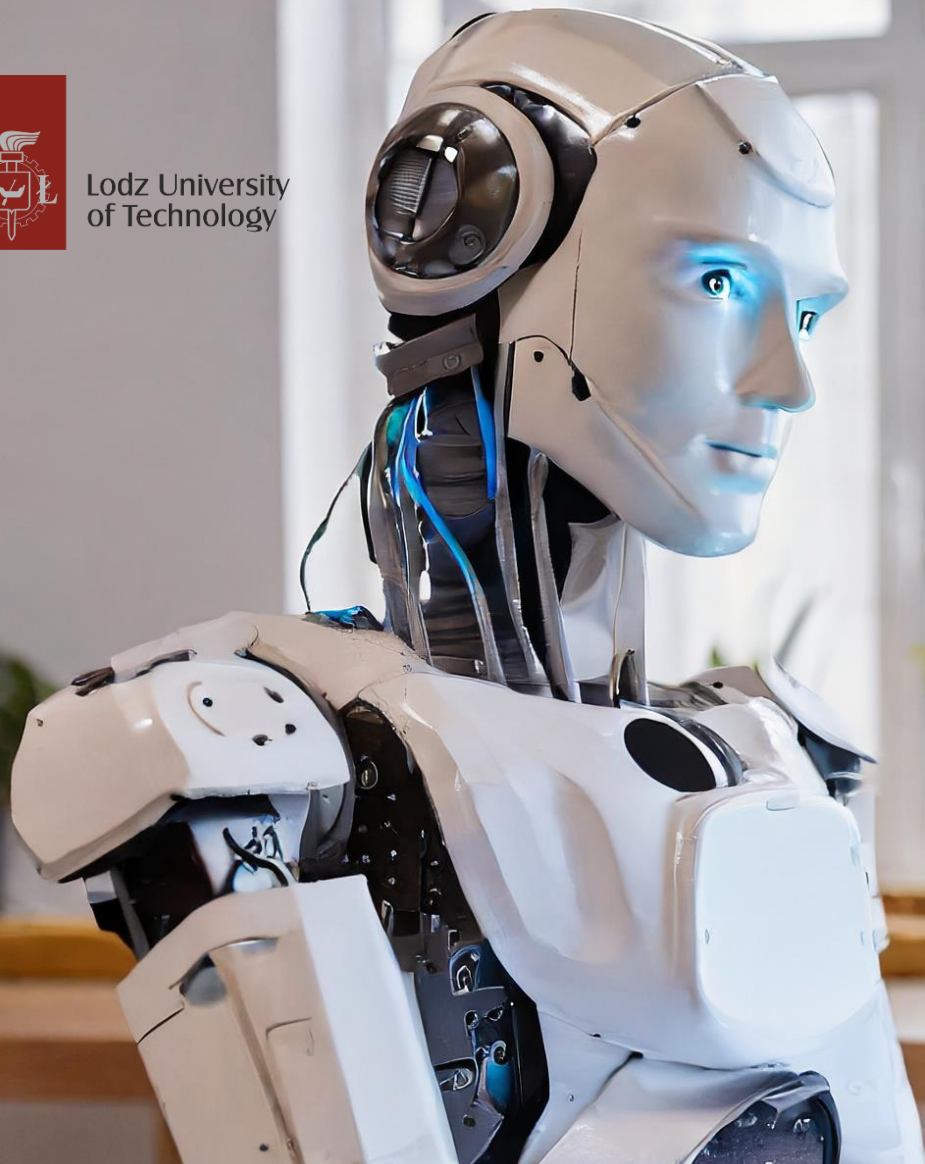




Lodz University
of Technology



**Progress report on the
implementation of the
EXCELLENCE INITIATIVE -
RESEARCH UNIVERSITY**

**by Lodz University
of Technology**

June 2023

Dear Ladies and Gentlemen,

I am delighted to present this report detailing the advancements our university made in the three years of participating in the program 'Excellence Initiative - Research University'. All of the efforts taken by Lodz University of Technology merged the abilities and talents of members of our academic community for the sake of strengthening the role and visibility of Lodz University of Technology in the international environment.

Amidst the adverse circumstances, including the COVID-19 pandemic, the Russian Federation's military aggression against Ukraine, and the rising costs of maintaining and operating the University, fulfilling the set objectives was challenging.

All the more reason for me to be pleased with the unwavering dedication and remarkable commitment of our academic community in the pursuit of excellence in research.



I extend my gratitude to prof. Łukasz Albrecht, Vice-Rector For Science, and prof. Paweł Strumiłło, Vice-Rector for Development. Working together with the members of the appointed Committee for The Excellence Initiative - Research University and Development Strategy, and informed by continuous analysis of the needs in this area, they spearheaded and coordinated pivotal activities.

We launched support mechanisms for the academic community intended to develop its research capacity. Among them is an incentive system, harmonized in all respects with the principles of the IDUB program. Within this scheme, our academic staff, doctoral candidates, and students are rewarded for their scientific achievements.

With a view to encouraging young researchers and doctoral candidates' development and improving their skills in drafting grant proposals, we implemented the FU²N program. Another initiative, the E²TOP program, affords the most talented students the opportunity to follow a personalized learning path focused on the students' first research projects conducted under the guidance of research mentors.

The University's association with the elite European Consortium of Innovative Universities (ECIU) has significantly shifted the ambits of our teaching and research. It has smoothed the path for our participation in international and interdisciplinary research groups, as well as academic mobility vital for advancement in research.

We also made progress on digitalization which is an important attribute of any university that is managed effectively and in accordance with contemporary standards. It is important to highlight, therefore, that after many months of legal, technical, and organizational preparation, we now have introduced electronic document circulation.

Additionally, another new tool to enable effective management and monitoring of the emerging and ongoing research, as well as comprehensive reporting in that area, namely the Project Management System, was implemented to further support our researchers in successful submission of proposals for international research funding and heading up international research groups.

The Research Support Center, integrated within the structures of the University, offers comprehensive assistance for our researchers in advancing their careers. Catering to the children of our employees, doctoral candidates, and students, the Non-Public Kindergarten and Non-Public Day Care Center were recently launched at Lodz University of Technology. I am deeply gratified to be able to see the University become an increasingly attractive place for work and study and facilitate the achievement of a balance between professional commitments and parental responsibilities.

As a university of technology, we understand perfectly well the significance of working in partnership with the socioeconomic environment. To advance dialogue between the academic and business community, a series of debates called 'Technologies of Tomorrow – Debates at Lodz University of Technology' was started. The University holds a great advantage in consistently attracting new partners. These collaborations add to education and identification of new turf for research, thus contributing to the regional and national economic development.

The initiatives and activities of the University community in the recent period focused on the systematic scaling up of efforts in the strategic areas of research specified in the IDUB program. This approach proved effective, demonstrated by the excellent results of the latest evaluation of scientific activity. Among the twelve disciplines pursued at Lodz University of Technology, three were classified in the category A+, six in the A category, and three in the B+ category.

As we head towards the next phase of the IDUB program, our goal remains to attain the status of a research university. We will step up our current efforts, put new measures in place, and continue to offer vigorous support to advance learning and research.

I invite you to take the time to read the full report to gain further insight into the progress Lodz University of Technology has made toward excellence in research. I extend my thanks to all involved for your dedication and express deep appreciation of your contribution.

prof. dr hab. inż. Krzysztof Józwik
Rector of Lodz University of Technology

Evaluation of scientific activity in 2017-2021

A+

- ◆ Chemical Engineering
- ◆ Chemical Sciences
- ◆ Food and Nutrition Technology

A

- ◆ Information and Communication Technology
- ◆ Materials Engineering
- ◆ Mechanical Engineering
- ◆ Mathematics
- ◆ Physical Sciences
- ◆ Management and Quality Studies

B+

- ◆ Architecture and Urban Planning
- ◆ Automation, Electronics, Electrical Engineering and Space Technologies
- ◆ Civil Engineering, Geodesy and Transport

In 2019, the Ministry of Science and Higher Education held the first competition under its 'Excellence Initiative - Research University' program. Following submission of its proposal, Lodz University of Technology was granted a 2% higher subsidy for the period 2020-2026. Owing to this additional funding, the University has been taking actions to raise the quality of its research, thereby enhancing its international visibility.

In 2020, **The Committee on The Excellence Initiative - Research University Program and Development Strategy** was appointed at Lodz University of Technology.



prof. dr hab. inż. Łukasz Albrecht

Chair



prof. dr hab. inż. Paweł Strumiłło

Deputy Chair

Members:

prof. dr hab. Marek Balcerzak; dr hab. inż. Robert Banasiak, university professor; dr hab. inż. Anna Diowski, university professor; prof. dr hab. inż. Anna Fabijańska; prof. dr hab. inż. Dariusz Gawin; prof. dr hab. inż. Katarzyna Grabowska; dr hab. inż. Sławomir Hausman, university professor; prof. dr hab. inż. Łukasz Kaczmarek; prof. dr hab. inż. Marcin Kamiński; prof. dr hab. inż. Hanna Kierzkowska-Pawlak; prof. dr hab. Maria Koziolkiewicz; prof. dr hab. inż. Tomasz Kubiak; dr hab. inż. Jacek Kucharski, university professor; prof. dr hab. inż. arch. Marek Pabich; dr inż. Dorota Piotrowska, university professor; dr hab. inż. Robert Sarzała, university professor; prof. dr hab. inż. Małgorzata Szykowska-Jóźwik; prof. dr hab. inż. Grzegorz Wielgosiński; dr hab. inż. Adam Wojciechowski, university professor; prof. dr hab. inż. Agnieszka Zakrzewska-Bielawska; mgr inż. Dawid Dygas; inż. Krzysztof Sobiecki.

The implementation plan for the IDUB program at Lodz University of Technology includes 6 strategic objectives. To ensure their attainment, each one was assigned operational objectives.



- 1 scientific excellence
- 2 internationalization
- 3 high quality of education
- 4 effective management of the University
- 5 staff development
- 6 technology transfer and cooperation with the economic environment and research institutes

1 Scientific excellence

Incentive system

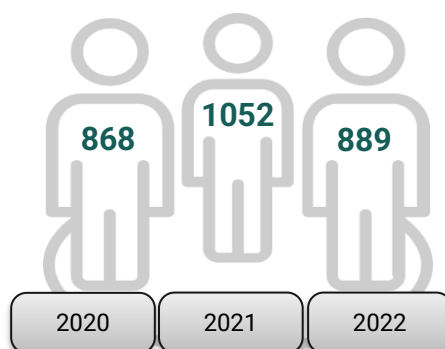
In the reporting period, Lodz University of Technology undertook a number of activities to further develop the University's research capacity and foster increased activity of the academic community in the national and international research environment.

A notable measure was introduced by the University in 2020, with the implementation of an incentive system as laid down in the **Regulations for Awards Supporting Scientific Excellence of Employees, Doctoral Candidates and Students** (Ordinance No. 67/2020 of the Rector of Lodz University of Technology dated 30 November 2020, as amended).

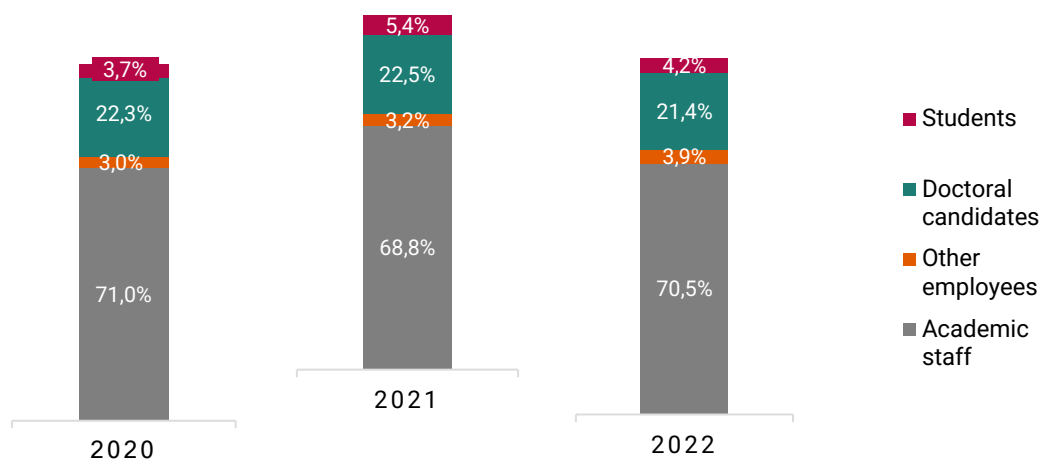
Awards are granted for the following scientific achievements:

- publications in the top journals included in the ministerial list of academic journals and peer-reviewed international conference proceedings, valid at the time of their publication;
- conference proceedings in the top peer-reviewed international conference proceedings included in the ministerial list of academic journals and peer-reviewed international conference proceedings, valid at the time of their publication;
- scientific monographs or chapters in peer-reviewed scientific monographs published by Level II publishers included in the ministerial list valid at the time of their publication;
- national and international patents;
- research grants.

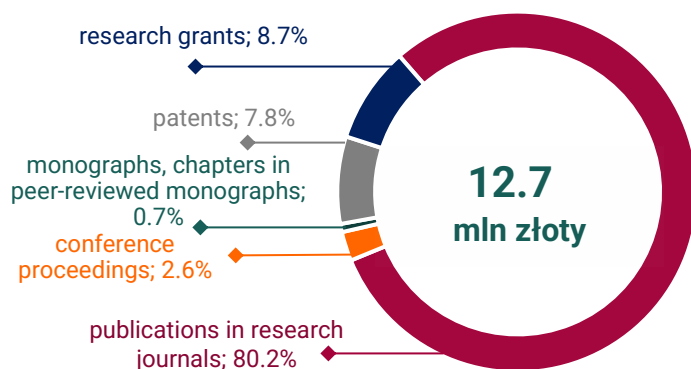
Individuals awarded in 2020-2022



Quantitative analysis of the incentive system



Total value of the awards for scientific achievements in 2020-2022

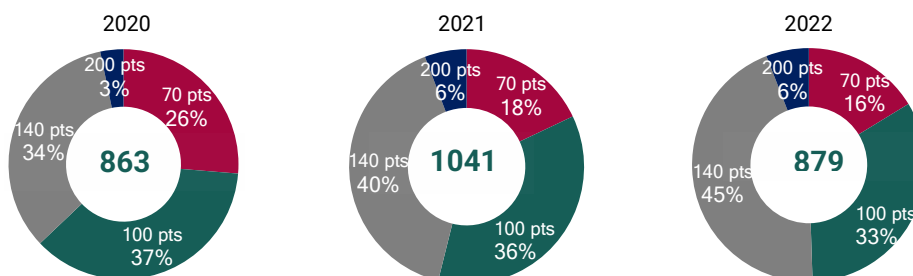


3.5 mln zł
value of awards paid in 2020

4.5 mln zł
value of awards paid in 2021

4.7 mln zł
value of awards paid in 2022

Number of publications in research journals awarded in 2020 - 2022

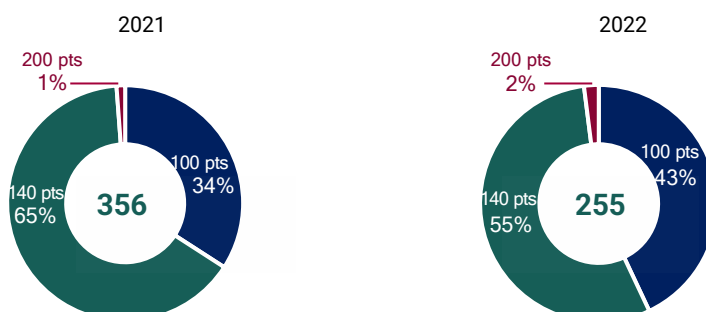


Open access grants

At Lodz University of Technology, we take actions to stimulate research activity, foster publishing excellence, and improve the University's national and international visibility. One of these actions was the Open Science scheme funded from Subtask 1.1 in the University's task budget 'Intensification of publication activity of TUL researchers, doctoral candidates, and students through OPEN ACCESS grants'.

Quantitative analysis of open access grants

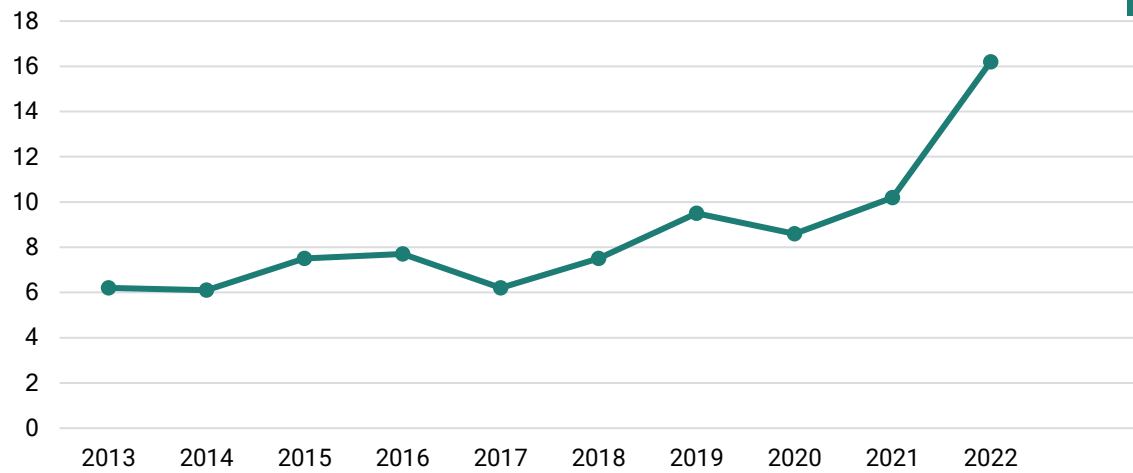
Number of open access grants in 2021 - 2022



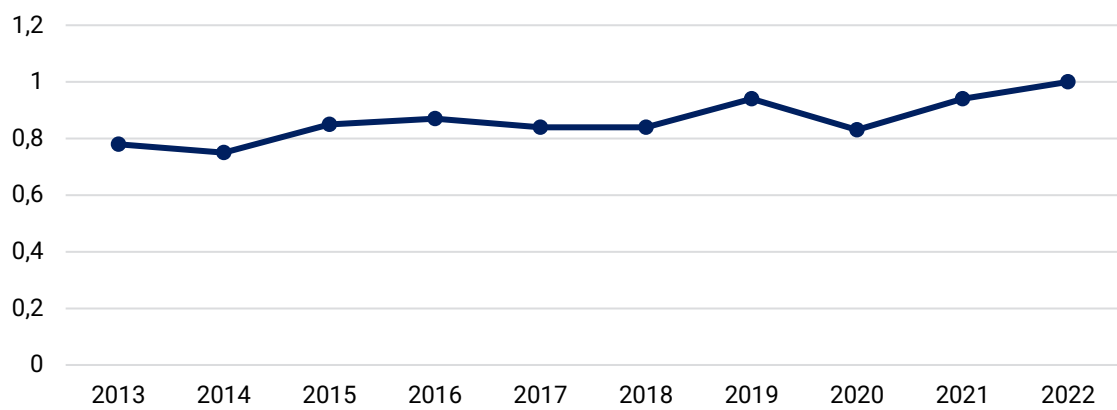
6.0 mln zł
value of grants awarded in 2021-2022

611
grants awarded in 2021-2022

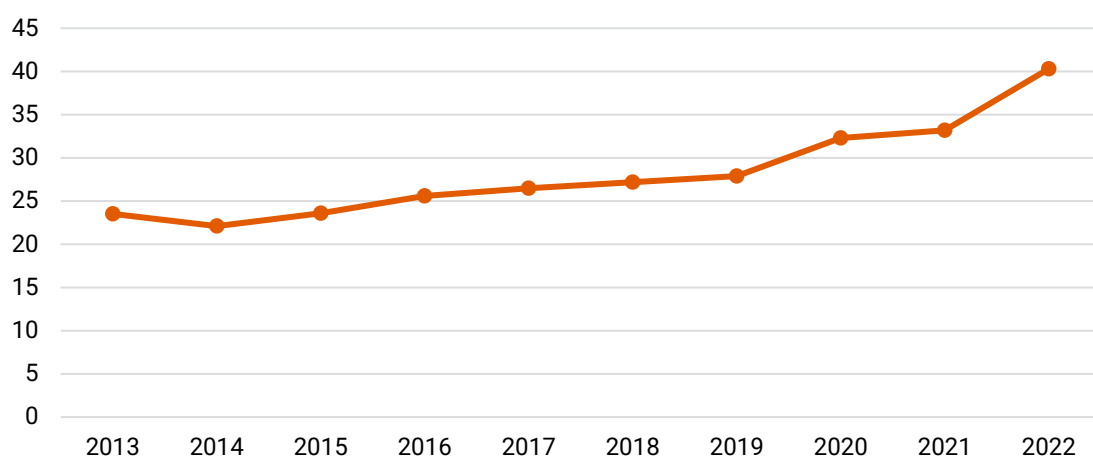
% of TUL publications in the top 10% of publications ranked by citations



Field-Weighted Citation Impact



% of international co-authorship publications



¹Source: Scopus database as of 2023

University-funded grant system

Introduced in 2021, **FU²N Fundusz Udoskonalania Umiejętności Młodych Naukowców** (Ordinance No. 55/2021 of the Rector of Lodz University of Technology dated PL September 29, 2021) is a further instrument to bolster the University's research potential. Calls for proposals are announced annually. The program is intended to strengthen the University's research and human resources capacity by raising doctoral candidates' and young scientists' skills in writing research grant proposals and boosting their effectiveness in securing research funding.

56
grant winners
in the 1st edition

950 000 zł
value of grants awarded in
the 1st edition

41
grant winners
in the 2nd edition

715 000 zł
value of grants awarded in
the 2nd edition



Quantitative
analysis of the
University grant
system

European Research Council

Looking to increase the likelihood of our researchers winning prestigious **European Research Council (ERC) grants**, the University launched a program that offers:

- the possibility of being released from teaching duties in the term in which the proposal is submitted or in the term preceding the submission (depending on the call schedule),
- assistance from an outsourced company with a track record of successful ERC grant applications,
- one-to-one guidance from the proposal facilitator, who will work closely with the researcher from the moment they qualify for the program (including liaising with the National Contact Point and other institutions supporting ERC applicants),
- the possibility of receiving funding towards their stay in a foreign or a domestic institution to seek pre-submission guidance (a lump sum towards the cost of travel, per diems, lodging).

Grant application support system

In 2021 – 2022, Lodz University of Technology supported research groups working on their grant proposals with the funds from the subtask '**Developing instruments to support individuals preparing grant proposals**' in the University's task budget.

external reviews of complete grant proposals

Option to have a complete grant proposal reviewed by independent external experts prior to the submission of the proposal to the financing institution.

foreign visits to establish consortia

Option to have the costs of a foreign visit reimbursed. Priority given to visits associated with the Horizon Europe framework program.

Language Support Centre

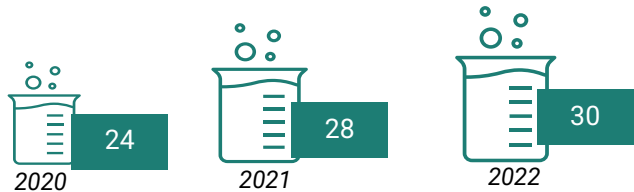
In 2022, Lodz University of Technology opened its **Language Support Centre (LSC)** that assists researchers submitting grant proposals written in English. Language revisions in proposal documentation help increase the likelihood of receiving funding. This task is shared by the TUL Project Services and Language Center.

The University adopted its Gender Equality Plan to prevent gender discrimination and work towards ensuring better work-life balance. The Gender Equality Plan Implementation and Monitoring Panel and Equality Officers were appointed. Implementation of the Gender Equality Plan is one of the formal requirements of participating in calls for proposals announced by the European Commission under Horizon Europe, effective from 2022.



International research projects at TUL

Quantitative analysis of research projects



Lodz University of Technology secured international research grants in these programs funded under the 2021-2027 budget perspective:



4.

TUL is the fourth best technical university in the national ranking of the Horizon Europe² program participants

TUL's Fund for Academic Conference Excellence (FACE) was established in 2021 to enhance and increase Lodz University of Technology researchers' research output. The program opens up opportunities to gain funding for participation in prestigious international scientific conferences.

5 applications
in 2022

15,900 zł
value of the funding awarded

Qualitative analysis of FACE program

In 2022, the Artificial Intelligence Group launched a series of seminars to disseminate the results of AI research and AI methodologies across the University. Their purpose is to advance IT competence (especially in AI) among non-IT Faculties as well as to provide inspiration and real-world IT problems for IT academics to ponder. Underpinning the series is research collaboration that reaches beyond Faculty borders.

²Source: National Contact Point for Horizon Europe, National Center for Research and Development, as of June 15, 2023

Annually, competitions are held for awards bestowed by the Rector of Lodz University of Technology for:

- the best-cited male/female author of a publication,
- the female/male author of the best scientific publication,
- the best publishing female/male doctoral candidate,
- for the youngest first male/female author of a scientific publication for the most valuable implementation.



In the competitions organized from 2021 onwards, distinctions have been awarded in the disciplines in which the University is authorized to confer academic degrees.

The rectors of Lodz University of Technology and the Medical University of Lodz, endorsing scientific collaboration, in 2022 announced for the first time, **a competition for the best publication jointly prepared by researchers from both universities** to be held on a regular basis from that moment on.

The aim of the new competition is to promote inter-university collaboration and identify the best research ideas. In the two editions conducted so far, awardees were granted a prize of 40,000 złoty.

Lodz University of Technology joined two European Knowledge and Innovation Communities of the European Institute of Innovation and Technology: **EIT Health** and **EIT Food**.



The idea behind the EIT Communities is for organizations to work together to share their expert knowledge within what is referred to as the 'knowledge triangle'. This is a principle whereby experts from the worlds of business, science, and education collaborate to foster optimal environment for the development of innovation.

Scientists from Lodz University of Technology participate in international research activities aimed at advancing knowledge and promoting innovative solutions in the field of health and nutrition.



In 2022, the University hosted the EIT Health Open Day, where the competitions and activities within the project were discussed. A special guest of the event was Francesca Avolio, EIT Health InnoStars Regional Director.

The University joined the **Coalition for Advancing Research Assessment (CoARA)**, which brings together more than 350 organizations from more than 40 countries. Its aim is to develop good practice for assessing scientific research based on responsible use of bibliometric indicators, as well as qualitative assessment and analysis of other forms of scientific activity.

Under the 'Agreement on Reforming Research Assessment', to which Lodz University of Technology is a signatory, the appraisal of scientific research includes three areas: the appraisal of research organizations and units, the appraisal of research projects, and the appraisal of individual researchers and research groups.

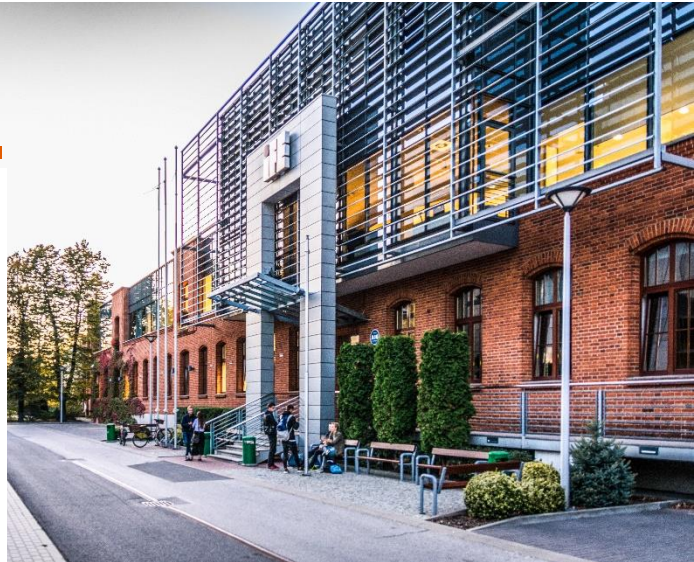
2 Internationalization

ECIU

European Universities are international partnerships of universities that aim to become European higher education institutions of the future. They are united by an integrated long-term strategy of cooperation, a single European 'campus' to facilitate academic exchange, and European knowledge creation teams.



At the end of 2021, Lodz University of Technology joined the **European Consortium of Innovative Universities (ECIU)** – an elite network of European universities, thereby forming a unique partnership with one of the first European Universities selected by the European Commission in 2019



Membership of this highly selective network offers new opportunities for Lodz University of Technology academic community to participate in interdisciplinary research groups and mobility related to academic development.

The cornerstone of the ECIU University is a challenge-based approach (**CBL challenge-based learning**) - a model that sees learners, teachers, and researchers working together with business and society to solve real-life problems.







In June 2023, the University held a **workshop on ECIU's activities in the area of Research** to highlight opportunities for scientific collaboration that stem from Lodz University of Technology's membership of this consortium.

Researcher Mobility Fund

To stimulate challenge-based research and encourage this type of activity across the ECIU consortium, the **ECIU Researcher Mobility Fund (RMF)** was established at TUL. The purpose of the Fund is to support academic staff wishing to initiate and expand research collaborations with other member institutions. The maximum grant awarded per visit to another ECIU member university is 25,000 złoty.

Fostering mobility

The university offers its staff the possibility to participate in a number of international mobility programs and communicates the benefits of foreign mobility to the academic community. The following serve to promote mobility:

-  Mobility Week;
-  Mobility Day;
-  Erasmus with Leo the Lion (Mój Erasmus z Lwem Leonem) contest;
-  Mobility stories.

Erasmus+ Excellence

Lodz University of Technology is a laureate of the European Universities - Alliances of the Future competition, organized by the National Agency of the Erasmus+ Program and the European Solidarity Corps. The competition aimed to identify the most inspiring and active Polish universities involved in university alliances and to further promote the initiative and the relevance of European Universities for the Polish and European economy.



The University was recognized in the '**Erasmus+ Excellence**' category. The award is the result of the engagement with the ECIU University, the first European University created by a network of 14 innovative universities. Lodz University of Technology participates in two of the EC's five educational programs and represents the ECIU in one of them.

Erasmus+ InnHUB Łódź

The office of the **Erasmus+ InnHUB Innovation Center Łódź** was established at the Center for International Cooperation (CWM) of Lodz University of Technology in February 2023. The activities of the Erasmus+ InnHUB Innovation Center Lodz are focused on funding opportunities for innovative projects that support the development of a modern education system and strengthen the development of professional competences of individuals of different age.

Welcome Point

From May 2022 through April 2023, Lodz University of Technology completed a project called 'Organization of Welcome Point to serve international students and staff at Lodz University of Technology'. The goal was to improve Lodz University of Technology institutional internationalization capacity and to raise competences in this area among TUL's staff working at the Center for International Cooperation.



The goal was achieved with the establishment of **TUL's Welcome Point - a university go-to point for foreigners**, staffed with highly competent personnel and fully stocked with the necessary resources, including information materials.

Rules for receiving foreign visitors



Pursuant to Ordinance No. 74/2022 of the Rector of TUL dated December 22, 2022 on the rules for receiving, funding, and settling the costs related to the stay of foreign visitors at Lodz University of Technology, the organizational unit inviting the visitor is required to develop the program of the visit and appoint a coordinator responsible for complying with the provisions of the Ordinance and handling the matters of the board and accommodation associated with the visitor's stay at TUL.

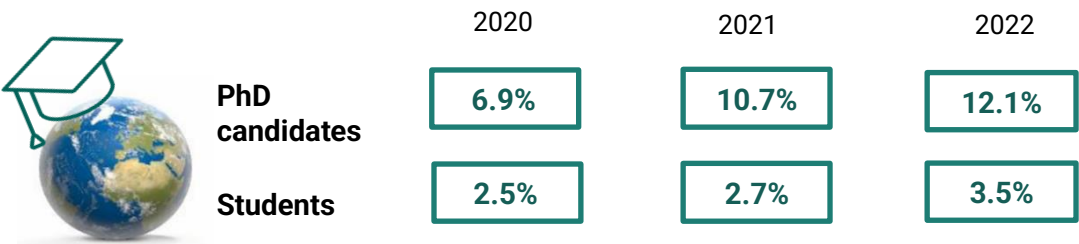
In 2021, Lodz University of Technology entered into new double degree agreements with the following French universities:

- Ecole Catholique d'Arts et Métiers de Lyon,
- Ecole Catholique d'Arts et Métiers de Strasbourg,
- Ecole Nationale Supérieure d'Arts et Métiers (ENSAM).

Part of its educational offering provided in partnership with foreign universities, TUL renewed a double degree agreement in Electronics and Telecommunications (second-cycle degree) with the University of Naples Federico II in 2022.

In 2022, the University won funding for the project **ActiveD2- Active Double Degree: Implementation of a Joint Degree Model Based on Active Teaching and Learning Methods** (ActiveD2–Active Double Degree: Wdrożenie modelu studiów wspólnych opartego na aktywnych metodach kształcenia i uczenia się). The goal of the project, carried out in the framework of the NAWA Strategic Partnerships scheme, is to add new and innovative teaching and learning paths, namely double degree and student exchange programs, to enrich the existing educational offer.

Indicator of internationalization among students and PhD candidates



Qualitative analysis of internationalization



On 15 April 2020, X became the first Polish university to be granted **institutional accreditation** by HCERES (Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur). More than 170 staff, students, alumni, and partners of the University attended meetings with the French accreditation panel. TUL fared very well on all six evaluation criteria and was awarded a 5-year accreditation. The accreditation attests to the University's high standards in teaching, research, and management and to its commitment to continual improvement in all of its activities.



In November 2021, TUL Language Centre successfully completed the re-accreditation process and, having adhered to the stringent standards, was awarded the **Eaquals quality seal** for the second time. The accreditation panel, having evaluated the curricula, the teaching and learning resources, and management of the language courses, certified the high quality of the services provided by the Language Centre.



In 2020, Lodz University of Technology undertook it to prepare for the **Accreditation for Entrepreneurial and Engaged Universities (ACEEU)**. It is the only comprehensive accreditation system available that validates the engagement and entrepreneurial spirit in higher education institutions. It is designed for universities that wish to demonstrate that they contribute significantly to the economic and social development of their communities, and for those that wish to strengthen their impact on their communities. In 2021, the University took the first steps towards meeting the ACEEU assessment criteria. The self-assessment report was submitted to ACEEU at the end of 2022. In 2023 the University was visited by an accreditation panel.

The University is classified in many international rankings, including the most prestigious ones in the Big4 Group. That fact has a positive effect on the University's visibility and confirms the quality of its education and research.

Foreign rankings

Lodz University of Technology in global rankings:



QS World University Ranking

The QS World University Rankings 2023 included 22 Polish universities, with Lodz University of Technology among them ranked in the 801-1000 bracket.

For the first time, the University was ranked in the QS by subject, in no fewer than four disciplines:

- Chemical Engineering (251-300) – only three universities classified in the discipline;
- Mechanical, Aeronautical & Manufacturing Engineering (401-450);
- Chemistry (551-600);
- Materials Science (351-400).



Times Higher Education World University Ranking

THE World University Rankings 2023 included 32 Polish universities. Lodz University of Technology was ranked in the 1501+ range in the world ranking. Furthermore, apart from the main ranking, the University was classified in THE Rankings by Subject, in 5 areas.



Times Higher Education Impact Rankings

THE Impact Rankings 2023 included 23 Polish universities. In the overall classification, Lodz University of Technology ranked in the 601-800 range. The University received the highest scores for its efforts towards Goal 8 Economic Growth and Decent Work, winning 1st place in Poland, and for Goal 17 Partnership for the Goals, where it was placed in the national top three.



US News Best Global Universities Rankings

The ranking included the top 2,000 universities in the world, with 43 Polish universities among them. Lodz University of Technology was ranked in 20th place in Poland, 513th in Europe, and 1394th in the world. By field, the University was ranked 169th in Polymer Science, 524th in Engineering, 700th in Materials Science, and 777th in Chemistry.



ShanghaiRanking's Global Ranking of Academic Subjects

In 2022, Lodz University of Technology was classified in the Energy Science & Engineering discipline, in the 301-400 range.



SCImago Institutions Rankings

Lodz University of Technology was ranked 21st among 71 Polish universities and 1238th in the world. The university was classified in 25 categories (subjects).



Web of Universities (Webometrics)

In the global edition of Webometrics 2023 ranking (January edition), Lodz University of Technology held the 10th place in Poland, 387th in Europe, and 963rd in the world.



CWUR - Center for World University Rankings

In the Global 2000 list, the University was ranked 1371st.



University Ranking by Academic Performance (URAP)

In the 2022-2023 edition, Lodz University of Technology was rated in 15 disciplines, and ranked 18th among Polish universities, and 1051st in the world.



CWTS Leiden Ranking

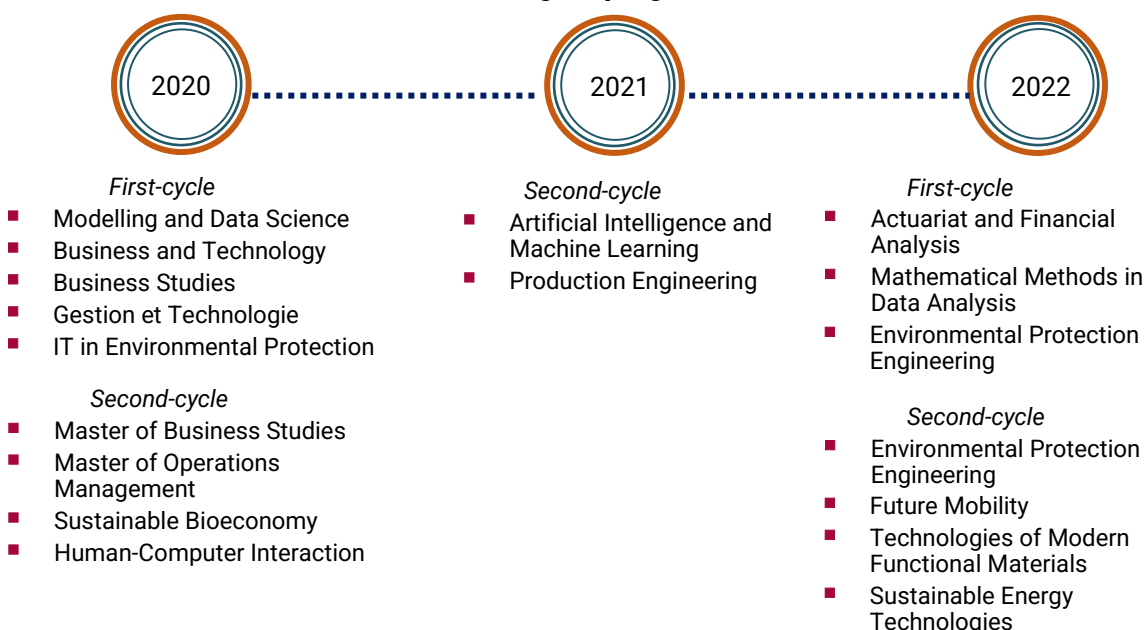
In the 2023 edition, the University was ranked globally (regardless of the field): 710th in the scientific impact category, 776th in the gender category, 929th in the collaboration and Open Access categories.

3 High quality of education

New degree programs

Lodz University of Technology successfully takes on new challenges and introduces new offerings for prospective students. Observing new developments in the socioeconomic environment, it refines its curricula to ensure that the learning process is as effective as the stakeholder's need and expect them to be.

New degree programs:



Internal Education Quality Assurance System

With a view to improving the quality of education, in 2022, the University amended the ordinances regulating:

- **Internal Quality Assurance System**, which details the objectives and the scope of the system, its structure, and the units responsible for the process of teaching quality assurance in the University.
- **Evaluating the quality of teaching**. In the academic year 2021/2022, the first interim teaching quality diagnosis was conducted for all subjects. It facilitates prompt identification of the root of the problem and efforts to address it. The diagnosis was done with **Sphinx Campus**, a new surveying and reporting tool.
- **Teaching observation**, establishing the principles for conducting planned, intervention-based, and peer observations, where the last one mentioned was just recently introduced at TUL with the intention to facilitate the exchange of good practice among academic teachers.

International program accreditation

In 2020-2022, Lodz University of Technology was granted **EUR-ACE® Label** (EUROpean ACcredited Engineer) accreditation for the following degree programs:

- Chemistry,
- Computer Science in the Faculty of Electrical, Electronic, Computer and Control Engineering,
- Mechanical Engineering,
- Mechatronics,
- Nanotechnology
- Chemical Technology.



Computing
Accreditation
Commission

In 2022, two degree programs taught in English, namely Computer Science and Information Technology, were accredited by the **Accreditation Board for Engineering and Technology (ABET)**.



Chemistry (1st and 2nd cycle) and Chemical Technology (2nd cycle) degree programs run by the Faculty of Chemistry were accredited by the **European Chemistry Thematic Network (ECTN)** and, in 2023, were granted 3 international ECTN certificates: Chemistry Bachelor, Chemistry Euromaster, and Chemical Technology Euromaster.

The accreditation is synonymous with the acknowledgement that the Faculty of Chemistry adheres to the highest European standards in the quality of teaching.

Tutoring

Tutoring is one of the approaches designed to guide the student in managing their diverse skill sets. Lodz University of Technology completed a long-running project called **Masters of Didactics** (Mistrzowie Dydaktyki), which allowed the University to enrich its offerings with personalized forms of education that rely on the master-disciple relationship. 75 tutors from Lodz University of Technology received training provided by five project partner universities in Europe.

Project results were disseminated during the Teaching Café - Inspiration Hour seminar called 'Tutoring or how to provide TUL students with comprehensive guidance' (Tutoring, czyli jak udzielić wszechstronnego wsparcia studentom PŁ).



The tutoring model introduced by the University offers three options:

Pastoral tutoring

introduced for IFE students in the academic year 2022/23. Support offered primarily to new students to assist them in assimilating into the University culture, building relationships, and developing extra-curricular interests

Tutoring for high-achievers

an opportunity to follow a professional path of academic and professional development under the guidance of a research tutor who supports the student in their work and facilitates the advancement of their knowledge

Peer tutoring

taps into the research potential of our students and serves to spotlight productive student collaboration. It is a teaching strategy whereby students give peer-to-peer academic support to their younger fellow students

Competence examination

A model for **competence examination** based on a case study research method was developed. It is a special form of validation of aggregated learning outcomes specific to the field of study. The examination involves analysis of descriptions of problems (cases) typical of the field of study. The competence exam is administered in the final semester of the degree program. Teacher training and organizational support in the implementation of the model is offered by the Centre for Teaching and Learning - Instructional Support Section.



The **E²TOP (Excellence in Engineering: Talents in Research with Opportunities Program)** is a new program established at Lodz University of Technology not only for academically gifted students, but also for ambitious and enthusiastic academic teachers.

Its goal is to stimulate and nurture academic development of TUL students by giving them the opportunity to follow a personalized learning path centered around research projects. In the course of the program, the student is mentored by a research adviser who supports them in their work and facilitates the process of learning.

Each of the E²TOP program participants receives a 5,000 złoty grant to equip their lab station or to relieve any other exigencies of the project. They also take part in international scientific conferences, summer schools, and training courses.

Six students were selected to participate in the first edition of the E²TOP in 2022 and carried out their research projects under the guidance of five mentors:

- **Michał Grabowski** (Faculty of Mechanical Engineering), mentor: dr hab. inż. Marcin Barburski, University professor; project: *Combining 3D printing with lightweight textile construction for a knee orthosis* (Połączenie druku 3D z lekką konstrukcją włókienniczą jako orteza stawu kolanowego);
- **Wiktor Barańczyk** (Faculty of Electrical, Electronic, Computer and Control Engineering), mentor: dr inż. Piotr Duch; project *Do you understand what I am signing to you?* (Czy rozumiesz co do Ciebie migam?);
- **Masza Góralczyk** (Faculty of Chemistry), mentor: dr hab. inż. Marcin Kozanecki, University profesor; project: *Drugs in the arms of her majesty the queen of life* (Leki w ramionach Królowej Życia);
- **Anna Kania** (Faculty of Material Technologies and Textile Design); mentor: dr hab. inż. Marcin Barburski, university professor; project: *Heat-generating textile composites for the construction industry* (Grzejące kompozyty tekstylne dla budownictwa);
- **Wiktoria Gerlicz** (Faculty of Biotechnology and Food Sciences); mentor: dr hab. inż. Aneta Białkowska, university profesor; project: *MICROsolutions to MACROproblems: what microbial consortia can do for the world* (MIKROrozwiązanie MAKROproblemu - co bakterie mogą zrobić dla świata);
- **Marta Kopytowska** (Faculty of Civil Engineering, Architecture and Environmental Engineering); mentor: dr hab. inż. Artur Wirowski; project: *Smart steel structure node* (Inteligentny węzeł w konstrukcji stalowej).



14 students were qualified for the second edition of the program, in 2023: 5 in their first year and another 9 further into their degree programs. They, too, conduct research projects under the guidance of research mentors.

First-year students

- **Kornel Zawadzki** (Faculty of Mechanical Engineering) mentor: dr. inż. Michał Lipian, project: *Ram-horns or bull-horns – aerodynamics of bicycle handlebars* (Baranek czy byk - aerodynamika kierownic rowerowych);
- **Maciej Szulczewski** (Faculty of Mechanical Engineering); mentor: dr inż. Łukasz Frącczak, project: *Pneumatic robot for human gastrointestinal endoscopy* (Robot pneumatyczny przeznaczony do diagnostyki układu pokarmowego człowieka);
- **Dawid Bernatowicz** (Faculty of Chemistry); mentor: dr. hab. inż. Marcin Kozanecki, University profesor; project: *Caught in the net* (Wyłapanie w sieci);
- **Witold Formański** (Faculty of Technical Physics, Information Technology and Applied Mathematics); mentor: dr inż. Piotr Duch; project: *What bugs you? (Co Ci dolega?)*;
- **Agata Świetlik** (Faculty of Technical Physics, Information Technology and Applied Mathematics); mentor: dr. hab. Dariusz Siudak; project: *Mapping the spider network of the stock market crash – an innovative application of AI* (Odwzorowanie pajęczyny giełdowej zapaści - innowacyjne zastosowanie sztucznej inteligencji);

Students further into their degree programs

This group is comprised of the participants of the first edition:

- **Michał Grabowski** (Faculty of Mechanical Engineering), mentor: dr hab. inż. Cezary Rapiejko, university profesor; project: *TUBE 3D – bushings with enhanced abrasive and chemical wear resistance* (TUBE 3D - tuleje o zwiększonej odporności na zużycie ściernie i chemiczne);
- **Wiktor Barańczyk** (Faculty of Electrical, Electronic, Computer and Control Engineering); mentor: dr inż. Piotr Duch; project: *Do you understand what I am signing to you? (Czy rozumiesz co do Ciebie migam?)*;
- **Masza Góralczyk** (Faculty of Chemistry); mentor: dr hab. inż. Marcin Kozanecki, university profesor; project: *Drugs in networks* (Dragi w sieci);
- **Anna Kania** (Faculty of Material Technologies and Textile Design); mentors: dr inż. Magdalena Kłonowska and dr inż. Katarzyna Piekłak; project: *Designing knitted scaffold for the tricuspid valve of the heart* (Opracowanie koncepcji rusztowań nośnych zastawki trójdzielnej serca w technice dziewiarskiej);
- **Wiktoria Gerlicz** (Faculty of Biotechnology and Food Sciences); mentor: dr hab. inż. Aneta Białkowska, university profesor; project: *KerOUT – enzymatic degradation of keratin waste* (KerOUT - enzymatyczny rozkład odpadów keratynowych);
- **Marta Kopytowska** (Faculty of Civil Engineering, Architecture and Environmental Engineering); mentor: dr hab. inż. Artur Wirowski; project: *Designing smart nodes for steel structure connections with the instantaneous center of rotation method* (Inteligentne węzły w konstrukcjach stalowych wykorzystujące ziemne położenie środka obrotu).

The following students were also selected for the program:

- **Anna Walczak** (Faculty of Electrical, Electronic, Computer and Control Engineering); mentor: dr hab. inż. Krzysztof Grudzień, university profesor; project: *RUBIN – enhancing reflection with smart jewelry* (RUBIN - wspieranie refleksji z wykorzystaniem użytkowej biżuterii interaktywnej);
- **Konrad Stefaniak** (Faculty of Chemistry); mentor: dr hab. inż. Anna Masek, university profesor; project: *Poly(lactic acid) composites with plant-based additives* (Kompozyty poli(kwasu mlekowego) z dodatkami substancji pochodzenia roślinnego);
- **Sergiusz Rosiak** (Faculty of Biotechnology and Food Sciences); mentors: prof. Grażyna Budryn and dr hab. inż. Anna Marzec, university profesor; project: *Biodegradable polylactide-based polymer for food packaging applications* (Biodegradowalny polimer na bazie polilaktydu do zastosowania w opakowaniach żywności).

In 2023, the University produced a new series of popular science videos, **Grab yourself a piece of science** (Łap naukę), depicting the exciting world of researchers and laboratories, and demonstrating that the research conducted at the University does indeed change the world. Showcased in the series are student research clubs: Fiber, Experience, Main, SKaNeR - Raptors, SKaNeR- RFH, Kollaps, Ferment, GUST, Iron Warriors, Lodz Solar Team, Ryza, Nano, Polymer, EcoResearch, BioMedSpec, Fan, KINO, the Circle of Mathematicians, UbiComp, and Success. Funding for the project is provided by the Ministry of Education and Science from the Social Responsibility of Science scheme.



Lodz University of Technology organized **Lódź HCI Summer School 2022** centered on human-computer interaction. Students pursuing first-, second-, and third-cycle degrees participating in the School took part in group project workshops and in lectures given by prominent scientists from several European and American universities, including Chalmers University of Technology, University of St. Gallen, and James Madison University.

In 2023, 2 editions (winter and summer) of the **School of Competences for the 21st Century Industry** were held at TUL. The School is a project funded by NAWA from the SPINAKER program. The event was intended for students of engineering from TUL partner universities abroad, with which TUL has Double Degree agreements, and under the Erasmus+ program. 79 students attended the School, hailing primarily from France, Germany, and Spain.



One of the tasks in the second edition of the Integrated Program for Lodz University of Technology (Zintegrowany Program Politechniki Łódzkiej - edycja II) was to engage lecturers from foreign universities in teaching TUL's first- and second-cycle full-time students. As a result, 40 contracted foreign professors delivered 30 hours of lectures each.

TUL continued the application of a student-centered model of education called **Flipped Education** through the deployment of the Flipped Classroom instructional strategy. Collaboration was established with individuals from leading foreign institutions of higher education to pair them with TUL academic staff into peer teaching doublets.

The new doctoral training program introduced at TUL **Interdisciplinary Doctoral School (IDS TUL)** in 2022 creates a favorable environment for doctoral candidates to conduct self-directed research. The number of hours in the core curriculum and elective subjects was reduced to facilitate greater engagement in research activities.



In 2023, Lodz University of Technology launched the **Hot Topics in Science and Technology** program of seminars lead by prominent national and international scientists, addressed to doctoral candidates and academic staff in the research or research and teaching categories of the University employees in all scientific disciplines pursued at TUL. The purpose of the program is to reinforce international standing, visibility, and research capacity of Lodz University of Technology.

The IDS TUL website features **portfolios of the University's research groups** (developed in the course of the STER NAWA project). They are a great resource for applicants looking to find a scientific supervisor.

The call for proposals for mobility was announced under the Curriculum for Advanced Doctoral Education & Training - CADET Academy of TUL funded from the grant acquired by Lodz University of Technology from the STER NAWA program. The budget for the task **Cadet's Wings - Mobility Support** provides funding for living expenses, travel costs, and an allowance. It will be implemented until the end of 2023 or until the funds are depleted.



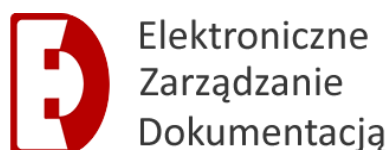
Also with the STER grant, the **Steer Your Future with IDS** series was produced to promote training offerings of the Interdisciplinary Doctoral School TUL, featuring inspiring stories shared by doctoral candidates.

4 Effective management of the University

EZD

In 2021, Lodz University of Technology signed an agreement with the State Treasury - Podlaskie Voivodeship Office in Białystok (Skarb Państwa – Podlaski Urząd Wojewódzki w Białymstoku) and the Warsaw School of Economics, whereby it was granted the privilege of using the EZD PUW system without incurring any associated fees or charges. A test version of the system was developed and launched by the TUL EZD Workgroup. Coordinators appointed across the University units supported the group in the organization and delivery of the training.

January 2023 saw the **production release of the EZD PUW** system. Since then, it has been the primary document circulation system at Lodz University of Technology.



Monitoring the implementation of the TUL development strategy

Two reports summarizing the activities undertaken in the period:

- January 2020 – September 2021,
- October 2021 – September 2022,

were prepared as a result of monitoring the progress towards the objectives set out in the Development Strategy of Lodz University of Technology adopted for 2020-2025.

Project management at TUL

In Ordinance No. 5/2022 of the Rector of TUL dated January 20, 2022, **the guidelines for preparing and executing projects funded or co-funded by external sources at TUL** were laid down. The following terms were defined:

- call attendant - an employee of the Project Service Center responsible for supporting the project team in the phase of application, execution, and closure of the project,
- project auxiliary - a person appointed by the head of the unit executing the project, responsible for giving support to the project team in the phase of execution and closure of the project.



The **Project Management System (MZP)** was introduced as a tool to structure information about the research projects at TUL and to ensure optimal monitoring of their progress. The MZP is designed to track a project throughout its lifecycle divided into three phases: proposal, execution, and closure.

The University established **a project allowance** in the Remuneration Regulations appended to Ordinance No. 25/2020 of the Rector of TUL dated 25 March 2020 on establishing the Remuneration Regulations at Lodz University of Technology.

In 2023, Lodz University of Technology joined the Technical Universities Project Management Offices Forum - TUPMO (Forum biur zarządzania projektami uczelni technicznych TUPMO). 20 technical universities are signatories to the agreement.

Research Support Centre was established within the structure of the University. It offers assistance to TUL researchers in all matters of science and research.



Under Ordinance No. 03/2020 of the Rector of TUL dated January 15, 2020 on changes in the organizational structure of the central administration of Lodz University of Technology and amendments to Organizational Rules and Regulations of Lodz University of Technology in the area under the oversight of the Vice-Rector For Education, the Office of Education was reorganized into the Teaching and Learning Center. The Center is comprised of:

- Curriculum Division,
- Technical and Administrative Support,
- **Instructional Support Section.**

Reconstruction efforts had been completed and the new Lodz University of Technology website was launched in 2021, with new graphic design and content layout. Another distinguishing feature of the new web service is its English language version, with virtually one-to-one correspondence to the Polish version. The website meets the requirements of accessibility, including the option of connecting to a sign language interpreter, and includes footage with audiodescription and subtitles. A standardized template for faculty, departmental, institute, and other unit websites was introduced.

In 2022, a new version of the WIKAMP platform was released:

- promotion of the user dashboard,
- identification through images, picture tiles,
- new way to navigate the portal: navigation menu and full-screen menu,
- WCAG-compliant,
- new functionalities such as favorites, filter/search menu contents and items, dark mode, support for keyboard shortcuts, improved appearance and functionality on mobile devices, in-built interactive tutorials.

Implementation of the **Information Bulletin** within the WIKAMP platform facilitated internal communication. The academic community was regularly updated on the new calls for proposals as well as training opportunities.



Open meetings with the Rector were introduced to allow the Rector and the employees to discuss the University's current activities and plans for the future.

5 Staff development

TUL Own Scholarship Fund

The TUL's Own Scholarship Fund used to support academically successful researchers pursuing a career path at TUL. Pursuant to Ordinance No. 40/2021 of the Rector of TUL dated July 27 2021 on establishing the Regulations of the Own Scholarship Fund of Lodz University of Technology, as of 2021, first-cycle students are also eligible to apply.

Quantitative analysis of the TUL Own Scholarship Fund



Incentivization of academic teachers

Detailed procedure for the award of the **teaching allowance** for special achievements and activities in improving teaching competences was adopted (Ordinance No. 1/2022 dated January 5, 2022 of the Rector of TUL).

Doskonałość dydaktyczna Uczelni

Since 2022, Lodz University of Technology has been executing the project Teaching Excellence of Universities (Doskonałość dydaktyczna uczelni). The project aims to raise the competence of the teaching staff and the quality of education. It provides the University with the opportunity to develop two models for quality management in education. The first is about designing and improving curricula based on the best international standards. The second one concerns a new path for the development of teaching competence of academic teachers through a system of digital badges. The beneficiaries of the project are the 400 TUL academic teachers who serve on the Board for the Curriculum for the Field of Study, course supervisors, and teaching and teaching and research staff seeking promotion to the position of university professor.

Program YES

The **YES - Young Excellent Scientists Program** promulgated by the ordinance of the Rector of TUL is one of the measures intended to bolster the University's capacity as regards its research and its human resources. The objective is to raise the level of internationalization of its human resources by recruiting young researchers from international research institutions.

Researcher profile



The university undertook efforts towards developing **webpages for individual TUL researchers** to showcase their academic achievement. The profiles will be fed with data from the Lodz University of Technology internal IT systems.

Building a personal brand

TUL academic staff participated in training on building an appealing personal profile of a scientist and increasing public understanding of their research. Participants learned about the current trends in the dissemination of research findings and about the benefits of online exposure, not least from the viewpoint of seeking funding for their research.



Research Week served to inspire interdisciplinary teams and invite them to pursue projects under the umbrella of the Łódź Academic Partnership. The five days were filled with debates, lectures, laboratory open sessions, and talks with experts representing, e.g., the National Centre for Research and Development, and the Foundation for Polish Science. The keynote lecture on Transformation to Regenerative Management (Regeneratywna transformacja gospodarowania) was given by prof. Jerzy Hausner.



The event featured presentations by the participants of the E²TOP program and the announcement of the results of the competition organized for them. The following day brought an opportunity to learn more about the research of doctoral candidates of the Interdisciplinary Doctoral School TUL and young scientists - laureates of the FU²N competition.

Also highlighted were the latest EU-funded research projects. Laboratory open sessions, in turn, allowed visitors to find out about the research capabilities and equipment of the laboratories. The rich and varied program included an Open Day at TUL for prospective students.



In 2022, Lodz University of Technology was granted a continuation of the European Commission **HR Excellence in Research** award for a further 3 years, until 17 June 2025. This prestige distinction gives Lodz University of Technology greater visibility in the European Research Area, by assuring scientists, including those from abroad, that Lodz University of Technology is an attractive partner for international projects and research.

The **OTM-R Policy – Open Transparent Merit-Based Recruitment** was adopted by the University, which specifies the manner and procedure for conducting competitions for academic positions (Ordinance No. 80/2021 of the Rector of TUL dated December 17, 2021).



Orientation Manual: TUL Guidelines and Key Information was developed for new members of Lodz University of Technology staff. It serves as a guide to the University, its policies and the essential documents that are required at the start of the employment process before proceeding to the onboarding process. The resource is available on the WIKAMP platform.

The University introduced procedures and defined the requirements for individuals in the group of research staff and in the group of research and teaching staff seeking promotion to the position of university professor (Ordinance No. 56/2020 of the Rector of TUL dated November 4, 2020) and procedures and requirements for individuals in the group of teaching staff seeking promotion to the position of university professor (Ordinance No. 57/2020 of the Rector of TUL dated November 5, 2020).

Several measures were taken to streamline the process of academic staff performance review. Two different evaluation forms were developed for the two groups: one for research staff and one for research and teaching staff. They are available on the WIKAMP platform.

The criteria and procedures for evaluating the performance of the University administration were drafted and approved. The content of the survey questionnaires, the analysis of the results, and the formulation of conclusions and recommendations are handled, respectively, by the Workgroup for the Development of the Criteria and Procedures for the Evaluation of the Performance of the University Administration and the Workgroup for the Evaluation of the Performance of the University Administration.



TUL Non-Public **Kindergarten** and TUL Non-Public **Day Care Center** are now open. Both establishments facilitate balancing professional and parental duties of staff, doctoral candidates, and students.

The establishment of the kindergarten and day care center at the University rounds up the Lifelong Learning philosophy - the educational offerings of Lodz University of Technology cater to every audience, from the youngest to the most senior.

6 Technology transfer and cooperation with the economic environment and research institutes

Center for Innovation and Entrepreneurship

In 2021, the Center for Innovation and Entrepreneurship was established within the central administration, in the area under the oversight of the Vice-Rector for Development (Ordinance No. 12/2021 of the Rector of TUL dated March 22, 2021). The Minister of Economic Development and Technology granted RICIP the status of an accredited Innovation Center as regards services provided under EU-funded programs. Thereby, the unit became authorized to provide paid innovation consulting and support services to entrepreneurs who seek such funding.

Scientific research services

Lodz University of Technology defined the **rules for the provision of scientific research services**, expert services, and other commissioned services in cooperation with the industry, including the provision of services leveraging the University's research infrastructure.

IP Property regulations

In 2021, **The Regulations on Intellectual Property Rights Administration and Principles of Intellectual Property Commercialization** (Regulamin zarządzania prawami własności intelektualnej oraz zasad ich komercjalizacji w Politechnice Łódzkiej) came into force at TUL. Its provisions apply to the University employees. Students, doctoral candidates, and other individuals who do not have a contractual employment engagement with TUL are bound by the Regulations if a contract concluded between the University and such individuals so provides.

Regulations on access to research infrastructure

Regulations on access to TUL research infrastructure (Regulamin korzystania z infrastruktury badawczej Politechniki Łódzkiej) were enforced, laying down the rights and obligations of the University and its employees, doctoral candidates, and students concerning access to research infrastructure in the conduct of scientific research, as well as the terms of access and the procedure for establishing fees to be charged for access to research infrastructure for the conduct of scientific research by third parties.

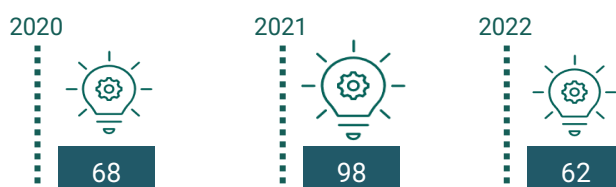
Supporting The Third Mission of the university



In 2021, a competition was organized for the best elaboration on the impact of scientific research on society and the economy. The competition was funded from the task budget resources allocated for the **'Support for the Third Mission of the University'**.

The university consistently reaches top places in the annual national rankings by the number of patents obtained.

Number of patents granted by the Polish Patent Office ³



Quantitative analysis of obtained patents

³ Data provided by the TUL Patent Attorneys' Office

Lodz University of Technology joined the **Masovian Hydrogen Valley** cluster in 2021. The cluster was established to build a hydrogen value chain in the Masovian region (starting from R&D, to production, to sales and after-sales service) and to advance hydrogen technologies. A letter of intent to establish the Masovian Hydrogen Valley was signed by 25 parties representing the world of business and science. PKN ORLEN S.A. serves as the coordinator of the cluster.

Within the framework of the Hydrogen Valley scheme, an educational program called H₂ Academy (Akademia H₂) was developed. The target audience for the program are university students and graduates interested in innovative hydrogen technologies and their applications in business. It involves a series of lectures, training events, and projects for future specialists in this field, developed by the Masovian Hydrogen Valley partners. In April 2023, the University hosted a series of academic activities for students, part of the H₂ Academy.



The university joined the **Polish Metrological Union (PUM)** in 2021. The Union was established during the National Forum for the Integration of Polish Metrology (Krajowe Forum Integracji Polskiej Metrologii). One of the tasks of PUM is to build a database of instruments deployed in Polish metrology laboratories.

In December 2022, the University joined the **Interdisciplinary Innovation Center 3W** (Interdyscyplinarne Centrum Innowacji) to disseminate the principles of responsible use of water, hydrogen, and coal, participate in interdisciplinary knowledge exchange, forge relations, and win support for projects that address the interdependence and synergy of water, hydrogen, and modern carbon technologies.



- Lodz University of Technology signed an agreement with **DS Smith Poland** in June 2021. The purpose of the agreement is to exchange experience, expand cooperation in education, research, and R&D to develop innovation in materials engineering, papermaking technology, and recycling.
- In November 2021, the University entered into a cooperation agreement with **HackerU**, a leader in applications of information technology in education (EdTech). Lodz University of Technology and its partner now offer Poland's first integrated training program on cloud systems management.
- Following the agreement concluded in 2021, ZME EMIT S.A. Research and Development Center will be established at Lodz University of Technology. **ZME EMIT S.A.** is a member of the Cantoni Group. The project is the first of its kind in Poland. TUL employees will support the company in the improvement and development of its products, especially in the design of modern energy-efficient electrical machines.
- Under the agreement with **IDEAS NCBR** a friendly setting for conducting research and education in the field of artificial intelligence and machine learning will be developed. The agreement, executed in March 2022, provides for additional places for doctoral candidates. Students selected in the jointly-conducted selection process will be offered technical and financial support from IDEAS NCBR.
- The university partnered with **MakoLab S.A.** and **Eutonomy** in May 2022. The goal is to develop and deploy intelligent measurement and control systems in residential buildings.
- Lodz University of Technology and **Accenture Poland** signed a letter of intent in October 2022, outlining collaborative efforts towards refining the education process and conducting collaborative projects in the area of development, instruction, and research.

- The university entered into a cooperation agreement with **Polskie Elektryczne Jądrowe (PEJ)** in 2022. The main objectives of the agreement are strengthening human resources capacity in the nuclear power sector, raising the level of student and graduate preparedness to enter the job market, and promoting advanced materials and technologies used in the nuclear industry.



- **Anwim**, the owner and operator of the MOYA gas station chain, became a partner of Lodz University of Technology in 2022. The agreement provides for the company to assist the University with projects that are already underway, as well as to initiate new collaborative efforts towards sustainable development goals.
- Cooperation between the University and the **Centralny Port Komunikacyjny (CPK)** was established with the agreement signed in April 2022, which provides for joint projects in the area of innovation and research and development, as well as internships for students, doctoral candidates, and academic staff.
- In January 2023, Lodz University of Technology and the **Saint-Gobain Group** in Poland concluded a cooperation agreement to undertake joint efforts towards student development and education, and collaborative research projects.

Cooperation with academic institutions

- In 2022, the University signed a cooperation agreement with the **Kozminski University** in Warsaw, which provides for cooperation in research, joint internships and scientific publications, as well as exchange of good academic practice, staff, student, and doctoral candidate mobility, and finally, promoting academic entrepreneurship focusing in particular on commercialization processes.
- In 2022, the long-standing collaboration between Lodz University of Technology and **the Main School of Fire Service (SGSP)**, currently Akademia Pożarnicza, was formalized with an agreement to cooperate in science, research and development, education, and in organizational activities.
- Lodz University of Technology and **Curtin University in Perth**, Australia, concluded a cooperation agreement in 2023. The agreement, which is binding across all five campuses of Curtin University, i.e., Australia, Dubai, Singapore, Malaysia, and Mauritius, provides for staff exchange to develop education and research forms, and activities to promote sustainable development.

Łódź Academic Partnership

Rectors of six higher education institutions in Łódź, i.e., Strzemiński Academy of Fine Arts, Academy of Music, Lodz Film School, University of Lodz, Medical University of Lodz, and Lodz University of



Technology, signed the **Declaration of Strengthening the Cooperation among Public Universities Members of the Łódź Academic Partnership** (Deklaracja zacieśniania współpracy łódzkich uczelni publicznych w ramach Łódzkiego Partnerstwa Akademickiego) in November 2022. The partnership focuses on the core missions of the universities in Łódź: scientific research and the arts, education, and relations with the socioeconomic environment.

Lodz University of Technology organized a consultation session with representatives of the **Łukasiewicz Research Network**. Both parties to the meeting presented prospects for cooperation within the following thematic areas: smart mobility, health, sustainable economy and energy, digital transformation, and modern materials and technologies.

The university became a strategic partner in the **Startups Powered by Invest in Lodz** accelerator program. In June 2023, at the Sports Bay of TUL, the City's program was officially inaugurated with mentors, experts, strategic partners, and startups from Poland and abroad in attendance.

Lodz University of Technology became one of the nine partners in the **Consortium for Research and Development of Aerospace and Marine Technology (LKM)** Rafał Stepnowski Think Tank (Konsorcjum na rzecz badań i rozwoju technologii lotniczych, kosmicznych i morskich (LKM) „Think Tank im. Rafała Stepnowskiego”), established in 2023. The primary aim of the consortium is to consolidate the scientific research capabilities in this field and to increase consulting capacity of academia, business, and public administration. Cooperation of the Consortium's Council of Business Partners with invited representatives of LKM high-tech companies shall facilitate collaborative development of new directions and consulting on strategic initiatives in the field of these technologies as they relate to defense and security.

A pilot **Laboratory for Active Use of Technology (PAKT)** (Pracownia Aktywnego Korzystania z Technologii (PAKT)) was opened at the University. The intention is to build bridges between all learning communities - school students, university students, and teachers and academics. Those participating in the activities of the Lab will be an agent in their learning process and will draw on what they learn to learn further. PAKT provides a setting that inspires creative use of new digital technologies by applying innovative learning pathways, classroom scenarios, and workshops.



The first national **PACCT Science Business Innovation Expo** was organized. During the event, business practitioners had the opportunity to learn about the research portfolio of Polish universities and offering of the institutions funding technology implementation. The Expo featured some 100 exhibitors. The event was attended by more than 500 visitors.

Lodz University of Technology succeeds in transferring innovative solutions to business practice, as well as in promoting the concept of entrepreneurship among researchers, doctoral candidates, and students. It organizes regular meetings with entrepreneurs. Since 2021, **Innovation in your Business - Brunch with Lodz University of Technology** series of webinars has been hosted by the Technology Transfer Section of the Center for Innovation and Entrepreneurship.

The distinguishing feature of a university of technology is the applicability of its research in business practice. A modern university is ought to be the initiator of the dialogue between the University and business, because it acts as an important expert voice. With this in mind, in 2022, TUL started a series of events called **TECHNOLOGIES OF TOMORROW - Debates at Lodz University of Technology** (TECHNOLOGIE JUTRA – debaty w Politechnice Łódzkiej), during which industry professionals and academics address questions that arise in 21st century science and business.

The University continued to provide **training for newly appointed research staff** on intellectual property protection and commercialization of innovative technologies.

In 2020, Lodz University of Technology and **Łódzkie Voivodeship** entered into a cooperation agreement on cybersecurity. The agreement provides for collaborative efforts to serve the community of Łódzkie Voivodeship by increasing the level of cybersecurity, which is especially relevant in times of dynamic global developments in digitalization.

In 2021, the University embarked on cooperation with the **City Investment Board** (Zarząd Inwestycji Miejskich). A letter of intent was signed to kick off the project 'Good Practice. Develop Łódź with Us' (Dobre Praktyki. Buduj z nami Łódź), as well as initiatives to enable students to gain knowledge and skills expected by the job market.

Lodz University of Technology, the Office of the City of Łódź, the Embassy of the Kingdom of Denmark in Poland, and Danfoss signed an agreement on cooperation to improve energy efficiency of Łódź construction industry. Over the course of Implementing the Engineers of the New Generation (Inżynierowie nowej generacji) project, TUL students will establish cooperation with Danfoss experts, participate in workshops and lectures, and visit benchmark facilities in Denmark and energy efficiency knowledge exchange centers.

Lodz University of Technology is a member or a coordinator of the following clusters:



Lodz ICT Cluster,



Stowarzyszenie Klaster Biogospodarki,



Łódzki Klaster Fala Energii,



Klaster „LODZistics – Logistyczna Sieć Biznesowa Polski Centralnej”,



Klaster Q.


In 2023, Lodz University of Technology joined Klaster Q, a group of 25 universities and companies working towards developing the national quantum technology potential. Klaster Q takes up varied tasks, including support for multicenter research and development projects and commercialization of their outputs for holistic development of advanced quantum technology sector in Poland.


TUL's Cooperation with the Lodz ICT Cluster was recognized by the Polish Accreditation Committee. Its Presidium distinguished the University in the **category Partner for Development - Excellence in Cooperation with the Socio-Economic Environment** (Partner dla rozwoju - doskonałość we współpracy z otoczeniem społeczno-gospodarczym). This distinction acknowledges the very high quality of IT education at Lodz University of Technology, provided in cooperation with leading IT companies. PKA praised the ideas of the Education Workgroup, e.g., teaching observations by IT professionals.



Administrative support for IDUB at TUL

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