ITMO University Strategy — 2027
The first Russian university to sell shares in a small innovative enterprise, Technopark, engineering center, entrepreneurship center, design workshop and lab for students (OLIMP and FabLab), 50+ SIEs, SumIT and Future Technologies acceleration programs, FundIT fundraising school, Technology Brokering School. The university organizes hackathons for solving business problems together with IBM, GS Group, Autodesk and others. Environment for entrepreneurship development:
- The first Russian university to sell shares in a small innovative enterprise
- Technopark, engineering center, entrepreneurship center, design workshop and lab for students (OLIMP and FabLab), 50+ SIEs
- SumIT and Future Technologies acceleration programs, FundIT fundraising school, Technology Brokering School
- The university organizes hackathons for solving business problems together with IBM, GS Group, Autodesk and others

Environment for attracting and developing talent:

Average USE score

<table>
<thead>
<tr>
<th>Year</th>
<th>ITMO</th>
<th>IBM GS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>85.41</td>
<td>90.2</td>
</tr>
<tr>
<td>2018</td>
<td>90.2</td>
<td>90.2</td>
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</table>

International students

<table>
<thead>
<tr>
<th>Year</th>
<th>ITMO</th>
<th>IBM GS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>79%</td>
<td>75%</td>
</tr>
<tr>
<td>2018</td>
<td>17%</td>
<td>17%</td>
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</table>

International faculty

<table>
<thead>
<tr>
<th>Year</th>
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<th>IBM GS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>2018</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Environment for scientific growth:

30+ international research centers (IRCs) of the heads of IRCs are 45 and younger

2,000+ publications in international scientometric databases annually:

- Publications in WoS /Scopus for 1 academic staff (over 5 years) 2013: 103/147 2017: 740/874
- Citations in WoS /Scopus for 1 academic staff (over 5 years) 2013: 19.27/24.32 2017: 20.77/29.32

Leader among Project 5-100 universities in terms of volume of income from R&D projects per one researcher

Volume of R&D per one researcher:

<table>
<thead>
<tr>
<th>Year</th>
<th>ITMO</th>
<th>IBM GS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1,373 min rub</td>
<td>1,787 min rub</td>
</tr>
<tr>
<td>2017</td>
<td>2,787 min rub</td>
<td>3,874 min rub</td>
</tr>
</tbody>
</table>

Percentage of R&D in total university revenue

<table>
<thead>
<tr>
<th>Year</th>
<th>ITMO</th>
<th>IBM GS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>33.49%</td>
<td>35.89%</td>
</tr>
<tr>
<td>2017</td>
<td>43.08%</td>
<td>45.23%</td>
</tr>
</tbody>
</table>

Main Schools and Institutes:
- School of Computer Technologies and Control
- School of Translational Information Technologies
- School of Photonics
- School of Biotechnology and Cryogenic Systems
- Institute of Entrepreneurial Technologies, Inc. Faculty of Technological Management and Innovations

Student body:
- Bachelor’s students: 6,700+
- Master’s students: 5,100+
- PhD students: 900+
- Specialists: 300+

International students enrolled in full-time study annually

- Master’s students in 2018: 67% did not study at ITMO previously
- 321 universities
- 83 regions of Russia
- 35 countries of Russia

Publications in WoS /Scopus for 1 academic staff (over 5 years) 2013: 103/147 2017: 740/874

Citations in WoS /Scopus for 1 academic staff (over 5 years) 2013: 19.27/24.32 2017: 20.77/29.32
MISSION AND STRATEGIC GOAL

**Our mission**

is to provide opportunities for the holistic development of individuals and to inspire them to tackle global challenges.

**The University’s strategic goal**

is to generate new knowledge, markets and businesses, to navigate individuals in the world of information while preserving the balance between physical and virtual reality.

**ITMO CODE**

- **V** - Values
  - respect for the individual; integrity; academic freedom; openness; love
- **F** - Fundamental Thinking
  - systematic, analytical and critical thinking; digital culture and skills; entrepreneurial culture and skills; design thinking
- **PS** - Professional Skills
  - quality; professions of the future; individual tracks
- **SS** - Soft Skills
  - creativity; communication; life skills; emotional intelligence; team work
ITMO UNIVERSITY’S RESEARCH FOCUS

Global challenge

- Traditional methods for generating, storing, transmitting and processing information are becoming insufficient due to the increasing complexity of economic and social processes and growing demand for digitalization.
- A reduced level of security in modern technologies and cyber-physical systems in the face of a growing number of mobile devices and “smart” things that are exchanging massive amounts of information without human participation.
- The growing crisis of information and communication, energy infrastructure and production facilities which requires the use of new components and materials.
- Changes in demographics due to increasing lifespan and changing lifestyles which require new methods for maintaining a high quality of life.

Major research area

Intelligent technologies
- Big data: machine learning, cloud computing, modeling and forecasting of complex systems (social, biological, technical), etc.
- Artificial intelligence, cognitive technologies and neurotechnologies: including speech analysis, computer vision, information search and optimization technologies and neuroinformatics, etc.
- Distributed ledger technology: blockchain and smart contracts.
- Wireless communication technologies: 5G and navigation and networking technologies.
- Internet of things: M2M communication, machine sensor technology, and device identification.
- Virtual and augmented reality technologies: technologies for creating input and output devices, and technology for creating graphics.
- Robotic systems: industrial robots, technologies for robot/human interaction, unmanned vehicles, service robotics, etc.
- Cyber and information security.

Cyberphysical systems
- Photonics and optoelectronics.
- Quantum technologies: quantum communications, quantum computing, quantum simulators, quantum cryptography.
- Laser and light technologies.
- Metamaterials, new materials.
- Sensors, sensor networks.
- Wireless communication technologies: Li-Fi, laser transmission of information, etc.

Photonics and quantum technologies
- Photonics and optoinformatics, optoelectronics.
- Food biotechnology.
- Refrigeration technologies, cryomedicine.
- Chemical engineering, nanopharmaceuticals, infochemistry.
- Bioinformatics, bioengineering, nanobiotechnology.
- Genomics.
- Biosensors.
- Technologies for controlling the properties of biological objects.

Biotechnology and life sciences
PROSPECTIVE STUDENT, STUDENT AND GRADUATE IN 2027

Prospective Student
- Dreams
- Thirsts for knowledge
- Creative
- Tolerant

Student
- Values freedom of choice in education and career
- Feels responsible for the quality of their work
- Questions, searches, double-checks
- Highly motivated
- Brave, thinks outside the box
- Tech-savvy

Prospective Student
- Looks for opportunities
- Focused on results
- Sees their future in technology, science or entrepreneurship

Graduate
- Able to choose future career path independently
- Ready to work anywhere in the world
- Aware of the consequences of decisions and ready to take responsibility for them

Student
- Creates their own educational track
- Doesn’t confine themselves to one major, looks for additional skills
- Acts as a co-teacher by sharing knowledge
- Flexible and mobile within both virtual and physical spaces

Prospective Student
- Creative and communicative
- Speaks a second language
- Can work in a team

Student
- Develops communicative, management and other competencies
- Studies individually and in groups, able to organize team work

Graduate
- Works in a multilingual and multicultural environment
- Forms teams and communities, sets goals and creates new ones
- Communicative, courteous, with strong intuition and emotional intelligence
PROSPECTIVE STUDENT, STUDENT AND GRADUATE 2027

**Alpha, “Google babies”**
- Gain knowledge with interest when they understand its benefit
- Appreciate freedom of choice and personalization
- Struggle to concentrate, but can quickly switch between activities or tasks
- Dependent on technology, are mobile, and are always online
- Accustomed to “transparency” of information and lack of privacy

**Generation α**
- Bachelor’s student
- Master’s student
- PhD student

**Z, “Digital Generation”**
- Easily navigate in the digital world, able to work with a large amount of data
- Form their opinion on forums and social networks, social popularity is a sign of success
- Pragmatic in their choice of educational track
- Have a narrow perception of the world
- Have work experience, already from their school years; choose a job that gives them satisfaction and income and doesn’t take up much of their time

**Generation Z**
- Student participating in a continued education program
- Student participating in a continued education program for children and adults

**Y, “Millennials”**
- Have rich professional experiences
- Take into account the opinion of authority figures
- Consciously choose their educational programs
- Deeply involved in digital technology
- Appreciate the possibility of self-expression

**Generation Y**
- Bachelor’s student
- Master’s student
- PhD student

**X**
- Accomplished in their profession and experts in their field
- Strive to achieve goals and are willing to work hard for the result
- Prefer self-learning and highly value education
- Have developed the ability to think wisely and have a broad outlook

**Generation X**
- Bachelor’s student
- Master’s student
- PhD student
PROFESSOR 2027

Professor
- motivates, inspires, captivates
- observes professional ethics and transmits it to the community
- respects his/her colleagues and students
- acts as an example and an authority for students
- focuses on cooperation and collaboration
- is proud of his/her profession, and the University is proud of him/her

Professor
- has a deep knowledge of the subject
- focuses on current scientific and educational trends, as well as global and current challenges
- actively conducts research and integrates it into teaching

Professor
- is a professional; creates unique content for his/her subject, actively uses current teaching methods and approaches
- assists the students along their path to becoming a professional, supports their interests in learning new things and develops their ability to think
- helps students to design and adjust their educational tracks
- regularly participates in professional development at leading international scientific and educational centers
- participates in the professional community

VALUES
- V

FUNDAMENTAL THINKING
- F

PROFESSIONAL SKILLS
- PS

SOFT SKILLS
- SS
PROFESSOR 2027: ROLES AND RESPONSIBILITIES

**Expert practitioner:**
A practicing professional with in-demand competencies, skills, knowledge in the professional field, able to organize and transfer his/her professional experience.

**Student:**
Assistant to the lecturer; able to generate knowledge in collaboration with the lecturer or in a team, helps others develop their skills and abilities.

**Artificial intelligence:**
Helps to analyze digital educational footprints and shapes individual educational tracks.

**Researcher:**
Participates in international research, disseminates knowledge about advanced R&D in the field and shapes the students’ research skills, integrates research methods and approaches to education.

**Digital educational platforms:**
Blended and online learning, virtual learning environments, interactive environments.

**Mentor:**
Consults and helps students based on their goals and objectives.

**Navigator:**
Helps to navigate the digital environment when searching for necessary information and choosing educational modules.

**Knowledge generator:**
Generates new knowledge, both independently and together with students and colleagues.
ITMO UNIVERSITY 2027: KEY CHARACTERISTICS

Focus
- Attracting and developing new talents
- Flexible management
- Technologies "with a human heart and mind"
- Supporting regional development
- Collaboration with the industry

Features
- Interdisciplinary
- Smart campus
- Lifelong education
- Blended learning
- Digital platforms

Approaches
- Personalization
- Digitalization
- Openness
- International research alliances and partnerships
- Translational, interdisciplinary research
- Trendsetting, promotion of technologies
- Entrepreneurial culture

Capabilities
- Creativity and unconventional thinking
- Awareness and commitment to results
- Systematic, analytical and critical thinking
- Solving complex tasks
- Leadership and teambuilding
ITMO University is the home to talents from around the world

- Recruiting globally
- Comfortable environment for education, work and living
- Collaboration of the university and the city for mutual benefit
- Global agenda and answers to major challenges
- World-class educational processes and technologies
- Unconventional thinking

ITMO University is a leader in development and validation of future technologies

- Cutting-edge research and development
- Unique infrastructure for research and innovation
- Development and market integration of new products, commercialization of technology
- Forming new market segments with industrial partners
- Expertise in key technologies
- Forming and participating in professional communities

ITMO University is a leader in humanization of technology

- Development of technologies that “liberate” humans from routine work and solving standardized tasks
- Development of technologies that ensure an increase in quality of human life and expand human abilities and opportunities
- Dissemination of trustworthy technologies approved by society
Professor is a lecturer
Professor is someone with practical experience, an expert; digital navigator
Prospective students: graduates of schools and universities
Prospective students: those who thirst for knowledge and skills throughout their whole life
Specializations and rigid educational programs
Many possible educational tracks; double specializations, mini-specializations, additional competencies
Students acquire information passively
Education through active participation: students create information and act as co-teachers
Educational model: lectures, seminars, practical classes; pilot testing of blended and network learning
Educational model: blended learning, individualized tracks, students co-developing MOOCs, network learning
Graduates seek out jobs related to their areas of study
Graduates create jobs for themselves and for others
Degree in a specific field
Degree/ professional certificate/ digital portfolio of a graduate

From (2018) To (2027)
ITMO UNIVERSITY 2027: TRANSFORMING R&D

From (2018)

- Researcher in a subject area; research activity as the primary focus
- Solving specific, narrow research tasks
- Responding to global challenges
- Interdisciplinary researcher; transfers research into education

To (2027)

- Research labs and teams based on disciplinary affiliation
- Interdisciplinary research centers, spaces and teams
- Fundamental and investigative research, focus on expansion of applied research and development
- Responding to global challenges
- Interdisciplinary research centers, spaces and teams
- Fundamental research, applied R&D and joint decisions for industrial tasks – ITMO Highpark as a testing ground for new R&D

- Confined to existing markets
- Development of technologies
- Research infrastructure within a specific department
- Multiuser research infrastructure, digital platforms for research and commercial activity
- Transforming and developing existing markets, and creating new ones

Fundamental research, applied R&D and joint decisions for industrial tasks – ITMO Highpark as a testing ground for new R&D
STRATEGIC PRIORITIES AND GOALS IN 2018–2027

Priorities

World-class education in the university’s priority areas

- Developing a system to search for, attract, select and develop talents from around the world
- Creating an environment and new spaces for personal development
- Transforming education with a focus on personalization and choice, individual tracks, and forming competencies for the digital world
- Constant support and encouragement of young research staff through own academic degrees with global recognition
- Paramount changes in educational technologies and approaches
- Internationalization and increasing number of international students, who then return home
- Digitalization of education: digital environment, blended learning, distance learning, digital portfolios for staff and students

Leadership in the university’s key research and technology fields, focusing on collaboration with priority regions of the world

- Implementing breakthrough research and technologies to respond to global challenges
- Establishing network partnerships with the world’s top research and educational centers in relevant fields
- Becoming leaders in cutting-edge technologies within priority areas and becoming a place of expertise and technology validation in the digital world
- Promoting cutting-edge technologies in focus areas, building trust towards technologies
- Attaining leading expert positions in major programs at national and global levels
- Supporting the economical development of St. Petersburg and the local community

Building a global ecosystem to support education, research, innovation and technology in a network format

- Forming partnerships with current and future global leaders based on the principles of open networking, intellectual and resource integration, and attention to cutting-edge technologies
- Commercialization and transfer of technologies in Russia, BRICS and developing countries
- Participation in launching hi-tech production with partners from Russia, BRICS and developing countries
- Developing the ITMO Family community and enhancing the university’s global reputation
- Supporting and participating in professional communities and associations

New model of the university in a digital environment: open, progressive and adaptive

- Developing a new model based on the principles of involvement and participation in managing and developing the university (staff, students and members of third parties), digitalization and transparency
- Outsourcing more of the university’s functions concerning construction and property management (ITMO University and JSC ITMO Highpark)
- Strategic staff management and forming a team for the university of the future
- Developing a smart environment and university services: digitalized university processes, intelligent technologies in management
STRATEGY 2027: STAGES AND AREAS OF DEVELOPMENT

Stage 1
2018–2020
- Transforming education through ITMO Code and new educational technologies
- AI in education, digital portfolios
- Developing the suitable environment and culture for interdisciplinary research and projects
- Attracting and training research staff using new HR methodologies
- Popularization of science and technology
- Involvement in digitalization of Russia’s economic sectors
- Developing National Technological Initiative centers, Research and educational centers
- ITMO Highpark

Stage 2
2021–2024
- Digital platforms and intelligent systems
- Digital certificates for graduates
- Open educational spaces, distance learning, including the use of partners’ facilities
- An environment for refining technologies and competencies; startup studios and testing grounds
- Smart campus and virtual environments

Stage 3
2025–2027
- Using augmented reality to develop talents
- New roles and models for students and teaching staff
- An infrastructure for pilot testing, assessment, validation, integration and promotion of technologies in collaboration with partners
- Intelligent digital services offering access to skills and technologies
- Digital platforms designed to involve the public in setting, and achieving goals
STUDENTS:
- Get to study in high-quality educational programs (individualized, with cutting-edge educational technologies, modular structure, and more);
- Actively involved in creating educational content and data, serving as (co-)teachers;
- Acquire competencies crucial for employment in the modern global economy;
- Have a broad choice in terms of education and career, all thanks to a new educational model using MOOCs, digital portfolios and certificates;
- Have life-long access to education at the university.

TEACHING STAFF and RESEARCHERS:
- Follow differentiated career tracks (individual tracks and programs for personal and professional development);
- Are experts with practical experience who implement flexible educational modules and world-class research;
- Are connected to the real sector of the economy, research and educational centers, regional, national and international communities through networks.

PARTNERS and EMPLOYERS:
- Have a supply of talented employees, work-ready and equipped with skills required for today’s digital economy;
- Have access to the university’s data, which includes graduates’ digital portfolios, information about their skills, technologies and inventions, allowing them to create effective solutions to industrial challenges and tasks;
- Have the ability to renew and improve their employees’ skills using the university’s resources.

THE ECONOMY, THE PUBLIC and THE CITY OF ST. PETERSBURG:
- The university assists in digitalization efforts of the Russian economy, increasing innovation activities in business, developing small and medium enterprises in St. Petersburg, the region and the country (ITMO Highpark);
- The Russian real economy is supplied with human resources capable of creating businesses and a new economy, and responding to present-day challenges;
- Results of fundamental, investigative and applied research are translated into the real sector of economy;
- The public receives expert information about developing technologies that improve people’s quality of life;
- St. Petersburg, a unique city, becomes home to a new, comfortable university campus; the university is a model of the city, and the city is a laboratory that introduces advanced products and technologies in order to develop and ensure high quality of life for its citizens.