







# Rzeszów University of Technology

#### The Facts

- Technical university with the longest tradition in the Podkarpackie region
- Highly-qualified academic staff
- Modern laboratories
- Student-friendly university
- Educational pride of the Podparpackie region
- Center for domestic and international scientific and educational achievements





# Rzeszów University of Technology

### The Past

- 1951: Evening School of Engineering (54 Students)
- **1963**: Technical College in Rzeszów 377 Students, 16 Academics
- 1974: Rzeszów University of Technology 4016 Students, 258 Academics
- 2017: 17000 Students, 780 Academics







## The University authorities



Rector Prof. Piotr Koszelnik, PhD, DSc, Eng.



Vice-Rector for Development and Business Cooperation Prof. Jarostaw Sep PhD, DSc, Eng.



Vice-Rector for Science Lesław Gniewek PhD, DSc, Eng, Associate Prof.



Vice-Rector for Student Affairs Prof. Grzegorz Ostasz PhD, DSc.



Vice-Rector for Education Iwona Włoch PhD, DSc, Associate Prof.







# University today (September 2017)

- 7 Faculties
- 26 (+2) Fields of study
- more than 17000 Students
- 778 Academics
- 174 professors and associate professors
- rights to confer postdoctoral degree in 5 disciplines
- rights to confer doctoral degree in 10 disciplines



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### University today

THE FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING, AND ARCHITECTURE NEXXW WHYDRIT OF TROMMOOF	/ Architecture / Civil Engineering / Environmental Engineering / Environmental Protection
THE FACULTY OF MECHANICAL ENGINEERING AND AERONAUTICS RESOURCESSION OF TECHNOLOGY	/ Aerospace Engineering / Materials Engineering / Mechanics and Mechanical Engineering / Mechatronics / Production Engineering and Management / Transport
THE FACULTY OF CHEMISTRY Addition university of Homeoor	/ Blotechnology / Chemical and Process Engineering / Chemical Technology / ( <i>Bloeconomy</i> )
THE FACULTY OF ELECTRICAL AND COMPUTER ENGINEERING RELEASE WRITERISTY OF TROBUCAY	/ Automatic Control and Robotics / Computer Science / Electrical Engineering / Electronics and Felecomunication / Power Engineering
THE FACULTY OF MATHEMATICS AND APPLIED PHYSICS ACLINEW UNIVERSITY OF INSWEDGY	/ Matematics / Medical Engineering
THE FACULTY OF MECHANICS AND TECHNOLOGY ADDITION UNIVERSITY OF TICHNOLOGY	/ Management and Production Engineering / Mechanics and Mechanical Engineering
THE FACULTY OF MANAGEMENT RESIDENT WRITERIUM OF TERMINARY	/ Finance and Accounting / Internal Security Logistics / / Inages / (Sport Studies)







## The Faculty authorities



Dean of the Faculty **Prof. Lech Lichołai** PhD, DSc, Eng.



Vice-Dean for Develop. **P. Nazarko** PhD, DSc, Eng.



M. Kłos

PhD, Eng.

Vice-Dean of Education

Vice-Dean of Education K. Boryczko PhD, Eng.







## About the Faculty







### Location











- the Faculty was created in 1966
- in 1993 the Faculty was granted the right to award PhD degree in civil engineering (till now more than 30 awards),
- in **2012** the Faculty was granted the right to award PhD degree in environmental engineering,
- in 2012 the Faculty was granted full academic rights







### (May 1<sup>st</sup>, 2018)

- the Faculty offers four, both BSc and MSc, courses
- 1,600 full-time BSc and MSc students
- 500 part-time BSc and MSc students
- 50 PhD students





## Architecture (BSc and MSc courses, 300 students)







# Civil engineering (BSc, MSc and PhD, 1150 students)







# Environmental engineering (BSc, MSc, PhD, 620 students)







## Environmental protection (BSc, MSc, 80 students)







# Academic staff (May 1<sup>st</sup>, 2018)

#### 156: researchers (139) and teachers (17)

- 8 full professors
- 17 associate professors
- 67 researchers with a PhD degree
- 47 researchers with a MSc degree
- 13 academic teachers with PhD degree
- 4 academic teachers with MSc degree



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#### 37 technical staff

• dean's office: 7; departments and laboratories: 30





# Research fields — some examples





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# Department of Roads and Bridges

- acceptance examination of bridges,
- analysis of bridge pile foundations,
- analysis of bridge reinforcement solution with pre-stressed CFRP tapes,
- analysis of acoustic emission of railway bridges,
- analysis of driver's visual interaction with environment.







# Department of Building Structures

- simulation based probabilistic procedures for design of structures for full "life" span
- non-linear analysis of steel building construction stability in imperfect approach,
- assessment of stiffness and load capacity of frame structures taking into consideration semi-rigid connections, spatial work of the structure, imperfection and second order effects.







# Department of Structural Mechanics

- application of artificial intelligence methods in analysis and identification problems in structural dynamics and geomechanics,
- analysis and comparison of measuring methods and data processing algorithms (in particular with using artificial intelligence methods) to identification of structures damages









# Department of Building Engineering

- new building materials,
- applying solar radiation in building engineering,
- architectural and construction solutions in heritage objects,
- thermal and moisture phenomena occurring in building barriers







### Department of Geodesy and Geotechnics

- monitoring measurement methods in construction,
- statistical methods of measurement results analysis,
- properties of cohesive and organic soils in the Podkarpackie Province.

### Department of Materials Engineering and Building Technology

- technology of concrete and concrete mixtures,
- durability of building structures,
- application of materials engineering methods in analysis of materials with cement matrix.





# Department of Water Purification and Protection

- water technology and water technology equipment,
- water purification and renewal,
- water and sewage management in industrial plants,
- environmental protection and monitoring techniques.







# Department of Heat Engineering and Air Conditioning

 efficiency of energy exploitation in construction, improvement of heating and air conditioning systems.







# Department of Infrastructure and Water Management

- development of theory and construction of multi-chamber retention reservoirs in sewerage systems,
- innovative retention reservoirs,
- modern methods of rainwater draining and management,
- optimization of sewerage systems,
- design methodology of sewerage grids and objects.







## Department of Water Supply and Sewage Systems

- reliability and safety of waterworks, sewerage, gas systems,
- methods of risk analysis and risk assessment in municipal systems,
- efficiency analysis of technical systems and objects of environmental protection,
- optimization of waterworks and sewerage systems,
- balneology, balneotechnics and health resort engineering.







# Department of Environmental Engineering and Chemistry

- surface waters ecosystem research,
- sustainable development and management of water ecosystems,
- water and wastewater purification,
- waste utilization and waste dumps influence on underground water, air and soil.







# Department of Town Planning and Architecture

- contemporary problems of architecture and urbanism of the Podkarpackie region,
- research and professional evaluation of legal solutions in architecture and urbanism,
- revitalisation of architectural and urban compounds,
- innovative solutions in architecture.





# Department of Architectural Design and Eng. Graphics

- methodology of architectural design,
- interdisciplinary and systemic architectural design,
- development of geometrical models of selected building objects.







# Department of Building Conservation

- legal forms of historic buildings protection,
- methods and ways of historic buildings protection,
- contemporary techniques and technologies of saving cultural heritage,
- revitalization of historic complexes.









### Laboratories

The Faculty has modern equipped laboratories, which make possible to conduct all necessary testing of construction materials, grounds, construction elements and models in a laboratory scale and a real scale. In the laboratories one can measure strength parameters, perform fatigue tests, test structures under static and dynamic load, measure the deformation, displacements and rotation angles, forces, as well as noise and other acoustic parameters.





# Civil engineering

Unique research apparatus:

- Iaser vibrometers for contactless vibration measurement,
- Q equipment for elastic wave propagation measurements,
- equipment for vision-based construction deformation measurements (two fast cameras),
- Shaking table for fatigue tests,
- electron scanning microscope and laser profilometer,
- thermovision cameras,
- inclinometer probe (displacement measurements in ground or in construction, assessment of ground stability and monitoring of slide zones, which occur in ground in landslide sites),
- 3D scanner





# Civil engineering

The road laboratory permits the investigation of various properties of road materials, as well as surface, base, and construction layers of the existing roads.

- wheel-rut-meter used to investigate the resistance of mineral-asphalt mixtures against rutting,
- Q chamber for the investigation of freeze-resistance,
- laser profilograph for assessment of the longitudinal and crosswise equality of road surfaces,
- georadar for the identification of construction layers of the surface and its base,
- gyrator press to produce samples in conditions close to the real conditions of asphalt surfaces densification.





## Environmental engineering

Faculty laboratories enable also to check quality and level of physicochemical and microbiological pollutions of natural, surface and underground water, pipeline water, sewers, soil, wastes, bottom sediments, sludge, biomass and atmosphere.

- emission, isotope, ion and Roentgen spectrometers,
- liquid chromatography system composed with mass spectrometer,
- system GC/MS gas chromatograph,
- Iluorescent microscope,
- oprtable analyser of gasses,
- portable system for emission measurement of volatile organic compounds.





## Laboratories

The equipment in the laboratories enables also the control of communal infrastructure in the area of analysis and monitoring of water supply and sewerage systems (flowmeters, stations for meteorological measurements, apparatus for monitoring and inspection of water, sewage and industrial network infrastructure), as well as research on renewable energy (analysis of physical properties of biomass and biofuels).

The detailed information concerning laboratories of the Faculty is available under: http://wbisia.prz.edu.pl/laboratoria.





# Laboratories — main laboratory





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## Main building of the Faculty





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