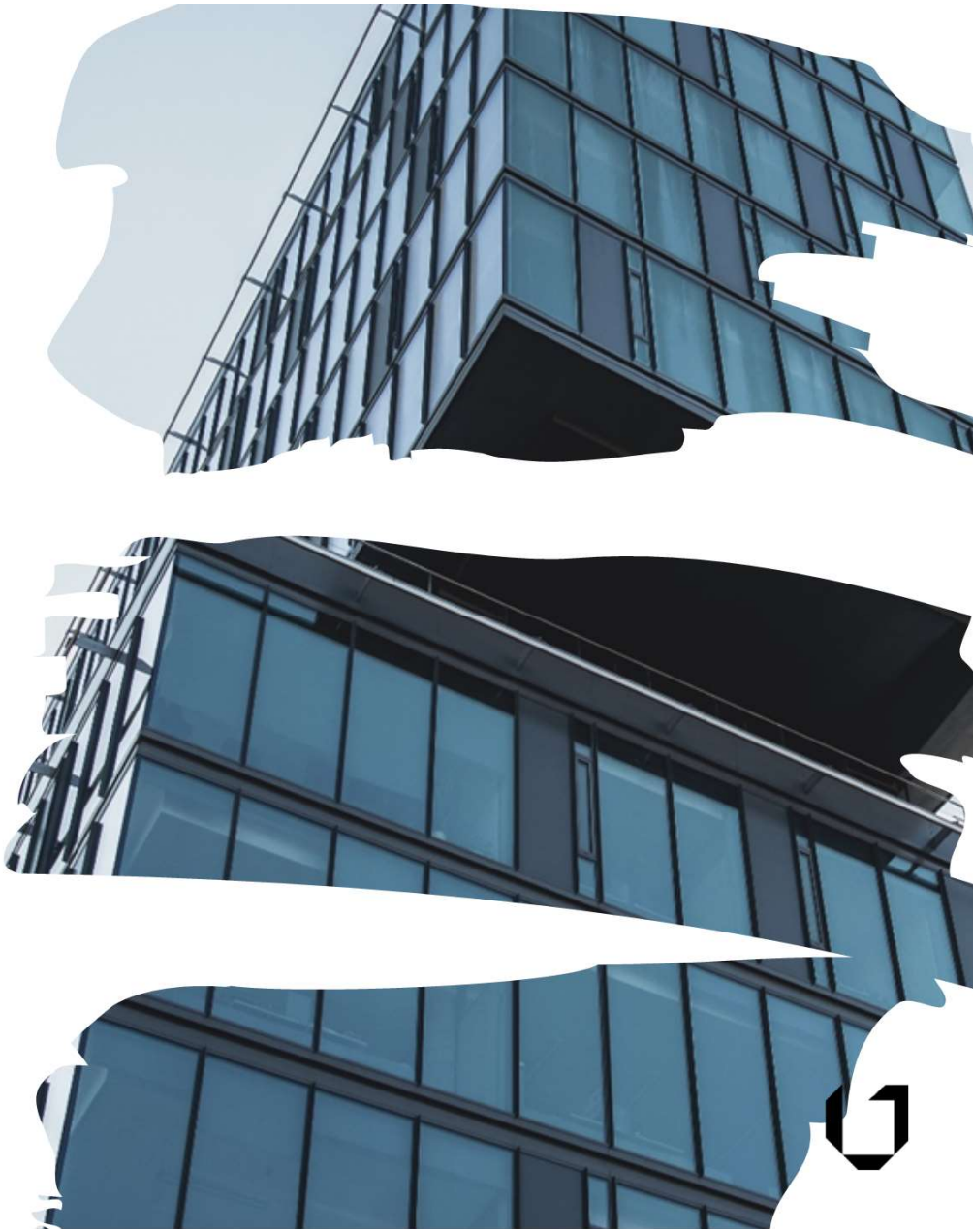
24% of them are international students from 91 countries

1 000 academic staff members - 76% with PhD degrees

300 business partners worldwide

400 partner universities in 60 countries globally

Member of ATHENA European University Alliance
www.athenauni.eu



11 faculties of VILNIUS TECH

Antanas Gustaitis' Aviation Institute

Architecture

Business Management

Civil Engineering

Creative Industries

Electronics

Environmental Engineering

Fundamental Sciences (ICT & Computer Sciences)

Mechanics

Transport Engineering

Lithuanian Maritime Academy

43 research divisions

6 Research Centres

24 Research Laboratories

13 Research Institutes

102 study programmes

75% in the field of Engineering, Information and Technological Sciences

59% taught in English:

- Professional Bachelor's (undergraduate) 120-240 ECTS
- Bachelor's (undergraduate) 180-240 ECTS
- Integrated (undergraduate + graduate) 300 ECTS
- Master's (graduate) 90-120 ECTS
- Master's (MBA) 60 ECTS

PhD studies in 12 fields

Technological Sciences

Civil Engineering
Electrical and Electronic Engineering
Environmental Engineering
Informatics Engineering
Materials Engineering
Mechanical Engineering
Transport Engineering

Natural Sciences

Informatics

Social Sciences

Communication and Information
Economics
Management

Humanities

History and Theory of Arts

22 Bachelor's degree study programmes taught in English:

ENGINEERING SCIENCES

- **Faculty of Mechanics:**
  - Applied Artificial Intelligence
  - Mechanics Engineering
  - Mechatronics and Robotics
  - Medical Engineering
- **Faculty of Transport Engineering:**
  - Automotive Engineering
- **Faculty of Civil Engineering:**
  - Civil Engineering
- **Faculty of Environmental Engineering:**
  - Building Energy Systems Engineering
  - Environmental Technology
  - Sustainability Technologies
- **Antanas Gustaitis Aviation Institute:**
  - Aviation Mechanics Engineering

INFORMATICS & TECHNOLOGICAL SCIENCES

- **Faculty of Fundamental Sciences:**
  - Bioengineering
  - Information Technologies
  - Mathematics of Modern Technologies
  - Multimedia Design
- **Faculty of Electronics:**
  - Artificial Intelligence Systems
  - Information and Communication Technologies
  - Computer Engineering

SOCIAL SCIENCES & ARTS

- **Faculty of Architecture:**
  - Architecture (integrated studies)
- **Faculty of Business Management:**
  - Business Management
  - Financial Engineering
- **Faculty of Creative Industries:**
  - Creative Industries
  - Entertainment Producing

26 Master's degree study programmes taught in English:

ENGINEERING SCIENCES

- **Antanas Gustaitis Aviation Institute:**
  - Aerospace Engineering
- **Faculty of Electronics:**
  - Computer Engineering
  - Electrical Power and Renewable Energy Engineering
- **Faculty of Mechanics:**
  - Biomedical Engineering
  - Mechanical Engineering
  - Mechatronics Systems
- **Faculty of Civil Engineering:**
  - Building Information Modelling
  - Structural Engineering
- **Faculty of Environmental Engineering:**
  - Environmental Engineering and Management
  - Industrial Engineering an Innovation Management
- **Faculty of Transport Engineering:**
  - Automotive Engineering

INFORMATICS & TECHNOLOGICAL SCIENCES

- **Faculty of Fundamental Sciences:**
  - Data Science and Statistics
  - Engineering of Artificial Intelligence
  - Information and Information Technologies Security
  - Information Systems Software Engineering
  - Management of Artificial Intelligence Solutions
  - Nanobiotechnology
- **Faculty of Electronics:**
  - Artificial Intelligence Systems
  - Digital Twin Technology

SOCIAL SCIENCES & ARTS

- **Faculty of Business Management:**
  - Business Leadership
  - Finance Engineering (FinTech)
  - Global Economics
  - International Business
- **Faculty of Creative Industries:**
  - Communication of Creative Society
- **Faculty of Environmental Engineering:**
  - Sustainability Management
- **Faculty of Transport Engineering:**
  - Transport Logistics

PhD studies in 12 fields of science:

TECHNOLOGICAL SCIENCES

- Civil Engineering
- Electrical and Electronic Engineering
- Environmental Engineering
- Informatics Engineering
- Materials Engineering
- Mechanical Engineering
- Transport Engineering

SOCIAL SCIENCES

- Management
- Economics
- Communication and Information

NATURAL SCIENCES

- Informatics

HUMANITIES

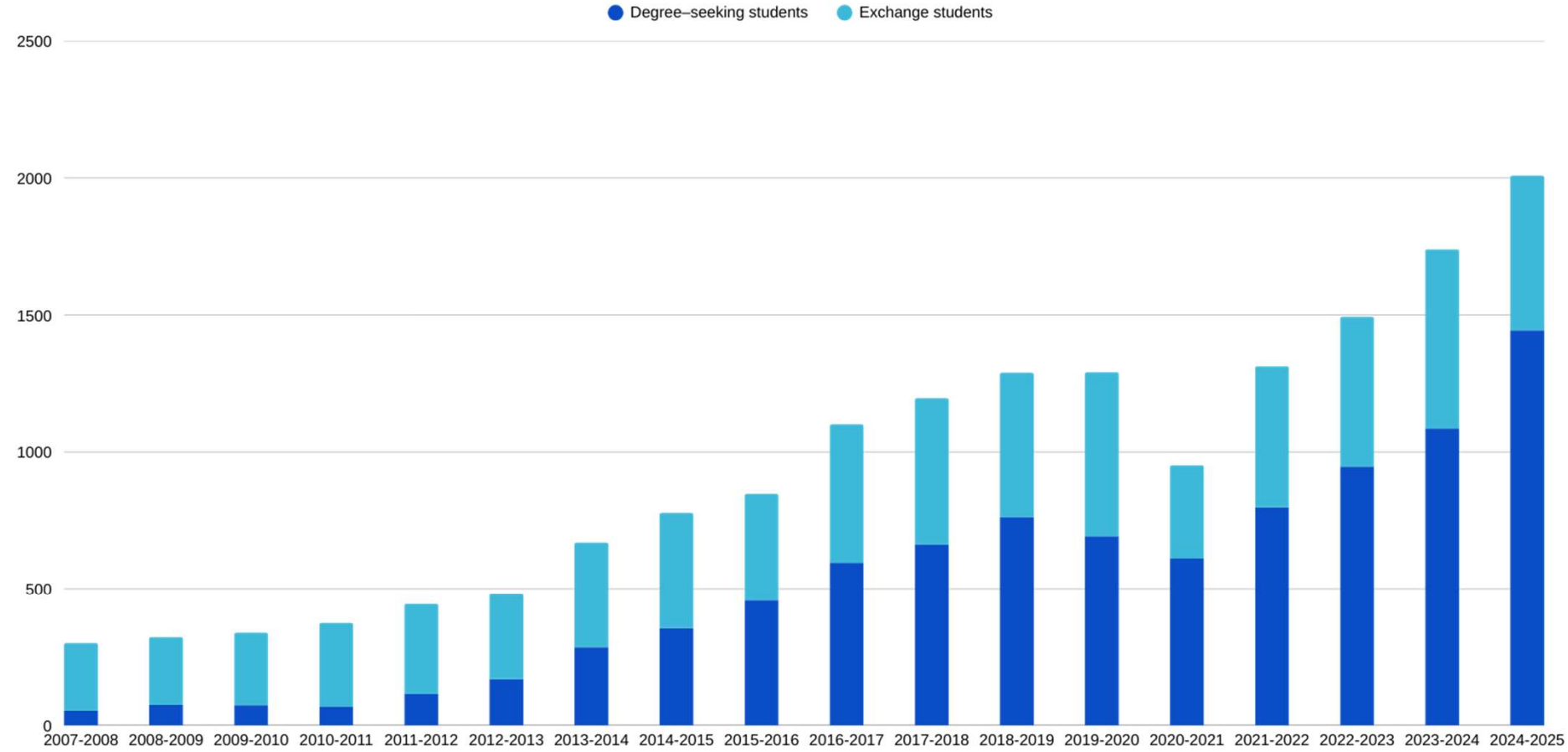
- History and Theory of Arts

Postgraduate programmes are based on individual work and are combined with course work and research.

More information about dissertation topics and application for PhD studies: **phd@vilniustech.lt**

VILNIUS TECH INTERNATIONAL STUDENTS

(from 91 country in 2024-2025)



VILNIUS GEDIMINAS TECHNICAL UNIVERSITY (VILNIUS TECH)

7 research priorities

Sustainable building

Environmental and energy technologies

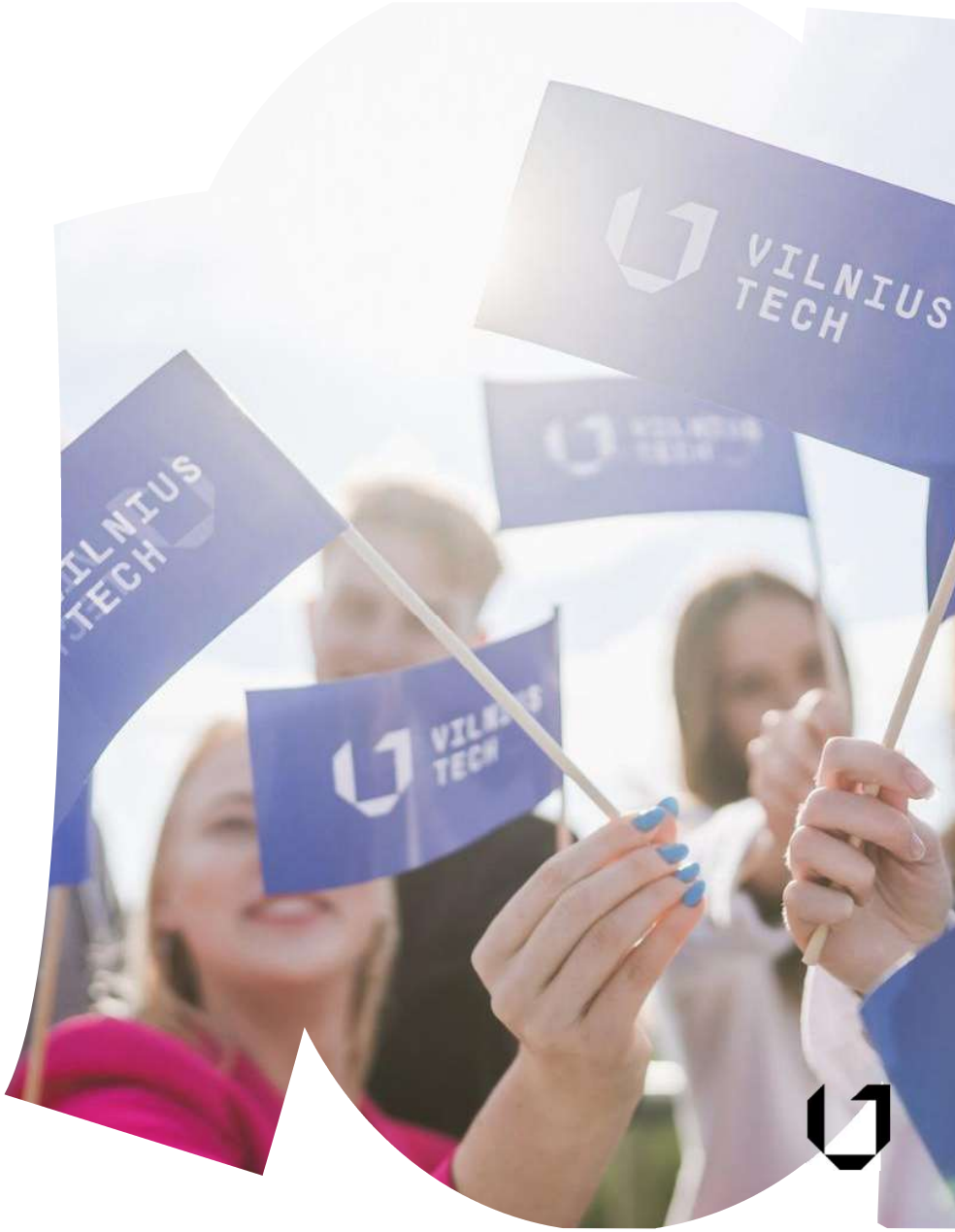
Sustainable transport

Mechatronics

Information and communication technologies

Economics engineering, management and communication

Fundamental research on materials and processes



43 research units

6 Research Centres

Civil Engineering Research Centre
Transport and Logistics Competence Centre
Technology Center for BIM
Aerospace data Centre
SmartEcoTech Competence Centre
Digital Defence Competence Centre

24 Research Laboratories

6 accredited
1 notified

13 Research Institutes

Research Institute of Sustainable Constructions
Research institute of Building and Bridge Structures
Research institute of Building Materials
Research Institute of Environment Protection
Research Institute of Geodesy
Road Research Institute
Research Institute of Territorial Planning
Institute of Applied Computer Science
Institute of Mechanical Science
Institute of Architecture
Research Institute for Telecommunications
Institute of High Magnetic Fields
Institute of Dynamic Management

VILNIUS TECH R&D areas for co-operation

Smart City & Digital Built Environment
- Building information modelling | Green building design
- Renovation solutions towards nearly zero-energy buildings
- LiDAR-based point cloud estimation

Civil and Structural Engineering
- Building energy assessment
- Transport links and roads
- Geodesy and land surveying

Urban Mobility
- Carsharing
- Intelligent transportation systems

Autonomous Vehicles
- Automated driving, perception, and control
- Smart mobile machinery and railway transport
- Green vehicles

Cyber Security
- Identification of human identity
- Drone technologies for security, monitoring and management

FinTech
- Responsible investment and risk management
- Investment portfolio management
- Mathematical models and methods in economic processes
- Blockchain technologies

CreaTech
- Virtual & augmented reality technologies
- Computer-generated imagery

Robotic Systems for Smart Manufactring
- Robotics applications in manufacturing
- IoT in digital manufacturing

Bioengineering
- Technologies for active and healthy ageing
- Human-machine interfaces
- Biohybrid systems and technologies

Circular Economy
- Eco-friendly materials and technologies
- Waste management and recycling

VILNIUS TECH publishing capacities

VILNIUS TECH publishes 16 research journals journals.vilniustech.lt

→ 10 journals in the Clarivate Analytics Web of Science
3 in JCR Q1

→ 13 journals are listed on the Scopus database
3 in Scopus Q1

→ 7 journals are included in COPE
(Committee on Publication Ethics)

Infrastructure Concentration

3 faculties relocated to the Sunrise Valley:

Electronics, Mechanics and Transport Engineering Faculties

8,525 sq.m. of new R&D and Studies area

36M EUR investment in infrastructure

5M EUR investment in equipment

New Generation Lithuania

VILNIUS TECH leading the SmartEcoTech project:

Development of Smart and Climate-Neutral Production Technologies and Materials based on R&D Ecosystem of Technological Universities and Companies.

16M EUR investment in equipment

3M EUR investment in joint projects with industry

VILNIUS TECH partners in the DIGI-DEFENSE project:

Digital Defence for Secure and Resilient Societies

6M EUR investment in equipment

0.5M EUR investment in joint projects with industry

Civil Engineering Research Centre of VILNIUS TECH:

University Excellence Initiative

6M EUR investment in infrastructure

5M EUR investment in human resources

New generation Lithuania

Future international competence centres of VILNIUS TECH

- Dual-use autonomous transport
- Applied R&D in Sustainable Energy
- Applied Chip Engineering

30M EUR of total investment in infrastructure and human resources

Google project for cyber security with VILNIUS TECH

0.7M EUR investment in interdisciplinary activities for students

VILNIUS TECH: putting sustainability policy into practice

Institutional policy (1)

2015. Green University Concept adopted

2020. Agreement signed between Lithuanian universities on climate change mitigation

2021. Sustainable University Concept approved

2023. Sustainability HUB established

2023. University wins and leads national mission: SmartEcoTech “Smart and Climate-Neutral Development of Lithuania”, led by VILNIUS TECH (32M Eur., 14 partners, 5 projects creating prototypes).

Institutional policy (2)

2024. VILNIUS TECH and Lithuanian builders association creates platform LSEPO – for the reuse of building materials

2025. “Smart and Climate-Neutral Manufacturing Processes, Materials and Technologies Competence Centre” established (16M Eur. investments in infrastructure and 2.9M for human resources)

Ongoing activities

- Continuous involvement of educators and scientists (over 350 WEB of Science publications, 2 study programs, online courses, sustainability study subjects integrated in most study programs)

- Cooperation with with the municipality (joint projects, activities)

- Implementation of new sustainability initiatives (automation systems and monitoring, university solar park, etc.)

Sustainability HUB

- Established in 2023
- Promotes sustainability culture
- Develops sustainability competencies

Challenge based Education, Training, Prototyping HUB

- Ecodesign LAB
- Data LAB
- LAB of Sustainable Consumption

Open Hybrid learning spaces

2 ATHENA hybrid classrooms

Green outdoor space

Sustainability HUB

Eco-design LAB (1)

A space is dedicated for processing, experimentation and design, where new environmental solutions and products are created, the production of which uses recycled plastic for 3D printing

- secondary and repeated use and recycling of materials for the creation of new product prototypes will be carried out
- **the possibilities of using plastic waste** for the development and production of other products will be demonstrated, using the principles of circularity and ecological design.

Sustainability HUB

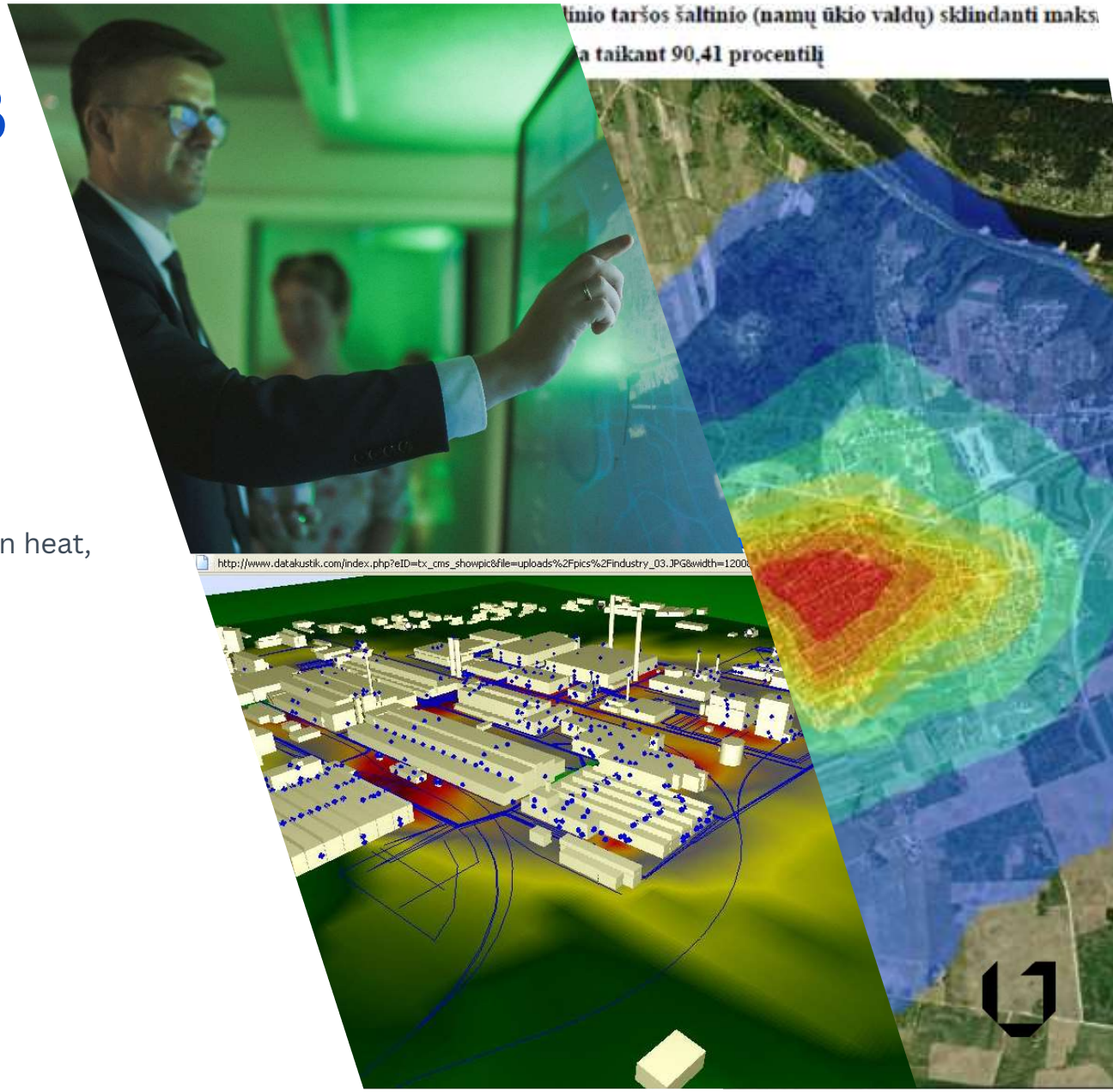
Eco-design LAB (1)

(Examples: recycling plastic into 3D printer filaments, etc., souvenirs, checkers, recycling coffee grounds into decorative flowerpots, textile collection and exchange (“Thank you” initiative, etc.)

Sustainability HUB

Data lab

(Examples: Vilnius city air pollution monitoring, urban heat, etc.)



Sustainability HUB

LAB of Sustainable Consumption

(Examples: production of gas, herbs, open kitchen, etc.)

National Mission SmartEcoTech "Smart and Climate-Neutral Development of Lithuania", led by VILNIUS TECH.

32M Eur, 14 partners, 5 projects in prototyping.

SmartEcoTech aims to create an innovative, science- and business-based ecosystem that:

- Implements advanced and more climate-neutral manufacturing technologies;
- Transforms the construction sector by reducing waste and CO_2 emissions;
- Promotes a circular economy

A **Competence Center** is being established for this purpose in 2025

Civil Engineering Science Center (CIMS)
“Center of Excellence”

Founded in 2023
6.15M Eur (2023-2027)

Research direction – sustainable, efficient and durable composite materials, structures and technologies

Outcome:
+50 publications (Q1, Q2),
+20 new PhDs employed
+10 foreign scientists employed
+1.2M Eur earnings from prototypes

Civil Engineering Science Center (CIMS) “Center of Excellence”

The project tasks are:

- To develop principles for designing composite concretes with reduced cement content using various wastes
- To create a Lithuanian Construction Materials Reuse Optimization platform
- To develop climate-neutral and sustainable asphalt and concrete pavements
- To develop and investigate a residential air quality improvement system that removes ultrafine particles
- To develop data-driven social models and sustainable solutions that increase safe public engagement and intelligence in decision-making related to sustainable technologies and civil engineering.


Max. Test Load
1000 kN

VILNIUS TECH and Lithuanian Builders Association online platform LSEPO online platform for the reuse of building materials

- The Lithuanian Builders Association (LSA) unites about 150 companies and organizations
- LSA members perform about 70% of construction work in Lithuania every year
- The activities of construction companies account for about 8% of Lithuania's GDP

“Smart and Climate-Neutral Manufacturing Processes, Materials and Technologies Competence Centre“

Established in 2025
16M Eur investments in infrastructure
2.9M Eur investment in human resources

Projects:

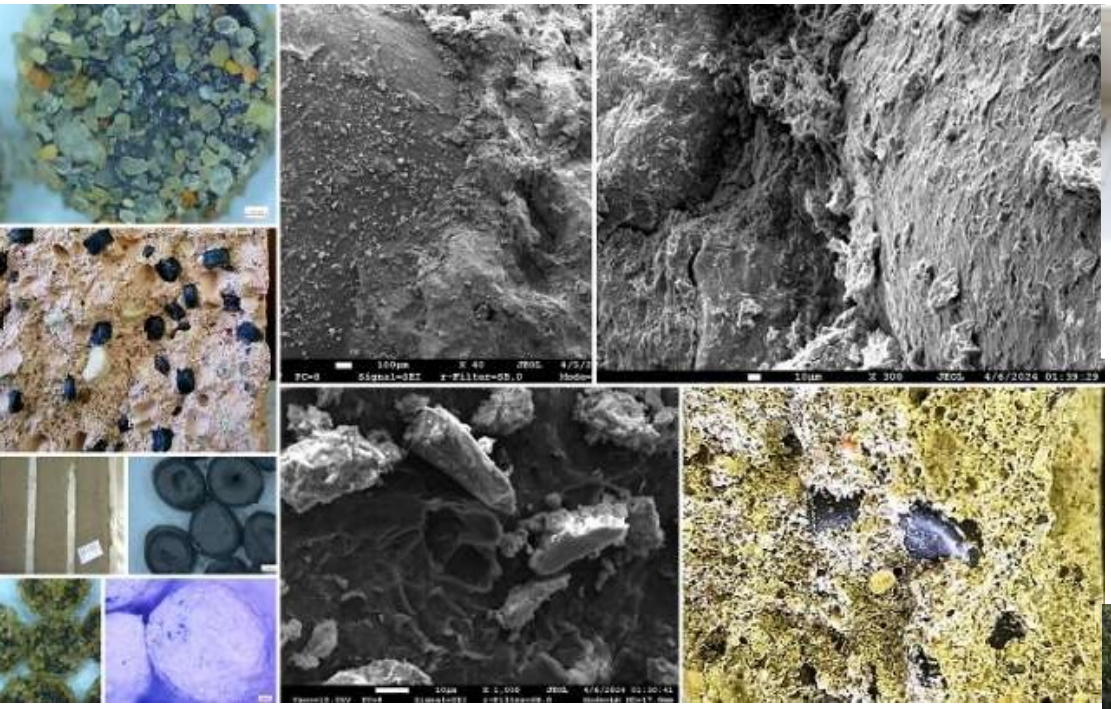
- Using green hydrogen in the transport sector
- Climate-neutral solutions for the construction industry
- Climate-neutral road and urban surfaces
- Noise-reducing barrier made of recycled plastic with recycled tire rubber
- Process management and optimization solutions for wastewater treatment and sludge treatment

Green hydrogen in the transport sector

Modification of asphalt

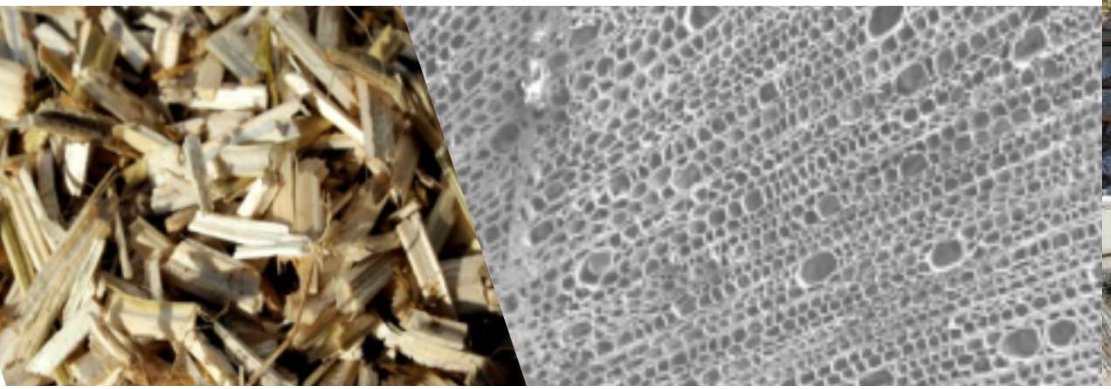
Noise-reducing barriers

Green technologies for industry



Modification of building materials

Climate-neutral stuctural solutions



Ongoing engagement of educators and researchers

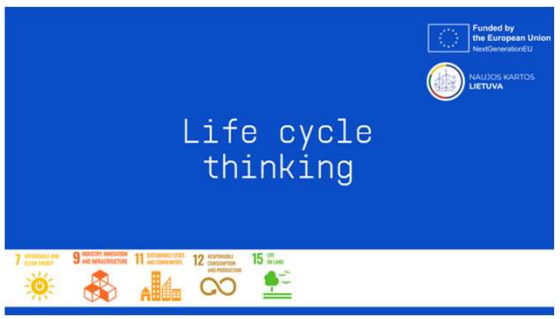
Sustainability Technologies (BsC)

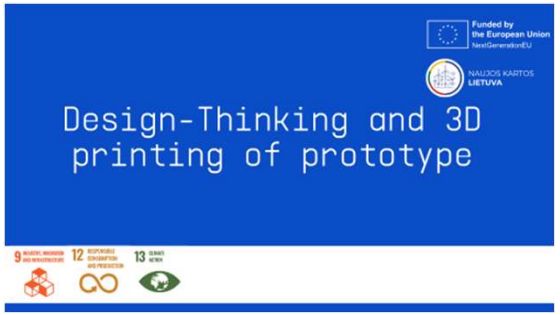
Focused to environmental technologies, circular economy, climate change solutions.

Sustainability Management (MsC)

Focused to management, SDG’s principles and technological solutions.

Sustainability Courses and Development Programs





Ongoing engagement of educators and researchers

Scientific outcome:

- stustainability (50 per year)
- +3 patents per year
- +1M Research and Experimental Development (R&D)

In cooperation with the city

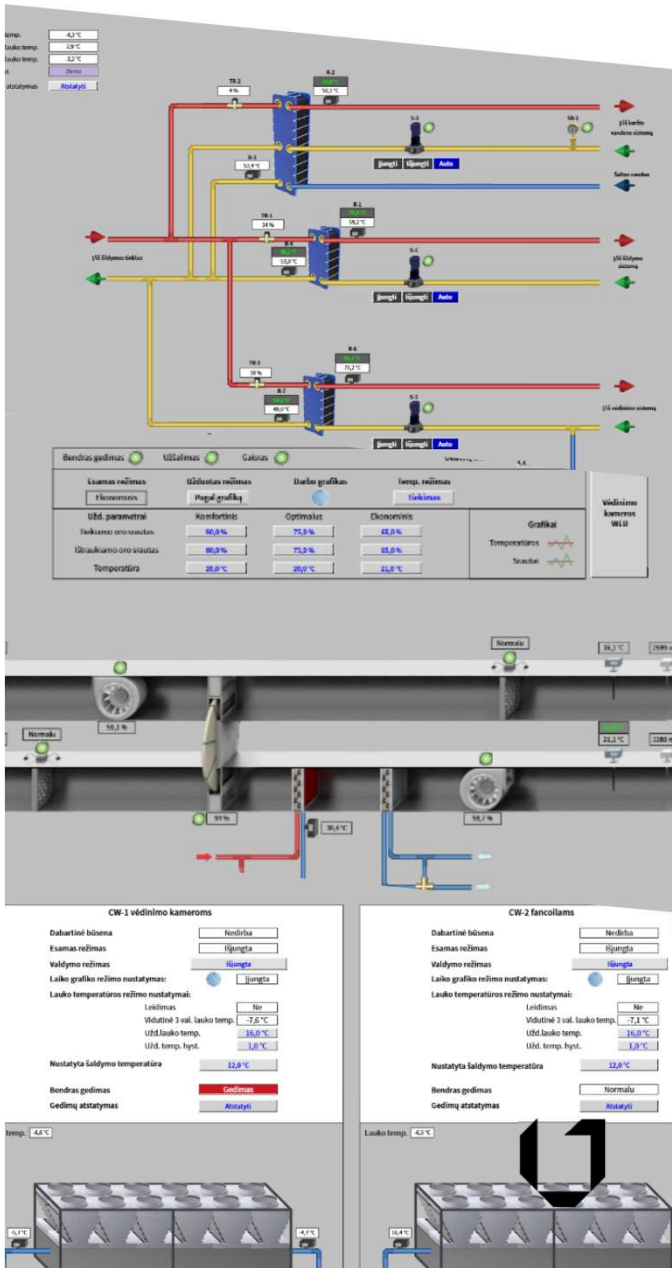
- Joint projects with Vilnius Municipality ("ID Vilnius" - a numerical model for solar generation for each building in Vilnius has been created; air pollution sensors and monitoring, temperature island monitoring, etc.)
- ABC in Energy (2024-2027) - Advanced tools for Behavioral Change in energy consumption for Higher Education Stakeholders.
- Zero-waste technologies are being developed in the construction sector (alternatives to cement, concrete and asphalt), circular economy projects are being implemented (reuse of plastics, textile, etc.)
- Green facades, energy-saving buildings, air, water and land transport innovations are being developed

Specific Conferences on topics of Sustainability

Title	Date	Short description / notes
National Conference “Aspects of Sustainability in Architecture”	2020-11-05	Organized by the Faculty of Architecture; held online via Zoom; focus on sustainability aspects in architecture.
Conference “Science – Future of Lithuania” Young Scientists	Annualy	Aimed at young researchers in all fields of engineering, sustainability.
Visuality 2025: Social Innovations for Sustainability Communication	2025-05-08 – 05-09	Conference on sustainability communication and social innovations; organized by the Faculty of Creative Industries.
NORDTEK 2025: Leaders in Sustainability and Digital Transformation	2025-06-11 – 06-13	Organized by VILNIUS TECH Sustainability Hub; theme – green and digital university transformation.
Environmental Conference “The Interesting Conference”	2025-03-20	Community conference; topics: sustainability, innovation, future solutions.

New sustainability systems are being implemented

- University infrastructure automation for sustainable consumption (BMS - Building Management System)
- University pollution and human resource monitoring
- University solar park (about 8 percent, 382,000 kWh)
- Other activities related to sustainability



Conclusion

- The university actively develops and implements sustainability technologies through the areas of studies, science and social impact.
- Competence centers, laboratories, infrastructure, attracting new researchers, study processes, and cooperation with business will allow the university to achieve the “0 emission” goals set out in the sustainability strategy.

VILNIUS TECH

Thank you for your attention!