

**FEATURES OF REALIZATION MASTER'S PROGRAM
"AUTOMATION OF TECHNOLOGICAL PROCESSES AND MANUFACTURES"**

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Abstract. The article discusses the content of graduate training programs 15.04.04. "Automation of technological processes and manufactures", realized in the Moscow Technical University of Communications and Informatics (MTUCI), from the point of view of the new challenges associated with the 4 Industrial Revolution.

Keywords: master's program 15.04.04 automation of technological processes and manufactures.

The fourth industrial revolution is already happening, whether we like it or not. Robots and artificial intelligence work in the factories. Outstretched first smart grid, drones monitoring the functioning and safety of high-voltage lines, the movement of the containers can be monitored in real time, watching the trajectory of tankers, bulk carriers, freight trains and trailers.

Designed digital oil fields and produced intelligent machines, conveyor lines, and even microscopes for medical laboratories that are connected to the Internet. Sensors and transducers penetrate into our life, as the sand after a walk on the beach. They can be found in the bags of housewives, in evening dresses, children's hats and slippers.

It will take some more time, and all the variety of connected devices will be connected into a single *ecosystem*.

Information platforms unite suppliers of raw materials and components, manufacturers, logistics centers, transport and service companies, as well as all customers (corporate and mass) in a virtual world, in which everyone will be able to interact with each other.

If we do not build the ecosystem consciously, it will build itself. Technological progress is almost impossible to stop. If the technology can increase productivity, improve processes, they will be implemented. But if you let the process take its course, will implement what is in the market - mainly foreign software products, platforms and components.

Russian manufacturers and developers have the potential to integrate into the niche created, but for that we need professionals with specific competences.

In MTUCI at the Department of "Intelligent systems in management and automation" is opened magistracy 15.04.04 "Automation of technological processes

and manufactures"(ATPM), the program "Intelligent Automated control systems" whose purpose is to train just such versatile educated professional specialists [1].

The area of professional activity of graduates includes: means, methods and techniques of science and technology for the automation of the existing and creation of new intelligent automated and automatic technologies and productions, on the basis of national and international standards; Research in design and intellectualization processes of industrial enterprises within a single ecosystem information space; creation and application of algorithmic, hardware and software systems ATPM implementing competitive production fully/partly without human participation.

Occupational activities which prepare graduates: engineering; organizational, managerial and research. It is planned that the graduate will be able to solve professional problems such as:

- design and development of new intelligent automated and automatic (IAA) technology, tools, systems, using modern means of design automation on the basis of national and international experience;
- development of modern technical, algorithmic and software;
- evaluation the innovation potential of projects;
- organization of the of the executive team, decision-making under conditions of different opinions;
- support a common information space enterprise planning and management at all stages of the life cycle of products;
- participate in the development of plans and programs of the organization of innovative activity at the enterprise; research.

Here are some basic and new modern special subjects of the program.

Robotic technological processes.

Systems Product Lifecycle Management. Virtual Design Bureau.

Integrated system design and management of ATPM.

State information systems.

Distributed Information and Control Systems

Intelligent control systems infocommunications

Information security of automated systems

Trusted hardware and software systems

Modern distributed database management system

Analytical support management decision-making system

Real-Time Systems

Systems for automatic identification of objects

Cognitive services; Machine Learning; Data Mining. Big Data

Training courses, scientific and educational practices, scientific seminars, participation in R & D, set out in the framework of the master's program aimed at developing competencies [2], ensuring the creation of solutions in accordance with such basic principles as:

- diversification - a wide range of basic technologies used;
- organizational flexibility - creation planning systems and production management, rapidly adaptable to possible changes in conditions;
- technological flexibility - using the basic system components (operating systems and databases) on the basis of open source solutions (Open Source);
- Synergy - priority use of products of Russian manufacturers for joint development of the domestic IT market.

Master's graduates with work experience presence after graduating MTUCI often remain to work in enterprises where they have worked when studied or were trained, and they are in demand for use in other enterprises of communication and info-communications [3].

References

1. <http://www.mtuci.ru/description/programs/>
2. <http://минобрнауки.рф/документы/5041>
3. <http://www.mtuci.ru/structure/faculty/view.php?dp=213>