

Division: *Institute of Engineering and Technology*

Academic programme: *15.04.01 Engineering, Information technology of welding engineering*

Mode of study: *full-time*

Programme length: *2 years*

Programme level: *Master's degree*

Language of instruction: *English*

Programme description: *Unique advantages of the program:*

- *Training in the provisions of Industry 4.0 in welding production*
- *Conducting computer simulation of welding processes*
- *Development of welding technology using digital systems*
- *In-depth study of welding theory and practice*
- *Programming of welding robots*
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The Master's program is based on the historically developed scientific direction of the department on the use of soft interlayers in welded joints made of high-strength steel grades.

The development of new high-tech and reliable welded structures is based on the digitalization of design and production procedures. Masters study modern software products - ANSYS (numerical calculations), SolidWorks, Compass-3D (design of drawings and 3D models), SYSWELD (modeling of welded structures taking into account welding technology), Fanuc Roboguide (programming of a welding robot), as well as robotic complexes.

The active introduction of robotic complexes into welding production is the main trend of digital transformation of enterprises. To date, the department has a Fanuc welding robot with a two-axis positioner, as well as a set of software for its programming (Roboguide), which allows conducting research in the field of welding with a high degree of repeatability.

You will master the creation of highly reliable welded structures taking into account the mechanical (soft and hard layers) and geometric (welding defects) inhomogeneities of their joints.

Thus, the master's program covers both the areas of digitalization, modeling, and robotization of welding technology.

Main programme-specific classes: *Graduates of the Master's program "Information technology of welding engineering" receive unique competencies in the field of:*

- *Digital design of reliable welded joints with adjustable mechanical and geometric heterogeneity.*
- *Computer simulation of welding technology in ESI SYSWELD with an assessment of the phase composition of the welded joint and the warping of the structure as a whole.*
- *Numerical simulation of the stress-strain state of welded joints in Ansys with evaluation of brittle, quasi-brittle and viscous strength.*
- *Topological optimization of welded structures in SolidWorks, Compass-3D packages*
- *Setup and programming of the Fanuc welding robot.*

During their studies, undergraduates undergo practical training and get a job in top enterprises around the world.

manager: *Mikhail Ivanov, PhD in Technical Sciences, Head of the Department "Welding Engineering"*