СӘТБАЕВ УНИВЕРСИТЕТІ	**MINISTRY OF SCIENCE AND HIGHER EDUCATION REPUBLIC OF KAZAKHSTAN** **NON-PROFIT JOINT STOCK COMPANY "KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"**	
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PROVISION

ON DEVELOPING THE DEGREE PROGRAMS

P 029-03-02-02.1.01–2022

Almaty 2022

PREFACE

1 DEVELOPED: by Educational and Methodological department of Academic Affairs Department at NPJSC "Kazakh National Research Technical University named after K.I. Satbayev"

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5 INTRODUCED for the first time

CONTENT

1 General provisions

1.1. The given Regulation is guided by the current legislation of the Republic of Kazakhstan, RK MES regulatory documents, Charter of KazNRTU named after K.I. Satbayev, internal regulatory documents.

1.2. The given Regulation is an internal regulatory document of KazNRTU named after K.I. Satbayev and was developed with the purpose to determine the requirements and procedure for elaborating the degree programs.

1.3. All work under this regulation is supervised by Vice-Rector for Academic Affairs. Accountability for maintaining the requirements of the regulations in working order is borne by Educational and Methodological Department (hereinafter referred to as EMD)

1.4. The regulation is mandatory for execution by K.I. Satbayev KazNRTU's all employees involved in preparation, conduct and documentation processes.

1.5. The given document is an internal regulatory document of NPJSC

K.I. Satbayev KazNRTU and is not subject to submission to other parties, except for auditors of certification bodies during quality management system inspections, as well as to consumers-partners (upon their request) with the permission of NPJSC K.I. Satbayev KazNRTU's first Head.

1.6. This Regulation on the order and procedure for elaborating the degree programs has been developed in accordance with Law of the Republic of Kazakhstan "On Education", Labor Code of the Republic of Kazakhstan and in accordance with requirements of the current state mandatory standards of higher and postgraduate education.

2 Designations and abbreviations

NPJSC «Kazakh National Research Technical University named after K.I. Satbayev» - NPJSC KazNRTU named after K.I. Satbayev

SMSE – State Mandatory Standard of Education of the Republic of Kazakhstan;

RK MES - Ministry of Education and Science of the Republic of Kazakhstan;

EMD - Educational and Methodological Department;

CT - competence-based training;

LIS (SIS, MIS, DIS) – independent study of a learner (student, master's student, doctoral student);

TLIS (TSIS, TMIS, TDIS) - independent study of a learner with the teacher (independent study of a student (master's student, doctoral student) with the teacher);

WC – working curriculum

IC – individual curriculum

CED – catalog of elective disciplines

UC – university component
CC – component of choice
ISCE – international standard classification of education
NQF – national qualifications framework
IQF – industry qualifications framework
PS – professional standard
LO – learning outcomes
KC – key competences

3 Concepts and definitions applied in elaborating the degree programs and organizing the educational process

1) academic freedom – a set of authorities of subjects of the educational process provided to them for independent determination of education content in disciplines of the component of choice, additional types of training and organization of educational activities with the purpose to create conditions for creative development of students, teachers and the use of innovative technologies and teaching methods;

2) Bachelor's degree – the level of higher education aimed at training personnel with the award of Bachelor's degree in the relevant degree program with mandatory acquisition of at least 240 academic credits;

3) higher special education (specialist) – the level of higher education aimed at training personnel with the assignment of specialist qualifications in the relevant degree program with mandatory acquisition of at least 300 academic credits;

4) descriptors – a description of the level and scope of knowledge, abilities, skills and competencies acquired by students upon completing the study of the degree program in appropriate level (stage) of higher and postgraduate education, based on learning outcomes, formed competencies and academic credits;

5) academic period (Term) – the period of theoretical training, established independently by the educational organization in one of three forms: semester, trimester, quarter;

6) academic credit is a unified unit of measurement of the volume of scientific and (or) academic work (workload) of a student and (or) a teacher;

7) academic calendar (Academic Calendar) – a calendar of educational and control events, professional practices during the academic year, indicating the days of rest (vacations and holidays);

8) academic hour is a unit of measurement of the volume of training sessions or other types of academic work, 1 academic hour is equal to 50 minutes, is used in preparing the academic calendar (schedule of the educational process), schedule of training sessions, when planning and accounting for the completed training material, as well as when planning the teaching load and accounting for the teacher’s work;

9) academic mobility – transfer of students or research-teachers to study or conduct research for a certain academic period (semester or academic year) to another university (within the country or abroad) with mandatory transfer of the mastered curricula, disciplines in the form of academic credits at their university or to continue their studies at another university;

10) active handouts (Hand-outs) - visual illustrative materials distributed during training sessions to motivate students to successfully master the topic creatively (lecture abstracts, links, slides, examples, glossary, tasks for independent work);

11) educational achievements of students - knowledge, abilities, skills and competencies of students acquired by them in the learning process and reflecting the achieved level of personal development;

12) final attestation of students (Qualification Examination) is a procedure carried out in order to determine the degree to which they master the scope of academic disciplines and (or) modules and other types of educational activities provided for by the degree program in accordance with the state mandatory standard of the appropriate education level;

13) independent study of a learner (hereinafter referred to as LIS) – work on a specific list of topics allocated for independent study, provided with educational and methodological literature and recommendations; depending on the category of students, it is divided into independent study of a student (hereinafter referred to as SIS), independent work of a master's student (hereinafter referred to as MIS) and independent work of a doctoral student (further - DIS); the entire volume of LIS is confirmed by tasks that require daily independent study from the student;

14) double-degree education - the opportunity to study according to two educational programs and curricula with the purpose to obtain two equivalent diplomas or one basic and one additional;

15) European System of Transfer (Transfer) and Accumulation of Credits (ECTS) is a method of transferring credits received by a student abroad into loans that are credited for their degree upon return to their educational organization, as well as the accumulation of credits within degree programs;

16) individual curriculum - a curriculum formed for each academic year by students independently with the help of an adviser based on the degree program and the catalog of elective disciplines and (or) modules;

17) credit mobility - relocation of students for a limited period of study or internship abroad - as part of continuing studies at their home university – with the purpose to accumulate academic credits (after the mobility phase, students return to their educational organization to complete their studies);

18) additional degree program (Minor) – a set of disciplines and (or) modules and other types of educational work determined by the student for study in order to form additional competencies;

19) the module is an autonomous, completed structural element of the degree program in terms of learning outcomes, having clearly formulated knowledge, skills, competencies acquired by students and adequate evaluation criteria;

20) modular training is a way of organizing the educational process based on the modular construction of the degree program, curriculum and academic disciplines;

21) the main degree program (Major) is a degree program defined by the student for study in order to form key competencies;

22) credit technology of training – training based on the choice and independent planning of the sequence of studying disciplines and (or) modules with accumulating the academic credits;

23) independent study of a learner under the guidance of the teacher (hereinafter referred to as TLIS) - the work of a student under the teacher guidance, carried out according to a separate schedule, which is determined by University or the teacher themselves; depending on the category of students, it is divided into: independent study of a student under the teacher guidance (hereinafter referred to as TSIS), independent study of master's student under the teacher guidance (further – TMIS) and independent study of a doctoral student under the teacher guidance (hereinafter - TDIS);

24) post-requisites - disciplines and (or) modules and other types of academic work, the study of which requires knowledge, abilities, skills and competencies acquired upon completion of the study of the given discipline and (or) modules;

25) prerequisites - disciplines and (or) modules and other types of academic work containing knowledge, abilities, skills and competencies necessary for developing the studied discipline and (or) modules;

26) transcript - a document containing a list of mastered disciplines and (or) modules, and other types of academic work for the corresponding period of study, indicating credits and grades;

27) tutor - a teacher who acts as an academic consultant to a student on developing the specific discipline and (or) module;

28) advisor - a teacher who performs the functions of an academic mentor of a student in the relevant degree program, assisting in selecting the learning trajectory (formation of an individual curriculum) and developing the degree program during the training period;

29) individual curriculum (hereinafter - IC) - a student's curriculum, independently formed by them for each academic year with the help of an adviser based on the degree program and elective disciplines catalog;

30) university component (hereinafter referred to as UC) is a list of academic disciplines and the corresponding minimum amounts of academic credits determined by University independently for developing the degree program;

31) competencies - the ability to use the knowledge, skills and abilities acquired in the course of training in professional activity in practice;

32) required component - a list of academic disciplines and the corresponding minimum amounts of academic credits established by SMSE, and studied by students on a mandatory basis according to the training program;

33) working curriculum (hereinafter referred to as WC) is an educational document developed by universities independently on the basis of the degree program and individual curricula of students;

34) elective component - a list of academic disciplines and the corresponding minimum amounts of academic credits offered by University, independently selected by students in any academic period, taking into account their prerequisites and post-prerequisites;

35) thesis - the final work, which is a generalization of the results of the student's independent study of an actual problem corresponding to the profile of the degree program;

35-1) diploma project - the final work of a student, which is an independent solution of applied problems corresponding to the profile of the degree program, performed owing to project approaches and (or) in the form of preparation of business projects, models, as well as creative projects and other ones.

4 General principles of degree program elaboration

The degree program is elaborated considering the labor market needs.

Instruments of interaction between the education system and the labor market are:

- National Qualifications Framework;
- Industry qualifications framework;
- Professional standards.

The degree program is developed in the context of competence model and consists of modules, the content of which depends on the goals, competencies and learning outcomes of the modules.

In the degree program developed on the basis of professional standard, the main labor functions are projected into professional modules.

Each professional module involves the formation of competencies related to performance of the profession’s main labor functions.

Competence-based approach in elaborating the degree program is implemented through the following principles:

- focus on achieving the learning outcomes/competencies;
- the knowledge, skills and abilities formed during the training should be aimed at the ability to solve professional tasks;
- modular principle of organizing the training based on an integrated, interdisciplinary, multidisciplinary approach focused on the achievement of competencies.

Stages of elaborating the degree program of higher and postgraduate education:

- preparation for elaborating the degree program;
- designing the degree program;
- elaborating the structural elements of the degree program;
- evaluation and quality of degree program elaboration.

Stage 1. Preparation for elaborating the degree program

At the stage of preparation for elaborating the degree program, University plans to open a degree program and determines the list of areas related to preparation and degree program.

To determine the list of training areas:

1. Defining the current and future market needs:

- the need for specialists and requirements for them at the current moment and in the future;
- employment prospects of graduates (deficit or surplus).

2. Analysis of the personnel training market (including in accordance with Atlas of new professions):

- the presence of competitors in the training market at the national and regional level;
- opportunities and threats in implementing the given program;
- strengths/weaknesses of competitors.

3. Analysis of University's capabilities to carry out the degree program:

- for the availability of necessary human resources;
- for the availability of necessary material, technical, information and financial resources;
- compliance of the possibility of implementing the educational program with Part 1 requirements of ESG (Standards and guidelines for internal quality assurance)/accreditation standards.

Based on the results obtained, University determines the list of training areas.

After determining the List of training areas, University creates Academic Committee.

Academic Committee is created for each degree program by one composition for all levels of study and is a collegial governing body that determines the main directions of developing the degree program and improving the quality of its implementation.

Goal of Academic Committee is to recommend a list of degree programs for elaboration, design and improvement of the degree program.

Academic Committee consists of:

1. representatives of University from among the teaching staff. To ensure an interdisciplinary approach, representatives of both specialized and providing general education and basic training of academic departments (departments, schools etc.) are involved in the composition;
2. representatives of students;
3. representatives of employers.

Stage 2. Designing the degree program

At the design stage of the degree program, it is necessary to carry out:

1. Research of professional activity sphere. Academic Committee analyzes the documents for forming the competencies (domestic and foreign National Qualifications Frameworks, Industry Qualifications Framework and professional standards; State mandatory education standards; qualification requirements for positions etc.)

2. Identification of professionally significant competencies. The main labor functions are projected into competencies and learning outcomes.

3. Formulation of the learning outcomes of the program. Based on elaborating the competencies.

4. Determination of the relationship between learning outcomes and evaluation criteria. Each learning outcome should have criteria for assessing its achievability and be measurable.

5. Designing the methods and tools for evaluating the achievement of learning outcomes. Using the measurable evaluation methods based on specific criteria.

6. Determination of resource requirements. Resource requirements are determined owing to qualification requirements for educational activities.

As part of the design of the degree program, Academic Committee conducts a study of the field of professional activity, during which it analyzes documents to form the initial list of competencies.

Research of professional activity sphere and identification of professionally significant competencies:

- state mandatory standard of education;
- qualification requirements for positions;
- professional standards;
- international standard classification of education;
- European qualifications framework;
- national qualifications framework;
- industry qualifications framework;
- survey of employers;
- atlas of professions;
- other documents.

The preliminary list of competencies for each area of training in this professional field is formed as follows:

- general competencies (behavioral skills and personal qualities) are determined;

- professional competencies are determined (theoretical knowledge and practical skills and abilities specific to this area).

In the course of the study, if necessary, employers are interviewed in order to clarify the preliminary list of competencies compiled on the basis of an analysis of the labor market, the Industry Qualifications Framework and the professional standard.

For this:

- an employer questionnaire is developed due to the initial competencies;
- survey methods are selected:
- quantitative (using standardized surveys);
- quality (interviews and focus groups);
- selecting the survey participants - representatives of the examined professional sphere, in which graduates of the degree program will work.

To conduct the survey, Academic Committee presents the survey participants with the preliminary list of competencies, survey participants determine the degree of importance of a particular competence in the workplace and the proficiency level of a specialist after graduation.

The study results of the labor sphere can be reflected in accordance with Appendix 1.

At the design stage of the degree program, the training program results are formulated depending on the competencies focused on the training level, the requirements of professional standards and (or) requirements/employers' expectations, as well as University's development strategy.

Learning outcomes serve as the basis for determining the amount of labor intensity of the relevant disciplines in academic credits allocated to the program within the framework of the degree program. The degree program's total labor intensity should not be less than the labor intensity of the appropriate level specified in State Mandatory Standards of Education. The relationship between disciplines and learning outcomes must be defined in the degree program.

Learning outcomes are formulated:

- depending on the competencies focused with the level of training;
- in accordance with descriptors of industry qualifications framework and professional standards requirements;
- in accordance with requirements/expectations of employers;
- based on the guidelines of European Credit Transfer and Accumulation System (ECTS);
- based on Bloom's taxonomy (1. knowledge; 2. comprehension; 3. analysis; 4. synthesis; 5. evaluation). An approximate list of verbs that can be used in formulating the learning outcomes is given in Appendix 2.

Learning outcomes are formulated on the basis of the guidelines of European Credit Transfer and Accumulation System (ECTS):

- learning outcomes should adequately reflect the context, level, scope and content of the program;
- descriptions of learning outcomes should adequately reflect the context, level, range and content of the program;
- formulation of learning outcomes should be brief and not too detailed;
- learning outcomes should be brief and not too detailed;
- learning outcomes should be understandable and verifiable in terms of the student's achievements upon the program completion;

- learning outcomes should be achievable within the specified amount of labor;
- learning outcomes should be linked to relevant learning activities, methods and evaluation criteria;
- it is advisable to indicate 10-12 learning outcomes.

When designing the learning outcomes, it is necessary to take into account that the degree program should equip graduates with three main types of competencies:

- behavioral skills and personal qualities (soft skills):
- self-learning and system thinking;
- trans-disciplinarity and cross-functionality;
- ICT competencies;
- knowledge of languages;
- technological literacy;
- creativity;
- entrepreneurial spirit;
- social intelligence;
- cooperation with team members;
- customer orientation;
- ability to work with consumer requests;
- work in the mode of high uncertainty and rapid change of task conditions (the ability to make fast decisions, respond to changes in working conditions, the ability to allocate resources and manage own time).
- professional skills (hard skills) that allow each specialist to act competently in any conditions of professional activity.
- digital sciences (digital skills).

Constructors of learning outcomes:

- learning outcomes begin with "After successful completion of this program, the student will be able to" phrase;
- an active verb is used to express what students are expected to do within the framework of professional activity and personal development, implementing professional functions through the application of competencies, due to the knowledge and skills acquired (for example: graduates can "describe", "apply", "summarize", "evaluate", "plan");
- clarifies what this result refers to (object, skill) (for example: is able to explain the "hard disk function"; can present a "living room design project made by hand");
- determines the level of independence and responsibility related to the level of training;
- clarifies how the achievement of learning outcomes can be demonstrated (for example: "to make a brief overview of the materials most commonly used in electrical engineering"; "to develop a research algorithm using current scientific methods" etc.);

- the possibility of evaluating the formulated learning outcomes is checked;

The learning outcomes should:

- be focused on labor functions;
- have synergy, that is, not to be the sum of the results of teaching disciplines;
- be focused on the labor market's prospective needs.

Each learning outcome should have criteria for evaluating its achievability and be measurable.

The evaluation criterion should describe "the completed action", respectively, the criteria are formed in the categories "knows", "is able to", "possesses" (for example, "knows" - reproduces and explains the educational material with the required degree of scientific accuracy and completeness; "is able to" - solves typical problems based on the reproduction of standard solution algorithms; "possesses" - solves complicated tasks based on the acquired knowledge, skills and abilities, with their application in typical situations).

Program design involves determining the structure of the program and the order of studying the disciplines aimed at shaping learning outcomes by specifying pre and post requisites for academic disciplines.

Next, methods and means of assessing the achievement of competencies are designed.

When designing the methods and tools for evaluating the achievement of learning outcomes, it is necessary to take into account that:

- the use of measurable evaluation methods based on specific criteria;
- assessment methods should be consistent with the assessed learning outcomes;
- the grades received should reflect the level of proficiency of the students' learning outcomes;
- assessment methods and tools are described in the discipline syllabus, as well as given in its brief description in Passport of the degree program.

The need for resources for executing the degree program is determined by the qualification requirements for educational activities.

Defining the resource requirements:

- human resources (implementing the degree program is provided by scientific and pedagogical personnel who have the appropriate and confirmed by official documents education);
- material and technical base (material and technical base of the educational process should be fully provided with the appropriate sanitary and fire safety rules and regulations equipment for all types of educational, laboratory, practical and research work of students, provided by the curriculum);
- information and library support (the degree program should be provided with educational and methodological resources for all training courses, disciplines (modules));
- social resources (for executing the degree program, social resources are also needed - established partnerships of University with enterprises and

organizations of the economy's real sector; connections in professional, pedagogical and business community; connections with public associations and non-profit organizations that express the interests of representatives of this segment of the labor market, professional communities).

Stage 3. Elaborating the degree program's structural elements

At the given stage, the degree program name and goal are formulated, the degree program content is designed and learning strategies are determined.

The degree program name should reflect the program content, the name should be brief, specific and informative, and also correspond to the direction of training based on Classifier.

The degree program goal should be formulated concisely, specifically to combine the learning outcomes that should be acquired by students. The degree program goal must meet the criteria - relevance, concreteness, achievability.

Next, the degree program content is designed through the definition of modules / academic disciplines of the program. The degree program is elaborated in the context of professional functions and consists of the list of academic disciplines, the content of which allows achieving the goals of competence and learning outcomes within the framework of the presented degree program.

In the brief description of the discipline, it is necessary to reflect the goal and discipline content as indicators of reaching the learning outcomes in degree programs. The discipline description should not contain any definitions, excerpts from lectures, textbooks etc. Duplication of disciplines or the presence of different disciplines with the same content is not allowed.

In the degree program elaborated on the basis of professional standard, the main labor functions are projected into competencies and learning outcomes.

After determining the list of modules and disciplines in the context of competencies and learning outcomes, the complexity of modules and disciplines in credits is defined. On this basis, considering the pre- and post-requisites, the degree program's draft curriculum is formed. At the same time, it is necessary to comply with State Mandatory Education Standards' requirements in terms of the number of credits, depending on the direction and level of training (including cycles and components).

When elaborating the degree program's structural elements, it is necessary to pay special attention to formulation of the learning outcomes of the module / discipline.

Module/discipline learning outcomes are what a student should be able to do after successfully completing the module/discipline with the purpose to demonstrate their knowledge, understanding, skills and/or competencies. Learning outcomes of the module/discipline determine the minimum requirements for a student to successfully complete the module/discipline.

Learning outcomes of the module/discipline should be focused on learning, not teaching, and they do not specify what the teacher can provide, but show what the student can demonstrate.

All learning outcomes of the module/discipline should be evaluated. In addition, when writing the discipline's learning outcomes, it is important to consider how the discipline is integrated into the module, therefore, when formulating the module's learning outcomes, how the module is integrated into the overall program.

After formulating the learning outcomes of the program/ modules/disciplines and determining their complexity, learning strategies are determined.

The training strategy should be focused on the use of innovative teaching methods and information technologies.

With student-centered learning, the student must be in the center of teaching/learning and be an active participant in the learning process and decision-making.

When developing an academic discipline, it is necessary to determine which methods of teaching and evaluating the development of learning outcomes are best suited to achieve appropriate learning outcomes and their adequate and fair assessment.

The relationship between the achievability of the formed learning outcomes according to the educational program and academic disciplines is recommended to be reflected in Appendix 3.

Evaluation methods should ensure the measurability of the learning outcomes stated in the program.

The relative order of studying disciplines is determined through a system of pre and post requisites.

Stage 4. Evaluation and quality of degree program elaboration

Quality of the degree program elaboration is assessed by the following parameters:

- relevance of the given degree program in the labor market (at the national, regional or local levels);
- demonstration of University's potential for executing the degree program;
- presence of clearly described learning outcomes in the degree program based on the industry qualifications framework and professional standard;
- defining the amount of academic credits required for the full achievement of learning outcomes;
- adequacy of methods for assessing students' mastering the learning outcomes provided for in the degree program;
- compliance of the types of students’ activities during the educational process with the elaborated learning outcome;
- ensuring constructive interaction with stakeholders;
- transparency of the process of teaching, learning and evaluation of mastering the learning outcomes;
- providing the program management with continuous improvement of the degree program based on monitoring the results.

Internal assessment of the quality of degree program elaboration is carried out by University's Educational and Methodological Council with the involvement of stakeholders (expertise).

Evaluation of the quality of degree program elaboration, before being included in Register of the degree program, is fulfilled by Academic Committee with the involvement of stakeholders.

5 Degree programs elaboration

Elaboration, monitoring of implementation, quality assurance of degree programs are the main function of Academic Committee.

Structure of the degree program is presented in Appendix 4 and contains the following sections.

1. Description of the degree program.
2. Goal and objectives of the degree program.
3. Requirements for evaluation the degree program's learning outcomes.
4. Passport of the degree program.

4.1 General information.

4.2 Matrix of correlation of learning outcomes in the degree program as a whole with the competencies being formed.

4.3 The relationship between the achievability of the formed learning outcomes according to the educational program and academic disciplines.

4.4 Information on modules/disciplines (if there are modules, it is necessary to highlight them).

1. Curriculum of the degree program
2. Additional degree programs (Minor)

Goals and objectives of DP are formed considering the strategy, mission and vision of University, faculty, department and should give a clear understanding of the degree program to all interested parties.

Goals are formed based on the requests of the program's main consumers, while potential employers' requirements are a priority for the program developers.

Goals of the first-level (Bachelor's) programs should differ from the goals of the second-level (Master's) programs.

When defining DP goals, it is important to have a broad discussion of them in Academic Committee. This is necessary, because in accordance with requirements of the standards of specialized (program) accreditation, the program goals should be shared by the team, should be published and be accessible to all interested parties.

Learning outcomes expressed in competencies are developed at the level of the degree program, module and individual discipline. Learning outcomes should be achieved by all graduates at the time of graduation from the program.

Forming the matrix of compliance of modules, disciplines, competencies of the program graduate. Matrix clearly shows which learning outcomes contribute to the achievement of certain competencies, and allows you to systematically design

the degree program content.

The degree program content should not contain duplicate fragments from academic disciplines; educational modules.

When developing degree programs, it is necessary to take into account that the volume of each academic discipline is an integer number of academic credits. Discipline is evaluated with a volume of at least 5 academic credits. It is allowed to evaluate the discipline in 3-4 academic credits.

Each academic discipline has one non-repeating name, with the exception of physical education, languages.

Academic disciplines' content is determined by departments.

Working curricula (syllabi) are developed in all disciplines of the degree program.

The volume of one module must be at least 5 credits and includes two or more academic disciplines or in combination of one or more disciplines with other types of academic work.

Professional practices, theses (projects), Master's/Doctoral dissertations (projects) are included in the degree program's relevant modules. At the same time, each type of professional practice belongs to different modules.

Professional practice is a mandatory type of the student's educational work. The main types of professional practice are educational, industrial and pre-graduate, pedagogical, research.

With the credit technology of training, the independent study of students is divided into two parts: independent study, which is performed under the teacher guidance (TSIS), and the part that is performed completely independently (actually SIS). The entire volume of SIS is confirmed by tasks that require daily independent work from the student.

The ratio of time between the student's contact work with the teacher and SIS for all types of educational activities is approved by Academic Council of NPJSC K.I. Satbayev KazNRTU. At the same time, the volume of classroom work is at least 30% of the volume of each discipline.

Planning of theoretical training and intermediate certification is carried out by a single volume of credits, i.e. the total number of credits for each discipline includes both its study, preparation and passing of forms of intermediate attestation in the given discipline. To plan 10% of the total hours of discipline for intermediate attestation.

Each academic discipline is studied in one academic period and ends with the final control.

Planning of education content, the way of organizing and conducting the educational process is carried out on the basis of credit technology of training.

Degree programs are discussed at Department meeting, Academic Council of Institute, Educational and Methodological Council at KazNRTU named after K.I.Satbayev and approved by Academic Council at KazNRTU named after K.I.Satbayev.

6 Requirements for degree programs content

The degree program content of higher education consists of disciplines of three cycles - general education disciplines (hereinafter referred to as GED), basic disciplines (hereinafter referred to as BD) and profile disciplines (hereinafter referred to as PD). The ratio of cycles in percentages and credits to the total volume of credits and hours of the degree program are given in the current SCSE.

GED cycle includes the disciplines of the required component (hereinafter referred to as RC) and University component (hereinafter referred to as UC). BD and PD cycles include UC and CC disciplines.

In the list of GED cycle, it is not allowed to reduce the volume of disciplines of compulsory component, the content of which is determined by standard curricula. The exception is the shortened degree programs of higher education with the accelerated study period on the basis of technical and vocational, post-secondary or higher education.

Scope and content of UC and CC of the degree program are determined by Departments and consider the labor market needs, employers' expectations and the student's individual interests.

Volume of GED cycle is determined by the current SCSE. Students of universities of all specialties and (or) areas of training at the undergraduate level pass the state exam in "Modern History of Kazakhstan" discipline upon its completion, in the same academic period.

Disciplines of required component of GED cycle:

1) aimed at forming the ideological, civil and moral positions of the future specialist, competitive on the basis of knowledge of information and communication technologies, building communication programs in the state, Russian and foreign languages, orientation to a healthy lifestyle, self-improvement and professional success;

2) form a system of general competencies that ensure the socio-cultural development of the personality of the future specialist based on forming their ideological, civil and moral positions;

3) develop the ability to interpersonal social and professional communication in the state, Russian and foreign languages;

4) contribute to advancing the information literacy through the mastery and use of modern information and communication technologies in all spheres of their lives and activities;

5) form skills of self-development and education throughout life;

6) form a personality capable of mobility in the modern world, critical thinking and physical self-improvement.

Upon completion of the study of the required disciplines of GED cycle, the student will be able to:

1) evaluate the surrounding reality on the basis of worldview positions formed by knowledge of fundamentals of philosophy, which provide scientific understanding and study of the natural and social world by methods of scientific

and philosophical cognition;

2) interpret the content and specific features of the mythological, religious and scientific worldview;

3) argue their own assessment of everything that is happening in the social and industrial spheres;

4) show a civic position based on a deep understanding and scientific analysis of the main stages, patterns and peculiarities of the historical development of Kazakhstan;

5) use methods and techniques of historical description to analyze the causes and consequences of events in the modern history of Kazakhstan;

6) assess situations in various spheres of interpersonal, social and professional communication, taking into account basic knowledge of sociology, political science, cultural studies and psychology;

7) synthesize knowledge of these sciences as a modern product of integrative processes;

8) use scientific methods and techniques of research of specific science, as well as the entire socio-political cluster;

9) develop their own moral and civic position;

10) operate with social, business, cultural, legal and ethical norms of the Kazakh society;

11) demonstrate personal and professional competitiveness;

12) apply in practice knowledge in the field of social sciences and humanities, which has worldwide recognition;

13) make the choice of methodology and analysis;

14) summarize the study results;

15) synthesize new knowledge and present it in the form of humanitarian socially significant products;

16) engage in communication in oral and written forms in Kazakh,

Russian and foreign languages to solve the problems of interpersonal, intercultural and industrial (professional) communication;

17) implement the use of language and speech means based on the system of grammatical knowledge; analyze information in accordance with the communication situation;

18) evaluate the actions and actions of communication participants.

19) use various types of information and communication technologies in personal activities: Internet resources, cloud and mobile services for the search, storage, processing, protection and dissemination of information;

20) build a personal educational trajectory throughout life for self-development and career growth, focus on a healthy lifestyle to ensure full-fledged social and professional activities through methods and means of physical culture.

Disciplines of UC and (or) CC of GED cycle are aimed at developing students' competencies in the field of economics and law, basics of anti-corruption culture, ecology and life safety, as well as entrepreneurship skills, leadership, and receptivity to innovation.

Within the framework of the degree program, integrated programs are being developed in GED cycle disciplines, which have an interdisciplinary nature.

BD cycle includes the study of academic disciplines and the passage of professional practice. BD cycle includes all types of practices (professional practice)

PD cycle includes academic disciplines and types of professional practices.

Programs of disciplines and modules of BD and PD cycles are interdisciplinary and multidisciplinary in nature, providing training at the junction of a number of fields of knowledge.

Evaluation procedure, the procedure and forms of conducting the current, intermediate attestation are regulated by the academic policy of NPJSC K.I.Satbayev KazNRTU.

Final attestation of the degree program of higher education is carried out in the form of writing and defending a thesis (project) or preparing and passing a comprehensive exam. At the same time, comprehensive exam program reflects the integrated knowledge and key competencies formed by the labor market in accordance with the degree program of higher education.

The procedure for the final attestation is regulated by the academic policy of NPJSC KazNRTU named after K.I. Satbayev.

With the purpose to implement the program of trilingual education, when planning an educational program, it is planned to study 50% of academic disciplines in the language of instruction (state or Russian), 20% of academic disciplines in the second language (Russian or state, respectively) and 30% of academic disciplines in English.

While introducing the elements of dual training system when planning an educational program, it is necessary to master up to 40% of the discipline's teaching material directly at the workplace (technological process, financial and economic processes etc.).

7 Requirements for the maximum amount of student workload

Academic load is measured by the time required for a student to study an academic discipline, module or the entire degree program of higher education and necessary to achieve the established learning outcomes in the degree program of higher education.

Academic load includes all the student's educational activities - lectures, seminars, term papers (projects), practical and laboratory work, industrial practice (with dual training), professional practice, thesis (project), independent study, including under the teacher guidance.

When determining the student's workload, it should be taken into account that the academic year may consist of academic periods, the forms of which (semester – 15 weeks, trimester – 10 weeks, quarter – 7-8 weeks), periods of intermediate attestation, practices, vacations, the period of final attestation (in the

final year).

The full academic load of one academic year corresponds to 60 academic credits or 1800 academic hours. One academic credit is equal to 30 academic hours.

Duration of Master's degree is determined by the amount of academic credits grasped. Upon mastering the established amount of academic credits and achieving the expected learning outcomes for obtaining Master's degree, Master's degree program is considered fully grasped. Training of personnel in Magistracy is carried out on the basis of degree programs of higher education in two directions:

1) scientific and pedagogical with the training period of at least two years;

2) profile with the training period of at least one year.

Training of personnel in Doctoral studies is carried out on the basis of Master's degree programs in two directions:

1) scientific and pedagogical with the training period of at least three years;

2) profile with the training period of at least three years.

Upon admission of the master of the profile direction to PhD doctoral program, the degree program of postgraduate education of the pedagogical profile at scientific and pedagogical Magistracy is additionally established as prerequisites for them.

8 Modular principles of creating the degree programs

The essence of modular training is that the training content is structured into autonomous organizational and methodological modules, content and scope of which can vary depending on the didactic goals, profile and level differentiation of students.

Combination of modules provides the necessary degree of flexibility and freedom in selection and configuration of the required specific educational material for training (and self-study) of a certain category of students and implementation of special didactic and professional goals.

With the modular construction of an academic discipline, its program is structured into modules aimed at acquiring the necessary knowledge, abilities, skills and competencies by students.

Basic principles of modular training are:

1) a systematic approach to constructing the structure of degree programs, the specific discipline and their content’s definition;

2) structuring of knowledge into separate elements and a clearly expressed approach of cooperation between teachers and students;

3) ensuring methodically correct coordination of all types of training sessions within each module and between them;

4) flexibility of the structure of modular course and degree programs themselves;

5) effective control of students' knowledge, dispersal of control measures by semester;

6) possibility of implementing the methodological principles of developing learning, which create prerequisites for students' creative activity.

Each module of the degree program is focused on achieving the certain learning outcomes.

Modules based on the meaningful unity of disciplines can be built according to "horizontal" and/or "vertical" scheme. In "horizontal" module, the discipline's all components make an approximately equal and relatively independent contribution to educational outcome, which can be studied in parallel. "Vertical" module includes the consistently studied disciplines aimed at achieving a certain educational result, from fundamental and general professional ones to special narrowly applied ones.

Construction of modular degree program is based on:

1) preliminary interdisciplinary study of the content of existing degree programs in order to exclude duplicate fragments from academic disciplines;

2) definition of the list of training modules;

3) determination of possible educational trajectories (taking into account the areas of activity specified in IQF and professional standards, Master's programs, elective disciplines, additional degree programs etc.);

4) management of degree programs aimed at updating the educational process on modular learning principles.

Types of professional practices, theses and master's/doctoral dissertations are included in the degree program's corresponding modules, depending on the relationship and unity of goals with academic disciplines. At the same time, each type of professional practice can belong to different modules.

As part of the module, the share of each component in credits is determined in direct proportion to its volume in the module's total labor intensity.

In accordance with the modular principle, it is advisable to make up the degree program and academic disciplines from the invariant part (modules for compulsory study, consisting of an intra-university component) and variable, that is, replaceable modules that take into account the needs of the labor market, employers and students.

Modules are divided into the following types:

1) general modules - including disciplines of GED cycles that form general educational competencies that are not directly related to the specialty, as well as socio-ethical, cultural competencies (interpersonal, intercultural, civil), economic (entrepreneurial) and organizational and managerial competences;

2) specialty modules - including disciplines of BD and PD cycles that form the basis of specialty and are aimed at forming the professional (key and additional) competences, including critical thinking, creativity (oeuvre), active lifestyle, innovativeness;

Curriculum, built on the modular principle, is a model of the content of education, consisting of modules that are structured into disciplines of GED, BD, PD cycles and include disciplines of University component and component of choice.

Curriculum is elaborated by departments and coordinated by Institute's Academic Council, Educational and Methodological Council of KazNRTU named after K.I. Satbayev and approved at the meeting of Academic Council of KazNRTU named after K.I. Satbayev.

Upon completion of studying the module, the final control is carried out in the form of testing for each discipline separately and, if necessary, taking practical skills (integrated / complex / separately for each discipline of the module).

To receive credits for the module, it is necessary to perform all types of work on each component and a positive assessment on the final control.

In case of an unsatisfactory assessment in one of the disciplines of the module at final control, only this discipline is retaken (in the case of FX assessment) or re-studied.

Degree programs, as well as amendments and additions to them are approved before the beginning of the academic year until June 1 of the current academic year at the meeting of Academic Council of KazNRTU named after K.I. Satbayev.

9 Requirements for the level of training of students

Requirements for the level of training of students are determined on the basis of Dublin descriptors of the first level of higher education (Bachelor's degree) and reflect the acquired competences expressed in the achieved learning outcomes.

Learning outcomes are formed both at the level of the entire degree program of higher education, and at the level of individual modules or academic discipline.

Descriptors of the first level (Bachelor's degree) reflect the learning outcomes that characterize the abilities of students:

1) to demonstrate knowledge and understanding in the field being studied, based on advanced knowledge of the given field;

2) to apply knowledge and understanding at a professional level, formulate arguments and solve problems of the studied area;

3) to collect and interpret information for creating judgments taking into account social, ethical and scientific considerations;

4) to communicate information, ideas, problems and solutions to both specialists and non-specialists;

5) learning skills necessary for independent continuation of further education in the field of study.

Learning outcomes in the programs of higher special education are equal to learning outcomes in the corresponding Master's degree programs in the profile direction.

Requirements for the level of training of a master's student are determined on the basis of Dublin descriptors of the second level of higher education (Master's degree) and reflect the acquired competences expressed in the achieved learning outcomes:

1) to demonstrate developing knowledge and understanding in the field under study, based on advanced knowledge of this field, when developing and (or) applying ideas in research context;

2) to apply own knowledge, understanding and abilities at the professional level to solve problems in a new environment, in broader interdisciplinary context;

3) to collect and interpret information for forming judgments taking into account social, ethical and scientific considerations;

4) to clearly and unambiguously communicate information, ideas, conclusions, problems and solutions to both specialists and non-specialists;

5) learning skills necessary for independent continuation of further education in the field of study.

Learning outcomes are formulated both at the level of the entire Master's degree program and at the level of individual modules or academic discipline.

Individuals who have completed their studies under Bachelor's/Master's degree program and successfully passed the final certification are awarded Bachelor's/Master's degree and a diploma of higher/postgraduate education with an appendix (transcript) is issued free of charge.

Requirements for the level of training of a doctoral student are determined on the basis of Dublin descriptors of the third level of higher education (Doctorate) and reflect the acquired competences expressed in the achieved learning outcomes:

1) to demonstrate a systematic understanding of the field of study, mastering the skills and research methods used in this field;

2) to demonstrate the ability to think, design, implement and adapt an essential research process with the scientific approach;

3) to contribute with their own original research to expansion of the boundaries of the scientific field, which deserves publication at the national or international level;

4) to critically analyze, evaluate and synthesize new and complex ideas;

5) to communicate their knowledge and achievements to colleagues, the scientific community and the general public;

6) to promote knowledge-based technological, social or cultural development of society in the academic and professional context.

Learning outcomes are formulated both at the level of the entire degree program of Doctoral program, and at the level of individual modules or academic discipline.

Individuals who have mastered the degree program of Doctoral studies and defended a doctoral dissertation, with a positive decision of Dissertation Councils of University with a special status or Committee for Quality Assurance in the field of education and science at Ministry of Education and Science of the Republic of Kazakhstan, based on examination results, are awarded the degree of Doctor of Philosophy (PhD) or Doctor in profile, and a state-issued diploma with appendix (transcript).

Appendix 1

Results of the study of the labor sphere

Profession	Labor function A	Professional task A 1	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task A 2	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task A 3	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task A 4	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
	Labor function B	Professional task B 1	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task B 2	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task B 3	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task B 4	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends

	Labor function C	Professional task C 1	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task C 2	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task C 3	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends
		Professional task C 4	Knowledges
			Skills
			Standards of conduct
			Equipment and tools
			Future trends

Appendix 2

The approximate list of verbs that can be applied in formulating the learning outcomes

Verbs that can be applied to reveal knowledge:

Define, describe, enumerate, find, link, assert, write, measure, compare, revise, extract, identify, show, name.

Verbs that can be applied to reveal understanding:

Generalize, describe, compare, classify, contrast, transform, discuss, distinguish, identify, evaluate, explain, formulate, give examples, interpret, translate, express, illustrate, discuss, predict, present and choose.

Verbs that can be applied to reveal the ability to use:

Apply, evaluate, modify, select, show, discover, calculate, explain how, illustrate, predict, prepare, produce, link, show, solve, study, check, calculate, construct, update, classify, experiment, solve.

Verbs that can be applied to reveal the ability to analyze:

Analyze, divide, classify, arrange, compare, conclude, contrast, criticize, diagnose, explain, combine, differentiate, distinguish, study, justify, draw conclusions.

Verbs that can be applied to reveal the ability to synthesize:

Consider, affirm, connect, compose, conclude, create, receive, develop, formulate, generalize, establish, transform, integrate, rearrange, organize, plan, propose, invent, reformulate, communicate, revise, select, generalize, synthesize, teach, tell.

Verbs that can be applied to reveal assessment skills:

Evaluate, determine the cost, decide, determine, rank, recommend, elect, distinguish, choose, compare, conclude, criticize, defend, judge, confirm, make ratings, generalize.

Verbs that can be applied to reveal problem-solving skills:

Solve, choose, define, propose, plan, confirm, evaluate, formulate, describe the order of actions, develop, suggest options.

Verbs that can be applied to reveal communication skills:

Communicate, express, explain, answer, debate, defend, review, exam, tell, teach, present, draw conclusions.

Appendix 3

Relationship between the achievability of the formed learning outcomes according to the degree program and academic disciplines

#	Name of the discipline	Brief description of the discipline	The number of credits	The formulated learning outcomes (codes)								
				LO1	LO2	LO3	LO4	LO5	LO6	LO7	.....	……..
Cycle of general education disciplines Required component												
						v						
Cycle of general education disciplines University component												
							v					
Cycle of basic disciplines University component												
Cycle of basic disciplines Component of choice												
					v							
Cycle of profile disciplines University component												
									v			
Cycle of profile disciplines Component of choice												
				v								

Appendix 4

SATBAYEV UNIVERSITY

Institute _____
Department _____

DEGREE PROGRAM

_____

cipher and name of the degree program

Code and classification of the field of education:
Code and classification of training directions:
Group of degree programs:
Level of NQF:
Level of IQF:
Duration of training:
The number of credits:

Almaty city, 2022

The degree program _____ was approved
cipher and name of the degree program

at the meeting of Academic Council of KazNRTU named after K.I. Satbayev.

Minutes # __ dated «____» _____20__.

Reviewed and recommended for approval at the meeting of Educational and Methodological Council at KazNRTU named after K.I. Satbayev.

Minutes # __ dated «____» _____20__.

The degree program _____
cipher and name of the degree program

was developed by Academic Committee in the direction «_____»

Full name	Academic degree/ academic title	Position	Place of work	Signature
Chairperson of Academic Committee:				
Teaching staff:				
Employers:				
Students				

Content

List of abbreviations and designations

1. Description of the degree program

2. Goal and objectives of the degree program

Goal of DP:
Objectives of DP:

3. Requirements for assessing the learning outcomes of the degree program

4. Passport of the degree program

4.1. General information

#	Field name	Comments
1	Code and classification of the field of education	
2	Code and classification of training directions	
3	Degree program group	
4	Name of the degree program	
5	Brief description of the degree program	
6	Goal of DP	
7	Type of DP	
8	Level of NQF	
9	Level of IQF	
10	Distinctive features of DP	
11	List of competences of the degree program	
12	Learning outcomes of the degree program	
13	Form of training	
14	Duration of training	
15	The number of credits	
16	Languages of instruction	
17	Academic degree awarded	
18	Compiler(s) and authors	

4.2. Matrix of correlation of learning outcomes according to the degree program as a whole with the competences formed

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	…..
QC1								
…								
…								
QC…								

4.3. Relationship between the achievability of the formed learning outcomes according to the degree program and academic disciplines

#	Name of discipline	Brief description of the discipline	The number of credits	Formed learning outcomes (codes)								
				LO1	LO2	LO3	LO4	LO5	LO6	LO7	.....	……..
Cycle of general education disciplines Required component												
						v						
Cycle of general education disciplines University component												
							v					
Cycle of basic disciplines University component												
Cycle of basic disciplines Component of choice												
					v							
Cycle of profile disciplines University component												
									v			
Cycle of profile disciplines Component of choice												
				v								

4.4. Information on disciplines

3	Name of the discipline	Brief description of the discipline (30-50 words)	The number of credits	Formed competences (codes)
Cycle of general education disciplines University component				
Cycle of basic disciplines University component				
Cycle of basic disciplines Component of choice				
Cycle of profile disciplines University component				
Cycle of profile disciplines Component of choice				

5. Curriculum of the degree program

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K.I. SATBAYEV

SATBAYEV UNIVERSITY

APPROVED by
Board Chairman -
Rector of KazNRTU
named after K.I. Satbayev
_____ M.M.Begentayev
«____» _____ 2022.

CURRICULUM
OF THE DEGREE PROGRAM for admission for 2022-2023 academic year
Degree program 6B0……. – «…….»
Group of degree programs 6B0….. – «……»

Form of training: _____ Duration of training: _____ Academic degree: _____

Code of the discipline	Name of the discipline	Cycle	Total amount in credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in hours	Form of control	Allocation of classroom lessons based on courses and semesters							
								I course		II course		III course		IV course	
								1 semester	2 semester	3 semester	4 semester	5 semester	6 semester	7 semester	8 semester
Cycle of general education disciplines (GED)															
M-1. Module of language training															
LNG 108	Foreign language	GED, RC	10	300	0/0/6	210	E	5	5						
LNG 104	Kazakh (Russian) language	GED, RC	10	300	0/0/6	210	E	5	5						
M-2. Module of physical training															
KFK 101-104	Physical Culture	GED, RC	8	240	0/0/8	120	Difcredit	2	2	2	2				
M-3. Module of Information Technology															
CSE 677	Information and communication technologies (in English)	GED, RC	5	150	2/1/0	105	E			5					
M-4. Module of socio-cultural development															
HUM 100	Modern history of Kazakhstan	GED, RC	5	150	1/0/2	105	SE	5							
HUM 132	Philosophy	GED, RC	5	150	1/0/2	105	E			5					

HUM 120	Module of socio-political knowledge (sociology, political science)	GED, RC	3	90	1/0/1	60	E			3					
HUM 134	Module of socio-political knowledge (cultural studies, psychology)		5	150	2/0/1	150	E				5				
M-5. Module fundamentals of anti-corruption culture, ecology and life safety															
HUM 133	Fundamentals of anti-corruption culture	GED, CC	5	150	2/0/1	150	E				5				
MNG 488	Fundamentals of Entrepreneurship and Leadership														
CHE 656	Ecology and life safety														
	CYCLE OF BASIC DISCIPLINES (BD)														
M-6. Module of physical and mathematical training															
MAT 101	Mathematics I	BD, UC	5	150	1/0/2	105	E	5							
PHY 111	Physics I	BD, UC	5	150	1/1/1	105	E	5							
MAT 102	Mathematics II	BD, UC	5	150	1/0/2	105	E		5						
M-7. Module of basic training															
GEN 429	Engineering and computer graphics	BD, UC	5	150	1/0/2	105	E		5						
	Department component	BD, UC	4	120	2/1/0*	75	E	4							
	Department component	BD, UC	5	150	2/1/0*	105	E		5						
	Department component	BD, UC	6	180	2/1/1*	120	E			6					
	Department component	BD, UC	5	150	2/1/0*	105	E				5				
	Department component	BD, UC	5	150	2/1/0*	105	E			5					
	Elective	BD, CC	5	150	2/1/0*	105	E			5					
	Department component	BD, UC	5	150	2/1/0*	105	E				5				
	Department component	BD, UC	5	150	2/1/0*	105	E					5			
	Elective	BD, CC	5	150	2/1/0*	105	E				5				
	Department component	BD, UC	5	150	2/1/0*	105	E					5			
	Department component	BD, UC	5	150	2/1/0*	105	E					5			
	Department component	BD, UC	5	150	2/1/0*	105	E					5			
	Department component	BD, UC	5	150	2/1/0*	105	E					5			

	Elective	BD,CC	5	150	2/1/0*	105	E					5			
	Department component	BD,UC	5	150	2/1/0*	105	E						5		
	Elective	BD,CC	4	120	2/1/0*	75	E						4		
	Elective	BD,CC	5	150	2/1/0*	105	E						5		
	Elective	BD,CC	6	180	2/1/1*	120	E							6	
	Educational practice	BD, UC	2						2						
CYCLE OF PROFILE DISCIPLINES (PD)															
M-8. Module of professional activity															
	Department component	PD, UC	4	120	2/1/0*	75	E						4		
	Department component	PD, UC	5	150	2/1/0*	105	E						5		
	Department component	PD, UC	4	120	2/1/0*	75	E						4		
	Department component	PD, UC	6	180	2/1/1*	120	E							6	
	Elective	PD, CC	5	150	2/1/0*	105	E							5	
	Elective	PD, CC	5	150	2/1/0*	105	E							5	
	Elective	PD, CC	6	180	2/1/1*	120	E							6	
	Elective	PD, CC	5	150	2/1/0*	105	E							5	
	Elective	PD, CC	5	150	2/1/0*	105	E								5
	Elective	PD, CC	5	150	2/1/0*	105	E								5
	Elective	PD, CC	5	150	2/1/0*	105	E								5
	Production practice I	PD, UC	2								2				
	Production practice II	PD, UC	3										3		
M-9. Module of final attestation															
ECA003	Preparation and writing of the thesis (project)	FA	6												6
ECA103	Defense of the thesis (project)	FA	6												6
	M-10. Module of additional types of training														
AAP500	Military training	DME	0												
	Total based on UNIVERSITY:							**31**	**29**	**31**	**29**	**30**	**30**	**33**	**27**
								60		**60**		**60**		**60**	

The number of credits for the entire study period					
Cycle code	**Cycles of disciplines**	**Credits**			
		Required Component (RC)	**University Component (UC)**	**Component of Choice (CC)**	**Total**
GED	Cycle of general education disciplines	51		5	56
BD	Cycle of basic disciplines		82	30	112
PD	Cycle of profile disciplines		24	36	60
	Total for theoretical training:	***51***	***106***	***71***	***228***
FA	Final attestation	12			12
	TOTAL:	**63**	**106**	**71**	**240**

Note:

1. Module of basic training and professional activity of Department themselves prescribe the names of modules and their amount
2. * - Division into types of work at the discretion of Department
3. If necessary, the disciplines: Physics II, Mathematics III, General chemistry of Department include, at the expense of credits of Department's BD, UC component from the basic training module
4. The full academic load of one academic year should be 60 academic credits
5. Appendix of the catalog of elective disciplines in the same way as Curriculum is divided based on modules, with the inclusion of "R&D" Module

Decision of Academic Council at KazNRTU named after K.I. Satbayev.
Minutes # __ dated «____» _____20___.

Decision of Educational and Methodological Council at KazNRTU named after K.I. Satbayev.
Minutes # __ dated «____» _____20___.

Decision of Academic Council _____.
Minutes # __ dated «____» _____20___.

Vice-Rector for Academic Affairs **_____** **Full name**

Director of Institute **_____** **Full name**

Head of Department **_____** **Full name**

Representative of Specialty Council from employers **_____** **Full name**

6. Supplementary degree programs (Minor)

Name of supplementary degree programs (Minor) with disciplines	Total number of credits	Recommended semesters of study	Documents on the results of mastering the supplementary degree programs (Minor)

REGISTRATION SHEET ON CHANGES

Serial number of the change	Section, item of the document	Type of the change (to replace, cancel, add)	Notification number and date	The change was made	
				Date	Surname and initials, signature, position