

KAUNAS UNIVERSITY OF TECHNOLOGY

OF RESEARCH AND EXPERIMENTAL (SOCIO-CULTURAL)
DEVELOPMENT, AND INNOVATIONS



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APPROVED

The Decree of the Senate of Kaunas University of Technology
No. V3-S-33 of June 23 2015
(amended by the Decree of the Senate of Kaunas University of Technology
No. V3-S-19 of March 21 2018)



In 2009, the Senate took a resolution that Kaunas University of Technology is University of Research and Innovation. This is a path of permanent improvement and development of University's academic and non-academic performance reflecting on society and business needs.

In 2015–2020, the University is focused on the following areas:

- To attract, educate and sustain talents and leaders of science and innovation:
- To achieve and maintain high quality of scientific research and innovation performance;
- To increase internationalisation of Research and Innovation activities and strengthen Research and Innovation impact on Lithuanian and other countries society and business.

The University academic community has clearly identified the priority areas and continues to consolidate the potential of the international researchers, improve the quality of scientific research and international visibility of their results, and develop innovations. The priority research areas include: health technologies, digital transformation and smart environments, new materials for medicine and industry,

food technologies and innovation management. The increasing impact factor of the scientific publications, number of the international patents, publications with foreign co-authors and number of the international doctoral students, international competitive funding Research and Innovation, expanding membership in international networks EUA, ECIU, CESEAR, EEEI, etc. – all of this allows to monitor the competitiveness of Research and Innovation performance in international context. KTU is the first Lithuanian university coordinating H2020 projects – we expect the same success in the next coming programme Horizon Europe.

Created advanced knowledge and technology are focused on the quality and attractiveness of the studies in all study cycles. Students and doctoral students are involved in the Research and Innovation projects; they cooperate with research mentors. Considerable amount of students and doctoral students get involved in various entrepreneurial initiatives in the early stage of their studies; they apply their knowledge and develop technologies that are used for the establishment of the knowledge-intensive start-ups. One of the University's missions is to establish rapidly growing, knowledge-intensive and technology-intensive start-ups that would increase innovativeness of Lithuanian and European economy. KTU is the first Lithuanian university that established an academic business incubator "Start-up Space" for development of knowledge and technology-intensive start-ups — we expect their success in the global business world.

The University can be proud of the functioning system for knowledge and technology transfer, established spin-offs and licencing agreements. Research and Innovation income has increased from both Lithuanian and foreign business over the last years. The University Research and innovation services are carried out together with Lithuanian, German, Denmark, Switzerland, Belgium, Japan, USA and businesses of other countries. KTU is the first Lithuanian university that established an academic centre for knowledge and technology transfer "National Innovation and Entrepreneurship Centre"; it makes significant contribution to the development of the regional innovation ecosystem – we expect a breakthrough of innovations.

KTU creates advanced knowledge and technologies with strong impact!



Introduction



Strategy of Research and Experimental (Socio-Cultural) Development, and Innovations (hereinafter - R&D&I) 2015-2020 (hereinafter -R&D&I Strategy) of Kaunas University of Technology (hereinafter – University, KTU) aims to ensure implementation of the R&D&I objectives set in the University's strategy. Strategic R&D&I objective identified in the University's strategy is development of international, multi-field and interdisciplinary research, particularly in the fields of physical sciences and technologies; creation of knowledge making significant influence on society and economy; directing of research and experimental (socio-cultural) development towards the needs of industry, business and society; preparation and education of doctoral students and post-doctoral researchers; creation of potential of high international level researchers. For this purpose the University conducts R&D&I in physical sciences, biomedicine, technologies, social sciences and humanities, publicises and commercialises their results; prepares scientists of physical sciences, technologies, social sciences and humanities, conducts outsourced research for Lithuanian and foreign entities, and implements international and national research projects.

R&D&I strategy aims to identify and anticipate the response to the needs of dynamic R&D&I environment and security of quality of R&D&I activities and success.

R&D&I strategy consists of seven sections, which provide review of present R&D&I achievements of the University and comparison with achievements of other Lithuanian universities, analysis of changes in the University's environment and the needs for the University's R&D&I activities influenced by these changes. After consideration of the present situation and changes in environment, R&D&I strategic objectives, vision, principles, priorities and strategy implementation plan 2015–2020 are formulated. Section 7 presents the principles for evaluation of R&D&I activities.

Strategic objectives of research and experimental development, and innovations of Kaunas University of Technology

Strategic priorities of KTU activities in accordance with the decree No. V7-T-0-1 of the **Council of Kaunas University of Technology of 27 January 2012:**

- Talented and motivated students, lecturers and researchers;
- Critical mass of world-class lecturers, researchers and foreign students;
- Unity of studies and science, cohesion with industry and business;
- Multidisciplinary and multi-field research and studies;
- International recognition in creation and transfer of advanced knowledge and future technologies;

- Participation in global knowledge networks;
- Quality of activities and effective management;
- Inspiring and friendly environment;
- O Dispersion of knowledge and values in society.

University implements strategic priorities of its activities via the following tasks:



Development of physical, biomedicine, technological, social sciences and humanities, and international level, multi-field and multidisciplinary research and creation of knowledge, which has significant influence on society and economics;



Direction of research and experimental development towards the needs of industrial, business and socio-cultural development;



Insurance of attraction and development of talented and motivated Lithuanian and foreign doctoral students and post-doctoral researchers, and becoming internationally recognized school of doctoral studies and joint study programmes;



Collection, maintenance and development of potential of researchers of high international level;

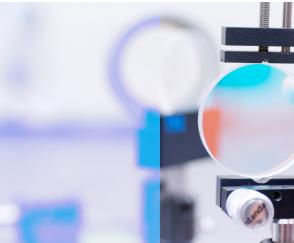


Promotion of development of the centre of research of high international level.









Research, experimental development and innovations at Kaunas University of Technology



KTU successfully participates in the international projects (96 international projects in the EU, USA, Asia), in the establishment of the international research centres "Centre of Excellence for Healthy Ageing", "Centre of Excellence of IoT", and in the publication of the research results in high-level LMT international journals with an impact factor Clarivate Analytics Web of Science: The Lancet Neurology (Impact factor (IF) 26.284), Advanced Materials (IF 14.8), Reports on Progress in Physics (IF 14.311), Neurology (IF 8.249), Trac: Trends in Analytical Chemistry (IF 6.351), Journal of Cleaner Production (IF 5.7), Journal of Cleaner Production (IF 5.715), Neurosurgery (IF 4.889)

By support of the publishing of scientific journals, the University contributes to the needs of the international academic community and dissemination of knowledge in the world. KTU scientific journals have an impact factor Clarivate Analytics Web of Science and Elsevier Scopus, they are refereed in other well-known international databases, editorial boards of the journals consist of Lithuanian and foreign members of the editorial board, and a wide range of foreign authors.

KTU National Innovations and Entrepreneurship Centre (NIVC) unites the activities of the integrated science, studies and business centres (valleys) "Santaka" and "Nemunas". It aims to create appropriate conditions for provision of research services to business companies based on one-stop-shop principle and promotion of science-business cooperation. "Startup Space", established at KTU in 2012, is the first academic incubator on innovative start-ups in Lithuania.

Analysis of results of the University's R&D&I activities in the last five years (University's self-assessment, 2014); results of the LMT evaluation of research (artistic) activities 2015-2016), as well as good practice of leading universities from other countries, highlights the **areas of the University's R&D&I activities that need improvement:**



- **Development of R&D&I community** development of sense of community, overstepping the "limits" of departments. Also, the objective is to create a closer cooperation with regional and Kaunas community, business, involving their representatives to research and dissemination of their results; developing innovation groups clusters and international cooperation networks; become R&D&I pole of attraction and create knowledge-based welfare of local community.
- **Quality of publications** the objective is to increase the citation of KTU publications by increasing the number of publications, which co-authors are foreign researchers; publishing in high-level international scientific journals with impact factor; avoiding self-citation.
- Development of the impact of R&D&I achievements the objective is to increase the amount of international patents; develop R&D&I services for entities; develop R&D&I open access centre; develop activities of the research centres with accredited laboratories; develop R&D&I international and national projects; develop promotion and dissemination of the results of R&D&I activities.

- Productivity of academic departments the objective is to ensure consistent R&D&I activities and sustainable development of the University's academic departments; it is particularly important to make sure that researchers devote a sufficient amount of time for R&D&I activities by balancing the workload of studies and research activities, and there is a consistent improvement in the quality of the results of R&D&I activities for one researcher.
- Effectiveness of R&D&I management and diversification of funding sources the objective is to ensure that the University's academic departments have information systems for activity management, which enable to receive required information for decision-making. In addition, the objective is for the departments to develop a few expert areas, which allow diversification of income sources and insurance of stability of the department's activities. University seeks to have R&D&I infrastructure corresponding to the needs of modern R&D&I activities.
- KTU at QS TOP University ratings the objective is to ensure that KTU results at "Times Higher Education World University Rankings" are higher each year. In 2017 KTU was in 701+ QS Global World University Ranking ratings, 451–500 QS Engineering and Technology and was 51st in QS Emerging Europe and Central Asia (QS EECA).



Vision and strategic objectives of research and experimental development, and innovations



innovations (Senate's decree No. 61 "On strategic objectives of Kaunas University of Technology in the areas of research and innovations" of 28 November 2007), which focuses on quality of research and experimental (socio-cultural) development and sustainable impact on society and business in development of innovation economy.

ania. University aims to maintain position of the leader in Lithuania and becomes one of the leading universities in Europe in the priority areas of KTU research and innovations.

In 2013 the Senate approved 5 R&D&I priority areas of the University's research which integrate the University's activities in all the fields of studies, research and innovations:

Diagnostic and measurement technologies,

Smart environments and information technology,

New high tech materials,

Technologies for sustainable development and energy,

Sustainable growth and socio-cultural development.

Considering dynamic R&D&I environment, studies provided by the University and its limited resources, University aims to guarantee a basic R&D&I level in all KTU study fields and strengthen international positions in KTU long-term priority breakthrough areas of research and innovation:

Health technologies,

including development of medical and health preservation technologies (means, devices, equipment, procedures applied for prevention, preventive tests, diagnostics, treatment and rehabilitation) while solving health problems and improving the quality of life.

Digital transformation and smart environments,

including development and integration of artificial intelligence, Internet of Things, big data, semantics, multimodal analysis, cyber security, multidisciplinary models and automation of IT processes;

New materials for industry and medicine,

including creation of the materials with exceptional properties in various industries (for examples, energy, construction, etc.) that can become an effective alternative for traditional materials;

Food technologies,

including researches of food chemistry, microbiology, technologies and engineering,

Innovation management,

including research of knowledge economy, application of information communication technologies, management of business processes, social innovations and development of civil society.

These breakthrough areas are identified in accordance with the University's results and potential in research and innovation activities, business needs and capabilities to perform R&D&I, as well as global research development trends, provisions of the European Union programme "Horizon 2020", suggested areas of the European Union Framework Programme 9, priority areas of research and experimental (socio-cultural) development, and innovation development (Smart Specialization) approved by the Government of the Republic of Lithuania.

While implementing the University's strategy, R&D&I activities contribute to increasing of innovation in Lithuanian business and public sector, and economic growth; also, it involves active work with business entities and public sector of the European Union and other countries, meeting various R&D&I needs of the sectors of economic activity and regions.

Associations:























Participation in European Institute of Innovation and Technology EIT:

EIT HEALTH HUB

EIT FOOD HUB

EIT INNOENERGY

Partners:









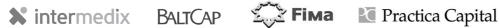


















Principles of R&D&I activities:

University conducts R&D&I activities at level 1-7 of technological readiness. University's R&D&I activities include the areas of physical sciences, biomedicine, technologies, social sciences, humanities and arts.

University aims for high quality of R&D&I in each field and encourages multi-field and interdisciplinary research.

All intellectual property created at the University is property of the University. It is stored and managed under procedure approved by the University's Senate (Senate's decree No. V3-S-26 "On documents regulating management of inteOrganizational StructureUniMSK - University Research

Strategy Committee UniSPK - University Study Programmes Committee

University follows high ethical standards in all activities, including R&D&I. R&D&I activities and their management is transparent, it aims to decrease possibilities of interest conflicts, and violations of R&D&I ethics.

University attracts and educates talented researchers and R&D&I leaders.

University participates, formulates and supports international R&D&I networks; foreign R&D&I talents work in the groups of researchers.

University ensures that created new knowledge and technologies are transferred in all study cycles and non-formal education.

University actively participates in commercialisation of the University's intellectual property in Lithuania and abroad - it provides facilities for creation and creates new knowledge and technology intensive companies; licences intellectual property. Commercialisation of intellectual property is conducted as one-stop-shop for insurance of the quality of cooperation with business.

University develops, maintains and updates necessary R&D&I infrastructure. University conducts experimental production in cooperation with business partners.

University diversifies R&D&I income and attracts state assignations, private funds, funding for R&D&I competitions and support funds.

Implementation of the strategy of research and experimental development, and innovations

R&D&I strategic priorities are implemented via the following priorities of R&D&I activities:

Attraction, education
and maintenance of
R&D&I talents and
leaders;

Seeking to achieve and maintain high quality of R&D&I results;

Increase of R&D&I internationality

by strengthening of R&D&I impact

on Lithuanian and foreign society

and business.



I. Attraction, education and maintenance of R&D&I talents and leaders

- To pursue assurance of quality and excellence culture in the community by insuring the management of high-level leaders, improvement of competences, quality of mentorship and continuous learning, support and assessment.
- To prepare future scientists, who are capable of providing creative and innovative solutions for scientific problems, positively influence development of society and are able to work in both academic and non-academic job positions..
- To insure quality in preparation of R&D&I project applications prepared by academic departments, project management as well as development of respective competence for successful participation in the competitions for funding of R&D&I activities in Lithuania, within and beyond the European Union.





INDICATORS

Attract, educate and sustain R&D&I talents and leaders, and strengthen KTU community.

Ensure required structure of R&D&I staff and their competence: research leaders (project managers), researchers, doctoral students, post-doctoral researchers, master's students and other researchers; engineers, if needed.

Ensure attraction and development of talented and motivated Lithuanian and foreign doctoral students and post-doctoral researchers.

Ensure quality of research competences.

Ensure quality of doctoral studies for international recognition and development of joint study programmes.

Attract the high-level researchers, doctoral students and scientists from foreign countries.

Number of new R&D&I project managers increased by 30 %

At least one world-class researcher-leader works in **50 % of first level** academic departments.

Increased participation of doctoral students, post-doctoral researchers and master's students in R&D&I projects and activities.

Number of foreign doctoral students, post-doctoral researchers in doctoral studies and at the University increased **twice**.

Increase of the amount of joint doctoral programmes.

Number of highly competent foreign members in the **doctoral committees** of science fields.

Increasing number of foreign principal researchers.

Increasing number of doctoral students, students employed in research projects.

II. Seek to achieve and maintain high quality of R&D&I results

- To seek productivity of academic departments ensuring sustainable development of R&D&I activities of the University's academic departments, consistent improvement of the results and quality of R&D&I activities.
- Development of physical, biomedicine, technological, social sciences and humanities, and international level, multi-field and multidisciplinary research and creation of knowledge, which has significant influence on society and economics

STRATEGIC
OBJECTIVE

TASKS

INDICATORS

Ensure consistent improvement of the results and quality of R&D&I activities.

Ensure the improvement process of the competences of publication of the research results.

Increased level of scientific publication's

Increasing number of publications in top scientific journals.

international and national projects.

Develop high-level R&D&I Successfully participate in the European Union programme for research and innovations "Horizon 2020" and prepare for participation in the European Union Framework Programme 9.

Income of R&D&I contracts in all academic departments increased by 10%.

Income of competitive funding increased by 20%, particularly H2020.

Number of patents increased by 10%.

Aim to ensure R&D&I guality in the study process.

Aim to ensure quality of research competences in the study process.

Feedback assessment (students' research competences) results increased by 5%.

R&D&I management.

Promote effectiveness of Aim to diversify funding sources.

Aim for society and business to make direct contribution to R&D&I development and

By 2020 attract endowment for development of R&D&I strategic projects.

Endowment by business and society by 2020 makes 2 % of R&D&I income.

Income of R&D&I contracts in all academic departments increased by 10%.

Develop and maintain necessary R&D&I infrastructure.

Develop and maintain necessary R&D&I infrastructure.

Ensure professional management.

Insure maintenance, renovation and development.

By 2020 average working time of the most expensive R&D&I equipment reaches 80 % of the entire possible working time.

Laboratory of experimental development and creation of prototypes is established.

III. Increase of R&D&I internationality by strengthening of R&D&I impact on Lithuanian and foreign society and business

- University aims to direct R&D&I activities and strengthen their impact on Lithuanian and foreign society and business. Direct research and experimental development towards the needs of industrial, business and socio-cultural development, and insure dissemination of the results.
- University encourages participation, forming and maintenance of international R&D&I networks.





INDICATORS

Ensure dissemination and impact of high quality results.

Increase the amount of international patents.

Develop R&D&I services for foreign entities.

Aim to actively participate in commercialisation of the University's intellectual property in Lithuania and abroad.

Present research results in high-level

Number of licencing agreements increased twice.

Number of international patents increased twice.

Number of R&D&I contracts with other countries industry and business increased by 20 %

Encourage publications in international scientific journals.

Develop promotion and dissemination of the results of R&D&I activities.

scientific events.

Number of publications in top international scientific journals with impact factor increased by 5 %.

Increasing number of information notices about scientific news and innovations in the media.

Number of presentation in high-level international conferences increased by 5 %.

Number of articles with foreign co-authors increased by 5 %.

Aim for internationality of R&D&I activities and results.

Encourage cooperation via COST activities, ECIU, LINO and other networks.

Strengthen partnerships by involving high-level international partners in joint R&D&I activities.

Increasing number of joint thematic scientific events with foreign scientists.

Increasing number of joint R&D&I projects with high-level international partners.

^{*} values of indicators are given for 2020 in comparison to 2015 m.

R&D&I management



R&D&I policy and strategy is developed and approved by the University's Council, Senate, Rector, Vice-Rector for Research and Innovations in consultation with the University's Research Strategy Committee (hereinafter – UniMSK). UniMSK is a functional, collegial, advisory body for making and implementation of the policy and strategy of the University's research and experimental development, and innovations. UniMSK implements the University's objectives in research and innovations; it is responsible for development of the package of research and innovations.

Research activities at first level academic departments – faculties and research institutes – are conducted via implementation of the approved strategy of science field (or a group of fields). While making strategic decisions, Deans of the faculties and Directors of the institutes aim to ensure qualitative and quantitative growth of the results of the departments' R&D&I activities and synergy of R&D&I and study processes.

Research activities are performed at the research groups and institutes of the University's faculty's and first level research institutes based on the collected R&D&I competences. Deans, Vice-Deans for Research and Innovations and Principal Researchers are responsible for implementation of R&D&I strategic objectives at the faculties' research groups, Directors of the institutes – at first level research institutes. All of them mobilise researchers, plan and coordinate implementation of R&D&I activities.

R&D&I policy and strategy is based on clustering of R&D&I. For this the unit of assessment (UoA) was composed on the base of science field (or a group of science fields) in a single science area. UoA is a virtual structure that provides synergy between R&D&I and studies based on the University's R&D&I and Study Strategies. The UoA consists from several first level academic divisions or their parts or is a part of single first level academic division. UoA shows its research excellence in a particular science field (or group of them) as well a strong multidisciplinary approach. Each UoA acts in one or several university breakthrough areas of R&D&I, giving sustainable impact on development of society and economy.

Organizational Structure

Doctoral School

Doctoral Training, Talent & Young Researcher Education & Training UniMSK - University Research
Strategy Committee
UniSPK - University Study
Programmes Committee
UniRM - University
Research & Education
Management &
Administration Bodies

Unit of Assessment

Faculties & Institutes

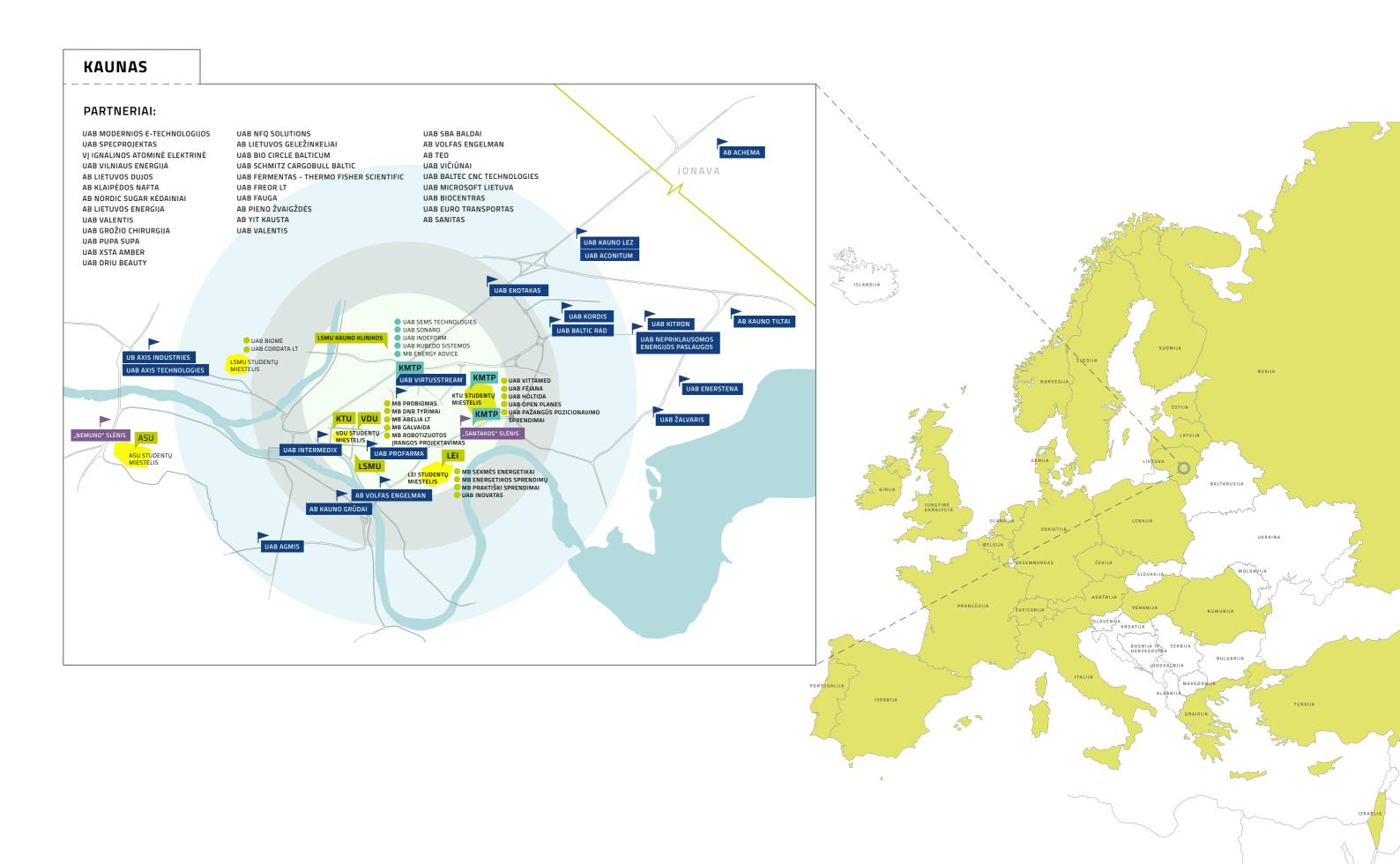
Doctoral Training, Talent & Young Researcher Education & Training

Strategy of Science Field(s); Research & Education Synergy UniMSK & UniSPK & UniRMA & Support

Research & Education Strategy; Quality Assurance

Implementation of the processes of research strategy is maintained by the departments subordinate to the Vice-Rector for Research and Innovations (constituting UniRMA): Research and Innovations, Research and Innovations Competence Centre, Doctoral School, National Innovations and Entrepreneurship Centre, including KTU "Startup Space". Implementation of R&D&I strategy is maintained by other administrative departments of the University.

Innovation ecosystem



Also:

Environment of research and experimental development, and innovations



R&D&I environment includes political-legal, economic, technological, socio-cultural, and demographic factors. Political-legal environment is determined by R&D&I strategic documents and directives of the European Commission, as well as Lithuanian R&D&I legal basis. The main documents impacting the University's R&D&I strategy are the following:

- Horizon 2020 The Framework Programme for Research and Innovation (Brussels, 30.11.2011 COM(2011) 808 final);
- Innovating for Sustainable Growth: A Bioeconomy for Europe (Brussels, 13.2.2012,COM(2012) 60 final);
- A European strategy for Key Enabling Technologies A bridge to growth and jobs' (Brussels, 26.6.2012 COM(2012) 341 final);
- A Reinforced European Research Area Partnership for Excellence and Growth (Brussels, 17.7.2012 COM(2012) 392 final);
- European Commission (205a), The European Charter for Researchers and The Code of Conduct for the Recruitment of Researchers, EUR 21620;
- European Commission (2010d), Communication from the Commission. Europe 2020. A strategy for smart, sustainable and inclusive growth, COM (2010) 2020 Final;
- European Science Foundation (2013), New Concepts of Researcher Mobility – a comprehensive approach including combined part-time positions. Science Policy Briefing. April 2013;
- Principles for Innovative Doctoral Training, Brussels, 27/06/2011.

 National progress strategy "Lithuania's progress strategy "Lithuania 2030" (resolution of the Seimas of the Republic of Lithuania No. XI-2015 "On Approval of the National Progress Strategy "Lithuania's Progress Strategy "Lithuania 2030") of 15 May 2012);

- Lithuania's smart specialization (priority areas approved by the resolution of the Government of the Republic of Lithuania No. 951 "Approving the Priority Areas of Research and (Socio-Cultural) Development and Innovation Development (Smart Specialization)" of 14 October 2013). Priority areas for progress of research and experimental (socio-cultural) development, and innovations (Smart Specialization), and the programme for implementation of their priorities, approved by the resolution of the Government of the Republic of Lithuania No. 411 "On the Approval of the Programme on the Implementation of the Priority Areas of Research and (Socio-Cultural) Development and Innovation (Smart Specialisation) and Their Priorities".
- Concept of establishment and development of the valleys (resolution of the Government of the Republic of Lithuania No. 308 "On approval of the concept of establishment and development of integrated science, studies and business centres (valleys)" of 1 April 2014 updated the Concept of establishment and development of integrated science, studies and business centres (valleys), aiming to establish links with the process of smart specialization);
- Lithuania's Innovation development programme 2014–2020 (approved by the resolution of the Government of the Republic of Lithuania No. 1281 "On approval of the Lithuania's innovation development programme 2014-2020" of 18 December 2013). 2014-2020 R&D&I funding period in the European Union and Lithuania is aimed for development of closer relationships between science and business, as well as development of innovations based on R&D&I results. Lithuanian business environment is reflected by the European Union (EU) Innovation Union Scoreboard 2014, which indicates average need for innovations by Lithuanian businesses. Lithuanian business has average investments in R&D&I activities: R&D&I activities are not sufficiently developed in business and private sector; there is a limited number of working scientists; there is relatively small number of created and sold innovative services and products. In the next seven years, Lithuania will invest in priority areas of Lithuania's smart specialization, enhancement of the impact of R&D&I activities' quality, new knowledge and technologies on society and business, as well as strengthening of human potential.



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