6B07111 – “Thermal engineering”

Be able to:

-to describe the basic physical and thermodynamic laws, as well as concepts and methods of application of modern automated computer programs;
-apply the technical drawings and diagrams provided in the technical documentation when solving technical problems;
-to substantiate the ways of effective management of thermal engineering installations and technological equipment for the production, distribution and use of heat;
-to substantiate the parameters of power plants and complexes for the production, distribution and use of heat, steam and hot water boilers for various purposes;
-test protection and automation devices for individual elements of the power system with further analysis of their behavior in emergency situations;
-to develop modern automated systems for various technological lines and processes using digital and microcontroller technologies;
-to develop modern automated systems for controlling the parameters of energy processes using digital and microcontroller tools;
-design energy supply systems using original methods and in compliance with labor protection rules to achieve competitive results in production;
-develop energy supply systems based on alternative and renewable energy sources using computer modeling methods.

To know and understand:

-basic electrical and thermal engineering laws and methods of electricity distribution laws of statics, kinematics and dynamics for determining the kinematic characteristics of structural elements;
-basic electromechanical power converters for power supply and electric drive systems;
-methods for calculating the thermal and calorific parameters of the state, heat and operation in the thermodynamic processes of ideal, real gases, in humid containers and air;
-methods for calculating the processes of expiration, compression in a compressor, throttling, mixing and jet devices; methods for calculating the thermal efficiency of cycles, analysis of work losses (exergy) in the main elements of the cycle.
-structural design of superchargers, steam and gas turbines, -thermal and strength processes in flow parts and parts of blade machines, circuits and elements of main equipment, secondary circuits, protection devices and automation of energy facilities;
-the elementary basis of relay protection and automation, the history of the discipline, the purpose of the function and scope of relay protection and automation devices in power supply systems;
-methods for calculating protection devices for elements of power supply systems;
-functioning schemes operating in the organization of automatic control systems;
-methods of converting various types of energy into electrical energy.

Be competent in matters of:

-in modern trends in the development of electricity supply and its application in research, design, production, technological, organizational and managerial activities;
-in carrying out maintenance and quality control of the functioning, improvement, modernization and improvement of technical and astronomical indicators of thermal power plants and heat supply systems, non-traditional and renewable energy sources;
-in production and technological activities: in setting the parameters of the optimal operating mode of equipment; in determining the schemes of energy facilities; in ensuring compliance with all specified parameters of the technological process and the quality of the energy produced;
-in conducting a technical and economic analysis of heat supply systems;
-in research activities: in the development of plans, programs and methods for testing heat supply systems;
-the use of information technology to process the results of experimental and theoretical research;
-in installation and commissioning activities: development of installation, commissioning and repair documentation of heat supply systems;
-in organizational and managerial activities;
-in the organization of the work of the team of performers;
-in choosing a solution that meets the various requirements of heat supply systems.