The master’s degree program

APPLIED SYSTEMS ENGINEERING

Higher school of systems engineering

MIPT
HIGHER SCHOOL OF SYSTEMS ENGINEERING

RUSSIAN ECONOMY DEVELOPMENT TENDENCIES ARE CHANGING THE REQUIREMENTS TO YOUNG ENGINEERING SPECIALISTS' KNOWLEDGE AND SKILLS

Decision: combining best practices of Russian fundamental education and specialized courses of international systems engineering schools

Economy changes

- Hi-tech production revival
- Product's life cycle shortening
- Increase of production flexibility
- Growth of requirements in competitiveness of products (price/quality, speed of development, manufacturability of production)
- World economy globalization
- Exposure to abrupt changes

Requirements for specialists

- Complex understanding of industry
- Familiarity with the latest modern world practices in field of engineering and production of hi-tech products
- Economics and marketing knowledge
- Skills and knowledge in project and human management
- Deep understanding of systems interconnections in project design
- Relevant practical experience
- Ability to work in non-standard and crisis conditions

THE MAIN PURPOSE OF THE PROGRAM: TRAINING MANAGERS FOR HIGH-TECH AREAS

The master’s degree program is oriented towards training:

Candidates for leading positions of key technological branches (chief designer, leading designer, chief engineer, chief technologist)

Managers of high-tech projects in state and private companies

Managers of public services and agencies responsible for the implementation of technological and industrial policies

THE PROGRAM IS BASED ON THE CUSTOMER'S KEY PRIORITIES

PURPOSE

The purpose of the program is to prepare senior and middle technical managers of Russian enterprises (aviation, engineering, electronics, defense) in the directions needed for technological upgrading and creating a new generation of systems and products

FOCUS

Education is focused on strengthening competences in such areas as:

1. Project management
2. Systems engineering
3. Operations management

PRINCIPLES

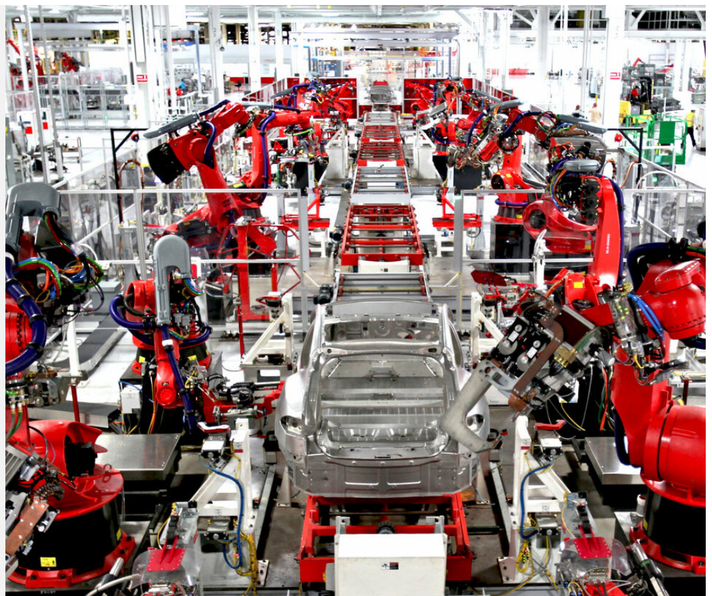
The basic principle of all courses is a combination of technical courses on the base of MIPT and project work under the direction of leading Russian high-tech companies' experts

MAIN FOCUS OF THE PROGRAM:
SYSTEMS ENGINEERING

Systems engineering is an interdisciplinary field of engineering that focuses on designing and managing complex engineering projects according to their life cycles








THE SYSTEMS ENGINEERING APPROACH TO THE DESIGN AND MANAGEMENT OF COMPLEX PROJECTS INVOLVES THE FOLLOWING PRINCIPLES AND ADVANTAGES

Solution of the complex problems, **reducing** time and cost of development in 2 times, **reducing** mistakes in CD by 3-5 times

PROBLEM DECOMPOSITION

Separation of a complex problem into simpler ones makes it easier to find a solution and articulate the tasks for each employee

TIME DECOMPOSITION

Splitting the project into phases, with specific results allows to control the development process effectively, to measure the efficiency and to apply corrective measures on time

PRODUCT DECOMPOSITION

Separation of the most complex products into the system, segments, elements, assemblies, subassemblies and parts allows to manage the configuration and suppliers effectively

ACTION DECOMPOSITION WITH FOLLOWING INTEGRATION

Allows you to define a clear sequence of required actions: requirements, specification, decomposition, design, integration, verification, operation and decommissioning

THE PROGRAM CONSISTS OF 3 BLOCKS

01

GENERAL COURSES

- Innovations management
- Economics and finances
- Marketing and strategy
- Foreign language

02

SPECIAL COURSES

CORE DISCIPLINES

- Systems Engineering
- Production and supply chain
- Technology project management

03

PROJECTS

- Adoption of obtained knowledge in real projects for each student guided by experts from sponsoring organizations and MIPT faculties

DISCIPLINE
“SYSTEMS ENGINEERING”

- Systems Engineering - introduction
- Engineering systems design
- Industrialization

Integrating technological systems into a single complex product that meets the customer’s requirements

Reducing time costs, accomplishing many demands and ensuring the success of project implementation

Creating effective and flexible supply chains

Alexander Borodkin, PhD

BOEING

Alexey Romanov, PhD

ЦНИИМАШ TSNIIMASH

Sang Won Kim, PhD

KAIST

DISCIPLINE “TECHNOLOGY PROJECT MANAGEMENT”

- Tools for systematic creation of innovations at the enterprise, TRIZ
- Fundamentals of project management
- Project manager tools

Teaching the cutting edge tools and methods of complex and large-scaled projects management, practical introduction of the obtained skills in field of real existing projects implementation and gaining feedback from best leading Russian enterprises’ experts

Focusing on preparing project managers for complex and large-scaled programs in mechanical engineering, defense, aerospace engineering

Alexander Kudryavtsev,
TRIZ Master

Alexander Kutuzov,
PME, PRIME

PM Expert

Valery Gromov,
MCTS

DISCIPLINE “PRODUCTION AND SUPPLY CHAIN”

- Introduction into operations
- Quality management
- Production and supply chain management

Bowon Kim, PhD

KAIST

Katalin Diossi, PhD

Standards and demands of QMS, managing quality costs

Modern production system, demands, approaches and methods used in hi-tech production with ‘best practices’ examples

Supply chain and suppliers management. Supply chain planning. Suppliers interaction management in terms of approved suppliers selection, contracting and supply procurement

Dmitry Gavrilov, Master CPIM Instructor

SAP

Experts

PROGRAM IS DESIGNED IN STRONG CONNECTION BETWEEN THE THEORY AND PRACTICAL PROJECTS

	MODULE 1	MODULE 2	MODULE 3	MODULE 4	MODULE 5	MODULE 6	MODULE 7
General	Foreign language						Final project
	History, philosophy and methodology of natural science						
	Economics, organization and management of technological innovations		Fundamentals of science-intensive technologies		National innovation system		
	Concept development and rough prototyping		Theory and methods of decision making		Economics and IP rights		
	Marketing and strategy of science-intensive technologies						
Leadership	Emotional intelligence		Management of MFTs				
		Time management	Launch of small-batch production				
Systems engineering	Systems engineering - introduction			Индустриализация			
	Engineering systems design		Problem analysis and decision concept		Calculation and model substantiation		
Technology project management	Tools for systematic creation of innovations at the enterprise, TRIZ		Fundamentals of project management		Project manager tools		
Production and supply chain			Introduction into operations				
			Quality management		Production and supply chain organization		

Courses Group projects Individual projects

STUDYING COURSES IN THE TOP WORLD UNIVERSITIES AND VISITING LEADING FOREIGN COMPANIES

Market leaders

World leader in the steel production, the most profitable steelmaking company in Asia

posco

Engineering

World leaders of automobile and shipbuilding industry

KIA HYUNDAI MOTOR GROUP

DSME Daewoo Shipbuilding & Marine Engineering

Top universities

Courses “Industrialization” and “Introduction into operations”

KAIST Korea Advanced Institute of Science and Technology

DGIST Daegu Gyeongbuk Institute of Science & Technology

KARI Korea Aerospace Research Institute
The most innovative Asia innopolis

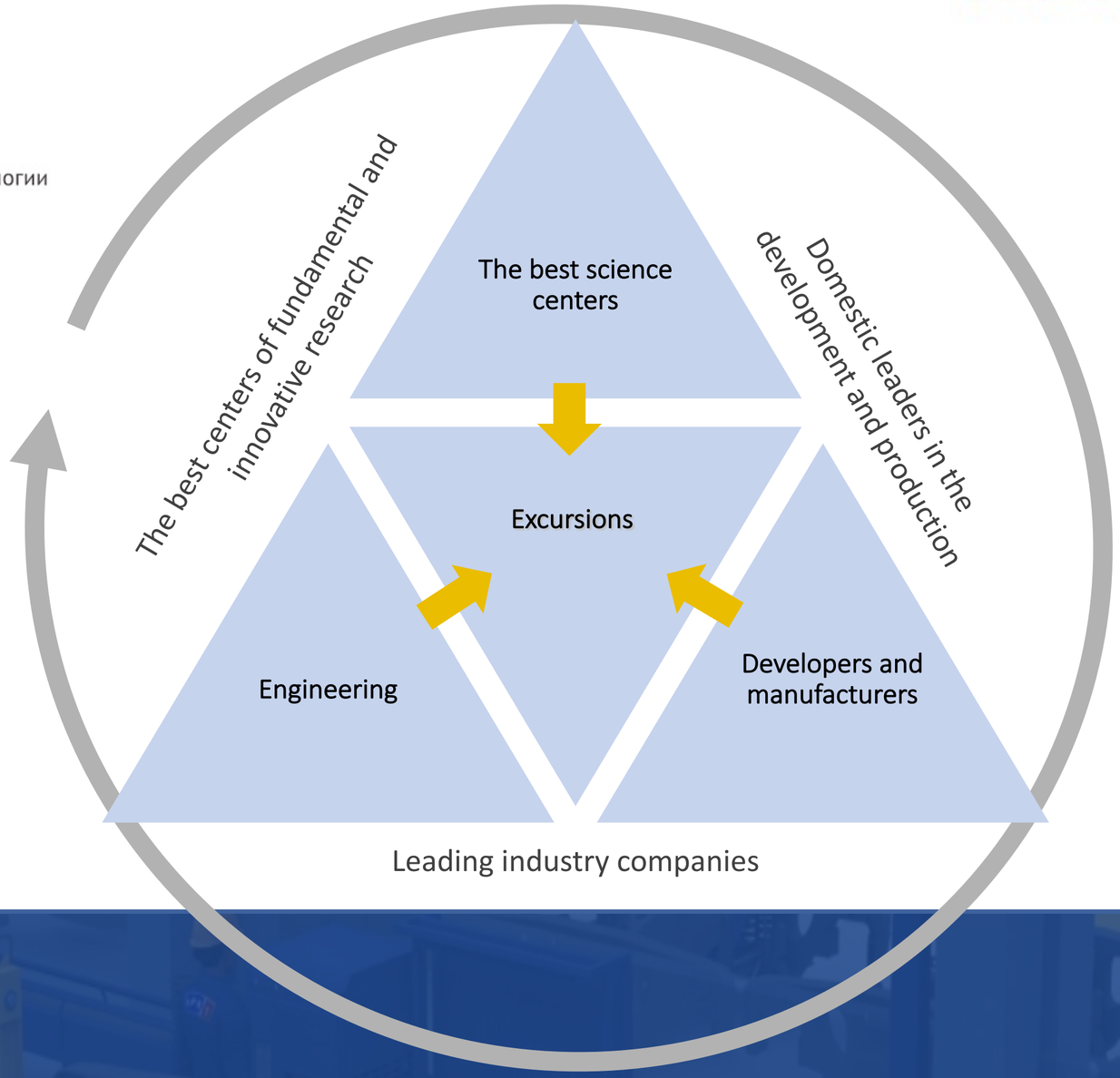
Developers and manufacturers

International flagships, developers and manufacturers of electronic industry

SAMSUNG LG Display

InssTek DMT® Metal 3D Printing Specialist

EXCURSIONS TO LEADING RUSSIAN MANUFACTURES AND ORGANIZATIONS

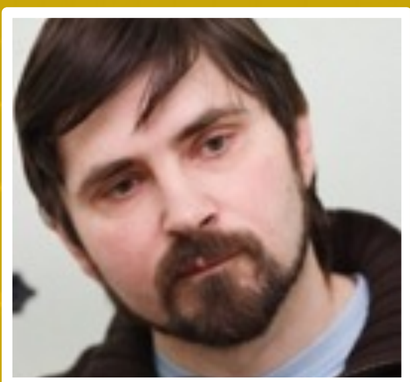


THE WORLD'S LEADING EXPERTS CONDUCT
MASTER CLASSES FOR HSSE STUDENTS

Sergey Kravchenko, PhD
President of Boeing Russia

Gennady Krasnikov,
Doctor of Technical Sciences,
Academician of RAS
General Director of MERI

In-Ki Hong
First CEO Daewoo Shipbuilding and Marine Engineering (DSME) (1995 - 2015)



Dmitry Saprykin, PhD
General Director of "ESTO"

Gennady Bendersky
General Director of PJSC "ALMAZ R&P Corp."

Igor Ushinsky, PhD
Professor of the Skolkovo Institute of Science and Technology

Alexander Kuleshov,
Doctor of Technical Sciences,
Academician of RAS
President of the Skolkovo Institute of Science and Technology

Aleksey Borovkov
Head of the National Initiative Center "New Production Technologies"

Tina Kandelaki
General producer of the "Match TV", TV host

Natalya Lebedeva
Senior Partner and Leading Trainer of KPG Training Center Ivanova & Lebedeva

WE SELECT ONLY THE MOST WORTHY CANDIDATES FOR THE PROGRAM

Selection criteria for candidates within the corporate Customer:

- Young specialists (up to 35 years old) with fundamental science or engineering background
- 3-5 years work experience in high-tech industry (aviation, automotive, defense, metallurgy, oil & gas)
- Well-qualified (completed projects, patents, implementation)
- The most gifted and tending to work creatively professionals with strategic way of thinking
- Hardworking candidates with strong inner motivation for career growth

HSSE MIPT

ADMISSION STAGES

01.

- Registration on the site test.se.mipt.ru
- Filling in the form
- Physics testing
- Mathematics testing

02.

- Motivation letter
- Submitting the documents
- English language testing

03.

- Mathematics interview
- Specialty interview
- Overall Interview

04.

- Signing of the contract
- Admission order

GRADUATES SKILLS:
SYSTEMS ANALYSIS AND PROJECT MANAGEMENT

Understanding of the total life cycle management of complex high-tech products and related branches

Systems analysis skills

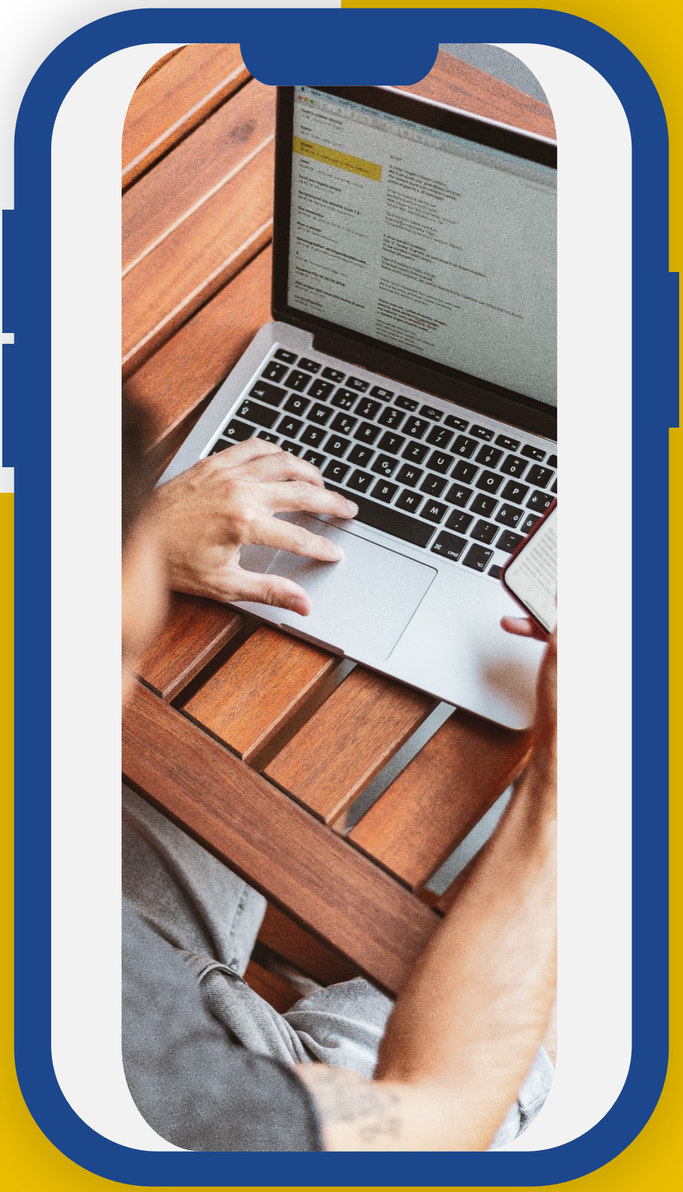
Ability to work in team

Knowledge of modern project management

Ability to make decisions in the face of uncertainty

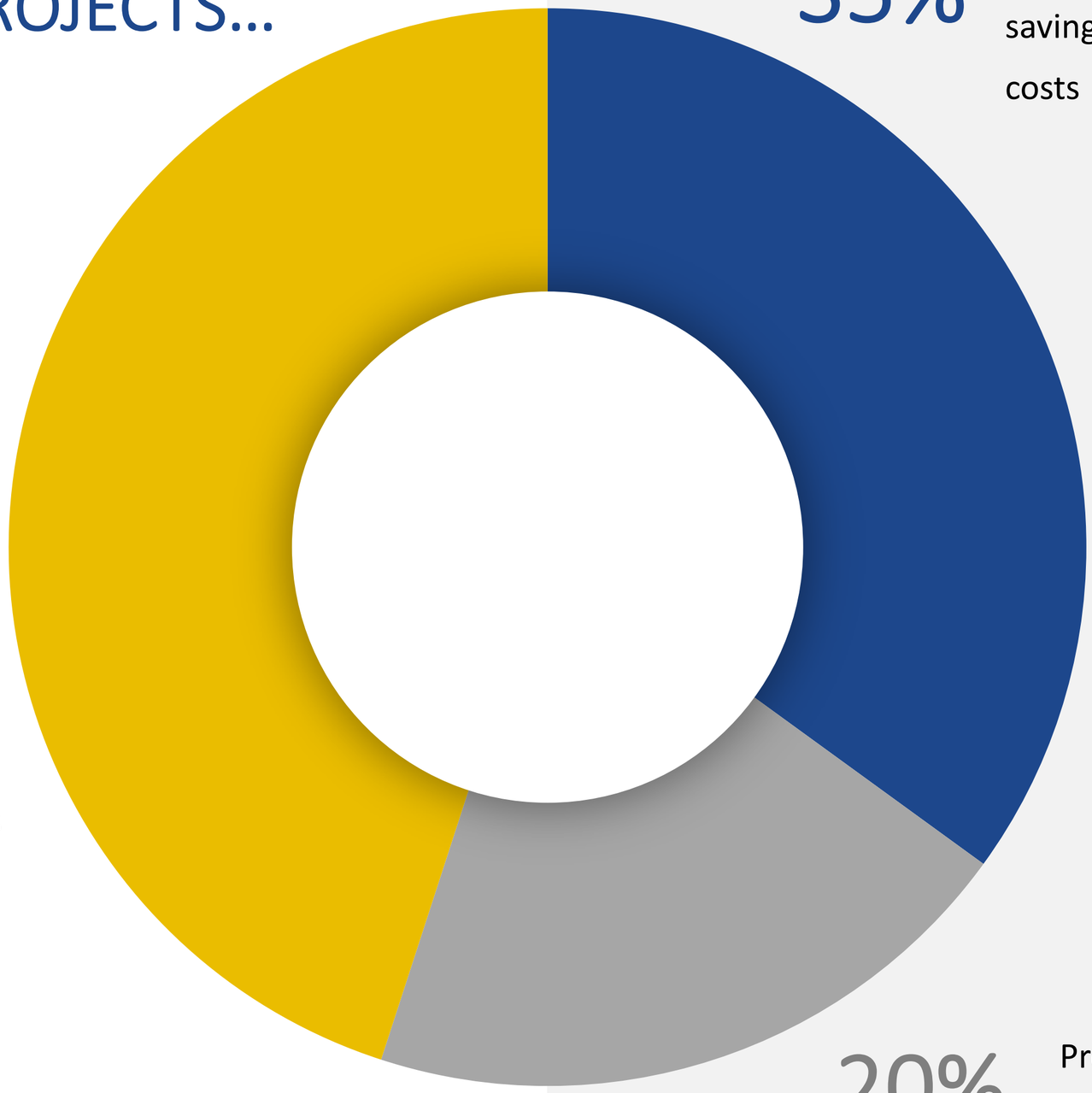
Knowledge of international guidelines and standards

THE PROPOSED FORMAT OF TRAINING ALLOWS TO COMBINE EDUCATION AND WORK



- Full-time masters degree program
- Amount of students: 50
- Fee-based education
- Customization of disciplines for the specifics of corporate Customers
- Full-time tuitions are 2-3 weeks per quarter
- Duration — 2 years
- Site visits
- Participation of the world leading experts

OUR GRADUATES HAVE ACHIEVED THE HIGHEST RESULTS IN THEIR DEGREE PROJECTS…



35%

More than **2,2 billion rubles** – saving or optimizing customer’s costs

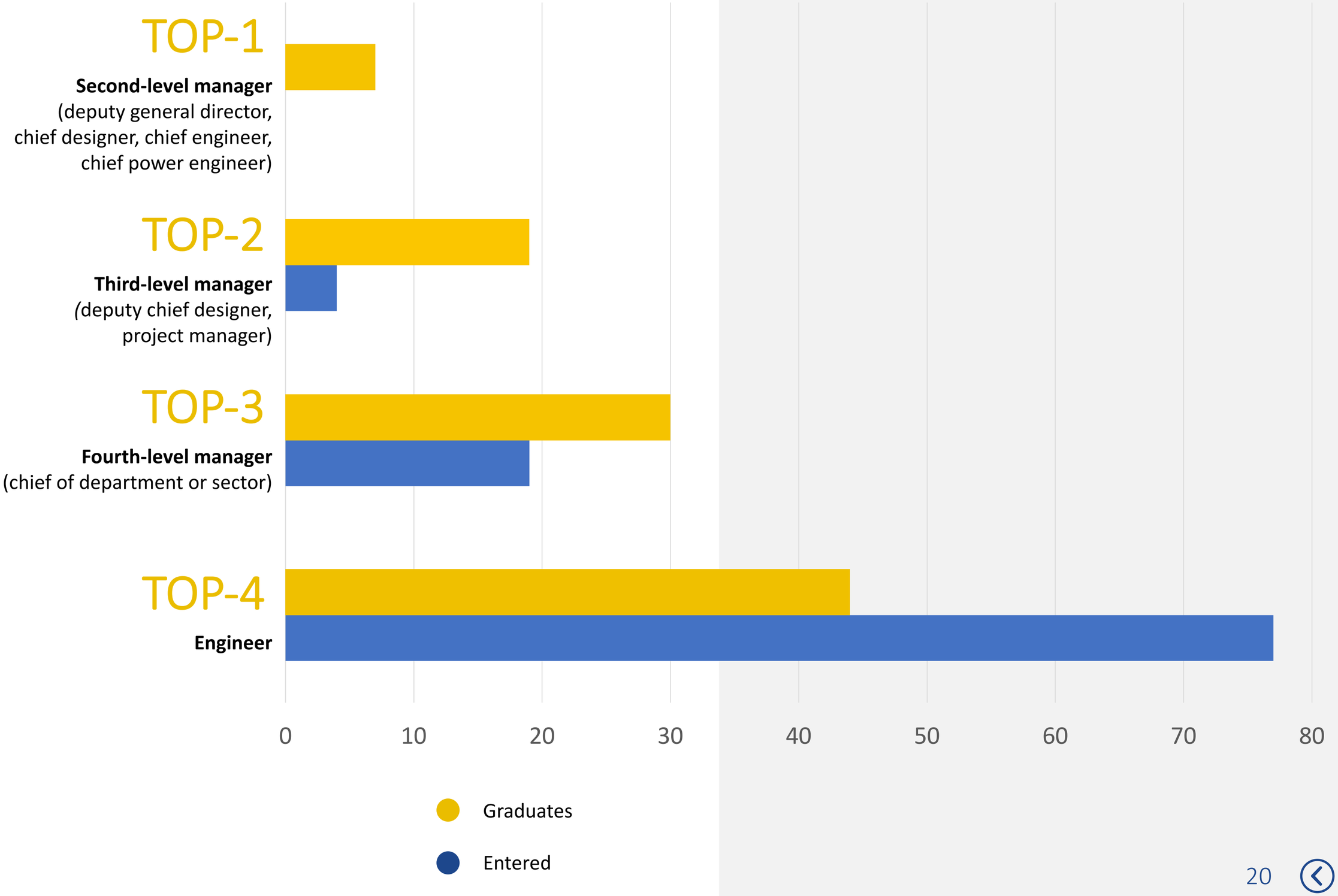
45%

Customer’s business case solutions

20%

Projects that solve strategic and sectoral problems

… AND SIGNIFICANT RESULTS IN THEIR CAREEER AFTER GRADUATION



WE'VE GOT VERY POSITIVE FEEDBACK FROM OUR CUSTOMERS…

RUSSIAN HELICOPTERS

"… As a result of training we have got an expert combining skills of both technical and economic components that will allow to carry out the responsible tasks related to design and administrative activity … The employee has a strict systematic approach combined with taking into account the maximum amount of the cost parameters in the framework of project management…"

HIGH-PRECISION WEAPONS

"…Our employees came back from training with understanding what system analysis is and what its benefits are. It becomes possible for them to take active part in the solution of complex non-standard tasks, take a broad view on goals and objectives in their departments and the company on the whole. I'm sure that over time these employees will be included in the "golden asset" of our company…"

EVRAZ

"…We highly value the quality of the program. The employees use some approaches to their work which were never used before training, and this enables to solve upcoming problems more effectively and swiftly. "One sidedness", which is usual for people working on a single position for a long time, now is absent and that is in no doubt a plus of MIPT education. Andrei shares his knowledge with other employees regularly, allowing them to develop, too…"

ТЕХНОДИНАМИКА

"…Effectiveness and productivity of the employee has grown. The employee began to use a systematic approach and project management tools. For example, he has developed and implemented documentation to substantiate the laboriousness which wasn't used before. Alexander Kostyuchenko shares his knowledge, both with young specialists and with experienced colleagues with the desire…"

...AND FROM GRADUATES THEMSELVES

“I like the approach to training, it is considerably different from the corporate one, nobody enforces corporate standards, it is more freedom in making decisions. You can freely communicate with people from other industries, adopt the best practices, look at your industry from the different perspectives.”

Shabis A.G., JSC ”EVRAZ ZSMK”

“I feel that the quality and productivity of my work have improved ... I allocate highlights on which it’s necessary to focus on, find and remove weak points.”

Bodrov D.O., JSC “KBP”

“I switched to a new job and started working for Technodinamika, I became head of the department, my loads had increased, but the experience that I got from the program helps me cope with everything.”

Rovneyko R.V., SC “Technodinamika”

“Training in the United States broadened my horizons. We looked at how a product is developed, saw some of the processes from inside, realised that everyone can have problems, began to look at domestic engineering from another side.”

Kostuchenko A.P., SC “Technodinamika”

“Teamwork skills, implementation of group tasks, knowledge of time management and management of multi-functional teams helps me to improve efficiency of work in the company.”

Rybakov I.V., JSC “Kamov”

THE VALUE OF OUR PROGRAM IS CONFIRMED BY
THE CONTINUOUS INCREASE OF THE NUMBER OF OUR CUSTOMERS

RUSSIAN HELICOPTERS

RTI

HIGH-PRECISION WEAPONS

UNITED ENGINE CORPORATION

BOEING

PJSC “ALMAZ R&P Corp.”

EVRAZ

KRET

NLMK

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