

Presentation of training programs taught in RUSSIAN

Department of Foundry Processes and Materials Science provides training in the following areas:

- **"Metallurgy"** (bachelor's degree). Training profile: "Jewelry and industrial casting technologies".
- **"Materials Science and Materials Technologies"** (bachelor's degree). Training profile: "Materials Science and materials technology in mechanical engineering".
- **"Metallurgy"** (Master's degree). Training profile: "Foundry production", "Metal science and heat treatment of metals".
- "Materials technology" (postgraduate and doctoral studies in scientific specialties: "Foundry production", "Metal science and heat treatment of metals and alloys").

The training period is:

- * bachelor's degree – 4 years;
- * master's degree – 2 years;
- * postgraduate study – 4 years.

According to the profiles of training of the foundry orientation, qualified specialists are trained-foundry workers who know the technologies of smelting various alloys and are able to make the necessary casting from liquid metal. In the course of training, students gain theoretical knowledge, as well as skills in the development of casting technologies not only for the production of jewelry, but also for industrial castings.

Jewelry casting is done by people with a good knowledge of casting techniques, highly developed artistic taste and extensive experience in finishing cast parts. The art of the caster's profession goes back to ancient times.

Casters make a variety of shapes-from tiny watch parts, small instrument parts and jewelry to the huge shafts of ocean-going ships, giant hydro turbine wheels and heavy-duty hydraulic presses. They are able to synthesize nanostructured alloys with unique properties, as well as develop alloys with a given level of consumer properties.

The main professions of graduates include:

- foundry technologist;
- automatic casting line operator;
- master of the foundry departments;
- patternmaker;
- technologist-designer of jewelry casting;
- jeweler-technologist;
- operator of technological equipment for jewelry production.

Foundry shop technologist:

- * Develops the technological process for the production of cast parts, forms the main regulatory documents for the workshop, and checks the correctness of the developed technology through computer programs.
- * Monitors and, if necessary, adjusts the technological process.

Automatic Casting Line Operator:

- * Monitors the operation of the automatic line;
- * Makes adjustments to the technological modes of operation of the automatic line, as well as evaluates its performance on control and measuring devices.

Master of the foundry departments:

- * Implements the technological process of production of products according to the developed technology;
- * Organizes the work of the shop staff, as well as controls the implementation of the technology of manufacturing cast products.

Patternmaker:

- * Carries out the production of model kits by mechanized and manual methods;
- * Manufactures model kits on numerical control machines, as well as various types of 3D printers;
- * Checks the dimensions of model sets and their compliance with the drawing and other technological documentation.

Technologist-designer of jewelry casting:

- * Develops the technological process of making jewelry, as well as makes adjustments to the configuration of the product.
- * Performs control and adjustment of technological processes for the production of jewelry and art products.

Jeweler-technologist:

- * Performs procurement operations (calculation of alloys for a given sample, melting, casting into molds, rolling of blanks, wire drawing).
- * Carries out the production of art and jewelry using manual manufacturing methods and mass production technologies.
- * Creates and adjusts 3D models for jewelry and art purposes, taking into account the features of the selected manufacturing technology.

Operator of technological equipment for jewelry production:

- * Works on such technological equipment as: 3D printer, 3D router, 3D scanner, injector, melting and muffle furnaces, installations of vacuum and centrifugal jewelry casting, including in protective environments, etc.

According to the profile "**Materials Science and materials technologies in mechanical engineering**", qualified specialists are trained-materials scientists who know the technologies of alloy synthesis and their heat treatment. In the course of training, students will gain theoretical knowledge, as well as skills in developing technologies for the production of materials in mechanical engineering.

According to the profiles of training in materials science, the main future professions should include:

- Materials Engineer;
- Thermist technologist;
- Metallographer;
- Test Engineer of materials and coatings;
- Metallurgist.

Materials Engineer:

- * Develops new materials, methods for processing these materials, as well as methods for studying the properties and structure of these materials.
- * Develops a technology for the production of a new material that ensures its high quality, obtaining the specified properties and competitive cost.

Thermist technologist:

- * Selects the material for the manufacture of parts, depending on the conditions of their operation.
- * Develops modes of heat treatment of various metals and alloys to give them the necessary properties.

Metallographer:

- * Performs metallographic analysis of materials, determines the main structural components, describes and classifies the identified defects.
- * Analyzes the causes of defects in thermal and chemical-thermal treatment of metals and alloys; causes of breakdowns of metal products.

Test Engineer of materials and coatings:

- * Determines the mechanical and operational properties of materials and coatings.
- * Performs dynamic, static and cyclic tests of materials and products made from them.

Metallurgist:

- * Controls the technological process, offers new technologies to reduce the cost of the finished product and reduce energy costs.
- * Determines the chemical composition of the alloy, selects the appropriate temperature and processing time, and develops new equipment.