REPORT

on the results of the work of the external expert evaluation committee for compliance with the requirements of the standards for specialized accreditation of educational programs
6B06107 Cyberphysical systems
6B06108 Data Science and Machina Learning
6B06110 Software Engineering
8D06102 Computer and Software Engineering

INTERNATIONAL INFORMATION TECHNOLOGY UNIVERSITY
in the period from 19 to 21 October 2020

INDEPENDENT AGENCY FOR ACCREDITATION AND RATING
External expert commission

Addressed to the
IAAR Accreditation
Council

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2020

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(I) LIST OF TERMS AND ABBREVIATIONS

RK – The Republic of Kazakhstan
MES RK – Ministry of Education and Science of the Republic of Kazakhstan
SCES – State compulsory education standard
SPDE – State program for the development of education
IAAR – Independent agency for accreditation and rating
HEI – Higher educational institution
OE – Organization of education
IITU – International Information Technology University
FCTC – Faculty of Computer Technology and Cybersecurity
FDT – Faculty of Digital Transformations
DAA – Department of Academic Affairs
CEIS – Computer Engineering and Information Security
EP – Educational program
MEP – Modular educational program
WC – Working curriculum
EMCD – Educational-methodical complex of disciplines
EMCS – Educational-methodical complex of the specialty
IC – Individual curriculum
CED – Catalog of elective disciplines
QMS – Quality Management System
FS – Faculty staff
IWST – Independent work of a student with a teacher
GPA (Grade Point Average) – Grade Point Average
SWOT (strength weakness opportunity treat) – Strengths, Weaknesses, Opportunities and Threats
ECTS – European Credit Transfer and Accumulation System
LR – Legal regulations
NQF – National qualifications framework
NQS – National qualifications system
ESG – Standards and guidelines for quality assurance in the European Higher Education Area

(II) <u>INTRODUCTION</u>

In accordance with order No. 88-20-ОД dated 10/12/2020 of the Independent Agency for Accreditation and Rating, from October 19 to October 21, 2020, an external expert commission conducted an online assessment of the conformity of educational programs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering», «8D06102 Computer and Software Engineering» of the International Information Technology University to the standards of primary specialized accreditation of the IAAR (dated May 25, 2018 No. 68-18 / 1-ОД, first edition).

The report of the external expert commission (EEC) contains an assessment of the submitted educational programs against the IAAR criteria, recommendations of the EEC for further improvement of educational programs and the parameters of the profile of educational programs.

The members of EEC:

1. Chairman of the IAAR Commission – Tamyarova Maya Vladislavovna, candidate of technical sciences, Deputy Dean for Academic and Remote Work of the Aircraft Constructing Faculty, associate professor of the Department of Measuring and Computing Complexes of the Ulyanovsk State Technical University (Ulyanovsk, Russian Federation);

2. Foreign IAAR expert – Grakovski Alexander, professor, Dean of the Faculty of Computer Science and Electronics, Transport and Telecommunication Institute (Riga, Latvia);

3. Foreign IAAR expert – Veaceslav Nastasenco, associate professor, PhD, Technical University of Moldova (Chișinău, Moldova);

4. Foreign IAAR expert – Ognyan Borisov Manolov, associate professor, PhD, European Polytechnical University (Pernik, Bulgaria);

5. Foreign IAAR expert – Gostin Alexei Mikhailovich, candidate of technical sciences, associate professor, Ryazan State Radio Engineering University named after V.F. Utkin (Ryazan, Russian Federation);

6. IAAR expert – Ismailova Aisulu Abzhapparovna, PhD, Seifullin Kazakh Agro Technical University (Nur-Sultan);

7. IAAR expert – Sultanova Zamzagul Khamitovna, candidate of economic sciences, acting associate professor, Western Kazakhstan Agrarian-Technical University named after Zhangir Khan (Uralsk);

8. IAAR expert – Ashirbekova Gulmira Shaitmaganbetovna, candidate of philological sciences, L.N. Gumilyov Eurasian National University (Nur-Sultan);

9. IAAR employer – Pilipenko Yuri Aleksandrovich, chairman of the board of directors, «EXPOBEST» International Association of Producers of Goods and Services (Almaty);

10. IAAR employer – Rezov Mikhail Grigorievich, chief specialist of the department for support of the electronic document management system, «National Information Technologies» JSC (Nur-Sultan);

11. IAAR student – Mauina Gulalem Myrzaliyevna, 3rd year PhD student «Information Systems» ED, Seifullin Kazakh Agro Technical University (Nur-Sultan);

12. IAAR student – Tolebai Aidos Bakhtiyaruly, 1st year student «Cyber Security» EP, Astana IT University (Nur-Sultan);

13. IAAR student – Bobkova Svetlana Sergeyevna, 4th year student «Finance» EP, Kostanay Regianal University named after A. Baitursynov (Kostanay);

14. Observer for the Agency – Kanapuanov Timur Yerbolatovich, PhD, Head of International Projects and Public Relations of the IAAR (Nur-Sultan).

(III) <u>PRESENTATION OF THE EDUCATION ORGANIZATION</u>

International Information Technology University (IITU) is a leading educational institution in the Central Asian region in the field of training highly qualified, internationally recognized IT specialists. The university was founded in 2009 on the instructions of the First President of the Republic of Kazakhstan Nursultan Abishevich Nazarbayev (АБ 0064060, 29.05.2009). The University was created in close collaboration with Carnegie Mellon (USA).

The mission of the IITU is to generate knowledge and train personnel of the digital era, to form the country's intellectual and scientific and technical potential in the field of ICT based on the integration of education, breakthrough innovative technologies and scientific research.

The University provides educational services for higher and postgraduate education in accordance with the Classifier of areas for training personnel with higher and postgraduate education, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan dated October 13, 2018 No. 569 and state compulsory standards of higher and postgraduate education of the Republic of Kazakhstan, approved by order Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 604.

Personnel training is carried out according to the three-level model «Bachelor-Master-Doctor PhD» in accordance with the Law of the Republic of Kazakhstan «On Education», the Bologna Declaration and other international documents in the field of education.

The strategic priorities of the university are aimed at achieving international recognition. First of all, the university positions itself as a Digital University, which implies the training of specialists in the digital era, the development of systems of digital forms of education, the development and provision of digital services for stakeholders with the formation of a digital footprint, as well as reaching the position of a leading digital University, i.e. enter the ranking of world universities.

One of the goals of IITU is to achieve the level of a research university, the tasks of which are:

– formation of innovative and research infrastructure;
– formation of a conveyor belt preparation system for initiative projects of teaching staff for participation in competitions;
– creation of a mechanism for involving 80% of the teaching staff in research activities;
– formation of innovative symbiosis with leading IT companies;
– generation of new knowledge and dissemination of scientific results;
– commercialization of the results of innovative and scientific achievements.

The university created the Development Strategy of IITU JSC for 2020-2025, approved by the decision of the Board of Directors of IITU JSC dated January 15, 2020 (Minutes No. 5). In its activities, the university relies on the Quality Policy 2019-2020. The procedures and those responsible for the processes in the field of quality assurance are defined in the Documented Procedure "Internal Audit"в Documented Procedure «Internal Audit».

On March 5, 2019, «International Information Technology University» JSC received a decision of the accreditation commission ASIIN (Germany) on institutional accreditation and was accredited until September 30, 2023.

At the end of 2019, according to the rating compiled by the national chamber of entrepreneurs «Atameken», the educational programs of the CEIS Department takes the 1st place among the universities of the republic, gaining 3.9 points.

There are 302 teachers in the university. The share of teachers with academic degrees and titles of the number of full-time teachers is 54.75% at the time of the reporting period. The average age of the teaching staff of the university with academic degrees and titles in 2019-2020 is 38.5 years.

In the 2014-2015 academic year, the university graduated 519 people, including 415 bachelors, 91 master students and 13 part-time students. In the 2019-2020 academic year, the number of graduates became 829, almost doubled, namely 650 bachelors, 149 master students,

11 doctoral students and 19 part-time students.

The goal of the «Computer Engineering and Information Security» (CEIS) Department is to provide the educational process with modern methodological tools and educational technologies, to train high-level specialists (bachelors, masters) in the field of information software development and information security.

The mission of the department is to provide practice-oriented training of graduates in the field of creation, use and protection of information technologies intended for work in various industries and business and creating conditions for continuous professional self-improvement.

IITU and the CEIS Department, on the basis of the specialty «Computer Systems and Software Engineering», have implemented three EPs of the bachelor's degree and one EP of the doctoral level, which were approved by experts of the Center for the Bologna Process and Academic Mobility at the Ministry of Education and Science of the Republic of Kazakhstan and registered in the Register of EP: 6B06107 – «Cyberphysical Systems», 6B06108 – «Data Science and Machine Learning», 6B06110 – «Software Engineering», 8D06102 – «Computer and Software Engineering».

The contingent of students by forms and levels of EP training for the 2019-2020 academic year:

- 6B06107 – «Cyberphysical Systems» – 15 students;
- 6B06108 – «Data Science and Machine Learning» – 21 students;
- 6B06110 – «Software Engineering» – 174 students;
- 8D06102 – «Computer and Software Engineering» – 11 students.

The number of full-time teachers of the CEIS department is 53 people. Among them are 3 professors, 7 associate professors, 9 assistant professors, 21 senior lecturers, 10 lecturers and 3 tutors. The department consists of 1 Doctor of Technical Sciences, 9 Candidates of Technical Sciences, Candidate of Physical and Mathematical Sciences, and 7 PhDs, 1 foreign teacher.

The level of employment of graduates in accredited EPs is quite high – 82.8%.

Since IITU is a relatively young university, academic mobility for accredited EPs is still at the stage of preparation.

According to the rating of «Atameken» in the specialty «Computer Systems and Software Engineering» (covers accredited EPs 6B06107, 6B06108, 6B06110, 8D06102) in 2019, IITU took first place among 45 universities with the following indicators: average salary 201,225 tenge, employment level 82.8%, total peer review 1.46, total total: 3.90.

For accredited programs, there are 6 projects for grant financing in accordance with agreement No. 202 for grant financing dated March 16, 2018, namely:

- №AP05134071 «Development of methodology, architectural and software solutions for the transformation of business processes of their automation based on cloud BPaaS technologies (using the example of administrative processes of public administration)» – scientific supervisor d. of tech. sc., professor Uskenbayeva R.K.
- №AP05134597 «Hardware and software complex for the analysis and monitoring of climatic and ecological changes in the environment» – scientific supervisor cand. of ph.-math. sc., associate professor Duisebekova K.S.
- №AP05135692 «Development of virtual electronic laboratories with elements of augmented and virtual reality technologies for the study of physics in secondary educational institutions» – scientific supervisor PhD, associate professor Daineko Y.A.
- №AP05132050 «Development of «advanced» tools to facilitate high-quality and efficient analysis of unstructured data» – scientific supervisor cand. of tech. sc., associate professor Bektemysova G.U.

Commercialization for accredited EPs of the cluster is not available.

(IV) DESCRIPTION OF THE PREVIOUS ACCREDITATION PROCEDURE

The educational programs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» «8D06102 Computer and Software Engineering» are being accredited in the IAAR for the first time.

(V) <u>DESCRIPTION OF THE EEC VISIT</u>

The work of the EEC was carried out on the basis of the approved Program of the on-line visit of the expert commission on primary specialized accreditation of educational programs of the International Information Technology University in the period from 19 to 21 October 2020.

In order to coordinate the work of the EEC, on October 18, 2020, an on-line setting meeting was held, during which powers were distributed among the members of the commission, the schedule of the visit was clarified, and agreement was reached on the choice of examination methods.

To obtain objective information about the quality of educational programs and the entire infrastructure of the university, to clarify the content of self-assessment reports, on-line meetings were held with the rector, vice-rectors of the university in areas of activity, heads of structural divisions, heads of departments, teachers, students, employers. A total of 59 representatives took part in the meetings (table 1).

Table 1 – Information about employees and students who took part in on-line meetings with EEC IAAR:

Participant category	Quantity
Rector	1
Vice-rectors	3
Heads of structural divisions	11
Deans	2
Heads of centers	3
Heads of departments	6
Teachers	15
Bachelor, master, and doctoral students	13
Graduates	0
Employers	5
Total	**59**

During the on-line excursion, members of the EEC got acquainted with the state of the material and technical base, visited lecture room 907, research laboratory of mechatronics and intelligent systems 010, training laboratory Cisco 406, educational research laboratory of Microsoft technologies 407, educational laboratory of robotics 806, training laboratory cybersecurity 404.

At the on-line meetings of the IAAR EEC with the target groups of the university, the mechanisms for implementing the policy of the university were clarified and the specific data presented in the university self-assessment report were specified.

EEC members did NOT visit online the organizations for industrial practice of accredited EPs.

EEC members attended online training sessions:

− Bilimzhanuly M., senior lecturer – Discrete Mathematics (Practice), Date: October 20 (Tuesday), Time: 15:10 16:00;

− Tokanov O.S. senior lecturer – Object-oriented programming (Lab), Date: October 20 (Tuesday), Time: 16:10-17:00;

− Bekaulov N.M. tutor – Object-oriented programming (Lab), Date: October 20 (Tuesday), Time: 14:10-15:00;

− Duzbayev N.T. – Theory and Models of High-Performance Computing Systems, Date: October 20 (Tuesday), Time: 16.10-18.10.

In accordance with the accreditation procedure, a survey was conducted of 64 teachers,

115 students, including junior and senior students.

To confirm the information provided in the Self-Assessment Report, external experts requested and reviewed the IITU working documents. Along with this, the experts studied the Internet positioning of the university through the IITU web portal: https://iitu.kz/.

As part of the planned program, preliminary recommendations for improving the accredited educational programs of the IITU, developed by the EEC based on the results of the examination, were presented at an online meeting with the management on October 21, 2020.

(VI) COMPLIANCE WITH SPECIALIZED ACCREDITATION STANDARDS

6.1. The standard «Management of the educational program»

✓ *The organization of higher and / or postgraduate education must have a published quality assurance policy. Quality assurance policy should reflect the link between research, teaching and learning.*
✓ *The organization of higher and (or) postgraduate education must demonstrate the development of a culture of quality assurance, including in the context of EPs.*
✓ *Commitment to quality assurance should apply to any activity performed by contractors and partners (outsourcing), including the implementation of joint / double degree education and academic mobility.*
✓ *The EP management demonstrates its readiness to ensure the transparency of the EP development plan based on the analysis of its functioning, the actual positioning of the PA and the focus of its activities on meeting the needs of the state, employers, students and other stakeholders. The plan must contain the timing of the start of the implementation of the educational program.*
✓ *The EP's management demonstrates the existence of mechanisms for the formation and regular revision of the EP development plan and monitoring its implementation, assessing the achievement of learning goals, meeting the needs of students, employers and society, making decisions aimed at continuous improvement of the EP.*
✓ *EP management must involve representatives of stakeholder groups, including employers, students and teaching staff in the formation of the EP development plan.*
✓ *The EP's management must demonstrate the individuality and uniqueness of the EP development plan, its consistency with national priorities and the development strategy of the organization of higher and (or) postgraduate education.*
✓ *The organization of higher and (or) postgraduate education must demonstrate a clear definition of those responsible for business processes within the EP, an unambiguous distribution of job duties of personnel, and the delineation of functions of collegial bodies.*
✓ *EP management must provide evidence of the transparency of the educational program management system.*
✓ *EP management must demonstrate the existence of an internal EP quality assurance system, including its design, management and monitoring, their improvement, decision making based on facts.*
✓ *The EP's management must carry out risk management, including within the framework of the EP undergoing primary accreditation, as well as demonstrate a system of measures aimed at reducing the degree of risk.*
✓ *EP management must ensure the participation of representatives of employers, teaching staff, students and other interested persons in the collegial management bodies of the educational program, as well as their representativeness in making decisions on the management of the educational program.*
✓ *The educational organization must demonstrate innovation management within the EP, including the analysis and implementation of innovative proposals.*
✓ *The EP's management must demonstrate evidence of readiness for openness and accessibility for students, teaching staff, employers and other interested parties.*
✓ *EP management must be trained in educational management programs.*

Proof part

IITU is responsible for the quality of the education provided and its provision and it applies to all accredited EP implemented by the university:

− *the educational program «6B06107 Cyberphysical Systems», approved on 20.03.2019;*

− *the educational program «6B06108 Data Science and Machine Learning», approved on 20.03.2019;*

− *the educational program «6B06110 Software Engineering», approved on 20.03.2019;*

− *the educational program «8D06102 Computer and Software Engineering», approved on 05.03.2019.*

The IITU policy in the field of education quality is described in a set of corporate regulations published on the university's web portal – *https://iitu.kz/en/:*

− *«QM-01 Quality guide», approved by the rector of IITU on November 01, 2018;*

− *«QM-02 Academic policy», approved by the rector of IITU on March 18, 2020;*

− *«Academic Integrity Code», approved by the rector of IITU on April 26, 2019;*

− *«Code of Corporate Ethics», approved by the decision of the Board of IITU JSC on July 04, 2011.*

Accredited EPs of the IITU undergo periodic modernization according to plans:

1. The development plan of the educational program «6B06107 Cyberphysical Systems» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

2. The development plan of the educational program «6B06108 Data Science and Machine Learning» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

3. The development plan of the educational program «6B06110 Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

4. The development plan of the educational program «8D06102 Computer and Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

5. The work plan of the CEIS department, approved by the IITU rector on 29.08.2019.

The conclusions of the EEC on this standard were confirmed during the meetings with the administration and management of the IITU divisions:

1. Meeting with the rector of IITU on October 19, 2020;

2. Meeting with the vice-rectors of IITU on October 19, 2020;

3. Meeting with the heads of the IITU structural divisions on October 19, 2020;

4. Interview with heads of departments on October 19, 2020.

Analytical part

The quality assurance policy and the changes made to it are systematically brought to the attention of employers at the IITU within the framework of annual meetings with them to adjust the content of the EP. The quality policy is approved at a meeting of the IITU Academic Council and is annually reviewed and discussed at a meeting of the CEIS department (Work plan of the CEIS department).

According to the regulatory documents, the internal quality audit of the IITU is carried out once a year. Monitoring and responsibility for defining the goals and quality of the EP are borne by the Faculty of Computer Technologies and Cybersecurity, the CEIS department, providing the cycle of compulsory interdisciplinary courses and major disciplines.

The key performance indicators formulated in the IITU Academic Policy are the starting point and the main recommendation for the tactical and operational development of EP. EEC confirms that the uniqueness and advantage of each EP submitted for accreditation was confirmed during interviews with EP coordinators and in the analysis of the documentation submitted by the university.

IITU provides transparency of the EP management system. An important element of the EP quality assurance policy is the anti-corruption policy at the university, which includes anti-corruption measures, the availability of university leadership for teachers and students, flexibility in responding to requests formulated in the IITU's «Academic Integrity Code».

Strengths / best practice of the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− The IITU management has an internal EP quality assurance system based on corporate procedures QM-01 and QM-02, which regulate the EP design and quality control of the educational process.

− IITU pursues an anti-corruption policy in the university and applies anti-corruption

measures described in the «Academic Integrity Code» and «Code of Corporate Ethics».

− IITU, faculty and EP leadership are easily accessible for teachers and students and flexibly respond to their requests.

− The CEIS department has a transparent management and quality assurance system for EP.

− All accredited EPs contain sections devoted to the implementation of innovations.

− Accredited EP are published on the university's web portal in compact (for all users) and expanded formats (for internal purposes).

− The management of the accredited EP is trained in education management.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− Develop a quality assurance mechanism in the implementation of joint / double-degree education and academic mobility.

− Increase the number of employers' representatives in the collegial management bodies of the educational program and their representativeness in making decisions on the management of the educational program.

− Plan the internal and external mobility of EP students indicating the forms of exchange, the number of students and terms based on the relevant memorandums with other universities.

− Organize training for EP management on EP risk management methodologies.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Management of the educational program» 15 criteria are discussed, of which 6 have a strong position, 6 – satisfactory and 3 – need improvement.

6.2. The standard «Information management and reporting»

✓ *The educational organization must demonstrate the existence of a system for collecting, analyzing and managing information based on the use of modern information and communication technologies and software and that it uses a variety of methods to collect and analyze information in the context of the EP.*

✓ *EP management must demonstrate mechanisms for the systematic use of processed, adequate information to improve the internal quality assurance system.*

✓ *EP management must demonstrate fact-based decision making.*

✓ *Within the EP, a system of regular reporting should be provided that reflects all levels of the structure, including an assessment of the effectiveness and efficiency of the activities of units and departments, scientific research.*

✓ *The organization of education must establish the frequency, forms and methods of assessing EP management, the activities of collegial bodies and structural units, top management, the implementation of scientific projects.*

✓ *The educational organization must demonstrate the determination of the order and ensuring the protection of information, including the identification of persons responsible for the accuracy and timeliness of the analysis of information and the provision of data.*

✓ *An important factor is the availability of mechanisms for involving students, employees and teaching staff in the processes of collecting and analyzing information, as well as making decisions based on them.*

✓ *The EP's management must demonstrate the existence of a communication mechanism with students, employees and other stakeholders, including the availability of conflict resolution mechanisms.*

✓ *The educational organization must demonstrate the existence of mechanisms for measuring the degree of satisfaction of the needs of teaching staff, personnel and students within the EP.*

✓ *The educational organization should provide for an assessment of the effectiveness and efficiency of activities, including in the context of EP.*

✓ *The information to be collected and analyzed within the EP should take into account:*
  − *key performance indicators;*

> – *the dynamics of the contingent of students in the context of forms and types;*
> – *academic performance, student achievement and expulsion;*
> – *satisfaction of students with the implementation of EP and the quality of education at the university;*
> – *availability of educational resources and support systems for students.*
> ✓ *The educational organization must confirm the implementation of the procedures for processing personal data of students, employees and teaching staff on the basis of their documentary consent.*

Proof part

IITU has introduced mechanisms for the systematic use of processed information based on the use of modern ICT. This is served by:

1. Corporate web portal of IITU – https://iitu.kz/en/
2. Corporate educational portal – http://dl.iitu.kz/
3. Corporate information system Campus – https://campus.iitu.kz/
4. Corporate information system KABIS – https://kabis.iitu.kz/

Analytical part

IITU operates both classical processes of management and information transfer, and processes implemented with the help of IT.

Dissemination of information and receipt of feedback in the university is carried out through meetings of collegial bodies, working groups created to solve urgent problems.

IITU has implemented the following data collection and analysis systems for decision-making:

– creporting system of structural units on the results of work;
– consideration of issues on collegial bodies;
– analysis of the external and internal environment of the university;
– internal audits and checks to obtain information on processes;
– stakeholder satisfaction assessment systems.

IITU has a developed IT structure – corporate web-portal, MOODLE-compliant DL educational portal, the information systems Campus and KABIS. All IT systems of the university are working, and their content is actively updated.

Access to the internal information subsystems of the IITU is well protected by hardware and software, and access to students and employees to their resources is provided using corporate accounts and passwords.

IITU has an IT department with highly qualified specialists who support and maintain the IT systems of the university, as well as employees at different levels responsible for their content.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

– IITU possesses and actively uses a developed, purpose-structured and secure information system to collect and analyze information in the context of quality assurance of EP.

– Corporate regulatory documents of the university clearly describe the frequency, forms and methods of assessing EP management, the activities of collegial bodies and structural divisions, the implementation of their scientific projects.

– MUIT has and uses periodic reporting and assessment of the performance of departments, as part of the corporate quality management system.

– The developed web portal of the IITU allows students, employees and other interested persons to contact the management of the university, faculty, CEIS department and the EPs in order to find out and resolve issues and possible conflicts.

– The university has highly qualified specialists in the maintenance of its information

system.

− Accredited EP are developed on the basis of analysis and assessment of the requirements of the labor market of the Republic of Kazakhstan, as well as after consultations with potential employers, and, as a result, the EP focuses on the skills of students (practical training, certification).

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
− there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
Within the standard «Information management and reporting» 16 criteria are discussed, of which 6 have a strong position and 10 – satisfactory.

6.3. The standard «Development and approval of the educational program»

> ✓ *The educational organization must define and document procedures for the development of EP and their approval at the institutional level.*
> ✓ *The EP's management must ensure that the developed EP meets the established goals, including the expected learning outcomes.*
> ✓ *The EP's management must ensure the availability of developed models of the EP graduate, describing the learning outcomes and personal qualities.*
> ✓ *The EP's management must demonstrate the conduct of external examinations of the EP content and the planned results of its implementation.*
> ✓ *The qualification awarded upon completion of the EP must be clearly defined and correspond to a certain level of the NQS.*
> ✓ *The EP's management must determine the impact of disciplines and professional practices on the formation of learning outcomes.*
> ✓ *An important factor is the ability to prepare students for professional certification.*
> ✓ *The EP's management must provide evidence of the participation of students, teaching staff and other stakeholders in the development of EP, ensuring their quality.*
> ✓ *The complexity of the EP should be clearly defined in Kazakhstani credits and ECTS.*
> ✓ *The EP's management must ensure that the content of academic disciplines and learning outcomes are consistent with the level of education (bachelor's, master's, doctoral studies).*
> ✓ *The structure of the EP should provide for various types of activities that ensure the achievement of the planned learning outcomes by students.*
> ✓ *An important factor is the correspondence between the content of the EP and the learning outcomes of the EP, implemented by organizations of higher and (or) postgraduate education in the EHEA.*

Proof part
IITU independently designs and plans the content of the EP in accordance with the national and industry qualification framework, and also takes into account the requirements of professional standards.

The development and approval process of the accredited EP is based on the following corporate regulatory documents of the university:
1. «QM-01 Quality quide», approved by the rector of IITU on November 01, 2018.
2. «QM-02 Academic policy», approved by the rector of IITU on March 18, 2018.
3. «R-11 Rules for ongoing monitoring of progress, intermediate and final certification of students», approved by the rector of IITU on 14.12.2018.
4. «Rules for organizing the educational process on credit technology of education», approved by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 152 dated 20.04.2011.

5. «P-34 Regulations on the ECTS credit transfer system» approved by the rector of IITU on November 06, 2015.

Accredited EP are focused on learning outcomes. They define a set of required professional competencies and formulate a model for an EP graduate in accordance with the needs of the labor market, employers' requests and based on the national qualifications framework:

1. The educational program «6B06107 Cyberphysical Systems», approved on 20.03.2019;

2. The educational program «6B06108 Data Science and Machine Learning», approved on 20.03.2019;

3. The educational program «6B06110 Software Engineering», approved on 20.03.2019;

4. The educational program «8D06102 Computer and Software Engineering», approved on 05.03.2019.

5. The development plan of the educational program «6B06107 Cyberphysical Systems» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

6. The development plan of the educational program «6B06108 Data Science and Machine Learning» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

7. The development plan of the educational program «6B06110 Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

8. The development plan of the educational program «8D06102 Computer and Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020.

The conclusions of the EEC on this standard were confirmed during the meetings with the administration and management of the IITU divisions:

1. Meeting with the rector of IITU on October 19, 2020;

2. Meeting with the vice-rectors of IITU on October 19, 2020;

3. Meeting with the heads of the IITU structural divisions on October 19, 2020;

4. Interview with heads of departments on October 19, 2020;

5. Visual inspection of the IITU infrastructure for accredited EP, held on October 19, 2020.

Analytical part

For each accredited EP, a map of competencies, minimum requirements for mastering the educational program, a list of compulsory and selective disciplines, a recommended model for mastering EP disciplines are formulated to achieve maximum results.

The labor intensity of EP academic disciplines is determined in ECTS credits on the basis of internal documents: «Academic policy», «Regulations on the system of credit transfer of ECTS type», «Rules for organizing the educational process on credit technology of education» and other documents of the university.

To further stimulate the preparation of EP students for professional certification, specialized centers have been created at IITU – CISCO Academia and Microsoft Center.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− Availability of CISCO Academia and Microsoft center at the university, which facilitates preparation of EP students for professional certification.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

– there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Development and approval of the educational program» 12 criteria are discussed, of which 1 has a strong position and 11 – satisfactory.

6.4. The standard «Continuous monitoring and periodic evaluation of educational programs»

✓ *The educational organization should determine the mechanisms for monitoring and periodic evaluation of the EP to ensure the achievement of the goal and meet the needs of students and society. The results of these processes should be aimed at continuous improvement of the EP.*
✓ *Monitoring and periodic evaluation of the EP should provide for:*
– *the content of the programs in the light of the latest scientific achievements in a particular discipline to ensure the relevance of the taught discipline;*
– *changes in the needs of society and the professional environment;*
– *workload, academic performance and graduation of students;*
– *the effectiveness of student assessment procedures;*
– *expectations, needs and satisfaction of students with EP training;*
– *educational environment and support services and their relevance to EP goals.*
✓ *A mechanism for informing all interested persons about any planned or taken actions in relation to EP should be defined by the educational organization, the EP's management.*
✓ *All changes made to the EP must be published. The EP's management should develop a mechanism for revising the content and structure of the EP, considering changes in the labor market, employers' requirements and the social demand of society.*

Proof part
The methodology for assessing and monitoring the quality of accredited EP at the IITU is determined by the internal documents of the university:

1. «QM-01 Quality quide», approved by the rector of IITU on November 01, 2018;

2. «QP-03 Organization of the educational process (bachelor's degree)», approved by the rector of IITU on March 18, 2019;

3. «QP-04 Organization of the educational process (master's degree)», approved by the rector of IITU on November 21, 2020;

4. «QP-09 Preparation of Doctors of Philosophy (PhD)», approved by the rector of IITU on November 21, 2019;

5. «R-11 Rules for ongoing monitoring of progress, intermediate and final certification of students», approved by the rector of IITU on 14.12.2018.

The University conducts a number of activities for the development of accredited EP in accordance with the documents:

6. The development plan of the educational program «6B06107 Cyberphysical Systems» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

7. The development plan of the educational program «6B06108 Data Science and Machine Learning» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

8. The development plan of the educational program «6B06110 Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

9. The development plan of the educational program «8D06102 Computer and Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational

Activities of the IITU 28.08.2020.

EEC meetings and interviews with the administration and teachers from the IITU and employers:

1. Meeting with the vice-rectors of IITU on October 19, 2020;

2. Meeting with the heads of the IITU structural divisions on October 19, 2020;

3. Interview with heads of departments on October 19, 2020;

4. Interview with the teaching staff of the OP of the 2nd cluster dated October 19, 2020;

5. Interview with employers of the EP of the 2nd cluster dated October 20, 2020

confirmed the efforts of the university to adapt the EP to new technologies and changing labor market requirements.

Analytical part

IITU has mechanisms for the approval, periodic assessment and monitoring of implemented EP and awarded qualifications – control over the compilation and content of the EP, over the development of working curricula by the Vice-Rector for Academic and Educational Activities, Director of the Department for Academic Affairs, Dean of the Faculty, Head of the CEIS department.

These mechanisms include:

− conducting intermediate and current certification of students (twice a year during examination sessions) – in accordance with the *«Rules for conducting ongoing monitoring of progress, intermediate and final certification of students»*;

− conducting the final state certification – according to *«Organization of the educational process (bachelor's degree)»*, *«Training of doctors of philosophy (PhD)»*;

− receiving feedback on internship from enterprises and organizations;

− taking into account the achievements of students in scientific, educational and social activities, confirmed by certificates, diplomas, and certificates;

− assessment by graduates of accredited EP;

− peer review of graduate qualification works of students.

For effective management, control, accounting and analysis of educational, research and other processes Corporate information system Campus is used – *https://campus.iitu.kz/*, with the help of which the planning and monitoring of the educational process, information support for decision-making, providing students with information about the educational process.

The Academic Council, the Educational-Methodological Council and the Academic Committee of the IITU, as well as a number of large employing organizations – the Association of IT Companies, KAIB, Kazakhtelecom JSC and others take part in the revision of the content and structure of the EP.

In the second semester of each academic year, the CEIS department discusses and revises the working curricula of accredited EP (up to 30% of disciplines) with the participation of employers in order to take into account their wishes, as well as changes in the State Educational Standard of Education and changes in labor market requirements. The results of the discussion of the EP at the meeting of the department are recorded.

The EP's management disseminates information about the development, formation and approval of the EP through electronic document management, and also publishes them on the university's web portal.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− strengths according to this standard are not identified.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer

and Software Engineering»:
- − there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Continuous monitoring and periodic evaluation of educational programs» 9 criteria are discussed, of which 9 have a satisfactory position.

6.5. The standard «Student-centered learning, teaching and evaluation of performance»

✓ *The EP's management should ensure respect and attention to various groups of students and their needs, provide them with flexible learning paths.*
✓ *The EP's management should provide for the use of various forms and methods of teaching and learning.*
✓ *An important factor is the presence of own research in the field of teaching methods of academic disciplines of the EP.*
✓ *The EP's management must demonstrate the existence of feedback mechanisms on the use of various teaching methods and assessment of learning outcomes.*
✓ *The EP's management must demonstrate the existence of mechanisms to support the autonomy of students with simultaneous guidance and assistance from the teacher.*
✓ *EP management must demonstrate the existence of a procedure for responding to student complaints.*
✓ *The educational organization must ensure consistency, transparency and objectivity of the mechanism for assessing learning outcomes for each EP, including appeal.*
✓ *The educational organization must ensure that the procedures for assessing the learning outcomes of EP students are consistent with the planned results and objectives of the program. Criteria and methods of assessment within the EP must be published in advance.*
✓ *The educational organization should determine the mechanisms for ensuring the development of learning outcomes by each EP graduate and ensure the completeness of their formation.*
✓ *Evaluators should be familiar with modern methods of assessing learning outcomes and regularly improve their qualifications in this area.*

Proof part
IITU pursues a policy of attentive and respectful attitude towards its students, which is confirmed by the relevant internal documents of the university:

1. The form «Agreement for the provision of educational services» between the IITU and the student;

2. «R-04 Admission rules for undergraduate programs», approved by the rector of IITU on June 19, 2019;

3. «R-05 Admission rules for postgraduate programs», approved by the rector of IITU on May 25, 2018;

4. «QP-03 Organization of the educational process (bachelor's degree)», approved by the rector of IITU on March 18, 2019;

5. «QP-04 Organization of the educational process (master's degree)», approved by the rector of IITU on November 21, 2020;

6. «QP-09 Preparation of Doctors of Philosophy (PhD)», approved by the rector of IITU on November 21, 2019;

7. «R-11 Rules for ongoing monitoring of progress, intermediate and final certification of students», approved by the rector of IITU on 14.12.2018;

8. The form «Application for appeal» of the student;

9. The form «Application for the postponement of the exam» of the student;

10. The form «Application for the transfer of the exam» of the tutor;

11. The form «Individual curriculum» of the student 2020-2021;

12. Methodical instruction «Connecting to Wi-Fi for students» –
https://dl.iitu.kz/file.php/1/WiFi_stud_new2018.zip;

13. Form «Contract for professional practice» of the student.

IITU also supports, to the best of its capabilities, students with high academic achievements, as well as with social problems (*order of the rector of IITU N185-C of May 14, 2020 «On measures of social support for students»*).

The interview with EP students for accredited EP dated October 20, 2020, confirmed that IITU takes into account in its work, first of all, the interests and requests of students.

Analytical part

At IITU, the student is the main participant in the implementation of the EP, and his interests and requests are taken into account primarily when ensuring the quality of the educational process.

The management of accredited EP provides equal opportunities for students to form an individual educational program aimed at the formation of professional competencies, skills and learning outcomes presented in the EP passports.

By seeking help from the advisers of study groups, students can prepare Individual Curricula (IC), in which they can build an individual trajectory of their learning within the EP.

The CEIS department uses a variety of forms and methods of teaching – laboratory work, case-study, implementation of independent and group projects and coursework.

Teachers of the department often use active teaching methods, when a student independently acquires knowledge in the learning process.

To receive and respond to student complaints, there are complaints and suggestion boxes located in the educational building, a virtual reception on the main page of the IITU web portal, where you can ask questions to the rector.

Periodic questioning of students is also an important component of the feedback mechanism in the university. The questionnaire «Teacher through the eyes of students» is carried out anonymously online during the session before the start of each exam.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
− Students from Nazarbayev Intellectual Schools of the Republic of Kazakhstan can reduce their term of study by transferring part of the disciplines.
− Many multi-language training courses have been prepared and are available through Microsoft Teams for those wishing to learn along flexible learning paths.
− Accredited EPs provide for independent and group laboratory work and projects, remote and interactive training based on modern IT technologies, and EP laboratories have the ability to conduct laboratory and coursework at a distance (robots available via the Internet, 3D printers).
− The teaching staff of the CEIS department has extensive experience in teaching educational disciplines of EP using modern information technologies. Their research, knowledge and experience in the field were presented in the project ERASMUS + KA2 ACADEMICA «Accessibility and harmonization of higher education in Central Asia through modernization and development of curricula» and ERASMUS + «Kazakh Universities to Foster Quality Assurance Processes in Technology Enhanced Learning» (KUTEL).

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
− there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Student-centered learning, teaching and evaluation of performance» 10 criteria are discussed, of which 3 have a strong position and 7 – satisfactory.

6.6. The standard «Students»

✓ *The educational organization must demonstrate the existence of a policy for the formation of the contingent of students in the context of EP from admission to graduation and ensure the transparency of its procedures. The procedures governing the life cycle of students (from admission to completion) must be defined, approved, published.*

✓ *The EP's management should determine the procedure for the formation of the contingent of students based on:*

  – *minimum requirements for applicants;*
  – *the maximum size of the group during seminars, practical, laboratory and studio sessions;*
  – *forecasting the number of government grants;*
  – *analysis of available material and technical, information resources, human resources;*
  – *analysis of potential social conditions for students, including providing places in a hostel.*

✓ *The EPs management must demonstrate readiness to conduct special adaptation and support programs for newly admitted and foreign students.*

✓ *The educational organization must demonstrate that its actions are consistent with the Lisbon Recognition Convention.*

✓ *The educational organization should cooperate with other educational organizations and national centers of the «European Network of National Information Centers for Academic Recognition and Mobility / National Academic Recognition Information Centers» ENIC / NARIC in order to ensure comparable recognition of qualifications.*

✓ *The EP's management must demonstrate the existence of a mechanism for recognizing the results of academic mobility of students, as well as the results of additional, formal and non-formal education.*

✓ *The educational organization should provide an opportunity for external and internal mobility of EP students, as well as a willingness to assist them in obtaining external grants for training.*

✓ *The EP's management must demonstrate a willingness to provide students with places of practice, facilitate the employment of graduates, maintain communication with them.*

✓ *The educational organization should provide for the possibility of providing EP graduates with documents confirming the acquired qualifications, including the achieved learning outcomes, as well as the context, content and status of the education received and evidence of its completion.*

✓ *An important factor is the availability of mechanisms for monitoring the employment and professional activities of EP graduates.*

Proof part

The methodology for the formation of the contingent of students and the organization of the educational process for the accredited EP is described in a number of internal documents of the IITU:

1. «QM-02 Academic policy», approved by the rector of IITU on March 18, 2020;

2. «R-04 Admission rules for undergraduate programs», approved by the rector of IITU on June 19, 2019;

3. «R-05 Admission rules for postgraduate programs», approved by the rector of IITU on May 25, 2018;

4. «P-71 Regulation on the procedure for recognizing learning outcomes of non-formal education», approved by the rector of IITU on February 26, 2020;

5. «QP-03 Organization of the educational process (bachelor's degree)», approved by the rector of IITU on March 18, 2019;

6. «QP-04 Organization of the educational process (master's degree)», approved by the rector of IITU on November 21, 2020;

7. «QP-09 Preparation of Doctors of Philosophy (PhD)», approved by the rector of IITU on November 21, 2019;

8. «Rules for organizing the educational process on credit technology of education», approved by order of the Ministry of Education and Science of the Republic of Kazakhstan No. 152 dated 20.04.2011.

The concern of the IITU administration about the formation of the contingent and the arrangement of graduates of the accredited EP was confirmed at the meetings of the EEC with teachers, students and employers:

1. Interview with the teaching staff of the EP on the accredited EP dated October 19, 2020;

2. Interview with EP students for accredited EP dated October 20, 2020;

3. Interview with employers of EP on accredited EP dated October 20, 2020.

The attention with which the university relates to the provision of conditions for training was also demonstrated by a visual inspection of the IITU infrastructure for accredited EP dated October 19, 2020.

Analytical part

For students from socially vulnerable segments of the population of the Republic of Kazakhstan, IITU practices the provision of quotas (in% of the total number of grants) upon admission: 1% for orphans, 1% for disabled people, 0.5% for participants in the Second World War and those equated to him, 4% for persons of Kazakh nationality who are not citizens of the Republic of Kazakhstan.

IITU accepts applicants with a general school education only on the basis of the UNT and, since training in the EP is carried out in English, it recommends that applicants have a basic level of knowledge in English (Intermediate).

To form study groups, the university conducts testing of applicants in basic programming skills and computer science, and in English. The group occupancy from the academic stream is determined by the Department of Academic Affairs (DAA).

The IUIT web portal provides information necessary for admission to the bachelor's degree – the rules and conditions for admission, a description of the EP with an indication of the core subjects of the unified national testing, a list of required documents, regulatory documents, announcements, information on the number of grants, tuition fees, discounts and quotas, and etc.

The university does not have dormitories, so there is a practice at IITU, according to which specialists from the Department of Marketing and PR of the university provide assistance with the resettlement of students.

The educational process at IITU is conducted according to a multilevel system using credit technology, with the introduction of unified credit systems – credits. The university has a «P-34 Regulations on the ECTS credit transfer system», which are based on the «Rules for organizing the educational process according to credit technology of education» of the Ministry of Education and Science of the Republic of Kazakhstan.

The emphasis in accredited EP is placed on the mastery of practical skills by students with subsequent certification, and for this purpose the university has created a number of specialized laboratories.

The Department for International Cooperation and Academic Mobility of the University is responsible for coordinating activities on international academic mobility, comparing and mutual recognition of learning outcomes and qualifications of students.

IITU cooperates with many universities in the world: Schmalkalden University of Applied Sciences (Germany), Universiti Teknologi MARA (Malaysia), Green River College (USA) and others.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− In addition to a diploma of higher education, EP graduates are given the opportunity to receive a CISCO Academy certificate and / or Microsoft certificates.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data

Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− Internal and external mobility of university students should be carried out based on relevant contracts, indicating the form of exchange, the number of students and terms.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Students» 14 criteria are discussed, of which 1 have a strong position, 12 – satisfactory and 1 – needs improvement.

6.7. The standard «Teaching staff»

✓ *The educational organization should have an objective and transparent personnel policy, including in the context of EP, including recruitment, professional growth and development of personnel, ensuring the professional competence of the entire staff.*

✓ *The educational organization must demonstrate the compliance of the staff potential of the teaching staff with the development strategy of the university and the specifics of the EP.*

✓ *The EP's management must demonstrate awareness of responsibility for their employees and providing them with favorable working conditions.*

✓ *The EP's management must demonstrate a change in the role of the teacher in connection with the transition to student-centered learning.*

✓ *The educational organization should determine the contribution of the teaching staff of the EP to the implementation of the development strategy of the university, and other strategic documents.*

✓ *The educational organization should provide opportunities for career growth and professional development of the teaching staff of the EP.*

✓ *The EP's management must demonstrate a willingness to involve practitioners of the relevant industries in teaching.*

✓ *The educational organization should demonstrate the motivation for the professional and personal development of EP teachers, including the encouragement of both the integration of scientific activity and education, and the use of innovative teaching methods.*

✓ *An important factor is the willingness to develop academic mobility within the EP, attracting the best foreign and domestic teachers.*

Proof part

The faculty is the main resource for the mission of the institution. IITU manages the human resources of the teaching staff in accordance with its development strategy and taking into account the specifics of the accredited EP. The main provisions of the personnel policy of the university are reflected in the internal documents:

1. «Personnel policy», approved by the rector of IITU on November 06, 2015;

2. «P-01 Planning of academic work and teaching load of teaching staff»;

3. «R-07 Rules for competitive replacement of positions of teaching staff and scientific workers», approved by the rector of IITU on December 14, 2018;

4. «P-41 Regulation on advanced training and development of the competence of employees», approved by the rector of IITU on September 01, 2015;

5. «P-51 Regulations on the anti-plagiarism system», approved by the rector of IITU on March 27, 2019.

The management of the university and the CEIS department monitors to prevent staff turnover, to maintain the degree of staff satisfaction in the disciplines of EP and professional development and the development of the competencies of its employees, which was confirmed at meetings and interviews:

1. Meeting with the rector of IITU on October 19, 2020;

2. Meeting with the heads of the IITU structural divisions on October 19, 2020;

3. Interview with heads of departments on October 19, 2020;

4. Interview with the teaching staff of the EP on the accredited EP dated October 19, 2020.

Analytical part

The ratio of the number of employees of the CEIS Department with academic degrees to the total number of teachers is 32%, and the share of specialists with practical experience in the field of IT is 40%. At the CEIS department, one foreign professor takes part in the implementation of the EP.

The recruitment of teachers is carried out based on the results of a competition for filling vacant positions. The Department of Personnel and Documentation Management of the IITU conducts an analysis of candidates' resumes for compliance with qualification requirements. The candidate goes through the selection procedures (interview, trial lesson), and the final decision is made at a meeting of the contract-competitive commission of the university.

Once a year, the attestation of the teaching staff is carried out with the issuance of recommendations on the conformity (inconsistency) of the position held, the promotion or demotion of the attested.

The teaching staff of the department and EP carry out scientific and business contract projects with a total volume of about 50 million tenge per year in grant projects of the Ministry of Education and Science of the Republic of Kazakhstan and international projects.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− The teaching staff of IITU and the CEIS department is very young and this creates a favorable atmosphere for career growth. This is also facilitated by the availability of university documents regulating personnel policy, qualification requirements and provisions on advanced training and development of teaching staff.

− Approximately a third of the teaching staff of the CEIS department have experience in IT enterprises, which is an undoubted advantage and shows the desire of the EP management to attract practitioners to teaching.

− The university practices material and moral stimulation of the professional and personal development of teaching staff based on the results of the annual certification, as well as based on the results of the questionnaire survey among students, with an increase or decrease in their position.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Teaching staff» 9 criteria are discussed, of which 3 have a strong position and 6 – satisfactory.

6.8. The standard «Educational resources and student support systems»

✓ *The educational organization must ensure enough training resources and student support services that meet the goals of the EP.*

✓ *The educational organization must demonstrate the sufficiency of material and technical resources and infrastructure, taking into account the needs of various groups of students in the context of EP (adults, working,*

foreign students, as well as students with disabilities).

✓ *The EP's management must demonstrate the existence of procedures for supporting various groups of students, including information and counseling.*

✓ *The EP's management must demonstrate the compliance of information resources with the specifics of the EP, including:*

– *technological support for students and teaching staff in accordance with educational programs (for example, online training, modeling, databases, data analysis programs);*

– *library resources, including the fund of educational, methodological and scientific literature on general education, basic and profiling disciplines on paper and electronic media, periodicals, access to scientific databases;*

– *examination of research results, graduation works, dissertations for plagiarism;*

– *access to educational Internet resources;*

– *functioning of WI-FI on the territory of the educational organization.*

✓ *The educational organization should strive to ensure that educational equipment and software intended for use in the development of educational programs are similar to those used in the relevant industries.*

Proof part

IITU has great technical capabilities and resources to educate and support its students. This is confirmed by the presence of a developed information system of the university, as well as the presence of relevant internal regulatory documents:

1. Corporate web-portal of IITU – https://iitu.kz/;

2. «P-41 Regulations on the anti-plagiarism system», approved by the rector of IITU on March 27, 2019;

3. The form «Individual curriculum» of a student for 2020-2021;

4. Methodical instruction «Connecting to Wi-Fi for students» – https://dl.iitu.kz/file.php/1/WiFi_stud_new2018.zip

5. Methodical instruction «Connecting to Wi-Fi for teaching staff» – http://dl.iitu.kz/file.php?file=%2F1%2Fcourse1%2FPodkljuchenie_k_WiFi_Teachers.rar

Relevant interviews with teachers and students of the EP, as well as a visual inspection of the classrooms and laboratories of the CEIS department, confirmed the good material base of the IITU for the EP:

1. Interview with heads of departments on October 19, 2020;

2. Interview with the teaching staff of the EP on the accredited EP dated October 19, 2020;

3. Interview with the students of EP on accredited EP dated October 20, 2020;

4. Visual inspection of the IITU infrastructure for accredited EP, held on October 19, 2020.

Analytical part

MUIT has a modern building with a total area of about 6500 m^2 with well-equipped classrooms for 50-60 seats and laboratories for 20 seats.

The IITU library has two spacious reading rooms with computers. Accredited EPs are provided with relevant educational literature:

Educational program	Books	Contingent	Supply
6B06107 «Cyberphysical Systems»	1216	15	81
6B06108 «Data Science and Machine Learning»	1785	21	85
6B06110 «Software Engineering»	15193	174	87
8D06102 «Computer and Software Engineering» (doctoral studies)	173	11	15

In addition to literature on a paper basis, the library has a resource of electronic textbooks and manuals, combined into an electronic library, which are easily accessible to remotely authorized users of the university.

Licensed software products for general and specialized purposes are installed on computers of laboratories of accredited EPs:

№	Name	Quantity	Description
1	Microsoft Office365 A1	4500	Staff and students
2	Kaspersky Endpoint Security for Business Select Educational	1000	Antivirus software
3	COMSOL Multiphysics CKL License (Academic)	1	Eccum
4	Mathworks MATHLAB with Partial Differential Toolbox Academic	30	Eccum 10+МУИТ 20
5	Adobe Presenter	2	Kutel project
6	Autodesk Education	3000	For sudying
7	Windows Server Datacenter Core	32	Server software

The classrooms, laboratories of IITU and the CEIS department have access to educational resources on the Internet through a wireless and wired corporate info-network at a speed of 320 Mbit / s (for authorized users), which is serviced by a team of 6 IT specialists (there are plans to expand the team).

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− IITU has a modern and comfortable building with a sufficient number of classrooms and laboratories.

− The library of the university has equipped premises, a large resource of books on paper and in electronic form for accredited EP.

− The library provides students with access to the resources of the republican interuniversity library, the KABIS system, scientific databases – SCOPUS, Springer, etc. The rules for using the library are publicly available on the university's web portal.

− All premises of accredited EPs are equipped with a corporate info-network with access to Wi-Fi, which is maintained by a team of highly qualified IT specialists.

− The CEIS department actively uses online training on EP. The laboratories of the department are equipped with equipment and specialized software products that fully correspond to similar modern tools from the IT industry.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

− there are no recommendations for this standard.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standard «Educational resources and student support systems» 8 criteria are discussed, of which 5 have a strong position and 3 – satisfactory.

6.9. The standard «Informing the public»

> ✓ *The educational organization must publish reliable, objective, relevant information about the educational program and its specifics, which should include*:
> – *expected learning outcomes of the educational program being implemented;*
> – *qualifications and (or) qualifications that will be awarded upon completion of the educational program;*
> – *approaches of teaching, learning, as well as the system (procedures, methods and forms) of assessment;*
> – *information about passing scores and learning opportunities provided to students;*
> – *information about the employment opportunities of graduates.*
> ✓ *The EP's management should provide for a variety of ways to disseminate information, including the media, information networks to inform the general public and stakeholders.*
> ✓ *Informing the public should include support and explanation of national development programs for the country and the system of higher and postgraduate education.*
> ✓ *The educational organization must demonstrate the reflection on the web resource of information characterizing it in general and in the context of educational programs.*
> ✓ *An important factor is the availability of adequate and objective information about the teaching staff of the EP.*
> ✓ *An important factor is informing the public about cooperation and interaction with partners within the EP.*

Proof part

IITU pays great attention to informing the public about its training programs in order to attract as many applicants as possible:

1. Corporate web portal of IITU – https://iitu.kz/
2. YouTube video channel of the IITU – https://www.youtube.com/user/IITUAlmaty
3. LinkedIn page – https://www.linkedin.com/school/iitu/
4. Facebook pages – https://www.facebook.com/universityAlmaty/ and
https://www.facebook.com/CEandT/
5. Instagram - https://www.instagram.com/iitu_kz/?hl=ru
6. CEIS department page – https://www.iitu.kz/ru/articles/departments/komp_uternaa-injeneria-i-informazionnaa-bezopasnost_/

Analytical part

Corporate IITU web-portal has web pages in Kazakh, Russian and English, where any user can find most of the required information on the university.

Information about the EP is available on the main page of the web portal, as well as on the page of the CEIS department, where the EP qualifications by training levels are indicated.

Representatives of the PR and Marketing Department of IITU annually give field lectures to students of district and regional schools, as well as schools in other cities of Kazakhstan.

The press center of the university periodically informs the public about cooperation and interaction with external partners within the EP.

IITU maintains its channel on the Internet platform YouTube, has pages on LinkedIn and social networks Facebook and Instagram.

In the announcements on the pages the IITU and the CEIS department publish informative and image messages, which highlight the life and study at the university in specialties on behalf of students. Here you can get acquainted with the academic and non-academic achievements of students, teaching staff and the university as a whole.

A stand is installed at the CEIS department, informing those who wish about the specifics of specialties, about the results and achievements of the EP.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer

and Software Engineering»:
- – *strengths according to this standard are not identified.*

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
- – Submit on the IITU web portal ordered information about all the teachers of the CEIS department and accredited EP, including at least a photo, academic degree and position, courses taught, contact information.
- – Give more importance to the content of the printed editions of the university (for example, the new journal International Journal of Information & Communication Technologies), where one could read detailed information about the activities of the university, the department of CEIS and the accredited EP.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:
Within the standard «Informing the public» 10 criteria are discussed, of which 9 have a satisfactory position and 1 – needs improvement.

6.10. The standard «The standards in the context of individual specialties»

✓ *EP should include disciplines and activities aimed at gaining practical experience and skills in the specialty in general and major disciplines in particular, including:*
- – *excursions to enterprises for specialization (factories, workshops, research institutes, laboratories, training and experimental farms, etc.);*
- – *conducting individual classes or entire disciplines at the enterprise of specialization;*
- – *conducting seminars to solve practical problems relevant for enterprises in the field of specialization, etc.*

✓ *The teaching staff involved in the education program should include, as full-time teachers, practitioners with a long experience of working as full-time employees in enterprises in the field of specialization of the EP.*
✓ *The content of all EP disciplines should be based on and include a clear relationship with the content of fundamental natural sciences.*
✓ *The EP's management should provide measures to enhance practical training in the field of specialization.*
✓ *The EP's management should provide the training of students in the use of modern information technologies.*

Proof part

IITU is one of the few universities in Kazakhstan that trains specialists in the rapidly developing and promising field of IT. The administration of the university pays special attention to the formation of accredited EP, taking into account the development of world achievements in this area. EP teaching is conducted using the most advanced technologies and teaching methods, as evidenced by EP and plans for their development:

1. The educational program «6B06107 Cyberphysical Systems», approved on 20.03.2019;
2. The educational program «6B06108 Data Science and Machine Learning», approved on 20.03.2019;
3. The educational program «6B06110 Software Engineering», approved on 20.03.2019;
4. The educational program «8D06102 Computer and Software Engineering», approved on 05.03.2019.
5. The development plan of the educational program «6B06107 Cyberphysical Systems» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

6. The development plan of the educational program «6B06108 Data Science and Machine Learning» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

7. The development plan of the educational program «6B06110 Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020;

8. The development plan of the educational program «8D06102 Computer and Software Engineering» for 2020-2023 approved by the Vice-Rector for Academic and Educational Activities of the IITU 28.08.2020.

Special attention to the accredited EP by the university, students and employers was confirmed at the meetings:

1. Interview with the heads of departments from October 19, 2020;
2. Interview with EP students for accredited EP dated October 20, 2020;
3. Interview with employers of EP on accredited EP dated October 20, 2020.

Analytical part

In the accredited EP, the modules consist of a number of disciplines that form the labor functions necessary for employers.

Each discipline, in turn, generates a number of learning outcomes required by future specialists in one direction or another. The content of the disciplines accredited by EP meets modern ICT trends, and also corresponds to fundamental general education and natural science training.

The CEIS department is working on modernizing the content of the EP and the compliance of the competencies and learning outcomes of the EP with professional standards and employers' requirements.

A large number of hours are allocated for the practical component of disciplines, educational and industrial practice is conducted to strengthen professional skills, which enables students, starting from the third year, to undergo internships in domestic and foreign IT companies.

Strengths / best practice of EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

– Analysis of the provided documentation shows a close relationship between fundamental and specialized disciplines in EP. Interviews with EP students confirmed that students understand and mastered this relationship.

– EP students possess modern information technologies, which is confirmed by the content and applied nature of the course projects being carried out.

Recommendations for the EPs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

– Introduce excursions and classes / disciplines at enterprises for further specialization of students in the EP.

– Attract employees of enterprises and companies with extensive experience in the IT field as part-time teachers in EP.

EEC conclusions on the criteria for the EP «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» and «8D06102 Computer and Software Engineering»:

Within the standards in the context of individual specialties 5 criteria are discussed, of which 2 have a strong position, 1 – satisfactory and 2 – need improvements.

(VII) OVERVIEW OF STRENGTHS / BEST PRACTICES FOR EACH STANDARD

for the educational programs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» «8D06102 Computer and Software Engineering»

1. The standard «Management of the educational program»

✓ The IITU management has an internal EP quality assurance system based on corporate procedures QM-01 and QM-02, which regulate the EP design and quality control of the educational process.

✓ IITU pursues an anti-corruption policy in the university and applies anti-corruption measures described in the «Academic Integrity Code» and «Code of Corporate Ethics».

✓ IITU, faculty and EP leadership are easily accessible for teachers and students and flexibly respond to their requests.

✓ The CEIS department has a transparent management and quality assurance system for EP.

✓ All accredited EPs contain sections devoted to the implementation of innovations.

✓ Accredited EP are published on the university's web portal in compact (for all users) and expanded formats (for internal purposes).

✓ The management of the accredited EP is trained in education management.

2. The standard «Information management and reporting»

✓ IITU possesses and actively uses a developed, purpose-structured and secure information system to collect and analyze information in the context of quality assurance of EP.

✓ Corporate regulatory documents of the university clearly describe the frequency, forms and methods of assessing EP management, the activities of collegial bodies and structural divisions, the implementation of their scientific projects.

✓ MUIT has and uses periodic reporting and assessment of the performance of departments, as part of the corporate quality management system.

✓ The developed web portal of the IITU allows students, employees and other interested persons to contact the management of the university, faculty, CEIS department and the EPs in order to find out and resolve issues and possible conflicts.

✓ The university has highly qualified specialists in the maintenance of its information system.

✓ Accredited EP are developed on the basis of analysis and assessment of the requirements of the labor market of the Republic of Kazakhstan, as well as after consultations with potential employers, and, as a result, the EP focuses on the skills of students (practical training, certification).

3. The standard «Development and approval of educational programs»

✓ Availability of CISCO Academy and Microsoft center at the university, which facilitates preparation of EP students for professional certification.

4. The standard «Continuous monitoring and periodic evaluation of basic educational programs»

✓ strengths according to this standard are not identified.

5. The standard «Student-centered learning, teaching and evaluation of performance»

✓ Students from Nazarbayev Intellectual Schools of the Republic of Kazakhstan can reduce their term of study by transferring part of the disciplines.

✓ Many multi-language training courses have been prepared and are available through Microsoft Teams for those wishing to learn along flexible learning paths.

✓ Accredited EPs provide for independent and group laboratory work and projects, remote and interactive training based on modern IT technologies, and EP laboratories have the ability to conduct laboratory and coursework at a distance (robots available via the Internet, 3D printers).

✓ The teaching staff of the CEIS department has extensive experience in teaching educational disciplines of EP using modern information technologies. Their research, knowledge and experience in the field were presented in the project ERASMUS + KA2 ACADEMICA «Accessibility and harmonization of higher education in Central Asia through modernization and development of curricula» and ERASMUS + «Kazakh Universities to Foster Quality Assurance Processes in Technology Enhanced Learning» (KUTEL).

6. The standard «Students»

✓ In addition to a diploma of higher education, EP graduates are given the opportunity to receive a CISCO Academy certificate and / or Microsoft certificates.

7. The standard «Teaching staff»

✓ The teaching staff of IITU and the CEIS department is very young and this creates a favorable atmosphere for career growth. This is also facilitated by the availability of university documents regulating personnel policy, qualification requirements and provisions on advanced training and development of teaching staff.

✓ Approximately a third of the teaching staff of the CEIS department have experience in IT enterprises, which is an undoubted advantage and shows the desire of the EP management to attract practitioners to teaching.

✓ The university practices material and moral stimulation of the professional and personal development of teaching staff based on the results of the annual certification, as well as based on the results of the questionnaire survey among students, with an increase or decrease in their position.

8. The standard «Educational resources and student support systems»

✓ IITU has a modern and comfortable building with enough classrooms and laboratories.

✓ The library of the university has equipped premises, a large resource of books on paper and in electronic form for accredited EP.

✓ The library provides students with access to the resources of the republican interuniversity library, the KABIS system, scientific databases – SCOPUS, Springer, etc. The rules for using the library are publicly available on the university's web portal.

✓ All premises of accredited EPs are equipped with a corporate info-network with access to Wi-Fi, which is maintained by a team of highly qualified IT specialists.

✓ The CEIS department actively uses online training on EP. The laboratories of the department are equipped with equipment and specialized software products that fully correspond to similar modern tools from the IT industry.

9. The standard «Informing the public»

✓ strengths according to this standard are not identified.

10. The standard «The standards in the context of individual specialties»

✓ Analysis of the provided documentation shows a close relationship between fundamental and specialized disciplines in EP. Interviews with EP students confirmed that students understand and mastered this relationship.

✓ EP students possess modern information technologies, which is confirmed by the content and applied nature of the course projects being carried out.

(VIII) OVERVIEW OF QUALITY IMPROVEMENT RECOMMENDATIONS FOR EACH STANDARD

for the educational programs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» «8D06102 Computer and Software Engineering»

1. The standard «Management of the educational program»
✓ Develop a quality assurance mechanism in the implementation of joint / double-degree education and academic mobility.
✓ Increase the number of employers' representatives in the collegial management bodies of the educational program and their representativeness in making decisions on the management of the educational program.
✓ Plan the internal and external mobility of EP students indicating the forms of exchange, the number of students and terms based on the relevant memorandums with other universities.
✓ Organize training for EP management on EP risk management methodologies.

2. The standard «Information management and reporting»
✓ there are no recommendations for this standard.

3. The standard «Development and approval of educational programs»
✓ there are no recommendations for this standard.

4. The standard «Continuous monitoring and periodic evaluation of basic educational programs»
✓ there are no recommendations for this standard.

5. The standard «Student-centered learning, teaching and evaluation of performance»
✓ there are no recommendations for this standard.

6. The standard «Students»
✓ Internal and external mobility of university students should be carried out based on relevant contracts, indicating the form of exchange, the number of students and terms.

7. The standard «Teaching staff»
✓ there are no recommendations for this standard.

8. The standard «Educational resources and student support systems»
✓ there are no recommendations for this standard.

9. The standard «Informing the public»
✓ Submit on the IITU web portal ordered information about all the teachers of the CEIS department and accredited EP, including at least a photo, academic degree and position, courses taught, contact information.
✓ Give more importance to the content of the printed editions of the university (for example, the new journal International Journal of Information & Communication Technologies), where one could read detailed information about the activities of the university, the department of CEIS and the accredited EP.

10. The standard «The standards in the context of individual specialties»

✓ Introduce excursions and classes / disciplines at enterprises for further specialization of students in the EP.

✓ Attract employees of enterprises and companies with extensive experience in the IT field as part-time teachers in EP.

Appendix 1. Evaluation table «CONCLUSION OF THE EXTERNAL EXPERT COMMISSION»

for the educational programs «6B06107 Cyberphysical Systems», «6B06108 Data Science and Machine Learning», «6B06110 Software Engineering» «8D06102 Computer and Software Engineering»

№	№	Evaluation criteria	Position of the educational organization			
			Strong	Satisfactory	Needs improvement	Unsatisfactory
	1.	**The standard «Management of the educational program»**				
1	1.	The organization of higher and / or postgraduate education must have a published quality assurance policy. Quality assurance policy should reflect the link between research, teaching and learning.	√			
2	2.	The organization of higher and (or) postgraduate education must demonstrate the development of a culture of quality assurance, including in the context of EP.		√		
3	3.	Commitment to quality assurance should apply to any activity performed by contractors and partners (outsourcing), including the implementation of joint / double degree education and academic mobility.		√		
4	4.	The EP's management demonstrates its readiness to ensure the transparency of the EP development plan based on the analysis of its functioning, the actual positioning of the educational organization and the focus of its activities on meeting the needs of the state, employers, students and other stakeholders. The plan must contain the timing of the start of the implementation of the educational program.		√		
5	5.	The EP's management demonstrates the existence of mechanisms for the formation and regular revision of the EP development plan and monitoring its implementation, assessing the achievement of learning goals, meeting the needs of students, employers and society, making decisions aimed at continuous improvement of the EP.		√		
6	6.	The EP's management should involve representatives of stakeholder groups, including employers, students and teaching staff in the formation of the EP development plan.		√		
7	7.	The EP's management must demonstrate the		√		

		individuality and uniqueness of the EP development plan, its consistency with national priorities and the development strategy of the organization of higher and (or) postgraduate education.				
8	8.	The organization of higher and (or) postgraduate education must demonstrate a clear definition of those responsible for business processes within the EP, an unambiguous distribution of job duties of personnel, and the delineation of functions of collegial bodies.		√		
9	9.	The EP's management must provide evidence of the transparency of the educational program management system.	√			
10	10.	The EP's management must demonstrate the existence of an internal EP quality assurance system, including its design, management and monitoring, their improvement, decision-making based on facts.	√			
11	11.	The EP's management must carry out risk management, including within the framework of the EP undergoing primary accreditation, as well as demonstrate a system of measures aimed at reducing the degree of risk.			√	
12	12.	The EP's management must ensure the participation of representatives of employers, teaching staff, students and other interested persons in the collegial management bodies of the educational program, as well as their representativeness in making decisions on the management of the educational program.		√		
13	13.	The educational organization must demonstrate innovation management within the EP, including the analysis and implementation of innovative proposals.	√			
14	14.	The EP's management must demonstrate evidence of readiness for openness and accessibility for students, teaching staff, employers and other interested parties.	√			
15	15.	The EP's management must be trained in educational management programs.	√			
Total by the standard			**6**	**6**	**3**	**0**
2. The standard «Information management and reporting»						
16	1.	The educational organization must demonstrate the existence of a system for collecting, analyzing and managing information based on the use of modern information and communication technologies and software and that it uses a variety of methods to collect and analyze information in the context of the EP.	√			
17	2.	The EP's management must demonstrate the existence of a mechanism for the systematic use of processed, adequate information to improve the internal quality assurance system.	√			
18	3.	The EP's management must demonstrate fact-based decision making.	√			

19	4.	Within the EP, a system of regular reporting should be provided that reflects all levels of the structure, including an assessment of the effectiveness and efficiency of the activities of divisions and departments, scientific research.	√			
20	5.	The educational organization should establish the frequency, forms and methods of assessing the management of the EP, the activities of collegial bodies and structural units, top management, the implementation of scientific projects.	√			
21	6.	The educational organization must demonstrate the determination of the procedure and ensuring the protection of information, including the identification of persons responsible for the accuracy and timeliness of information analysis and data provision.		√		
22	7.	An important factor is the availability of mechanisms for involving students, employees and teaching staff in the processes of collecting and analyzing information, as well as making decisions based on them.		√		
23	8.	The EP's management must demonstrate the existence of a communication mechanism with students, employees and other stakeholders, as well as mechanisms for resolving conflicts.	√			
24	9.	The educational organization must demonstrate the existence of mechanisms for measuring the degree of satisfaction of the needs of teaching staff, personnel and students within the EP.		√		
25	10.	The educational organization should provide for an assessment of the effectiveness and efficiency of activities, including in the context of EP.		√		
		Information intended for collection and analysis within the EP should consider:				
26	11.	key performance indicators;		√		
27	12.	dynamics of the contingent of students in the context of forms and types;		√		
28	13.	academic performance, student achievement and expulsion;		√		
29	14.	satisfaction of students with the implementation of the EP and the quality of education at the university;		√		
30	15.	availability of educational resources and support systems for students.		√		
31	16.	The educational organization must confirm the implementation of procedures for processing personal data of students, employees and teaching staff on the basis of their documentary consent.		√		
Total by the standard			**6**	**10**	**0**	0
3. The standard «Development and approval of educational programs»						

32	1.	The educational organization should define and document procedures for the development of the EP and their approval at the institutional level.		√		
33	2.	The EP's management must ensure that the developed EP meets the established goals, including the expected learning outcomes.		√		
34	3.	The EP's management must ensure the availability of developed models of the EP graduate, describing the learning outcomes and personal qualities.		√		
35	4.	The EP's management must demonstrate the performance of external examinations of the EP content and the planned results of its implementation.		√		
36	5.	The qualification awarded upon completion of the EP must be clearly defined and correspond to a certain level of the NQF.		√		
37	6.	The EP's management must determine the impact of disciplines and professional practices on the formation of learning outcomes.		√		
38	7.	An important factor is the ability to prepare students for professional certification.	√			
39	8.	The EP's management must provide evidence of the participation of students, teaching staff and other stakeholders in the development of EP, ensuring their quality.		√		
40	9.	The complexity of the EP should be clearly defined in Kazakhstani credits and ECTS.		√		
41	10.	The EP's management must ensure that the content of academic disciplines and planned results are consistent with the level of education (bachelor's, master's, doctoral studies).		√		
42	11.	The structure of the EP should provide for various types of activities that ensure the achievement of the planned learning outcomes by students.		√		
43	12.	An important factor is the correspondence between the content of the EP and the learning outcomes of the EP, implemented by organizations of higher and (or) postgraduate education in the EHEA.		√		
Total by the standard			**1**	**11**	**0**	**0**
4. The standard «Continuous monitoring and periodic evaluation of basic educational programs»						
44	1.	The educational organization should determine the mechanisms for monitoring and periodic evaluation of the EP in order to ensure the achievement of the goal and meet the needs of students and society. The results of these processes should be aimed at continuous improvement of the EP.		√		
		Monitoring and periodic evaluation of the EP should include:				

45	2.	the content of the programs in the light of the latest scientific achievements in a particular discipline to ensure the relevance of the taught discipline;		√		
46	3.	changes in the needs of society and professional environment;		√		
47	4.	workload and performance of students;		√		
48	5.	the effectiveness of student assessment procedures;		√		
49	6.	expectations, needs and satisfaction of students with EP training;		√		
50	7.	educational environment and support services and their relevance to EP goals.		√		
51	8.	The educational organization, EP management must define a mechanism for informing all interested parties about any planned or taken actions in relation to the EP.		√		
52	9.	All changes made to the EP must be published. The EP's management should develop a mechanism for revising the content and structure of the EP, considering changes in the labor market, employers' requirements and the social demand of society.		√		
		Total by the standard	**0**	**9**	**0**	**0**
	5.	**The standard «Student-centered learning, teaching and evaluation of performance»**				
53	1.	The EP's management must ensure respect and attention to various groups of students and their needs, provide them with flexible learning paths.	√			
54	2.	The EP's management should provide for the use of various forms and methods of teaching and learning.	√			
55	3.	An important factor is the availability of our own research in the field of teaching methods of academic disciplines EP.	√			
56	4.	The EP's management must demonstrate the existence of feedback mechanisms on the use of various teaching methods and assessment of learning outcomes.		√		
57	5.	The EP's management must demonstrate the existence of mechanisms to support the autonomy of students with simultaneous guidance and assistance from the teacher.		√		
58	6.	The EP's management must demonstrate the existence of a procedure for responding to student complaints.		√		
59	7.	The educational organization must ensure consistency, transparency and objectivity of the mechanism for assessing learning outcomes for each EP, including appeal.		√		
60	8.	The educational organization must ensure that the procedures for assessing the learning outcomes of EP students are consistent with the planned results and objectives of the program. Criteria and methods of assessment within the EP must be published in		√		

		advance.				
61	9.	In the educational organization, mechanisms should be determined to ensure the achievement of learning outcomes by each EP graduate and the completeness of their formation.		√		
62	10.	Evaluators should be familiar with modern methods of assessing learning outcomes and regularly improve their qualifications in this area.		√		
		Total by the standard	**3**	**7**	**0**	**0**
	6. The standard «Students»					
63	1.	The educational organization must demonstrate the existence of a policy for the formation of the contingent of students in the context of EP from admission to graduation and ensure the transparency of its procedures. Procedures governing the life cycle of students (from admission to completion), must be defined, approved, published.		√		
		The EP's management should determine the procedure for the formation of the contingent of students based on:				
64	2.	minimum requirements for applicants;		√		
65	3.	maximum group size when conducting seminars, practical, laboratory and studio classes;		√		
66	4.	forecasting the number of state educational grants;		√		
67	5.	analysis of available material, technical, information and human resources;		√		
68	6.	analysis of potential social conditions for students, including providing places in a dormitory.		√		
69	7.	The EP's management must demonstrate readiness to conduct special adaptation and support programs for newly admitted and foreign students.		√		
70	8.	The educational organization must demonstrate that its actions are consistent with the Lisbon Recognition Convention.		√		
71	9.	The educational organization should cooperate with other educational organizations and national centers of the "European Network of National Information Centers for Academic Recognition and Mobility / National Academic Recognition Information Centers" ENIC / NARIC to ensure comparable recognition of qualifications.		√		
72	10.	The EP's management must demonstrate the existence of a mechanism for recognizing the results of academic mobility of students, as well as the results of additional, formal and non-formal education.		√		
73	11.	The educational organization should provide an opportunity for external and internal mobility of EP students, as well as a willingness to assist them in obtaining external grants for training.			√	
74	12.	The EP's management must demonstrate a willingness		√		

		to provide students with places of practice, facilitate the employment of graduates, maintain communication with them.				
75	13.	The educational organization should provide the possibility of providing EP graduates with documents confirming the acquired qualifications, including the achieved learning outcomes, as well as the context, content and status of the education received and evidence of its completion.	√			
76	14.	An important factor is the availability of mechanisms for monitoring the employment and professional activity of EP graduates.		√		
		Total by the standard	**1**	**12**	**1**	**0**
	7.	**The standard «Teaching staff»**				
77	1.	The educational organization should have an objective and transparent personnel policy, including in the context of EP, including recruitment, professional growth and development of personnel, ensuring the professional competence of the entire staff.		√		
78	2.	The educational organization must demonstrate the compliance of the teaching staff potential with the development strategy of the educational organization and the specifics of the EP.		√		
79	3.	The EP's management must demonstrate awareness of responsibility for their employees and providing them with favorable working conditions.		√		
80	4.	The EP's management must demonstrate a change in the role of the teacher in connection with the transition to student-centered learning.		√		
81	5.	The educational organization should determine the contribution of the teaching staff of the EP to the implementation of the development strategy of the educational organization, and other strategic documents.		√		
82	6.	The educational organization should provide opportunities for career growth and professional development of the teaching staff of the EP.	√			
83	7.	The EP's management must demonstrate a willingness to involve practitioners of the relevant industries in teaching.	√			
84	8.	The educational organization must demonstrate motivation for the professional and personal development of EP teachers, including encouragement for the integration of scientific activity and education, the use of innovative teaching methods.	√			
85	9.	An important factor is the willingness to develop academic mobility within the EP, attracting the best foreign and domestic teachers.		√		
		Total by the standard	**3**	**6**	**0**	**0**
	8.	**The standard «Educational resources and student support systems»**				

86	1.	The educational organization must ensure enough training resources and student support services that meet the goals of the EP.	√			
87	2.	The educational organization must demonstrate the sufficiency of material and technical resources and infrastructure, considering the needs of various groups of students in the context of EP (adults, working people, foreign students, as well as students with disabilities).		√		
		The EP's management must demonstrate the existence of procedures for supporting various groups of students, including information and counseling. The EP's management must demonstrate the compliance of information resources with the specifics of EP, including:				
88	3.	technological support for students and teaching staff in accordance with EPs (for example, online training, modeling, databases, data analysis programs);	√			
89	4.	library resources, including the fund of educational, methodological and scientific literature on general education, basic and professional disciplines on paper and electronic media, periodicals, access to scientific databases;	√			
90	5.	examination of research results, graduation works, dissertations for plagiarism;		√		
91	6.	access to educational Internet resources;	√			
92	7.	functioning of Wi-Fi on the territory of the educational organization.		√		
93	8.	The educational organization should strive to ensure that educational equipment and software intended for use in the development of educational programs are like those used in the relevant industries.	√			
		Total by the standard	**5**	**3**	**0**	**0**
	9.	**The standard «Informing the public»**				
		The educational organization must publish reliable, objective, relevant information about the educational program and its specifics, which must include:				
94	1.	expected learning outcomes of the implemented educational program;		√		
95	2.	qualification and (or) qualifications that will be awarded upon completion of the educational program;		√		
96	3.	approaches of teaching, learning, as well as the system (procedures, methods and forms) of assessment;		√		
97	4.	information about passing scores and learning opportunities provided to students;		√		
98	5.	information about the employment opportunities of graduates.		√		
99	6.	The EP's management should provide for a variety of ways to disseminate information, including the media, information networks to inform the general public and		√		

		stakeholders.				
100	7.	Public awareness should include support and explanation of national development programs for the country and the system of higher and postgraduate education.		√		
101	8.	The educational organization must demonstrate the reflection on the web resource of information characterizing it in general and in the context of educational programs.		√		
102	9.	An important factor is the availability of adequate and objective information about the teaching staff of the EP.			√	
103	10.	An important factor is informing the public about cooperation and interaction with partners within the EP.		√		
Total by the standard			**0**	**9**	**1**	**0**

10. The standard «The standards in the context of individual specialties»

Natural Sciences

		Educational programs in the areas of «Natural Sciences», for example, such as «Cyberphysical systems», etc., must meet the following requirements:				
104	5.	EP should include disciplines and activities aimed at gaining practical experience and skills in the specialty in general and major disciplines in particular, including: – excursions to enterprises for specialization (factories, workshops, research institutes, laboratories, training and experimental farms, etc.); – conducting individual classes or entire disciplines at the enterprise of specialization; – conducting seminars to solve practical problems relevant for enterprises in the field of specialization, etc.			√	
105	6.	The teaching staff involved in the education program should include, as full-time teachers, practitioners with a long experience of working as full-time employees in enterprises in the field of specialization of the EP.			√	
106	7.	The content of all EP disciplines should be based on and include a clear relationship with the content of fundamental natural sciences.	√			
107	8.	The EP's management should provide measures to enhance practical training in the field of specialization.		√		
108	9.	The EP's management should provide the training of students in the use of modern information technologies.	√			
Total by the standard			**2**	**1**	**2**	**0**
TOTAL			**26**	**75**	**7**	**0**