

Program Technologies of the extreme state of matter

Level: 03.03.01 Bachelor's Degree Subject: APPLIED MATHEMATICS AND PHYSICS

Mode of study: full-time Duration: 4 years

Graduation department: the program is implemented at the Department of Chemical Physics (№4) of the Institute for Laser and Plasma Technologies of the MEPHI University. The Department was found in 1951. Nikolay N. Semenov, the Nobel Prize laureate, became its founder and first Head. The department has more than 50 years of experience in educational and research activities with the participation of employees of leading scientific organizations.

Program supervisor Sergey A. Gubin – Head of the Chemical Physics Department (Dr. Sci. in Physics and Mathematics, Professor)

Program aim:

The program is aimed at training professionals with deep physical and mathematical training and fundamental knowledge in the field of chemical Physics, Combustion and Explosion, Physics of Extreme States of Matter, industrial safety and ecology. Graduates in this specialty are research engineers who are able to solve a wide range of problems in the physics of fast-flowing processes, extreme states of matter at high pressures and temperatures, monitoring the safety of industrial facilities and the environment, developing methods for computer modeling and forecasting the consequences of man-made accidents and catastrophes. The graduates possess skills and research capabilities sufficient for productive and creative work in any area of modern physics of the extreme state of matter and high energy density physics.

Curriculum features:

The program relies on the cooperation between basic (general) and special courses in physics and in methods experimental research and physical simulation. The program includes several fundamental physical disciplines, special disciplines (Physics of combustion and explosion, Structure of molecules and nanoparticles, Gasdynamics, Thermodynamics, Molecular dynamics simulation), research, tutorial and pre diploma practices.

Competences:

Infrastructure:

Partners and practice: Leading Institutes of the Russian Academy of Sciences (Semenov Research Center of Chemical Physics, Institute of Geosphere Dynamics, Joint Institute of High Temperatures, Institute of Problems of Chemical Physics), Institute for Fire Protection for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters, Institutes of State Atomic Energy Corporation Rosatom and the military-industrial complex.