RUDN university

ACADEMY OF ENGINEERING

AUTOMATIC TECHNOLOGIES OF INDUSTRIAL SYSTEMS

MASTER'S PROGRAMME DEGREE

ADVANTAGES OF THE PROGRAM

- Availability of our own interactive class of EMCO CNC machine tools (6 workstations, 2 CNC machines: milling and turning).
- Laboratories for research and design work: Laboratory of the study of technological processes; Laboratory of physical and analog modeling of metal processing technological processes; Laboratory of automation and computerization of metal processing technological processes; Laboratories of nanosystems in mechanical engineering; Laboratory of Photomechanics.
- Students learn to set and solve engineering problems using system analysis and modeling of objects and processes of mechanical engineering.
- The international training groups allow you to build your own network of professional international contacts already at the university.
- During the training, lectures and master classes are held by invited Russian and foreign experts.
- A large number of individual and group creative projects.
- While learning students participate in international scientific and technical conferences, are published in peer-reviewed Russian and foreign scientific journals.
- The opportunity to participate in the student exchange program with partner universities.
- Possibility of internships with foreign partners.
- Flexible training schedule is composed taking into account the wishes of students.

EDUCATIONAL PROCESS

120 credits.
Lectures, practical classes and independent work, several types of internship

MATHEMATICAL MODELING IN MECHANICAL ENGINEERING

- The concept of a mathematical model.
- Types of mathematical models.
- Mathematical schemes for modeling systems.
- Formalization and algorithmization of systems functioning processes.
- The construction of a mathematical model.
- Simplification and refinement of the model.
- Methods of research solutions.
- Modeling of processes of design and technological preparation of production.

MANAGEMENT IN SCIENCE AND BUSINESS

- Management as a professional activity.
- Goal setting and organizational planning.
- Motivation of work.
- Control as a function of management.
- Making managerial decisions.
- Management of individual and group and effectiveness.
- Power and leadership.
- Communications in management.
- Organizational changes and enterprise development.
- Management ethics and social responsibility.

METHODOLOGY AND PRACTICE OF TECHNICAL EXPERIMENTS

- Engineering experiment.
- Measurement methods.
- Measurement errors.
- Design of measuring systems.
- Types of primary converters.
- Sensitive elements (CE) converters.
- Measuring electrical quantities, measuring time and counting events.
- Measurement of linear dimensions and their derivatives.
- Measurement of forces, masses and their derivatives.
- Measurement of thermal and light quantities.

NANOTECHNOLOGY IN MECHANICAL ENGINEERING

- Basic concepts and definitions.
- Features of physical interactions at the nanoscale.
- Quantum mechanics of nanosystems.
- The basic principles of the formation of nanosystems.
- Classification of nanoparticles and nanoobjects.
- Computer simulation of nanostructures and nanosystems.
- Research methods and diagnostics of nano-objects and nanosystems.
- Methods for creating nanodevices.
- Functional and structural nanomaterials.

TOOL PRODUCTION EQUIPMENT

- Universal grinding machines.
- Machine tools for sharpening gear cutting tools.
- Gear grinding machines.
- Universal thread grinding machines.
- Backing machines.
- Electroerosive cutting machines.
- CNC milling machines.

NEW CONSTRUCTION MATERIALS

- Metals and alloys with special properties.
- Non-metallic materials.
- Methods for producing bulk, powder and film nanostructured materials.
- Coatings.
- Economic criteria for comparing materials.
- Prospects for the development of the production of new materials.

STUDENTS FEEDBACK

LAZARENKO OLGA IGOREVNA, RUSSIA

In 2015, I graduated with honors from Technological University in Korolev with a degree in Mathematical Methods in Economics. Immediately after graduation, I got a job as an engineer in one of the central enterprises of the city of Korolev. Despite my good university training as a specialist, at a new job I had to face new aspects of production activity for me. In order to improve my professional skills and acquire new knowledge, I decided to get additional education. Therefore, I entered the magistracy of the RUDN University in the direction of 15.04.05 “Design and technological support of engineering industries.” The fact that the training schedule was very convenient for me - on weekdays in the evening and on Saturdays played a huge role.

Teachers continuously acquainted our group with the latest developments and showed how the modern world of engineering is structured, with its trends, discoveries, breakthroughs. Almost all the subjects that I was lucky to study in the last two years turned out to be very useful and almost one hundred percent fell into the requests for knowledge that I needed.

At the moment, I am doing my best to get diploma with honors. I hope that the information that I learned during my studies will contribute to my professional activity and will help my professional growth. In this regard, I want to express my deep gratitude to all the teachers of the Department of Mechanical Engineering and Instrument Engineering for their work, for the excellently organized educational process and the knowledge that they gave us. I would also like to express special thanks to my supervisor, Ph.D., associate professor Orlov Alexander Evgenievich.

HABA ETIENNE, GUINEA

I am sure that mechanical engineering is an industry that must develop first. In my country, it is very important to develop high-tech industries and be able to produce agricultural machinery ourselves.
In 2018, I graduated from the RUDN University magistracy in the direction of 15.04.05 «Design and technological support of engineering industries» with honors. First of all, I want to express gratitude to all the teachers for their attentive attitude towards students, their sincere desire to teach and give their knowledge, presenting them, easily and interestingly. Six years of study (including undergraduate) were interesting, difficult, but productive places. I can confidently say that I received the full knowledge that I may need for work.
I would like to note that the RUDN University has an excellent scientific and technical facilities, which allows you to create all the necessary conditions for brilliant educational results.

HEAD OF THE PROGRAMME

ALLENOV DMITRY GENNADEVICH

Ph. D in Technical Sciences, Associate Professor of the Department of Mechanical Engineering and Instrument Engineering.

Thesis: «Improving the control process of a cutting tool using vibroacoustics to ensure the required quality of the surface layer of machine parts».

FIELDS OF SCIENTIFIC INTERESTS:

diagnostics of machining processes, innovative engineering technologies, research of product quality and their operational characteristics.

Author of scientific articles in peer-reviewed Russian and foreign scientific journals (Higher Attestation Commission, SCOPUS, Web of Science).

Regularly gives presentations at international engineering conferences.