6B07110 – “Engineering of energy systems”

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 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.
- to 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;
- to 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
- the 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 thermodynamic processes of ideal, real gases, in moist steam 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 shovel machines
- circuits and elements of the main equipment, secondary circuits, protection devices and automation of energy facilities
- the elementary basis of relay protection and automation, the history of the development 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 installation and commissioning activities: development of installation, commissioning and repair documentation of power supply systems;
- in organizational and managerial activities: in organizing the work of a team of performers; in choosing a solution that meets the various requirements of energy supply systems.