CENTRAL ASIAN ASSOCIATION FOR ACCREDITATION OF EDUCATION
CAAAE

Approved by the
Accreditation Council

STANDARDS SPECIALIZED ACCREDITATION EDUCATIONAL PROGRAMS HIGHER EDUCATIONAL INSTITUTIONS

Almaty, 2024

СОДЕРЖАНИЕ

* *They are used for the accreditation of engineering and technical educational programs*

** *It is used for the accreditation of the pedagogical educational programs*

THE PREFACE

These standards for the accreditation of educational programs have been developed by the Central Asian Association for Educational Accreditation (CAAAE) in order to ensure high-quality training for specialists with higher professional education. Compliance with standards should guarantee quality and contribute to the continuous improvement of educational programs in higher education institutions.

The CAAAE standards comply with the provisions of the Bologna Declaration and distinguish between the first and second cycle programs. The term "cycle" is used to define an educational program leading to an academic degree. Bachelor's degree programs belong to the first cycle, and master's degree programs belong to the second cycle.

Since 1995, the Tempus QUEECA Project has been implemented in Kazakhstan aimed at creating and implementing a quality assurance system for engineering education in Central Asian countries, and has resulted in the creation of national agencies, including the CAAAE Agency for Quality Assurance of educational programs and the authorized ENAEE to award the EUR-ACE Label quality mark.

In 2015, the CAAAE became a member of ENAEE and FEANI, which allowed Kazakhstan to have a quality assurance system integrated into the European Union. This gives graduates of domestic universities the opportunity to receive internationally recognized diplomas and find free employment in the countries of the European Union. Such a transparent qualification recognition system is the first step towards creating a common market for labor resources and services.

The accreditation agencies that are part of the ENAEE mutually recognize the equivalence of programs with the EUR-ACE Label and guarantee that their quality meets the pan-European standard. Currently, the ENAEE includes such accreditation agencies as Engineers Ireland (Ireland), ECUK (Great Britain), ASIIN (Germany), Ordem dos Engenheiros (Portugal), CTI (France), AIOR (Russia) and CAAAE (Kazakhstan).

Currently, it is impossible to complete accreditation without the participation of the professional community. So, in particular, the founders of the CAAAE are the Association of Legal Entities "Association "Kazakhstan National Monitoring Committee IGIP", the Institution "National Academy of Sciences of Higher School of Kazakhstan", which allows taking into account the opinion of all interested parties in the quality assurance procedure of educational programs.

On March 06, 2023, by the decision of the Republican Accreditation Council, the CAAAE was included in the National Register No. 1 of the Ministry of Education and Science of the Republic of Kazakhstan for a period of five years.

The CAAAE standards and accreditation procedure have been developed taking into account international experience in assessing the quality of education and in order to meet the requirements for the quality of training by the accreditation systems of the Washington Agreement member countries, the requirements of the European Association for Quality Assurance of Higher Education ENQA, the European Network for Accreditation of Engineering Education ENAEE and the International Network for Quality Assurance in Higher Education INQAAHE [3].

The CAAAE standards are focused on evaluating the achievement of planned learning outcomes. Learning outcomes are a set of competencies, knowledge, skills, and methodological culture acquired by students at the end of the educational program. They are developed on the basis of the requirements imposed by the professional community to graduates, and are coordinated with the "Dublin Descriptors" developed within the framework of the creation of a single European higher education area during the implementation of the Bologna process.

A prerequisite for the accreditation of the program is the confirmation of the achievement of the planned learning outcomes by all students completing the program and the graduates' readiness for professional activity in accordance with the objectives of the program.

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The learning outcomes are planned based on the objectives of the educational program and must comply with the requirements of the CAAAE presented in this document. The objectives of the educational program are formulated by the department / university implementing the program, must be consistent with the educational standards of higher professional education of the Republic of Kazakhstan and the mission of the university. Educational programs licensed by the Education and Science Control Committee of the Ministry of Education and Science of the Republic of Kazakhstan are accepted for accreditation.

An educational program can be accredited only if it meets all the criteria listed below.

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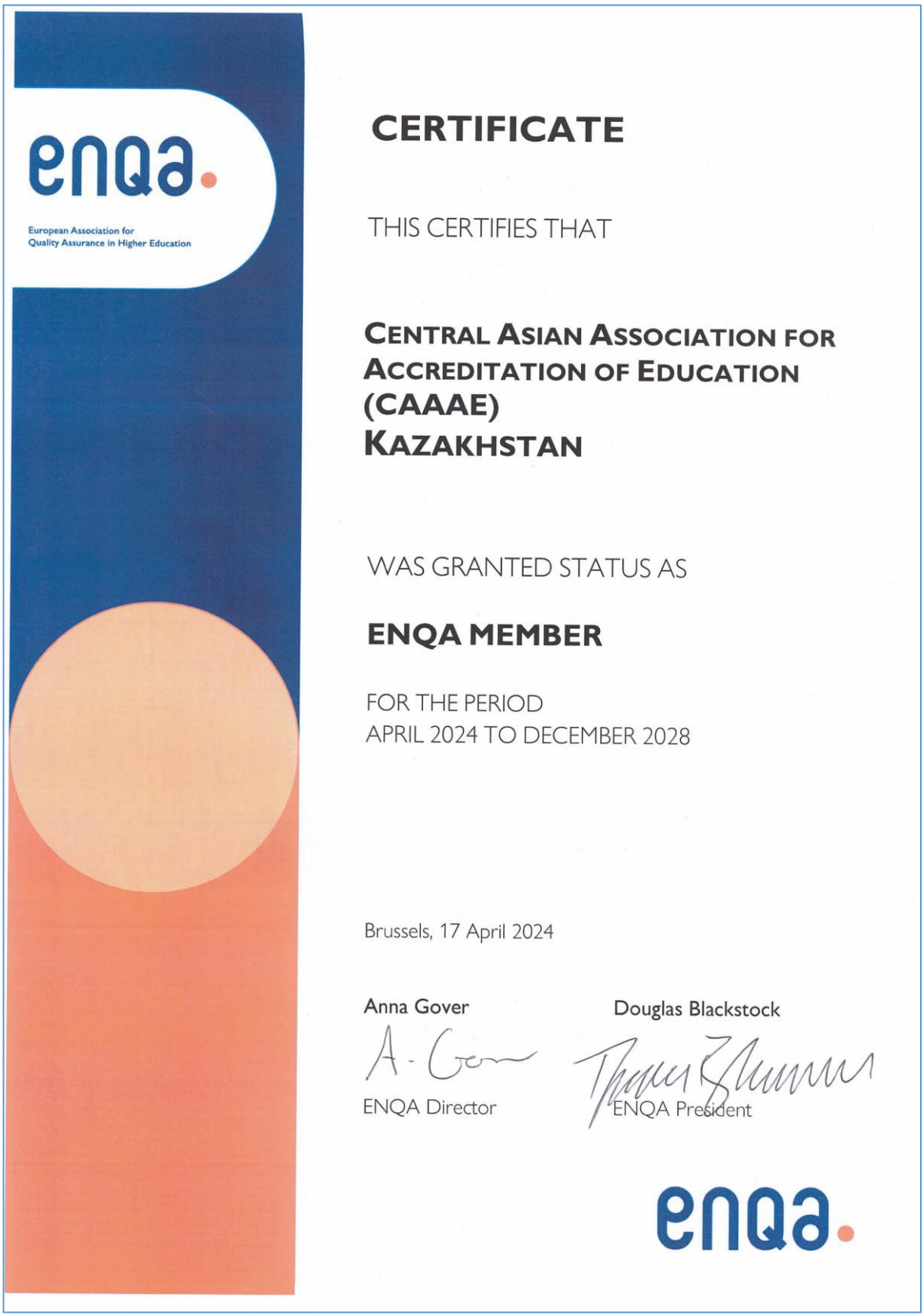

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European Association for Quality Assurance in Higher Education

CERTIFICATE

THIS CERTIFIES THAT

CENTRAL ASIAN ASSOCIATION FOR ACCREDITATION OF EDUCATION (CAAAE) KAZAKHSTAN

WAS GRANTED STATUS AS

ENQA MEMBER

FOR THE PERIOD
APRIL 2024 TO DECEMBER 2028

Brussels, 17 April 2024

Anna Gover
ENQA Director

Douglas Blackstock
ENQA President

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Central Asian Association for Accreditation of Education (CAAAE)

is re-authorized

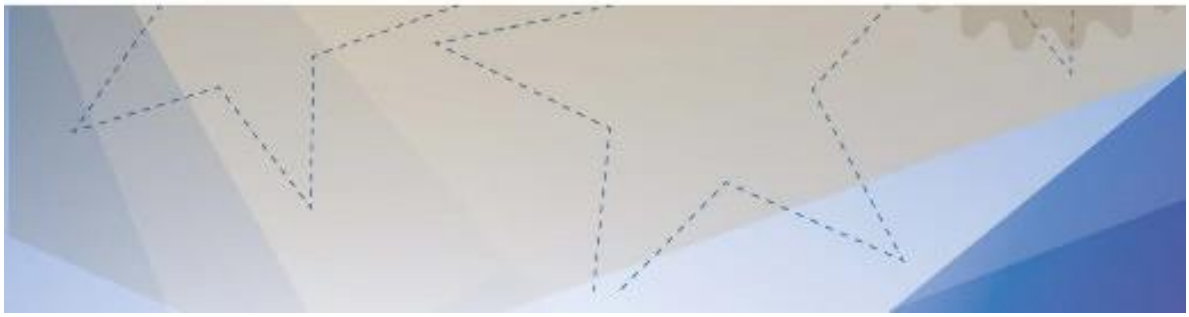
from 1 January 2023
to 31 December 2028

to award the EUR-ACE® Label to accredited Bachelor and Master level engineering programmes

José Carlos Quadrado

President

Brussels, 25 September 2023



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STANDARDS OF SPECIALIZED ACCREDITATION OF EDUCATIONAL PROGRAMS OF HIGHER EDUCATIONAL INSTITUTIONS

1. Scope of application

1.1 These standards have been developed in accordance with the Law of the Republic of Kazakhstan "On Education" and based on the standards and guidelines for quality assurance in the European Higher Education Area (ESG). When compiling these standards, the authors took into account the standards of existing accreditation agencies.

1.2 These standards are used as a quality assurance tool during the procedure of specialized accreditation of educational programs of a higher educational institution.

1.3 The provisions of these standards can be used by universities and are mandatory for them when undergoing specialized accreditation, regardless of their status, organizational and legal forms, forms of education and departmental subordination.

1.4 These standards are used by universities to conduct specialized self-assessment of educational programs, identify and improve internal quality assurance mechanisms, develop internal documentation and develop corporate culture.

2. Regulatory references

This standard uses references to the following legislative and regulatory documents:

2.1 Закон Республики Казахстан об образовании от 27 июня 2007 г. № 319-III.

2.2 Закон Республики Казахстан о внесении изменений и дополнений в некоторые законодательные акты Республики Казахстан по вопросам расширения академической и управленческой самостоятельности высших учебных заведений от 4 июля 2018 года № 171-VI.

2.3 Постановление Правительства Республики Казахстан «Об утверждении Концепции развития высшего образования и науки в Республике Казахстан на 2023 – 2029 годы» от 28 марта 2023 года №248.

2.4 Закон Республики Казахстан о техническом регулировании от 9 ноября 2004 г. № 603-II ЗРК.

2.5 Приказ Министра науки и высшего образования Республики Казахстан «Об утверждении государственных общеобразовательных стандартов высшего и послевузовского образования» от 20 июля 2022 года №2.

2.6 Закон Республики Казахстан об аккредитации в области оценки соответствия от 5 июля 2008 г. № 61-IV.

2.7 Приказ и.о. Министра науки и высшего образования Республики Казахстан «Об утверждении стандарта аккредитации педагогического образования» от 17 августа 2023 года №421.

2.8 Приказ Министра образования и науки Республики Казахстан «об утверждении Руководства по обеспечению качества по уровням образования» от 23 июня 2022 года №4.

2.9 Стандарты и руководства для обеспечения качества в европейском пространстве высшего образования (ESG) (новая редакция) (Утверждена на Ереванской конференции министров образования в 14-15 мая 2015 г.).

2.10 Руководство по использованию ECTS (Европейской системы перевода и накопления кредитов). - Офис публикаций Европейского Союза, 2015 год, ISBN 978-92 - 79-43562-1 (Утверждено на Ереванской конференции министров образования в 14-15 мая 2015 г.).

2.11 Национальная рамка квалификаций.

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** *It is used for the accreditation of the pedagogical educational programs*

2.12 Руководства по обеспечению качества по уровням образования, утвержденный приказом министра образования и науки Республики Казахстан от 23 июня 2022 года №292.

3. Terms and definitions

The following definitions are used in these standards:

3.1 **Accreditation of an educational organization** is a procedure for the recognition by an accreditation body of the conformity of educational services with established standards (regulations) of accreditation in order to provide objective information about their quality and confirm the availability of effective mechanisms to improve it;.

3.2 **An accreditation body** is a legal entity that conducts institutional and/or specialized accreditation of educational organizations based on standards developed by it.;

3.3 **Specialized accreditation** is an assessment of the quality of individual educational programs implemented by an educational organization.

3.4 **Distance learning technologies** (hereinafter referred to as DOT) are learning technologies implemented using information and telecommunication means with indirect (at a distance) or not fully mediated interaction between the student and the teaching staff.

3.**5 Information resources** - a set of library collections, electronic educational materials and other electronic educational resources, electronic catalogs, databases of electronic scientific resources, etc.

3.6 **Final certification of students** is a procedure conducted to determine the degree to which they have mastered the scope of academic subjects, academic disciplines and/or modules provided for by the state mandatory standard of the relevant level of education.

3.7 **Credit technology of education** is education based on the choice and independent planning of the sequence of subjects studied by the student with the accumulation of academic credits.

3.8 **Quality of education** - compliance of the level of knowledge of students and graduates with the requirements of the State Educational Standard and additional requirements established by the university.

3.9 **Marketing of educational services** is a type of university activity aimed at researching the satisfaction of the needs and requirements of consumers, designed to focus the production of educational services on training specialists in demand in the market.

3.10 **Educational monitoring** is the systematic observation, analysis, assessment and forecast of the state and dynamics of changes in the results and conditions of educational processes, the student body, the network, as well as the rating indicators of achievements of educational organizations.

3.11 **Professional practice** is a type of educational activity aimed at consolidating theoretical knowledge, skills, acquisition and development of practical skills and competencies in the process of performing certain types of work related to future professional activity.

3.12 **An educational program** is a single set of basic characteristics of education, including the goals, results and content of education, the organization of the educational process, ways and methods of their implementation, and criteria for evaluating learning outcomes.

3.13 **Educational activity** is a process of purposeful, pedagogically based, consistent interaction of subjects of education, during which the tasks of teaching, developing and educating a personality are solved.

3.14 **The final results of students' education** are a set of competencies, knowledge and skills that students should possess upon graduation from this educational program.

3.15 **The visit of the university by the commission of external auditors** is a component of the external assessment, which is a generally accepted part of the accreditation process. External expert auditors visit the university to check the materials of the self-assessment of the university's educational program, interview the faculty, students, and staff, and evaluate the quality and effectiveness of the

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services provided, as well as offer recommendations for their improvement. The result of the visit is an audit report on the educational programs of a higher educational institution.;

3.16 **Competence** – the ability to apply one's knowledge, skills and abilities. It manifests itself in personality-oriented activity and characterizes the ability of a specialist to realize his human potential for professional activity.

3.17 **Procedure** - an established way of carrying out an activity or process.

3.18 **Accreditation standards** - documents of the accreditation body that establish the requirements for the accreditation procedure;

3.19 **Student–centered learning** is a process of qualitative transformation for students and other students in the learning environment, aimed at improving their autonomy and critical ability through an effective approach.

3.20 **A quality management system** is a set of measures and constantly implemented operations that are used in an organization to achieve the required quality of services or products, which is the result of the activities of this organization. organizations.

3.21 **Intermediate certification of students** is a procedure conducted to assess the quality of students' mastery of the content of part or all of one academic subject, one academic discipline and/or module, as well as professional modules within the same qualification after completing their studies.

3.22 **A university** is an organization of higher and (or) postgraduate education that carries out scientific and pedagogical activities, personnel training, fundamental and (or) applied scientific research in various fields and is a leading scientific and methodological center.

4. Designations and abbreviations

The following designations and abbreviations are used in these standards:
University – higher education institution;
GOSO – state mandatory education standards;
DOT - distance educational technologies;
MSHE RK – Ministry of Science and Higher Education of the Republic of Kazakhstan;
Research and development–scientific and research work;
ICT - information and communication technologies;
Teaching staff – teaching staff;
ECTS – European Credit Transfer and Accumulation System;
ESG – Standards and recommendations for quality assurance in the European Higher Education Area;
SAPO – Standards of Teacher Education Accreditation;
NRK – National Qualifications Framework;
CAAAE – Central Asian Association for Accreditation of Education

5. Principles of specialized accreditation of educational programs

5.1 The presented standards for ensuring the quality of educational programs of higher education are based on the following principles:

5.1.1 The procedure for specialized accreditation of educational programs of universities is carried out on a voluntary basis;

5.1.2 the main responsibility for the quality of educational programs of higher education lies with the university;

5.1.3 the external assessment is conducted objectively, transparently and independently of the interference of third parties (government agencies, higher education institutions and public organizations);

5.1.4 The information provided by universities is used confidentially by the Central Asian Association for Educational Accreditation;

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5.1.5 informing the public at home and abroad about accredited educational programs is carried out by submitting information by the agency to the authorized bodies in the field of education and ENAEE, as well as by posting on the CAAAE website.

** Teacher education accreditation is based on the following principles:

1) competence;
2) independence;
3) impartiality;
4) objectivity;
5) voluntary;
6) Transparency.

5.1.6 The Central Asian Association for Education Accreditation focuses on standards and recommendations for quality assurance in the European Higher Education Area (ESG)

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STANDARDS FOR SPECIALIZED ACCREDITATION OF EDUCATIONAL PROGRAMS

Standard 1. Objectives of the educational program

1.1 General provisions

1.1.1. The educational program should have clearly formulated and documented goals consistent with the educational standards of higher professional education of the Republic of Kazakhstan, the mission of the university and relevant to the needs of potential consumers of the program.;

1.1.2. The objectives of educational programs should describe the academic, technical and professional characteristics of qualifications.

1.1.3. Educational institutions should have procedures for developing and approving their programs. Programs should be developed in accordance with established goals, including planned learning outcomes.

1.1. Evaluation criteria

1.2.1 The CAAAE assessment method focuses on the learning outcomes of the program. The learning outcomes should clearly correspond to the objectives of the program.

1.2.2 The concept of the program structure should be built in combination of a combination of individual modules, taking into account the formulated goals, forms of learning and teaching.

1.2.3 The requirements for professional practice and the labor market should be reflected and integrated into the development of the educational program and employment. The learning outcomes should be formulated in the form of planned graduate competencies that meet the requirements of the European and national qualifications frameworks, professional standards, and labor market demands. * Learning outcomes should be formulated in the form of planned graduate competencies that meet the requirements and standards of EUR-ACE:

- Knowledge and understanding;
- Analysis;
- Research;
- Practice;
- Decision-making;
- Communication and teamwork;
- Continuous learning.

1.2.4 The university should develop an effective mechanism to ensure the achievement and adjustment of the objectives of educational programs;

1.2.5 The objectives of the educational program should be shared by the staff of the department involved in the implementation of the educational program, be published and accessible to all interested parties.

1.2.6 The educational program should provide comprehensive information about all modules, including syllabuses, learning outcomes, teaching and learning methods, credit allocation, module assessment method, and other program requirements.

1.2.7 The educational program should ensure that the cumulative results of the modules reflect the learning outcomes of the program, taking into account the choice of modules by students. The degree and the name of the program correspond to the content of the educational program and the objectives of the program.

Standard 2. Program content

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2.1 General provisions

2.1.1 The educational program should have clearly formulated and documented learning outcomes that are conceptually consistent with the objectives of the educational program.

2.1.2 The structure and content of the educational program should ensure that students achieve the planned learning outcomes.

2.1 Evaluation criteria

2.1.1 The structure of the educational program should cover the following blocks:

• The structure of the curriculum in terms of time and content

A) Course duration and credit score system (ECTS)

B) The concept of modularity

C) The volume of compulsory, elective and elective courses

D) Justification of the program during the standard period of study

E) Assessment and description of the student's workload • Integration of the latest scientific developments into the curriculum

• Structuring, integration and control of practical stages and/ or periods spent abroad

• Description of interdisciplinary courses

• Mechanisms for ensuring the availability of courses for students with special needs. The duration of the educational program is sufficient to allow students to obtain a degree without exceeding the duration of the course. The developed credit system is focused on the volume of students' work. The program structure is designed to avoid excessive workload. The workload includes both learning-based attendance and independent study. This includes all the required elements of obtaining a degree. The disciplinary structure of the educational program

• Justification of the choice and expediency of assessment forms

• Integration of distance learning elements and new technologies

• Inclusion of a foreign language

• Guaranteed required qualifications of the teaching staff

2.2 The staff of the teaching staff, the material and technical equipment must meet the qualification requirements for licensing educational activities.

2.3 The content of the bachelor's, master's, and doctoral degree programs should correspond to the volume of credits defined in the State Educational Standard of the Republic of Kazakhstan.

2.4 The curriculum and work program of each discipline should correspond to the objectives of the educational program and ensure the achievement of learning outcomes by all graduates of the program.

2.5 The Disciplines module provides fundamental specialist training, serves as the basis for studying general professional and special disciplines, and contains advanced courses in addition to the basic ones.

2.6 The discipline module should provide the necessary legal, social, economic, and ethical competencies of a specialist, and form a commitment to sustainable development, occupational safety, and health protection.

2.6.1 The volume of the module must meet the requirements defined in the State Educational Standard of the Republic of Kazakhstan for bachelor's, Master's and doctoral programs.

2.6.2 The module's disciplines develop professional communication skills, pose a problem and suggest possible solutions.

2.7 The module of general professional and special disciplines provides the completeness of the training necessary to carry out professional activities in accordance with the objectives of the educational program.

2.7.1 The study of disciplines should correspond to the level of knowledge and ensure the ability to apply them in practice.

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2.7.3 An obligatory component of the bachelor's degree program is practical training, and for the master's degree is the practice and performance of research and (or) design work.

2.8 The training program should end with the completion of a final qualification work containing elements of research activities.

* The learning outcomes must meet the professional standards and requirements of EUR-ACE (Appendix A)

* Design training should help students develop creative thinking and skills that allow them to solve problems using their acquired knowledge and original approach. Mandatory elements of design should be the definition of goals and criteria, analysis, synthesis, construction, testing and evaluation.

* The training program must end with the completion of a final qualification work containing elements of research or development activities.

Standard 3. Students and the learning process

3.1 General provisions

3.1.1 By introducing student-centered learning into its programs, the university should focus as much as possible on the individual characteristics of the students and their specific personal understanding of the world. The methods by which the programs are implemented should encourage students to play an active role in the joint construction of the educational process.;

3.1.2 The university should ensure the development of educational programs that motivate students to play an active role in the joint creation of the learning process, and the assessment of student performance should reflect this approach.

3.1.3 The program should be developed in accordance with the planned learning outcomes, and the applied approaches in teaching and learning should be adequate to achieve these results.

3.2 Evaluation criteria

3.2.1 Students enrolled in the program must have completed secondary or vocational secondary education for Bachelor's degree, Bachelor's degree for Master's degree and Master's degree for doctoral degree

3.2.2 Students must have a sufficient level of knowledge necessary to master the educational program. A system should be provided for students with poor training to ensure that they master the educational program.

3.2.3 The learning process should ensure that all students achieve learning outcomes. The educational program should have a mechanism that ensures continuous monitoring of the curriculum and feedback for its improvement.

3.2.4 The university should provide students with the opportunity to practice in their specialty in scientific laboratories and enterprises and monitor the satisfaction of students, managers of internship enterprises and employers.

3.2.4 An important factor is to ensure the possibility of international and domestic academic mobility for students. The university should have its own mechanisms for recognizing the results of students' academic mobility.

3.2.5 Students and students should be directly involved in the internal quality assurance system of educational programs.

3.2.6 The university should have an effective student support system.

3.2.7 The examination rules and assessment of the achieved learning outcomes should correspond to the planned learning outcomes.

3.2.8 The university creates conditions for effective student advancement along an individual educational trajectory, including advice from advisors

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3.2.9 An important factor is the involvement of students in research and development.

3.2.10 The university should create favorable conditions for attracting and educating international students.

3.2.11 The university should develop a special program to support gifted students.

3.2.12 The university should provide an opportunity for students to communicate with each other through the creation of various student organizations, forums, online communities, etc.

3.2.13 The university should establish a mechanism for monitoring student satisfaction with the university's activities in general and individual services in particular. The university should organize special mechanisms for dealing with student complaints.

3.2.14 The university must demonstrate the functioning of a feedback system, including the prompt presentation of information on the results of the assessment of students' knowledge.

Standard 4. Teaching staff

4.1 General provisions

4.1.1 The university must be confident in the competence of its teachers. The university should apply fair and transparent processes in the recruitment and professional development of its employees;

4.1.2 The university should organize activities aimed at the development and professional development of teaching staff, administrative and managerial staff and university staff;

4.1.3 The university should regulate the organizational and functional structure of personnel management and its development, including the personnel selection system;

4.1.4 The university must ensure that the qualifications of teaching staff meet the needs of educational programs;

4.1.5 The university should have mechanisms for motivating and stimulating employees, adapting new employees, certifying and applying disciplinary measures against employees, and dismissing employees.

4.2 Evaluation criteria

4.2.1 The teaching staff should be represented by specialists in all fields of knowledge covered by the educational program.

4.2.2 Information about teaching staff should be available to the public, the university should keep them publicly available, and teaching staff questionnaires should be posted on the university's website.

4.2.3 The university should ensure the monitoring of the activities of teaching staff, a systematic assessment of the competence of teachers, and a comprehensive assessment of the quality of teaching. The university should also organize various mechanisms for assessing the quality of teaching, such as questioning students about the quality of teaching at the university, attending teaching staff classes, questioning teaching staff about the assessment of colleagues, etc.

4.2.4 The teacher's workload should include educational, methodological, scientific work (including preparation of projects and applications), organizational and methodological (including participation and organization of various events), professional development (professional development, including personal development and study of literature in the specialty), activities in a professional environment (for example, participation in professional associations and consulting).

4.2.5 The university must ensure the completeness and adequacy of individual planning of the work of teaching staff in all types of activities, monitoring the effectiveness and effectiveness of individual plans.

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** *It is used for the accreditation of the pedagogical educational programs*

4.2.6 The university must demonstrate the existence of a system of advanced training, professional and personal development of teaching staff and administrative and managerial staff.

4.2.7 The university should support young teachers and have a specific plan for the development of young teachers.

4.2.8 The university should ensure monitoring of the satisfaction of teaching staff through special methods. The university management should respond to the requests of the teaching staff on various issues.

4.2.9 Teaching staff should actively apply information and communication technologies in the educational process (e-learning, m-learning, etc.).

4.2.10 The university should develop academic mobility of teaching staff, attract the best foreign and domestic teachers, and conduct joint research. Also, to assist in the promotion of their own teaching staff in participating in academic mobility programs.

4.2.11 The university is obliged to create conditions for teaching staff to participate in public life and contribute to the development of science and culture in the region.

4.2.12 An important factor is the involvement of practitioners, representatives of industry and various sectors of the national economy as teachers.

4.2.13 The faculty has experience in the relevant industry and carries out research projects is an important advantage.

4.2.14 Teaching staff should participate in the process of improving the educational program as a whole and its individual disciplines in accordance with internal quality assurance mechanisms.

4.2.15 Participation of teaching staff in professional societies, receiving scholarships and grants, and membership in academies is an advantage.

4.2.16 Teachers should actively participate in the performance of research and methodological work, which should be confirmed by reports on research and methodological work, participation in scientific conferences, as well as the availability of at least two scientific publications per year for each teacher over the past five years.

4.2.17 Every teacher should know and be able to justify the place of his discipline in the curriculum, its relationship with previous and subsequent disciplines, and understand the role of discipline in the formation of a specialist.

4.2.18 The turnover of teaching staff should not exceed 30% during the accreditation period.

Standard 5. Preparation for professional activity

5.1 General provisions

5.1.1 Preparation for the activity should be carried out during the entire period of study under the program. The experience of research and project activities should be formed during the implementation of projects that necessarily include economic, ethical, socio-political and environmental aspects, issues of sustainable development and occupational safety.

5.1.2 The university should have an internal quality control system based on European Standards and recommendations for quality assurance in the European Higher Education Area (ESG).

5.1.3 The university/department should have a mechanism for evaluating the learning outcomes of the program as a whole and individual disciplines and documents confirming their achievement. Based on the data received from all stakeholders, the educational programm should be improved and developed.

5.2 Evaluation criteria

The educational program should ensure that all students achieve the learning outcomes necessary for their professional activities. Upon completion of the program, students must:

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** *It is used for the accreditation of the pedagogical educational programs*

5.2.1 demonstrate basic knowledge and understanding of the scientific principles underlying their professional activities;

5.2.2 be aware of advanced knowledge in certain areas of professional activity;

5.2.3 apply the acquired knowledge to identify, formulate and solve problems using appropriate methods;

5.2.4 be able to select and apply appropriate analytical methods;

5.2.5 be able to find the necessary literature, databases and other sources of information;

5.2.6 be able to plan and conduct an experiment, interpret data, and draw conclusions;

5.2.7 be able to combine theory, practice and methods to solve problems and understand the scope of their application;

5.2.8 work effectively individually, as well as as a member of a team on interdisciplinary topics;

5.2.9 have broad erudition, including knowledge and understanding of modern social and political issues;

5.2.10 be proficient in a foreign language at a level that allows you to work in an international environment with an understanding of cultural, linguistic and socio-economic differences;

5.2.11 demonstrate an understanding of safety and health issues, legal aspects, responsibility for activities, and the impact of decisions on the social context and the environment;

5.2.12 follow the code of professional ethics, responsibility and standards of activity;

5.2.13 understand the need and be able to independently study and improve their skills during the entire period of professional activity.

* be able to select and apply appropriate analytical and design methods;

* be able to select and use appropriate equipment, facilities, and tools;

Standard 6. Material and technical base

6.1 General provisions

6.1.1 The university must constantly update and improve the material, technical and information resources to ensure the quality of educational programs.

6.1.2 The material support must not be lower than the licensed indicators.

6.1.3 Students should have sufficient opportunities for independent study and research work.

6.2 Evaluation criteria

6.2.1 The university/department must constantly update, improve and expand the material and technical base. Classrooms, laboratories, and their facilities must be modern and adequate to program objectives.

6.2.2 The university should evaluate the dynamics of the development of material and technical resources and information support, the effectiveness of using the evaluation results for adjustments in planning and budget allocation.

6.2.3 The university should have the necessary number of computer classrooms, reading rooms, multimedia, language and scientific-methodical classrooms, and the number of seats in them.

6.2.4 The university library should have a sufficient book fund, including a fund of educational, methodological and scientific literature on general education, basic and specialized disciplines on paper and electronic media, periodicals in the context of the languages of instruction, as well as scientific databases, a database of electronic scientific journals.

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6.2.5 Educational materials, software, educational literature and additional resources and equipment should be accessible to all students.

6.2.6 Information and communication technologies support of the educational program is an important factor.

6.2.7 The university should provide educational programs with the necessary laboratories, landfills, etc.

6.2.8 The university should determine the degree of implementation of information technologies in the educational process, monitor the use and development of innovative teaching technologies by teaching staff.

6.2.9 Issues of the effectiveness and adequacy of the use of ICT are considered at meetings of the Academic Council of the University and other collegial bodies.

6.2.10 An important factor is the creation of conditions for the development and use of ICT by staff, teaching staff and students in the educational process and activities of the university.

3.2.11 The university should create the most favorable conditions for extracurricular activities of students. A service center, a canteen, a dormitory, a computer center, a library, reading rooms, gyms, a stadium, a medical facility, etc. should be provided for students.

Standard 7. Information support

7.1 General provisions

7.1.1 Information support should be adequate to the objectives of the program.

7.1.2 An important factor is the free access of students and teachers to information resources.

7.2 Evaluation criteria

7.2.1 The university/department should have a library containing the necessary materials for training: educational, technical and reference literature, various periodicals, etc.

7.2.2 Students and teachers should have computer classrooms and terminals with access to information resources (local area network, Internet). The university/department should monitor the availability and use of these resources.

7.2.3 The university/department must constantly update, improve and expand the information base.

7.2.4 The university should have its own personalized interactive resource (Univer, Platonus, etc.).

7.2.5 Free Wi-Fi should be available throughout the university.

7.2.6 The university should provide students with information, reference and methodological materials necessary for mastering the educational program (reference guide, academic policy of the university, academic calendar, etc.).

7.2.7 The university must demonstrate the availability of a web resource in three languages reflecting the mission, goals and objectives of the university, which contains all information about the university's activities, complete information about teaching staff, personal e-mail of the rector, a virtual book of complaints, etc.

7.2.8 The university must provide students with open access to information about the university's activities and available grants and scholarships.

Standard 8. Finance and Management

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8.1 General provisions

8.1.1 Educational institutions should have adequate funding for teaching and learning activities and adequate and accessible educational resources and student support services.

8.1.2 The financial system of the university should be stable, efficient, efficient, independent and transparent.

8.2 Evaluation criteria

8.2.1 The financial support of the program should not be lower than the licensed indicators.

8.2.2 The financial and administrative policy of the university/department should be aimed at improving the quality of the educational program.

8.2.3 The resource policy of the university/department should be aimed at maintaining and ensuring the continuous professional growth of teaching staff.

8.2.4 The teaching and support staff and the administrative and economic activities of the university/department should meet the needs of the educational program.

8.2.5 The management of the university/department should be effective and ensure the improvement of the educational program.

8.2.6 An important factor is the availability of a quality management system certified by independent organizations in the university/department.

8.2.7 The university should have an internal quality assurance system.

8.2.8 Funding should be result-based, and the university should have a mechanism for assessing the adequacy of funding for educational programs.

8.2.9 The university should have an effective financial reporting mechanism.

8.2.10 Each department or project team of the university must have its own financial resources and the right to independently manage them.

8.2.11 The university should have a transparent remuneration system for teaching staff.

Standard 9. Graduates

9.1 General provisions

9.1.1 The university should make maximum efforts to provide graduates with employment.

9.1.2 The university/department should have a system for studying employment, relevance, career support and continuous professional development of university graduates.

9.2 Evaluation criteria

9.2.1 The qualifications obtained upon completion of the educational program must meet all the requirements of the national qualification system.

9.2.2 The data obtained on the employment of graduates should be used for further improvement of educational programs.

9.2.3 The university should keep in touch with the graduates and support the various endeavors of its graduates

9.2.4 Graduates of the university establish communities or associations of graduates of this university.

9.2.5 An important factor is monitoring the employment and professional activities of graduates.

9.2.6 The university must provide its graduates with diplomas confirming their qualifications, as well as detailed applications for diplomas in three languages.

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APPENDIX A

Programme Outcomes for Bachelor Degree Programmes based on the framework standards and the EUR-ACE guidelines of the European Network for Quality Assurance in Engineering Education (ENAEE)

Knowledge and Understanding

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- knowledge and understanding of the mathematics, computing and other basic sciences underlying their engineering specialisation, at a level necessary to achieve the other programme outcomes;
- knowledge and understanding of engineering fundamentals underlying their specialisation, at a level necessary to achieve the other programme outcomes, including some awareness at their forefront;
- awareness of the wider multidisciplinary context of engineering.

Engineering Analysis

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- ability to analyse complex engineering products, processes and systems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to correctly interpret the outcomes of such analyses;
- ability to identify, formulate and solve engineering problems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to recognise the importance of non-technical –societal, health and safety, environmental, economic and industrial – constraints.

Engineering Design

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- ability to develop and design complex products (devices, artefacts, etc.), processes and systems in their field of study to meet established requirements, that can include an awareness of non-technical – societal, health and safety, environmental, economic and industrial– considerations; to select and apply relevant design methodologies;
- ability to design using an awareness of the forefront of their engineering specialisation.

Investigations

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- ability to conduct searches of literature, to consult and to critically use scientific databases and other appropriate sources of information, to carry out simulation and analysis in order to pursue detailed investigations and research of technical issues in their field of study;
- ability to consult and apply codes of practice and safety regulations in their field of study;
- laboratory/workshop skills and ability to design and conduct experimental investigations, interpret data and draw conclusions in their field of study.

Engineering Practice

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- understanding of applicable techniques and methods of analysis, design and investigation and of their limitations in their field of study;
- practical skills for solving complex problems, realising complex engineering designs and conducting investigations in their field of study;
- understanding of applicable materials, equipment and tools, engineering technologies and

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processes, and of their limitations in their field of study;

- ability to apply norms of engineering practice in their field of study;
- awareness of non-technical -societal, health and safety, environmental, economic and industrial – implications of engineering practice;
- awareness of economic, organisational and managerial issues (such as project management, risk and change management) in the industrial and business context.

Making Judgements

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- ability to gather and interpret relevant data and handle complexity within their field of study, to inform judgements that include reflection on relevant social and ethical issues;
- ability to manage complex technical or professional activities or projects in their field of study, taking responsibility for decision making.

Communication and Team-working

- ability to communicate effectively information, ideas, problems and solutions with engineering community and society at large;
- ability to function effectively in a national and international context, as an individual and as a member of a team and to cooperate effectively with engineers and non-engineers.

Lifelong Learning

- The learning process should enable **Bachelor Degree graduates to demonstrate:**
- ability to recognise the need for and to engage in independent life-long learning;ability to follow developments in science and technology.

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Programme Outcomes for Master Degree Programmes based on the framework standards and the EUR-ACE guidelines of the European Network for Quality Assurance in Engineering Education (ENAEE)

Knowledge and Understanding

- The learning process should enable **Master Degree graduates to demonstrate:**
- in-depth knowledge and understanding of mathematics, computing and sciences underlying their engineering specialisation, at a level necessary to achieve the other programme outcomes;
- in-depth knowledge and understanding of engineering disciplines underlying their specialisation, at a level necessary to achieve the other programme outcomes;
- critical awareness of the forefront of their specialisation;
- critical awareness of the wider multidisciplinary context of engineering and of knowledge issues at the interface between different fields.

Engineering Analysis

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to analyse new and complex engineering products, processes and systems within broader or multidisciplinary contexts; to select and apply the most appropriate and relevant methods from established analytical, computational and experimental methods or new and innovative methods; to critically interpret the outcomes of such analyses;
- ability to conceptualise engineering products, processes and systems;
- ability to identify, formulate and solve unfamiliar complex engineering problems that are incompletely defined, have competing specifications, may involve considerations from outside their field of study and non-technical – societal, health and safety, environmental, economic and industrial – constraints; to select and apply the most appropriate and relevant methods from established analytical, computational and experimental methods or new and innovative methods in problem solving;
- ability to identify, formulate and solve complex problems in new and emerging areas of their specialisation.

Engineering Design

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to develop, to design new and complex products (devices, artefacts, etc.), processes and systems, with specifications incompletely defined and/or competing, that require integration of knowledge from different fields and non-technical – societal, health and safety, environmental, economic and industrial commercial – constraints; to select and apply the most appropriate and relevant design methodologies or to use creativity to develop new and original design methodologies.
- ability to design using knowledge and understanding at the forefront of their engineering specialisation.

Investigations

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to identify, locate and obtain required data;
- ability to conduct searches of literature, to consult and critically use databases and other sources of information, to carry out simulation in order to pursue detailed investigations and research of complex technical issues;
- ability to consult and apply codes of practice and safety regulations;
- advanced laboratory/workshop skills and ability to design and conduct experimental

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investigations, critically evaluate data and draw conclusions;

- ability to investigate in a creative way the application of new and emerging technologies at the forefront of their engineering specialisation.

Engineering Practice

- The learning process should enable **Master Degree graduates to demonstrate:**
- comprehensive understanding of applicable techniques and methods of analysis, design and investigation and of their limitations;
- practical skills, including the use of computer tools, for solving complex problems, realising complex engineering design, designing and conducting complex investigations;
- comprehensive understanding of applicable materials, equipment and tools, engineering technologies and processes, and of their limitations;
- ability to apply norms of engineering practice;
- knowledge and understanding of the non-technical – societal, health and safety, environmental, economic and industrial – implications of engineering practice;
- critical awareness of economic, organisational and managerial issues (such as project management, risk and change management)

Making Judgements

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to integrate knowledge and handle complexity, to formulate judgements with incomplete or limited information, that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgement to deliver sustainable solutions for society, the economy and environment;
- ability to manage complex technical or professional activities or projects that can require new strategic approaches, taking responsibility for decision making.

Communication and Team-working

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to use diverse methods to communicate clearly and unambiguously their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences in national and international contexts;
- ability to function effectively in national and international contexts, as a member or leader of a team, that may be composed of different disciplines and levels, and that may use virtual communication tools.

Lifelong Learning Skills

- The learning process should enable **Master Degree graduates to demonstrate:**
- ability to engage in independent life-long learning;
- ability to undertake further study autonomously.

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