MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION OF HIGHER EDUCATION
"NOVOSIBIRSK STATE TECHNICAL UNIVERSITY"

GENERAL CHARACTERISTICS OF THE MAJOR PROFESSIONAL ACADEMIC PROGRAM OF HIGHER EDUCATION

Training area: 13.03.01 Heat and Power Engineering

Specialization: Production of Thermal and Electrical Energy

Qualification: Bachelor

Full-time form of education

Beginning year of the training program: 2019

The academic program was approved by the Academic Council of the Faculty of Power Engineering, protocol No. 7 dated 08/31/2020.

"APPROVED"

First Vice-Rector

_____ V.V. Yanpolsky

August 31, 2020

Novosibirsk 2020

CONTENT

1. GENERAL PROVISIONS

1.1 Regulatory documents

The major professional academic bachelor program (a bachelor program) for 13.03.01 Heat and Power Engineering training area and with specialization on Production of Thermal and Electrical Energy is developed in accordance with the following documents:

- The Federal State Educational Standard of Higher Education for 13.03.01 Heat and Power Engineering training area that is approved by the Order of the Ministry of Education and Science of the Russian Federation No. 143 dated 28.02.2018 (registered by the Ministry of Justice of the Russian Federation on 22.03.2018, registration number 50480).

Professional Standard (hereinafter - PS) 16.064 Specialist in the design of heating networks, approved by the Order of the Ministry of Labor and Social Protection of the Russian Federation on September 10, 2019 No. 609n (registered by the Ministry of Justice of Russia on October 4, 2019 No. 56139).

1.2 The purpose (mission) of the academic program

The mission of 13.03.01 Heat and Power Engineering academic program with specialization on Production of Thermal and Electrical Energy includes the following: the preparation of bachelors capable of carrying out research and professional activities in the field of heat power and heat engineering in the design and operation of heat power and heat engineering facilities aimed at producing heat, its application, control of its flows and transformation of other types of energy into heat.

1.3 The language of the academic program

The Bachelor's degree program is implemented in the state language of the Russian Federation.

1.4 The terms of mastering the academic program

The bachelor's program includes 240 credits regardless of the applied educational technologies, the implementation of the bachelor's program using a network form, the implementation of the bachelor's program according to an individual curriculum, (with the exception of accelerated training).

Obtaining education in accordance with the full-time program, regardless of the educational technologies, lasts 4 years including the vacations after the state final certification.

The bachelor's program implemented during one academic year includes no more than 70 credits.

1.5 E-learning and distance learning technologies

When implementing the academic program, e-learning and distance learning technologies are used via the electronic informational and educational environment of the Novosibirsk State Technical University (hereinafter - NSTU).

1.6 Network form of the academic program

The academic program is carried out by the organization independently.

1.7 Documents regulating the content and organization of the educational process

The major professional academic program represents a set of major educational characteristics (the scope, the content, the planned results), organizational and pedagogical conditions, forms of certification, which is presented in the following documents:

- general characteristics of the major professional academic program of higher education;
- curriculum;
- calendar training schedule;
- disciplines (modules) work program;
- practice work program;
- assessment materials in the form of assessment funds for disciplines and practice;
- programs and evaluation materials in the form of evaluation funds of the state final certification;
- teaching materials.

Information about the academic program is available on NSTU official website at http://www.nstu.ru/sveden/education.

The set of documents for the academic program is updated annually, taking into account the development of science, culture, economy, technology, and the social area.

1.8 Distinctive features of the academic program

Production of Thermal and Electrical Energy academic program for 13.03.01 Heat and Power Engineering training area has the following distinctive features:

- it takes the regional characteristics of graduates professional activity and employers needs into account;
- it is professionally orientated towards graduates professional activity – the design and operation of heat power and heat engineering facilities, in which graduates will be able to carry out their professional activities in the future, aimed at improving the efficiency and improvement of the main heat power facilities - thermal power plants and industrial enterprises in the heat power industry;
- it solves a set of design tasks allowing graduates to get a comprehensive understanding of the production of heat, its use, management of its flows and the conversion of other types of energy into heat and develop skills in the development of schemes and placement of the main and auxiliary heat and power equipment and highly efficient technological solutions in order to increase reliability and improving environmental performance;
- it possesses a set of professional activity objects that make it possible to work in the leading design, commissioning, research and development energy organizations in Russia, countries of the near and far abroad;

1.9. Demand for graduates

Graduates of the academic program are in demand at enterprises and organizations of Siberian Generating Company LLC, the Institute of Thermophysics named after V.I. S. S. Kutateladze SB RAS, production company CJSC COTES-Siberia, engineering company LLC ZiO-COTES, JSC SibTechEnergo, OSP LLC KER-Engineering, LLC UK RusEnergoMir, LLC NEP and other industrial enterprises in Novosibirsk and the Novosibirsk region, with most of which contracts for the training of specialists have been concluded.

2. CHARACTERISTICS OF GRADUATES PROFESSIONAL ACTIVITY

2.1 The areas, field, types of tasks, tasks and objects of graduates professional activity

Table 2.1.1 represents the areas, field and professional activity types specified for Production of Thermal and Electrical Energy academic program for 13.03.01 Heat and Power Engineering training area.

Table 2.1.1

Professional activity area(s) (according to the Register of professional activity areas and types)	Professional activity Field	Professional activity types of tasks	Professional activity tasks	Professional activity object(s) (branch(es) of knowledge)
16	in the field of design and operation of heat power and heat engineering facilities	design and engineering	calculation and design of parts and assemblies in accordance with the terms of reference	heat networks and heat supply systems
				Heat carriers and working fluids of power and heat engineering installations
			Participation in the collection and analysis of information source data for designing	Heat carriers and working fluids of power and heat engineering installations
				Heat networks and heat supply systems

2.2. The list of professional standards

The list of professional standards correlates with the major professional academic program in accordance with the register of professional standards (list of professional activity types). The register is published in the Professional Standards section on the Ministry of Labor and Social Protection of the Russian Federation website (http://profstandart.rosmintrud.ru). The list of professional standards corresponds to the field(s) of graduates' professional activity.

Table 2.2.1

Professional standard code and name	generalized job function			job function		
	code	name	qualification level	name	code	qualification level (sublevel)
16.064 Specialist in the field of design of heating networks	A	Preparation of design and working documentation for individual assemblies and	**6**	Project planning in accordance with the received assignment	A/14.6	6
				Preparation of design and working documentation	A/18.6	6

		elements, according to plans and profiles of heating networks		for plans and profiles of heating network routes		

A / 02.6 6

Table 2.2.1 represents the possible names of positions and professions according to professional standards). These generalized job functions are distinguished to form professional competencies at NSTU:

16.064 Specialist in the design of heating networks:

- Heating network design engineer
- Category III design engineer for the design of heating networks
- Category II design engineer for the design of heating networks

3. THE REQUIREMENTS FOR PROGRAM MASTERING

3.1 Assessment of competencies formation includes the following:

– current monitoring of progress;

– intermediate students certification;

– state final certification of graduates.

Current control and intermediate certification in disciplines and practice is carried out on the basis of a point-rating system. The forms of intermediate students certification are determined by the curriculum for every discipline. The certification rules are determined by the work programs and are explained to the students during the first month of studying the discipline.

The assessment materials include standard tasks, control papers, tests and other control methods that allow assessing the acquired competencies formation. Students are certified for the compliance of their personal achievements with the requirements for academic program mastering. Evaluation materials are developed and approved by the departments that provide the educational process with the academic program.

3.2 The set of the planned learning outcomes in disciplines (modules) and practices ensures the formation of all the competencies during the bachelor's program.

State final certification includes the preparation for the defense and defense of the final qualifying work.

Requirements for the content, scope and structure of the final qualifying work as well as the state exam are determined by the state final certification program.

4. THE STRUCTURE AND CONTENT OF THE ACADEMIC PROGRAM

4.1. The structure of the academic program

The structure of the academic program includes a compulsory part (major) and a part formed by participants of educational relations (electives).

Table 4.1.1

The structure of academic program		**Program scope, credits**
Section 1	Disciplines (modules)	220
Section 2	Practices	14

Section 3	State final certification	6
The scope of academic program		**240**

4.1. The Structure of the academic program

The structure of the academic program includes the mandatory part and the part which is formed by the participants of educational process.

4.2. Mandatory part of the Bachelor's program

The scope of the mandatory part accounts for at least 40% of the total program scope without including the scope of the state final certification.

4.3. Contact work

Educational activities in accordance with the program are carried out in the form of contact work of students with the teaching staff.

The minimum amount of contact work during training period is established by NSTU local act.

4.4. Elective subjects and additional courses

Students are provided with the opportunity to study elective subjects (modules) and additional courses in accordance with NSTU local regulatory act.

Elective subjects (modules) chosen by students are mandatory for studying.

The additional courses chosen by the students are mandatory for studying.

4.5. Characteristics of disciplines content

The content of the disciplines (modules) and practice provided by the curriculum is determined by the requirements for academic program mastering.

4.6. Applied educational technologies

Lectures, practical and laboratory classes are carried out to form the universal, general professional and professional competencies stated by the major academic program.

When organizing the educational process, active and interactive classes are used.

Specific types of educational technologies are defined in the work programs of the disciplines.

The curriculum provides the independent students work which is ensured with the necessary teaching materials available in NSTU electronic information and educational environment.

4.7. Practical training of students

Students practical training is organized by:

– practical classes, workshops, laboratory classes which ensure students participation in individual elements of work related to their future professional activities. These disciplines form general professional and professional competencies of students;

– practical classes according to the curriculum of Production of Thermal and Electrical Energy academic program for 13.03.01 Heat and Power Engineering training area.

4.8. Practice organization

To achieve the planned results of mastering the academic program, the following types of practices are stated:

– Educational: Educational practice: introductory practice,

– Educational: Educational practice: practice for obtaining primary skills of working with software,

– Practical: Practical placement: research work,

– Practical: Practical placement: pre-diploma work

– Practical: Practical placement: technological practice.

4.9. The upbringing of students when they master Production of Thermal and Electrical Energy academic program in 13.03.01 Heat and Power Engineering training area is carried out in accordance with the work program of upbringing approved at NSTU, the calendar plan of upbringing work and other educational and methodological materials.

5. CONDITIONS FOR THE IMPLEMENTATION OF THE ACADEMIC PROGRAM

The conditions for the implementation of the academic program meet the requirements of the Federal State Educational Standard of Higher Education for 13.03.01 Heat and Power Engineering training area.

6. PECULIARITIES OF ORGANIZING EDUCATIONAL ACTIVITIES FOR DISABLED PEOPLE

If there are disabled people among the students, the academic program is adapted according to the special educational needs of such students.

The period of studying in accordance with an individual curriculum for disabled people may be extended at their request by no more than six months compared to the period of the corresponding form of education.

The bachelor's program scope in the individual curriculum for disabled people, regardless of the form of study, cannot exceed 70 credits during one academic year.

At the request, NSTU provides disabled people the opportunity to undergo a bachelor's program according to the peculiarities of their psychophysical development and individual capabilities. The developmental disorders correction and social adaptation are provided if necessary.

The individual program to support the students educational activities is made up in cases of inclusive education.