

## **Educational program annotation**

### **38.04.02\_10 Energy management**

<b>Program field:</b>	38.04.02 Management
<b>Master's program:</b>	38.04.02_10 Energy management
<b>Qualification:</b>	master

#### **1. List of structural units in the program**

The master's program in the field 38.04.02 Management is implemented at the Institute of Industrial Management, Economics and Trade, graduating from the Graduate School of Business and Management.

In the implementation of the Master's program there are involved Graduate School of Business and Management, Graduate Linguistics and Translation school, as well as the Graduate School of Economy Basics and Management, who teach disciplines of the curriculum: for the Graduate School of Business and Management there are fixed profile courses for the direction and basic educational programs, for the Graduate Linguistics and Translation school - discipline "Foreign language in professional communication", teachers of the Graduate School of Economy Basics and Management teach "History and methodology of science."

#### **2. Mission and goals of the educational program**

The mission of the main educational programs included in the cluster is to train highly qualified management personnel capable of solving complex problems of the professional sphere, including through the use of information and communication technologies, the integration of engineering and economic education, as well as the development of personal growth skills.

The mission of the program corresponds to the tasks, standing in front of the domestic enterprises and is in training highly qualified specialists of higher management levels that can apply the methods of scientific work when solving management problems.

The purpose of the main educational program 38.04.02\_10 "Energy Management" is Professional training of highly qualified specialists in the management of energy enterprises and systems. The study of basic disciplines of the direction 38.04. 02 "Management" allows them to apply scientific methods in solving management problems, and in-depth study of the disciplines of specialization related to various aspects of management activities at the micro level (energy enterprises), mesolevel (regional energy systems) and macro level (unified energy system of the state) in terms of ensuring the requirements of economic, The theoretical knowledge, practical skills and abilities, received in full, allows a graduate to freely and confidently apply methods of energy management to activity of objects of research and on this basis to realize the potential increase of their efficiency, to set specific tasks and choose methods of their decision.

The peculiarity of this educational program is the system approach, in which energy production, transmission and consumption are considered as a complex socio-technical system, whose main components are technical, organizational-economic and socio-behavioral subsystems. The

coordinated analysis of these subsystems is carried out on the basis of materials of real Russian and international projects, implemented with the active participation of teachers involved in the implementation of this educational program. Students studying in this program have the opportunity not only to study the materials of these projects, but also to participate directly in their implementation as part of both research papers and graduate qualification works.

1. The program prepares graduates for work in the following positions: business analyst, business development director, executive director, commercial director. The training program is aimed at the formation of skills in students that correspond to trends in the labor market - a complex of soft skills (the ability to work in a team and be aware of their role, give reasoned opinion, the ability to solve problems and think critically) and hard skills (skills in data management and analysis, building and evaluating models, the ability to use various statistical packages, basic programming skills).

2. Involvement in the training process of leading practitioners from various spheres and sectors of the economy, in order to transfer masters of practical experience in managing enterprises of various industries and forms of ownership, can significantly increase the level of attractiveness of the program for applicants, and ensure that students (students) receive relevant professional skills, which is an undoubted competitive advantage of graduates in the labor market.

3. Integration into the curriculum of disciplines as a basic module, focused on deepening knowledge in the field of management, and a profile focus, focused on solving practical cases and analytical problems on the examples of existing organizations that are implementing and using digital technologies in business management solutions in business.

4. A unique combination of profile disciplines allows to form a system of "hard", professional skills, which allows to lead teams of executors, carrying out energy audit and providing energy saving, as well as increasing energy efficiency at the objects of national economy; to organize work at the electricity and capacity markets, including forming applications, taking into account energy profiles of enterprises and the structure of sales and purchase of electricity at the wholesale market; calculate the social and economic efficiency of energy-saving measures at state and municipal levels; use quantitative and qualitative methods to conduct scientific research in the field of organization and efficiency of the electric power industry; prepare analytical materials for energy-saving management and energy efficiency improvement summarize and critically evaluate the results received by domestic and foreign researchers in the field of organization and efficiency of electric power industry; identify and formulate topical scientific problems; have the ability to conduct independent research in accordance with the developed program; have the ability to apply modern methods and techniques of teaching economic and management disciplines; have the ability to develop curricula and methodological support for teaching the profile disciplines summarize and critically evaluate the results obtained by domestic and foreign researchers; identify and formulate current scientific problems; have the ability to conduct independent

research in accordance with the developed program; have the ability to apply modern methods and techniques of teaching management disciplines; have the ability to develop curricula and methodological support for teaching the disciplines of the profile.

5. The use of modern software products in the course of training, including Microsoft Project, a software product for managing complex, multi-stage projects; Excel software product, allowing the use of statistical research methods during data analysis.

6. Combining both classical approaches and teaching methods (lectures and seminars), as well as new, active methods, case sessions, participate in scientific and practical conferences with a view to be able to explore and exchange experience with representatives of other universities, number, foreign, and practitioners from the real sector of the economy.

### **3. Requirements**

Persons with higher education of any level, the presence of which is confirmed by a document of the established form, are allowed to master the MEP. Admission to training is carried out for the first year. The procedure and conditions for admission are regulated by the Admission Rules adopted by the decision of the Academic Council of SPbPU dated October 26, 2020 and approved by Order No. 1696 dated October 29, 2020.

### **4. Areas of professional activity and (or) areas of professional activity in which graduates who have mastered the educational program can carry out professional activities:**

01 Education and science (in the areas of professional and additional professional education; scientific research).

Graduates can carry out professional activities in other areas and (or) spheres of professional activity, provided that their level of education and acquired competencies correspond to the requirements for employee qualifications.

### **5. Type (types) of tasks of professional activity, for the solution of which the graduate should be ready:**

- organizational and managerial;
- research;
- analytical.

### **6. Professional standards, in accordance with which OPOP VO is developed:**

At the recommendation of representatives of employers, this educational program is based on the analysis of experience.

### **7. Structure and content of MEP**

The educational program is implemented through a system of disciplinary modules and a module of state final certification.

The Master's program consists of the following types of modules:

General scientific module (Fundamentals), within which the

development of universal, general professional, as well as mandatory professional competencies takes place. The general scientific module includes compulsory disciplines: History and methodology of science; Foreign language in professional activities; Scientific discourse.

Professional modules (Professional), within the framework of which the development of universal, general professional, as well as professional competencies takes place, which include:

a) basic module of the direction - a set of disciplines (modules) that form knowledge, skills and abilities in the direction of training.

b) a module of a profile orientation, which determines the orientation of training.

Mobility module is an educational cycle within the framework of an educational program, which represents an additional educational trajectory for students in addition to training in the main educational direction.

The module of project activity (Project) is an independent activity of students, focused on solving a certain practically or theoretically significant problem, implemented in the framework of disciplines, practices, research work.

The module "State final certification" includes: the defense of the final qualifying work and the state exam (s) (if any).

Optional disciplines aimed at the socio-cultural development of students.

The learning outcomes by disciplines (modules) are correlated with indicators of achievement of competencies and ensure the gradual formation of the competencies of the graduate of MPEP HE.

#### Structure and scope of the educational program

The structure of MPEP HE	Volume MPEP HE ( w . )
BLOCK 1 "Disciplines (modules)"	60
BLOCK 2 "Practice"	54
BLOCK 3 " State final certification"	6
Total	120
BLOCK 4 "Electives"	4

### **7.1. Competence-based curriculum and curriculum**

The competence- based curriculum includes two interrelated components: competency- forming and disciplinary-modular. The competence- forming part of the curriculum connects all the mandatory competencies of the graduate with the sequence of studying all academic disciplines, practices, etc. The disciplinary-modular part of the curriculum reflects the logical sequence of mastering the elements of MEP that ensure the formation of competencies.

The curriculum defines a list, labor intensity (in credit units and academic hours), sequence and semester distribution of disciplines (modules), practices, forms of intermediate certification of students, state final certification, the volume of contact work of students with a teacher (by type of training) is highlighted and independent work of students.

The educational calendar indicates the periods of the types of

educational activities and the periods of vacations.

## **7.2. Work programs of disciplines (modules), practice programs**

The working program of discipline (module) is developed according to the SIES, the curriculum, the matrix of competencies, which reflects the competence of all levels, indicators to them, as well as descriptors, provide them achievement.

### **7.3. Practice programs**

Practices are a mandatory section of MEP and are a type of training sessions directly focused on the professional and practical training of students. Practices consolidate the knowledge and skills acquired by students as a result of mastering theoretical courses in special disciplines, develop practical skills and contribute to the integrated formation of general cultural and professional competencies of students.

In the MEP "Energy Management" the following types and types of practices are established:

educational practice:

- practice to acquire primary professional skills.

production practice:

- practice to acquire professional skills and professional experience;
- research work;
- undergraduate practice.

## **7.4. Funds of assessment tools for the current and intermediate certification of students in the discipline (module), practice**

The fund of assessment tools for conducting the current and intermediate certification of students in the discipline (module), practice is included in the work program of the discipline (module) and the practice program, respectively, and is drawn up in the form of attachments to the programs.

### **7.5. Organization of research work of students**

Research work carried out Master om under the guidance of the scientific supervisor. The topics of research works correspond to the focus of the main educational program and are determined in accordance with the topic of the master 's final qualification work. The purpose of the research work is to integrate the educational process with the development of the professional sphere of activity in the areas of training masters to ensure the formation of students' research competencies necessary in conducting research and solving professional problems. The documents regulating the organization of students' research work are developed and executed in accordance with the University's Educational Policy, EMS in the direction 38.04.0 2 Management and the requirements of professional standards.

Master's research work includes:

1. Dispersed research work.
2. Concentrated research work.

Documents regulating the organization of research work of students, designed and executed in accordance with the work programs of disciplines "dispersed RW", " concentrated RW" and methodical recommendation pits and on registration of scientific and research work of

students reporting.

### **7.6. Fund of assessment tools for state final certification**

The fund of assessment means for the state final certification is developed for the implementation and protection of the final qualifying work. In the course of state final certification, the degree of compliance of the formed competencies of graduates with the requirements of this educational standard and the implemented educational program is assessed.

The fund of assessment means includes: the program of state final certification, including requirements for final qualifying works and the procedure for their implementation, criteria for assessing the results of defense of final qualifying works.

### **8. Places of practice and employment**

Students can have practical training at JSC LOESK, JSC TGC-1, JSC OGK-2 Kirishskaya GRES, LLC Gazpromneft-Sakhalin. There is a number of long-term agreements on internships between SPbPU and JSC Lenenergo, JSC TGC-1, JSC LOESK, JSC OGK-2 Kirishskaya GRES.

There are applications for graduates from city and regional enterprises from TGC-1, LOESK, GAZPROM-neft and many others.

### **9. Material and technical base for educational and scientific activities**

To implement the training of masters in the direction 38.04.02 Management, IIMET has:

- auditoriums for lectures, practical classes;
- research laboratories;
- classrooms for independent work of students.

In order to implement the basic educational program "Energy Management" of Master's Degree in IIMET there are laboratories with the necessary equipment:

Research Laboratory "Digital Technologies in Business and Education". The research laboratory was created in order to widely attract the teaching staff, graduate students, undergraduates and students. The use of the Laboratory is a necessary element of the implementation of the research and educational process. The laboratory was organized to carry out research projects funded from competitions for grants from the Russian Humanitarian Science Foundation, RFBR and other sources. Research carried out in the Laboratory is included in research plans.

The book value of the equipment is RUB 902,968.20.

Educational laboratory "Modern management technologies». The educational laboratory was created to provide the educational process with information and technical means and programs, as well as for the use and implementation of information technologies in scientific and innovative activities.

The book value of the equipment is 1,692,480.0 0 rubles.

The material and technical base of the educational program of the magistracy ensures the conduct of all types of classes, disciplinary and interdisciplinary training, laboratory, practical and research work of

students, provided for by the curriculum and corresponding to the current sanitary and fire safety rules and regulations.

Today, student education and research is carried out using databases on various indicators of the functioning of organizations.

Equipping the laboratory allows you to solve the most modern tasks in the field of strategic planning of the company's activities, collecting, processing and analyzing information about the factors of the external and internal environment of the organization for making management decisions.

## **10. Competitive advantages of graduates and possible places of employment**

The training of undergraduates is carried out on the basis of IIMET, laboratories, computer classes, using modern interactive teaching methods. A new format of interaction with students is the conduct of open lectures and master classes by leading specialists from enterprises - industry leaders.

As part of the program implementation on a regular basis in accordance with the schedule classes with master's students are conducted by leading experts-practitioners, such as the Head of Planning and Reporting Department of Power Supply Division of Gazprom Energoholding LLC Yudenko E.V., c.e.s, I.A. Korolev, Deputy Head of Municipal Formation #15 of Saint-Petersburg, leading instructor of the training group of the Operational Staff Training Department of Leningrad NPP-2 JSC "Concern Rosenergoatom", Head of the Prospective Development and Energy Saving Department of SPbGBU "Lensvet" A.M. Kosoy.

Graduates of this program will be able not only to get practical knowledge, but also to determine the future place of work during the period of mastering the competences of the discipline, read by the teachers-practitioners. Part-time employment is possible already in the period of training, as TGC-1 and LOESK JSC provides part-time employment for our graduate students.

## **11. The international cooperation**

Mainly international partners are leading foreign universities, European business schools and universities of applied sciences, including one implementing similar educational programs.

Close integration is also carried out with foreign consortia of partners, jointly implementing international research projects within the framework of, for example, cross-border cooperation programs, "Interreg Baltic Sea Region", " Erasmus +".

Cooperation and networking with international partners makes it possible to improve the quality of training of specialists through the development of academic mobility programs and inclusive learning, the use of advanced foreign experience, the attraction of foreign professors from leading universities and research centers, and the attraction of students for the implementation of research projects.

## **12. Main scientific directions and schools**

Teachers involved in the implementation of the educational program,

are engaged in research activities within the scientific directions on the following topics: development of regional green energy markets (within the international project Green ReMark; regional energy saving strategies in the housing and communal services; integrated innovative solutions for creating energy efficient outdoor lighting systems; synergy of climate change adaptation strategies and energy efficiency solutions.

### **13. The most significant results and achievements**

The main scientific and practical results of joint research of teachers and students within this educational program are presented in the reporting documentation for the following projects:

ENI CBC 2014-2020 program project "Development of regional green energy markets (Green ReMark)".

The project of BSR INTERREG program on the basis of the Agreement between the EU, Russia and Germany on participation in financing the activities of the transnational cooperation program BSR INTERREG "Smart City Districts of the Baltic Sea Region in the 21st Century (AREA21)".

Draft BSR INTERREG program "Smart City Areas of the Baltic Sea Region in the 21st Century in Action".

ENI CBC Program Project 2014-2020 "KS11135 King's Road Renaissance: new dimension and digital tools".

BSR INTERREG program project based on the Agreement between the EU, Russia and Germany on participation in financing activities of the transnational cooperation program BSR INTERREG "Synergy of Climate Change Adaptation and Mitigation in Energy Efficiency Projects (CAMS Platform)".

BSR INTERREG program project on the basis of the Agreement between the EU, Russia and Germany on participation in financing the activities of the transnational cooperation program BSR INTERREG "Baltic Sea Region Lighting - cities accelerate the implementation of sustainable and intelligent urban lighting solutions (LUCIA)".



## Annotations of educational program elements 38.04.02\_10 Energy management (subjects, practice and State Final Examination)

<b>Foreign language in professional communication</b>				
<b>Objectives:</b>	The purpose of the discipline is to achieve practical knowledge of a foreign language, which allows to use it in their future careers and research work, as well as in everyday conversation; in creating a base for correct understanding, translation and processing of foreign language texts; in the development of communicative competence of the academic, which allows the student to represent scientific production (articles, essays, reports, etc.) in an academic environment.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. The profession of an accountant. Financial and managerial aspects. Accounting standards and audit. Discussion of negotiations to conclude an alliance.</li> <li>2. The main aspects of accounting practice. Accounting and financial reporting. Discussion of negotiations on the conclusion of an alliance.</li> <li>3. Assets, liabilities, equity of the company. Tangible and intangible assets. Discussion of negotiations to conclude an alliance.</li> <li>4. Accounting for purchases and cash payments. Main log book. Business accounts. Discussion of negotiations on the conclusion of an alliance.</li> <li>5. Breakeven point. Overheads. Fixed costs. Discussion of negotiations on the conclusion of an alliance.</li> <li>6. Inventories, accounting systems, valuation and accounting of stocks of company divisions. Discussion of negotiations on the conclusion of an alliance.</li> <li>7. Banking practice. Financial statements. Automated accounting systems. Discussion of negotiations on the conclusion of an alliance.</li> <li>8. Audit of a company as a check of the correctness of its performance indicators. Discussion of negotiations on the conclusion of an alliance.</li> </ol>			
<b>Teaching and learning:</b>	Lecture	Practical training	Independent study	Exam
		48	50	10
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Graded assessment			
<b>History and Methodology of Science</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to form students' methodological and scientific culture, a system of knowledge, abilities and skills in the field of organizing and conducting scientific research; obtaining knowledge of the basics of methodology, methods and concepts of scientific research; the formation of practical skills and abilities in the application of scientific methods; education of moral qualities, instilling ethical norms in the process of carrying out scientific research.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. The emergence of science. About ENERAL position.</li> <li>2. Scientific knowledge during the Middle Ages and Renaissance.</li> </ol>			

	3. Arab Scientific Heritage. 4. Classical science of XVIII-XIX centuries. 5. Concept of scientific research. 6. Methods of theoretical and empirical research. 7. The concept of systemic methodology. 8. Communications and their specificity in modern science .			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
		16	83	9
<b>ECTS Credits:</b>	3 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Digital resources in scientific research</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to acquire skills in working with information: problem statement; formulation of goals and objectives; substantiation and choice of directions for searching and extracting information for conducting scientific research; in the acquisition and skills and understanding of the various types of digital resources needed to conduct scientific research; in acquiring the skills of conducting scientific research.			
<b>Content:</b>	1. Working with Information: problem statement; formulation of goals and objectives; substantiation and choice of directions for searching and extracting information for conducting scientific research 1.1. Information for scientific research. 1.2. Database. Base of publications. 2. Types of digital resources and stages of scientific research. 2.1. Types of scientific research. 2.2. Types of Digital Resources Needed for Scientific Research. Stages of scientific research. 2.3. Definition of the research problem and formulation of the topic. 3. Research Skills. 3.1. The problem in a broad sense. 3.2. Systematic problems of the global level. 3.3. Modeling a scientific problem by methods of mathematical formalization: well-structured or quantitatively expressed problems. 3.4. Modeling a scientific problem by methods of mathematical formalization: poorly structured or poorly quantitatively expressed problems.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	2+14(Э)	14+12(Э)	62	4
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			

<b>Research methods in management</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to use both existing and implementation of new tools and research methods in solving management problems ; c and identification of problems in the field of management and search for information about the problem ; assessing the reliability of the information received and making decisions when there is a lack of information ; in the receipt and information on technologically complex or innovative markets and products .			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Research in Management: Basic Concepts and Problems</li> <li>2. Explore data using a mixture of quantitative and qualitative analysis methods:               <ol style="list-style-type: none"> <li>2.1. Q-methodology.</li> <li>2.2. Content analysis.</li> <li>2.3. Conjoint analysis.</li> <li>2.4. Perception maps.</li> </ol> </li> <li>3. Special tasks and areas of research:               <ol style="list-style-type: none"> <li>3.1. Personnel research.</li> <li>3.2. Strategy and tactics of searching for market information.</li> </ol> </li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	16	31	9
<b>ECTS Credits :</b>	2 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Modern Strategic Analysis</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to teach students, when conducting strategic analysis, to make sound organizational and managerial decisions, to assess their operational and organizational effectiveness, and social significance, to ensure their implementation in conditions of complex (including cross-cultural) and dynamic environment ; To teach students to apply modern methods of strategic analysis of the organization's activities, including assessing the industry and competition in it .			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. The concept of strategy and the role of strategic analysis in the activities of the organization:               <ol style="list-style-type: none"> <li>1.1. The essence, goals, basic principles of the development of organizations.</li> <li>1.2. Strategic development of the organization</li> </ol> </li> <li>2. Directions, methods and models of modern strategic analysis:               <ol style="list-style-type: none"> <li>2.1. Competition and competitiveness</li> <li>2.2. Strategic Analysis Methods and Models</li> <li>2.3. Industry analysis .</li> </ol> </li> </ol>			

<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	42	18
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Graded assessment			
<b>Managerial Economics</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to form students' deep knowledge of the patterns of development of the modern economy and the general principles of behavior of firms in market conditions; in the formation of skills for the development of rational management decisions on the optimal distribution of limited resources between competing areas of work, both in the private and public sectors of the economy.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. An introduction to management economics. The firm and its behavior</li> <li>2. Demand analysis and consumer behavior</li> <li>3. Demand functions and elasticity of demand. Demand assessment.</li> <li>4. Theory and evaluation of production.</li> <li>5. Theory and cost estimation.</li> <li>6. Market structure. Pricing decisions and</li> <li>7. production volumes in different types of markets.</li> <li>8. Economic analysis of long-term investments in conditions</li> <li>9. certainty and risk analysis.</li> <li>10. The economic role of government.</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	42	54
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>Corporate financial reporting</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to economically competently analyze the financial statements of corporations for making subsequent management decisions in the production of non-economic activities of industrial corporations; about elaborated and effectively apply existing guides and develop new methods and models for solving of Adachi in the professional field.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Economic content and functions of corporate finance</li> <li>2. Problems of formation and standardization of corporate financial reporting</li> <li>3. Modigliani-Miller theorems and their implications for the theory of corporate finance.</li> <li>4. Compromise models of capital structure formation</li> </ol>			

	5. Stakeholder theory and corporate value 6. The market for corporate control: mergers and acquisitions 7. Problems, limitations and applicability of recommendations of various theories of capital structure.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	42	54
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>Corporate Finance</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to economically competently explain the essence of the methods and models used and substantiate the need for their application in ensuring the competitiveness of the management of production and economic activities of industrial corporations; about bosnovanno and effectively apply existing and develop new methods and models for solving of Adachi in the professional field.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Economic content and functions of corporate finance</li> <li>2. Modigliani - Miller theorems</li> <li>3. Stationary Ratio Models</li> <li>4. Asymmetric information models</li> <li>5. Stakeholder theory and corporate value</li> <li>6. The market for corporate control: mergers and acquisitions</li> <li>7. Problems, limitations and applicability of recommendations of various theories of capital structure.</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	42	54
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>Organization of sales activities on the wholesale electricity and capacity market</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to acquire practical skills in developing trading strategies on the electricity and capacity market, assessing the effectiveness of sales, the formation of analytical reports of sales activities			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Introduction. The concept of the wholesale electricity and capacity market</li> <li>2. Competitive capacity takeoff</li> <li>3. Actually delivered volume of capacity</li> <li>4. Pricing under power supply contracts</li> <li>5. Competitive selection of modernization projects</li> <li>6. Power trade on the Wholesale Electric Energy/Power Market</li> <li>8. Forecasting of free unregulated prices for electric power</li> <li>9. Financial settlements and accounts receivable on the Wholesale Electric Energy/Power Market</li> <li>10. Planning of profitable part of business-plan, calculation of marginal profit</li> </ol>			

	11. Electric power retail market. Basics of operation			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	16	85	27
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>World energy</b>				
<b>Objectives:</b>	The objectives of the discipline "World Energy" is to study the trends in the development of the most important part of the modern world economy - world energy; factors affecting the consumption of energy resources by countries of the world; conditions for future sustainable development of world energy; the role of global energy security in solving the problems of our time; strategies and forecast parameters for sustainable development of world energy until 2040; forecast estimates of world energy demand in the new economic growth in the world economy.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Trends in global economic growth, energy consumption and the development of energy technologies. <ol style="list-style-type: none"> <li>1.1. The role of energy in the development of human civilization</li> <li>1.2. Development of energy technologies for the production, transport and distribution of energy.</li> <li>1.3. The use of decentralized energy sources in the global electric power industry.</li> <li>1.4. Models of economic development and energy consumption in the countries of the world.</li> </ol> </li> <li>2. State, problems and tasks of the future development of the world fuel and energy complex. <ol style="list-style-type: none"> <li>2.1. Factors determining the development of the world fuel and energy complex.</li> <li>2.2. Strategic goals and conditions for future sustainable development world energy complex.</li> <li>2.3. Global energy security and its role in solving world economic and social problems.</li> <li>2.4. Strategies and forecast parameters for sustainable development world energy complex until 2050.</li> </ol> </li> <li>3. Forecast estimates of global energy demand and its satisfaction in the context of a decline in economic growth in the world economy. <ol style="list-style-type: none"> <li>3.1. Factors of instability of economic growth in the world economy.</li> <li>3.2. Energy demand in the global economy in the projected period.</li> <li>3.3. Assessment of world reserves of traditional energy resources and forecast of their possible production.</li> <li>3.4. Prospects for Interregional Energy Trade resources in the world.</li> <li>3.5. The projected volumes of investments for the development of the world fuel and energy complex, and in 2016-2035</li> </ol> </li> <li>4. Forecast trends in the development of technologies in the electric power sector of the world energy complex. <ol style="list-style-type: none"> <li>4.1. Forecast estimates of the future power consumption of the world economy and development of new energy technologies.</li> <li>4.2. Advanced energy production technologies electricity using non-renewable fuels, and their characteristics.</li> <li>4.3. Forecast trends in the development of energy technologies transport, transmission and distribution of electrical energy.</li> </ol> </li> </ol>			

- 4.4. Technologies for accumulating and storing electricity in electric power systems
- 4.5. Forecast estimates of the development of new consumption technologies and use of energy.
5. Energy technologies for energy production using renewable energy resources.
  - 5.1. Energy technologies for the use of river energy.
  - 5.2. Technologies for using the energy of the seas and oceans.
  - 5.3. Technologies for the use of geothermal energy.
  - 5.4. Wind energy technologies.
  - 5.5. Solar energy technologies.
  - 5.6. Biofuel technologies.
  - 5.7. Methods and mechanisms for stimulating the development of technologies production of non-traditional renewable sources energy in the world.
6. Energy technologies of transport systems and prospects for their development.
  - 6.1. Trends in the development of efficient energy technologies road transport.
  - 6.2. Forecast trends in the development of energy efficient technologies air transport.
  - 6.3. Forecast trends in the development of efficient energy technologies of maritime transport.
  - 6.4. Trends in the development of efficient energy technologies railway transport.
7. Energy technologies for the use of energy in the world industry.
  - 7.1. Directions for improving the technologies of use energy in the global industry.
8. Energy technologies of housing and communal services and directions of their improvement.
  - 8.1. Technologies for lining buildings, hot water supply, air conditioning and control systems.
  - 8.2. Technology of household electrical and energy-consuming appliances.
  - 8.3. Bioenergy technologies.
9. Forecast tendencies of innovative development of the electric power complex of Russia.
  - 9.1. Methodology and forecast estimates of energy consumption in Russian Federation.
10. Characteristics of the current state of the fuel and energy complex of Russia
  - 10.1. The state of the oil industry.
  - 10.2. The state of the gas industry
  - 10.3. The state of the coal industry.
  - 10.4. The state of the electric power industry and its technological potential.
11. Intelligent energy systems - models of future power supply systems in the world.
  - 11.1. Technological and socio-economic foundations of creation smart power systems.
  - 11.2. Problems of the Russian electric power industry and their possibilities solutions based on the creation of smart power systems
  - 11.3. Strategy and principles of practical implementation of the concept smart energy systems in the domestic electric power industry.
12. Strategy for the development of domestic power engineering - the basic industry of the Russian electric power industry.
  - 12.1. The state and problems of the development of domestic power engineering.

	<p>12.2. Characteristics of the scientific and production potential of electrical and power engineering.</p> <p>12.3. Concept and strategy for the development of electrical and power engineering to ensure the country's energy security.</p> <p>13. Global trends and geopolitical risks of the future development of the world economy and its energy complex.</p> <p>13.1. Main trends and problems of present and future development the world economy.</p> <p>13.2 Possible changes in the international economic system and geopolitical risks for the development of the world economy and its energy complex</p>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	24	36
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Examination			
<b>Planning and forecasting the development of power systems</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to acquire knowledge in the field of planning and forecasting of power systems; mastering the basic criteria and methods that are used to solve the problems of development and functioning of power systems; formation of the ability to perform calculations related to the substantiation of decisions on the structure, location and main parameters of generating sources and electrical networks in the EPS			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Characteristics of the structure and organization of development management and the functioning of electric power systems (EPS) and electricity markets in Russia and abroad.</li> <li>2. Goals, objectives, organization and technology of development planning EES.</li> <li>3. Principles and methods of forecasting future needs in electrical and thermal energy and energy consumption modes.</li> <li>4. Methods for the development of prospective power balances and electricity of EPS as a part of power networks, taking into account power supply reliability requirements.</li> <li>5. System characteristics of generating sources of various Like.</li> <li>6. Methods for optimizing promising daily and annual allowances operating modes of generating sources in daily and annual EPS load graphs.</li> <li>7. Methods of a feasibility study of a promising the structure and location of generating capacities in the EPS and energy networks.</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
		32+6	55	15
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Pass/fail assessment, Course project			



<b>Digital technologies in energy</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to provide students with knowledge, skills and abilities in the field of application of information and communication technologies in energy			
<b>Content:</b>	1. Analysis of developed and implemented government programs, digital standards and digital platforms in the energy sector. 2. Analysis of opportunities for digital transition for fuel and energy companies. 3. Review of existing information and communication technologies and assessment of opportunities, as well as the conditions for their application in the energy sector. 4. Description of the conditions for the development and development of digital IT services. 5. Description of the features of digitalization of public administration and control and supervisory activities in the fuel and energy complex. Formulation of requirements for personnel working in the field of digital energy.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	69	27
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>Energy innovations</b>				
<b>Objectives:</b>	The objectives of mastering the discipline "Innovations in Energy" is to study the development trends of the world and domestic energy; the role of electric power systems in the development of national economies, conceptual provisions for the development of smart energy systems and smart technologies, the conditions for their implementation in the Russian electric power industry to solve key problems of increasing the reliability and safety of power supply to consumers			
<b>Content:</b>	Trends in global economic growth, energy consumption and energy technology development. 1.1. The role of energy in the formation and development of human civilization. 1.2. Development of energy technologies for production, transport and distribution of energy. 1.3. The use of decentralized energy sources in the world electric power industry. 2. State, problems and tasks of the future development of the world fuel and energy complex. 2.1. Factors determining the development of the world fuel and energy complex. 2.2. Strategic goals and conditions for future sustainable development world energy complex. 2.3. Global energy security and its role in solving world economic and social problems. 3. Forecast trends in the development of technologies in the electric power sector of the world energy complex. 3.1. Forecast estimates of the future power consumption of the world economy and development of new energy technologies. 3.2. Advanced energy production technologies electricity using non-renewable fuels, and their characteristics. 3.3. Forecast trends in the development of energy technologies transport, transmission and distribution of			

electrical energy.

3.4. Technologies for accumulating and storing electricity in electric power systems.

3.5. Forecast estimates of the development of new consumption technologies and use of energy.

4. Energy technologies for energy production using renewable energy resources.

4.1. Energy technologies for the use of hydropower

4.2. Technologies for using the energy of the seas and oceans.

4.3. Technologies for the use of geothermal energy.

4.4. Energy technologies for using wind energy.

4.5. Sun energy technologies.

4.6. Biofuel technologies.

4.7. Methods and mechanisms for stimulating the development of technologies production of renewable energy sources in the world.

5. Forecast tendencies of innovative development of the electric power complex Russia.

5.1. Methodology and forecast estimates of energy consumption in Russian Federation.

5.2. The state of the electric power industry and its technological potential.

5.3. Characteristics of economic entities of the domestic electric power industry and principles of their regulation

6. The concept of intelligent electric power systems and strategies for its implementation in the technological structure of the information economy

6.1. Characteristics of the parameters of the technological order information economy

6.2. Conceptual provisions and strategic development goals intelligent power systems

6.3. Classification of intelligent technologies, principles and conditions for their implementation in the Russian power industry

6.4. Features of interaction of electric power companies with energy consumers in the context of their intellectualization

7. Assessment of the economic efficiency of the use of intelligent technologies in the domestic electric power industry

7.1. Classification of potential effects of use intelligent technologies in electric power systems

7.2. Methodological approach and principles for assessing potential the effectiveness of the use of intelligent technologies in domestic electric power systems

7.3. Methodology for systematic assessment of the effects of intellectualization domestic electric power systems

7.4. Evaluation of the economic efficiency of the application intelligent technologies in electric power systems on the example of the use of energy storage

7.5. Evaluation of the economic efficiency of the application intelligent technologies to improve reliability electric power systems

<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	16	58	18
<b>ECTS Credits :</b>	3 ECTS			

<b>Assessment:</b>	Examination			
<b>Economics and heat management</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to study the main methodological provisions in the management of an organization in the field of heat supply. Study of the principles of the structure of pricing and tariff setting in the field of production, transmission, sale of heat energy			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Regulatory regulation of the heat supply sector</li> <li>2. Heat supply systems</li> <li>3. Technical and economic indicators of heat supply systems</li> <li>4. Technological losses in heat supply systems</li> <li>5. Principles and methods of tariff regulation of heat and power enterprises</li> <li>6. Cost of heat energy / heat carrier production</li> <li>7. New approaches to tariff setting. The "alternative boiler room" method</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	32	33	27
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Examination			
<b>Fundamentals of work in the UIEE</b>				
<b>Objectives:</b>	The purpose of mastering the discipline is to study the principles of teaching in the electronic information and educational environment of the university. As a result of studying the discipline, students must confidently master the skills of gaining access to electronic information and educational resources and personal services.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. E-learning at SPbPU. Electronic information and educational environment and its components. Personal services for students.</li> <li>2. Online courses in the educational process. Resources of the information and library complex</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	2	4	26	4
<b>ECTS Credits :</b>	1 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Institutional Foundations of Economics and Electricity Management</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to form an idea of the structure of the electric power market, the form and degree of interconnection of market entities. Study of technology and results of management of the electricity (capacity) market for a holistic understanding of the possible consequences of management decisions taken in this area			

<b>Content:</b>	<ol style="list-style-type: none"> <li>1. General characteristics of the electric power industry as an infrastructure industry</li> <li>2. General characteristics of the regulatory framework for the organization and functioning of the electric power industry.</li> <li>3. The composition and characteristics of the legislative acts of the Russian Federation that determine the conditions and requirements for the functioning and development of the electric power industry.</li> <li>4. Characteristics of regulatory documents that determine the requirements for the organization and functioning of electricity and capacity markets.</li> <li>5. Characteristics of regulatory documents that determine the requirements for the reliable and safe functioning of the production structure of the electric power industry.</li> <li>6. Characteristics of regulatory documents that determine the requirements for the provision of services for the transmission of electricity and capacity and for technological connection to power grids.</li> <li>7. Characteristics of the principles and methods of state regulation of pricing in the electric power industry.</li> <li>8. Regulatory support for the organization and management methods for the development of the electric power industry.</li> <li>9. Methods and organization of investment management</li> <li>2. in the electric power industry.</li> </ol> <p>Characteristics of regulatory documents that determine the requirements for the organization and functioning of heat supply systems.</p>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	16	22	18
<b>ECTS Credits :</b>	2 ECTS			
<b>Assessment:</b>	Graded assessment			
<b>Economic assessment of the impact of energy on the environment</b>				
<b>Objectives:</b>	<p>The purpose of studying the discipline is the formation of basic ideas and knowledge about the economic mechanisms of environmental management in industry (for example, energy enterprises), mastering modern methods of economic assessment of the impact of man-made human activities on the environment, obtaining skills for their systematic use in environmental management in modern conditions.</p>			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Introduction. Economic assessment of the impact of energy on the atmospheric air</li> <li>2. Stationary and mobile objects.</li> <li>3. Economic assessment of the impact of energy on surface and groundwater bodies.</li> <li>4. Peculiarities of regulation and control of negative impact in the field of water use</li> <li>5. Economic assessment of the impact of energy on the environment during the disposal of production and consumption waste</li> <li>6. Manifestation of the features of energy production</li> <li>7. Determination of damage caused to water bodies as a result of violations of water legislation</li> <li>8. Water legislation</li> </ol>			

	9. Determination of damage to soil as an object of environmental protection. 10. Standards for soil quality.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
		32	58	18
<b>ECTS Credits :</b>	3 ECTS			
<b>Assessment:</b>	Examination			
<b>Economics and Energy Saving Management</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to form a system of knowledge and skills among students in the field of economics and energy saving management at the stages of production, transmission and consumption of electric and thermal energy.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. The concepts of energy resources (ER), energy efficiency and energy saving. Regulatory and legal framework energy saving</li> <li>2. Basics of Energy Saving Management</li> <li>3. Classification of losses of fuel and energy resources</li> <li>4. The main stages of the development of energy saving programs</li> <li>5. Methods of energy saving management</li> <li>6. Analysis and assessment of energy saving reserves</li> <li>7. Analysis and assessment of the structure and dynamics of energy consumption</li> <li>8. Evaluation of the effectiveness of energy saving measures</li> <li>9. Financial and economic analysis of energy saving projects</li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	16	22	18
<b>ECTS Credits :</b>	2 ECTS			
<b>Assessment:</b>	Graded assessment			
<b>Energy tariffs</b>				
<b>Objectives:</b>	<p>The aim of the course is to form specialists who can reasonably and effectively apply the theory and practice of tariff regulation at the enterprises of the energy sector of the national economy of the country. The objectives of the course are the acquisition by students of knowledge, skills and abilities concerning:</p> <ul style="list-style-type: none"> <li>- basic concepts of theory and practice of tariff regulation in the energy sector, in particular the experience of economically developed countries of the West;</li> <li>- study of the system of state regulation of tariffs in the Russian Federation;</li> <li>- learning methods</li> </ul> <p>formation of tariffs for services and products of energy enterprises in the Russian Federation; - selection of optimal tariff decisions in conditions of uncertainty of initial information.</p>			

<b>Content:</b>	1. Introduction. State regulation in the energy sector, tasks, functions, the system of tariff regulation in the Russian Federation 2. Domestic and foreign experience of pricing in the energy sector 3. Regulatory framework for the formation of energy tariffs in the Russian Federation, classification of tariff methods regulation, their characteristics and scope 4. Procedure for tariff regulation in the energy sector 5. Methods for calculating tariffs for electricity (power) in generating, grid and sales companies 6. Methods for calculating tariffs for heat energy (power) in generating, grid and sales companies 7. Calculation of tariffs for connection to the heat supply system 8. Calculation of payment for technological connection to electrical Networks 9. Calculation of utility bills			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	16	48	44	36
<b>ECTS Credits :</b>	4 ECTS			
<b>Assessment:</b>	Examination			
<b>Formalization and presentation of research results</b>				
<b>Objectives:</b>	The purpose of studying the discipline is to prepare masters for the correct presentation, design and presentation of the results of various types of scientific research in accordance with the requirements of GOST, regulations of the university, institute and higher school in this area.			
<b>Content:</b>	1. Types, structure, methods of registration and presentation of the results of scientific research 1.1 Forms of presentation of scientific results 1.2 Basics of registration and presentation of the results of scientific research. 2. Registration and submission of the final qualification work 2.1 Registration of the final qualification work 2.2 Presentation of the final qualification work.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
		16	47	9
<b>ECTS Credits :</b>	2 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Educational Foresight</b>				
<b>Objectives:</b>	The purpose of mastering the discipline is to form an idea of the practice of using online learning in the modern educational process, the use of educational analytics to assess the progress of one's own educational process, and the disclosure of modern methods of constructing an educational trajectory to expand the capabilities of students. Exploring the specific uses of online courses in the educational process.			
<b>Content:</b>	1. Basic concepts and definitions of e-learning and online learning 1.1. Electronic information and educational resources: definition and types			

	1.2. Overview of educational platforms 2. Acquaintance with online resources hosted on open educational platforms. Acquaintance with foreign educational platforms. 2.1. Features of courses hosted on various educational platforms. 3. Independent study of an online resource. Mandatory study of a resource posted on a foreign platform. 3.1. Choosing a course for self-study. 4. Passing intermediate tests of an online resource to demonstrate the progress of studying the material 4.1. Integration of an online course into the educational process. 5. Working on the online resource forum 5.1. Communication in the online space.			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	2		152	26
<b>ECTS Credits :</b>	5 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Career Adaptability</b>				
<b>Objectives:</b>	The purpose of mastering the discipline is to expand the area of the students subject knowledge to increase the scope of professional activity.			
<b>Content:</b>	1. Building a careerogram. 2. Career management in an organization. 3. Self-diagnosis of personality and self-coaching. 4. Preparing and submitting a reflective essay. 5. Intermediate control over the course (discipline).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
	2		152	26
<b>ECTS Credits :</b>	5 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Research work (dispersed), part 1</b>				
<b>Objectives:</b>	The practice is carried out in order to form and consolidate professional knowledge, skills and abilities obtained as a result of theoretical training, as well as to study production experience, acquire organizational skills and form a system of key competencies. The purpose of the internship is to gain experience in practical work, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.			

<b>Content:</b>	1. Preparatory stage: 1.1. Development of an individual task. 1.2. Organizational meeting to clarify the goals, objectives, content and order of internship. 1.3. Acquaintance with the place of the practice. 2. The main stage: 2.1. Collection and processing of regulatory and legal, production and technological information. 2.2. Implementation of an individual assignment. 3. Final stage: 3.1. Preparation and execution of the practice report. 3.2. Report protection (intermediate attestation).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			288	
<b>ECTS Credits :</b>	8 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Research work (dispersed), part 2</b>				
<b>Objectives:</b>	The practice is carried out in order to form and consolidate professional knowledge, skills and abilities obtained as a result of theoretical training, as well as to study production experience, acquire organizational skills and form a system of key competencies. The purpose of industrial practice is to gain practical experience, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.			
<b>Content:</b>	1. Preparatory stage: 1.1. Development of an individual task. 1.2. Organizational meeting to clarify the goals, objectives, content and order of internship. 1.3. Acquaintance with the place of the practice. 2. The main stage: 2.1. Collection and processing of regulatory and legal, production and technological information. 2.2. Implementation of an individual assignment. 3. Final stage: 3.1. Preparation and execution of the practice report. 3.2. Report protection (intermediate attestation).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			288	
<b>ECTS Credits :</b>	8 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			



### Research work (dispersed), part 3

<b>Research work (dispersed), part 3</b>				
<b>Objectives:</b>	The practice is carried out in order to form and consolidate professional knowledge, skills and abilities obtained as a result of theoretical training, as well as for the study of production experience, acquisition of organizational skills and the formation of a system of key competencies. The purpose of industrial practice is to gain practical experience, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Preparatory stage:               <ol style="list-style-type: none"> <li>1.1. Development of an individual task.</li> <li>1.2. Organizational meeting to clarify the goals, objectives, content and order of internship.</li> <li>1.3. Acquaintance with the place of the practice.</li> </ol> </li> <li>2. The main stage:               <ol style="list-style-type: none"> <li>2.1. Collection and processing of regulatory and legal, production and technological information.</li> <li>2.2. Implementation of an individual assignment.</li> </ol> </li> <li>3. Final stage:               <ol style="list-style-type: none"> <li>3.1. Preparation and execution of the practice report.</li> <li>3.2. Report protection (intermediate attestation).</li> </ol> </li> </ol>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			288	
<b>ECTS Credits :</b>	8 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Practice for obtaining professional skills and professional experience</b>				
<b>Objectives:</b>	The practice is carried out in order to form and consolidate professional knowledge, skills and abilities obtained as a result of theoretical training, as well as to study production experience, acquire organizational skills and form a system of key competencies. The purpose of the internship is to acquire practical work experience, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.			
<b>Content:</b>	<ol style="list-style-type: none"> <li>1. Preparatory stage:               <ol style="list-style-type: none"> <li>1.1. Development of an individual task.</li> <li>1.2. Organizational meeting to clarify the goals, objectives, content and order of internship.</li> <li>1.3. Acquaintance with the place of the practice.</li> </ol> </li> <li>2. The main stage:               <ol style="list-style-type: none"> <li>2.1. Collection and processing of regulatory and legal, production and technological information.</li> <li>2.2. Implementation of an individual assignment.</li> </ol> </li> <li>3. Final stage:</li> </ol>			

	3.1. Preparation and execution of the practice report. 3.2. Report protection (intermediate attestation).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			324	
<b>ECTS Credits :</b>	9 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Practice for obtaining primary professional skills</b>				
<b>Objectives:</b>	<p>The practice is carried out in order to form and consolidate professional knowledge, skills and abilities obtained as a result of theoretical training, as well as to study production experience, acquire organizational skills and form a system of key competencies.</p> <p>The purpose of educational practice is to deepen the knowledge gained in the process of theoretical training and acquire the necessary professional skills and abilities in accordance with the chosen direction of training</p>			
<b>Content:</b>	<p>.Preparatory stage:</p> <p>1.1. Development of an individual task.</p> <p>1.2. Organizational meeting to clarify the goals, objectives, content and order of internship.</p> <p>1.3. Acquaintance with the place of the practice.</p> <p>2. The main stage:</p> <p>2.1. Collection and processing of regulatory and legal, production and technological information.</p> <p>2.2. Implementation of an individual assignment.</p> <p>3. Final stage:</p> <p>3.1. Preparation and execution of the practice report.</p> <p>3.2. Report protection (intermediate attestation).</p>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			216	
<b>ECTS Credits :</b>	6 ECTS			
<b>Assessment:</b>	Pass/Fail assessment			
<b>Research work (concentrated)</b>				
<b>Objectives:</b>	<p>The practice is carried out in order to form and consolidate professional knowledge, skills and habits obtained as a result of theoretical training, as well as to study production experience, acquire organizational work skills and form a system of key competencies.</p> <p>The purpose of industrial practice is to gain practical experience, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.</p>			

<b>Content:</b>	1. Preparatory stage: 1.1. Development of an individual task. 1.2. Organizational meeting to clarify the goals, objectives, content and order of internship. 1.3. Acquaintance with the place of the practice. 2. The main stage: 2.1. Collection and processing of regulatory and legal, production and technological information. 2.2. Implementation of an individual assignment. 3. Final stage: 3.1. Preparation and execution of the practice report. 3.2. Report protection (intermediate attestation).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			216	
<b>ECTS Credits :</b>	6 ECTS			
<b>Assessment:</b>	Graded assessment			
<b>Internship</b>				
<b>Objectives:</b>	The practice is carried out in order to create and consolidate professional knowledge and skills, get nnyh as a result of theoretical training, as well as for the study of manufacturing experience, purchase org anizatorskih skills and key competencies formation system. The purpose of the internship is to acquire practical work experience, including independent activity at the enterprise (in the organization) and competencies in the fields and (or) spheres of professional activity.			
<b>Content:</b>	1. Preparatory stage: 1.1. Development of an individual task. 1.2. Organizational meeting to clarify the goals, objectives, content and order of internship. 1.3. Acquaintance with the place of the practice. 2. The main stage: 2.1. Collection and processing of regulatory and legal, production and technological information. 2.2. Implementation of an individual assignment. 3. Final stage: 3.1. Preparation and execution of the practice report. 3.2. Report protection (intermediate attestation).			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Independent study	Exam
			324	
<b>ECTS Credits :</b>	9 ECTS			
<b>Assessment:</b>	Graded assessment			

<b>Defense of the graduate qualification work, including preparation for the defense and the defense procedure</b>				
<b>Objectives:</b>	State final certification is carried out in order to establish the level of preparedness of a graduate of a higher educational institution to perform professional tasks and the compliance of his training with the requirements of the EMS and the main educational program in the direction of training (specialty) of higher education.			
<b>Content:</b>	The WRC should contain the following sections: <ul style="list-style-type: none"> <li>1. Title page</li> <li>2. The task</li> <li>3. abstract</li> <li>4. Content</li> <li>5. Introduction</li> <li>6. Main part</li> <li>7. Conclusion</li> <li>8. List of sources used</li> <li>9. Applications.</li> </ul>			
<b>Teaching and learning methods:</b>	Lecture	Practical training	Indep. study	Exam
			216	
<b>ECTS Credits :</b>	6 ECTS			
<b>Assessment:</b>				