ASIIN Seal & European Labels

Accreditation Report

Bachelor's Degree Programmes
Radioengineering, electronics and telecommunications
Information systems
Computer science

Master's Degree Programmes
Radioengineering, electronics and telecommunications
Information systems

Provided by
North–Kazakhstan State University named after M. Kozybaev

Version: 26 June 2015

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
5B071900 Радиотехника, электроника и телекоммуникации	Radioengineering, electronics and telecommunications	ASIIN, EUR-ACE® Label		TC 02
5B070300 Информационные системы	Information systems	ASIIN, Euro-Inf® Label		TC 02, 04
5B011100 Информатика	Computer science	ASIIN, Euro-Inf® Label		TC 04
6M071900 Радиотехника, электроника и телекоммуникации	Radioengineering, electronics and telecommunications	ASIIN, EUR-ACE® Label		TC 02
6M070300 Информационные системы	Information systems	ASIIN, Euro-Inf® Label		TC 02, 04
Date of the contract: 01.08.2013 **Submission of the final version of the self-assessment report:** 02.07.2014 **Date of the onsite visit:** 18.-19.02.2015 **at:** Petropavl, Kazakhstan				
Peer panel: Prof. Dr. Madhukar Chandra, Technical University of Chemnitz; Anastassiya Krasnyuk, student, Karaganda State Technical University Kazakhstan; Prof. Dr. Harald Loose, Brandenburg University of Applied Sciences;				

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes; Euro-Inf®: Label European Label for Informatics

[2] TC: Technical Committee for the following subject areas: TC 02 – Electrical Engineering/Information Technology; TC 04 – Informatics/Computer Science

Dr.-Ing. Klaus Pasemann, formerly Volkswagen AG; Prof. Dr.-Ing. Christoph Rappl, Deggendorf Institute of Technology; Prof. Dr. Dietmar Saupe, University of Konstanz External observer on behalf of the Kazakhstan accreditation bodies: Prof. Tlebayev, Taraz State University M. Dulatov	
Representative of the ASIIN headquarter: Marie-Isabel Zirpel	
Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of 10.05.2005 ASIIN General Criteria, as of 28.06.2012 Subject-Specific Criteria of Technical Committee 02 – Electrical Engineering/Information Technology as of 09.12.2011 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of 09.12.2011	

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Radioengineering, electronics and telecommunications	Bachelor of Technics and Technology		6	Full time / part time		8 Semester	240 ECTS	autumn semester 01.09.2004
Information systems	Bachelor of Technics and Technology.		6	Full time / part time		8 Semester	240 ECTS	autumn semester 01.09.1996
Computer science	Bachelor of Education		6	Full time / part time		8 Semester	240 ECTS	autumn semester 01.09.2005
Radioengineering, electronics and telecommunications	Master of Technical Science	Scientific-pedagogical training	7	Full time		4 Semester	120 ECTS	autumn semester 01.09.2008
Information systems	Master of Technical Science Master of Engineering and Technology	Scientific-pedagogical training Profiled direction	7	Full time		4 Semester 3 Semester	120 ECTS 90 ECTS	autumn semester 01.09.2001

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Radioengineering, electronics and telecommunications:

"LO1. To possess knowledge of bases of mathematics and natural science.
LO2. To possess deep knowledge of information technologies used in professional activity.
LO3. To demonstrate knowledge of bases of design, installation of radioelectronic systems.

[3] EQF = The European Qualifications Framework for lifelong learning

LO4. To demonstrate deep level of knowledge in the field of digital and electronic technologies.
LO5. To be able to use application programmes packages for calculating, modelling and automation of radioelectronic devices and systems design.
LO6. To have an understanding on principles of building and operation of devices of analog and digital signal processing in the field of speech, audio and images processing.
LO7. To demonstrate knowledge of requirements of standardization, metrological assurance and life activity safety in the design and operation of equipments and systems.
LO8. To know the official language and one foreign language to present documentation and information.
LO9. Awareness of further nontechnical effects of the practical engineering activity (ethical, ecological, commercial and industrial).
LO10. Readiness for achievement the necessary level of the physical fitness for ensuring the full-fledged social and professional activity."

The following **curriculum** is presented:

Year 1: Bases of mathematics and the natural sciences, Political Science, State History, Foreign language, Official language, Health-improving, Bases of radioengineering

Year 2: Bases of electrical engineering, Social-humanitarian knowledge, Bases of Economics, Health-improving, The interaction of man and nature, Technical foreign language, Electronics and electrical engineering, Digital device programming, Technical means of data processing and imaging

Year 3: Legal culture, Professional official language, Radio circuits and signals, Electromagnetic fields and waves, Design technologies of radio components and devices, Digital systems of control, Generation and procession of signals, Theory of automatic control, Sources of power supply

Year 4: Bachelor's degree work, Computer modelling of radio electronic means, Digital television, Labour safety, Metrological aspects of radioengineering.

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Information systems:

"LO1. To demonstrate knowledge and abilities in the field of natural-scientific, social, humanitarian, economic disciplines, also carry out gathering and interpretation of information for formation judgments in this field.

LO2. To demonstrate the basic knowledge and abilities in the field of linguistic communication, computer informatization.
LO3. To demonstrate skills of a new knowledge acquisition useful for the everyday professional activity and continuing education within Master programmes.
LO4. To show abilities and skills of handling modern techniques, ability to use information technologies in the field of professional activity.
LO5. To demonstrate knowledge of modern models, methods and technologies and abilities of information systems designing; knowledge of standard documents, methods of analysis and evaluation of development, implementation and functioning effectiveness.
LO6. To demonstrate abilities to use systemic conceptions for understanding and defining problems; abilities to program with modern instruments; abilities to make technical documentation for the workable information system; abilities to analyze own and foreign experiences of development and implementation of information systems.
LO7. To demonstrate skills of working with hardware-software complexes of information systems; skills of choice the architecture and interconnecting of hardware of information systems; skills of designing of information systems and their elements in concrete fields.
LO8. To demonstrate competence and knowledge in their subject area, bases of industrial relations and management principles with regard to technical, financial and human factors, and demonstrate knowledge of foreign experience in the chosen field of activity.
LO9. To demonstrate abilities to make presentations, to draw up scientific-technical reports on work performed results, to publish research results as articles and report at scientific-technical conferences in the field of management."

The following **curriculum** is presented:

Year 1: Computer Science and programming bases, Foreign languages, Official language, Health-improving, Man and society, Bases of information systems, Higher mathematics and physics, man and environment

Year 2: Ethical and legal norms, Mathematical statistics, Bases of economic analysis, Professional Languages, Health-improving, Databases, Programming technology, Applications Programming

Year 3: Computer modelling of systems, The infrastructure of computer systems, Operating systems, Research and innovation, Typology of modern information systems, Methods and means of designing information systems

Year 4: Bachelor's degree work, Systems of artificial intelligence, Modern management methods of information projects and resources, The technology of designing information systems.

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Computer science:

"LO1. Demonstrate knowledge and abilities in the field of natural-scientific, social, humanitarian, economic disciplines, indicative of a broad outlook and mind culture.
LO2. Demonstrate possession of ethical and legal standards of behaviour, tolerance to the traditions, cultures of other nations of the world, knowledge of the tendencies of social development of society, ability to live effectively and function in a social interaction successfully, organization skills of a communication process, also with the use of the foreign language.
LO3. Demonstrate ability to work in a team, correctly defend their point of view, and to offer new solutions; to reach compromises, to relate their opinion with the opinion of the collective, readiness to have a social responsibility for the results of own professional work.
LO4. Demonstrate possession of subject, psycho-pedagogical and methodic knowledge systems; abilities and skills to integrate knowledge of various subject areas in pedagogical problems solution, to find nonstandard and alternative decisions within the pedagogical situations; to carry out an integrated monitoring on the basis of psycho-pedagogical diagnostics.
LO5. Demonstrate an understanding of the basic principles of complex information systems, experience with such systems; to gather and interpret relevant data to inform judgments that include reflection on relevant social and scientific issues; ability to think in abstract models.
LO6. Demonstrate knowledge of scientific research activity methods and methodology and abilities to use them during planning, organizing and carrying out of scientific research work, possession of modern methods of analysis, evaluation and interpretation of the results of scientific and pedagogical research, testing and evaluation of the relation between theory and empirical data, preparing of reporting documentation and compilation of data in the form of scientific articles and reports.
LO7. Demonstrate understanding of essence and significance of information in the development of modern information society, realize dangers and threats arising in this process, comply with basic requirements of data security.
LO8. Demonstrate knowledge of languages of programming, software and their application, ability to translate problems into mathematical language, posed in terms of other subject areas, and to use superiority of this reformulation for their solution.

LO9. Demonstrate abilities and skills in developing the current educational and organizational documentation (didactic, control and measuring materials, etc.), ability to generalize and systemize own, as well as world pedagogical experience, to apply the experience of highly qualified teachers in practice.
LO10. Demonstrate possession of modern methods and techniques of teaching computer science, for the implementation of training programs of basic and elective courses and socialization processes, professional self-determination of students.
LO11. Demonstrate ability to build pedagogical interaction with students, teaching staff, workers in the classroom, with their parents; abilities to choose and use the optimal forms and methods of extra-curricular work on computer science and in general training work; to interact with parents, colleagues, social partners and professional communities to achieve a quality of educational process.
LO12. Demonstrate ability to analyze problems of modern society life and environment integrally and systemically; acquisition skills of new knowledge useful for the everyday professional activity, ability to orientate to modern data flows and adapt to phenomena, process changing dynamically and abilities necessary for self-education."

The following **curriculum** is presented:

Year 1: Basic social and humanitarian knowledge, Age specific psycho-physiological features, Language training, Health-improving, general pedagogics, Bases of Computer Science and Programming

Year 2: Socio-economic knowledge, Health-improving, Special pedagogics, Databases and programming, Theory of teaching computer science, Fundamentals of Mathematical Sciences, Mathematical Foundation of Information Systems

Year 3: Professional language training, Theories and methods of teaching and upbringing, Hardware and software support of the educational process, Scientific research and innovation in education, Computer support of the learning process, Methodology of teaching Mathematics, Design of information processes

Year 4: Final attestation, Management of information resources and projects, Pedagogical systems modelling, Subject-methodical training, Technological support of the learning process.

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Radioengineering, electronics and telecommunications:

"LO1. To know official and foreign languages to the extent necessary to get information of professional content and state own ideas and variants of professional problems solving in oral and written forms.
LO2. Formation of the scientific world outlook, necessary for the full-fledged development of a person as social as professional sphere.
LO3. To demonstrate knowledge of modern achievements in creating, operating and perspectives of development of compound electronic devices, systems and complexes for different fields of the activity.
LO4. To demonstrate readiness to the scientific activity and further self-education.
LO5. To demonstrate abilities to use specialized methodologies of modelling, designing, simulation, testing in professional activity."

The following **curriculum** is presented:

Year 1: Professional language training, Bases of a scientific and research outlook, Digital signal processing, Organization of scientific-research activity, Computerization of research in radioengineering, Modern technologies and tendencies in education

Year 2: Experimental and research work, Pedagogical and research practice, Modern tendencies in radio electronics and telecommunications.

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Information systems (scientific-pedagogical):

"LO1. To demonstrate extending knowledge and understanding acquired on the basis of higher professional education that provides a basis or opportunity for originality in developing or applying ideas, often within a research context.
LO2. To apply knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
LO3. To demonstrate ability to use specialized methods of modelling, design, testing in professional activity.
LO4. To communicate the conclusions, the knowledge and rationale underpinning these to specialist and non-specialist audiences clearly and unambiguously.
LO5. To demonstrate readiness to the scientific activity and further self-education."

The following **curriculum** is presented:

Year 1: Professional language training, Development tendencies of the modern information systems, Bases of a scientific and research outlook, Modern tendencies and technologies in education

Year 2: Practical work, Research work, Modern information systems development, Final attestation.

According to the self-assessment report the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Information systems (profiled):

"LO1. To demonstrate extending knowledge and understanding acquired on the basis of higher professional education that provides a basis or opportunity for originality in developing or applying ideas, often within a research context.
LO2. To apply knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
LO3. To demonstrate ability to use specialized methods of modelling, design, testing in professional activity.
LO4. To communicate the conclusions, the knowledge and rationale underpinning these to specialist and non-specialist audiences clearly and unambiguously.
LO5. To demonstrate readiness to the scientific activity and further self-education."

The following **curriculum** is presented:

Year 1: Professional language training, Development tendencies of the modern information systems, Bases of a scientific and research outlook, Modern information systems development, Information technologies in economics and management

Year 2: Experimental and practical work, Final attestation.

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-Evaluation Report
- Discussions with representatives of the university

Preliminary assessment and analysis of the peers:
The self-assessment report presented a list of the main intended learning outcomes for the degree programmes. In the objective tables they are subdivided into the fields of knowledge, skills and abilities as well as competences. The intended learning outcomes are made available to the students at the information desk of the department and on the website. All interested persons have the possibility to comment on the learning outcomes and to submit proposals for their adjustment. These proposals are discussed within the department before their approval. The peers confirmed that the learning outcomes are accessible to the public and that the relevant stakeholders are included in the process of their development.

The peers took into account the objectives and learning outcomes of each degree programme as a whole. However, as they did not fully understand the intended learning outcomes, and more specifically the differences between the programmes, they asked for further clarification.

During the discussions the peers learned that graduates of the degree programmes Radioengineering, electronics and telecommunications shall be able to handle radioengineering devices. They shall be able to project, use and test methods of modelling radio electronic systems and equipment. Graduates of the Master's programme shall be able to

[4] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

perform scientific tasks. Most of the graduates work for an employer that produces automatic systems for railroad traffic including wireless technology or for Kazakhtelecom. The employers produce mainly for the Kazakh market, partly also for Russia and China.

With regard to the intended learning outcomes, the panel largely confirmed the self-analysis as compared with the subject-specific criteria of the Technical Committee 02. The educational objectives "Knowledge and understanding", "Engineering analysis", "Engineering design", "Engineering practice and product development" and "Transferable skills" have been taken up in the described learning outcomes, albeit to different degrees. The field "Knowledge and understanding" for example is addressed in various learning outcomes. "Engineering practice" and "Design" is less pronounced. Furthermore the peers stated that the so-called qualifying aims described in the objective table do not always correspond to the main learning outcomes. For example LO3 "To demonstrate knowledge of bases of design, installation of radioelectronic systems" does not integrate a single qualifying aim in the field of radio electronic systems but only in the general field of electrical engineering.

When assessing the learning outcomes of the Master's programme the peers noted that they are rather general and none of the main learning outcomes are in the field of radio-engineering. The detailed qualifying aims describe learning outcomes in the field of "Knowledge and understanding", "Engineering analysis", "Engineering design", "Investigations and assessments" as well as "Transferable Skills". However, the panel stated that the expected profile of the graduates of the Master's degree programme is not described in a very precise way.

The degree programmes Information Systems aim at enabling students to model information systems and business processes, to work in a team and to have skills in project management. They shall be able to work with computer programmes that are relevant for global production. The main focus or application subject is management. Graduates of the Master's programme shall also be able to do scientific research. Graduates of the scientific-pedagogical programme are also able to work as a teacher at educational institutions.

With regard to the intended learning outcomes, the panel largely confirmed the self-analysis against the subject-specific criteria of the Technical Committee 04. The learning outcomes comprise social competences and specialist competences such as the necessary scientific foundations, understanding in central notions and conceptions of informatics, such as algorithms, data structures, programming and functioning of a computer. Methods of modelling are mentioned whereas methods of verifying and testing typically used in informatics are not referred to. As an application area of informatics the implementa-

tion of information systems in business is mentioned. However, the panel would have expected learning outcomes in the three pillars business administration, informatics and the specific core fields of information systems in a degree programme called “Information systems”. According to learning outcomes defined internationally for degree programmes in the field of information systems, such as in the ACM guidelines, students shall acquire competences not only in informatics and information systems but also in business administration. Notably, information systems and business administration did not seem to be an important part of the degree programmes.

Regarding the Master’s degree programme the panel stated that the learning outcomes of both specializations (profiled and scientific-pedagogical) are to a very large extend the same. The main learning outcomes are identical and the only difference is in the detailed description of the qualifying aims: Graduates of the profiled programme are able to solve practical tasks mainly by using neural network modeling whereas graduates of the scientific-pedagogical programme shall have gained various skills and abilities which enables them to work for the organization and management of enterprises and to use innovative methods for the solution of problems. The peers took note of this difference in the qualifying aims. The different specializations and the different profiles of the students should be transparent to all stakeholders, also the main learning outcomes should be more distinctive. In general the learning outcomes are described in a generic, not very subject-specific way. Nevertheless the peers identified learning outcomes in the fields of “formal, algorithmic and mathematic competences”, “analysis, design and implementation competences”, “technological competences”, “methodological competences” and “project management competences”.

Whereas the degree programmes in Information Systems are technically oriented the Bachelor’s degree programme Computer Science is an educational programme. Students learn programming languages which are taught in Kazakh schools. After graduation, students are expected to work as school teachers. But during the discussion with the students the panel learned that some of them strive for an employment as software engineers and the auditors questioned whether they are then qualified to work in industry. The learning outcomes pay particular attention to the pedagogical competences students should achieve. Nevertheless the panel identified also learning outcomes that correspond with the subject-specific criteria of the Technical Committee 04. Social competences and specialist competences such as the current scientific state of information systems, algorithms, functioning of a computer, operating and communication systems, methods of modelling, construction, verifying and testing and central paradigms of programming are described in the detailed qualifying aims.

In general, type and level of objectives and learning outcomes of the degree programmes seem to reflect the level of European first and second cycle programmes, respectively. Overall, the audit team found that the learning outcomes have been described sufficiently transparent, yielding a sound basis for the assessment of the students' and graduates' knowledge, skills and competences. According to the audit team, the learning outcomes reflect the level of the qualification sought-after. They appear to be achievable, valid, and reflect currently foreseeable developments in the subject area. However, they have to be redrafted to be more programme-specific and distinctive, thereby clarifying the intended competence profiles and competences to be acquired by graduates. Furthermore, the intended area of professional work should be described (for example school/university teacher or industry).

Not least taking into account the above reservations regarding the objectives and learning outcomes described for the programmes under review, the peers questioned whether the learning outcomes would be adequately implemented via the syllabus/curricular content and the teaching methods adopted (cf. Curriculum).

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Evaluation Report
- Module Curricula of all degree programmes

Preliminary assessment and analysis of the peers:

The name of the degree programmes have been discussed intensively during the audit visit. The peers considered the English names of the programmes to be not fully convincing. Regarding the Master's programme Radioengineering, electronics and telecommunications they had the impression that it is basically a degree programme in Electrical Engineering. As there are only very few modules in the degree programme that support a specialization in the field of radioengineering the auditors questioned whether the name is adequate to reflect the intended learning outcomes and the content of the degree programme.

The same applies to the Bachelor's and Master's programme Information Systems. When assessing learning outcomes and content of the degree programmes, the panel had the impression that it is rather a degree programme in Information Technology than in Information Systems. The term Information Systems is defined internationally for degree pro-

grammes for example by the ACM guidelines. Accordingly, students shall acquire competences not only in informatics and information systems but also in business administration. Contrary to what the name might suggest, the intended learning outcomes and the content of the programmes under review do not cover the competences behind the three pillars business administration, informatics and the specific core fields of information systems, as one would expect to be part of a degree programme called “Information systems”. The auditors pointed out that the name of a degree programme has to reflect the curriculum and the intended learning outcomes.

Furthermore, the auditors discussed the name of the Bachelor’s programme Computer Science. They did neither see a proper computer science curriculum as expected at universities nor a teacher’s curriculum, while the university proposes it to be both simultaneously (see chapter 1.3).

Criterion 1.3 Curriculum

Evidence:

- Model curricula
- Module handbook
- Self-Evaluation Report

Preliminary assessment and analysis of the peers:
The auditors assessed the curricula of the programmes under review against the programme objectives provided in the self-assessment report as well as against the stipulations of the Subject-Specific Criteria. In analysing the curriculum of the degree programmes, the peers took into account the fact that they are partly (around 30 percent) prescribed by national regulations. Around 70 percent of the content can be defined by the university itself. The curricula are designed by the department and approved by the methodological council of the university.

Against the background that knowledge of foreign languages is one of the learning outcomes in all degree programmes, the auditors questioned the command of English of the students. They learned that some subjects are conducted in English. Furthermore, English courses for teachers and students are free of charge. However, during the discussions with the students, the peer group noted that not all of them found it easy to converse in English despite the fact that these competences are defined as a learning outcome. To enhance the professional qualification of the students and their possibility to participate

in international research and development activities the auditors recommended enhancing and promoting the use of English language either in teaching or via participation in external activities such as conferences, seminars or student exchange.

Regarding the Bachelor's and Master's degree programme Radioengineering, electronics and telecommunications the panel highly appreciated that the field of electrical engineering is trained comprehensively and that graduates of the degree programmes possess sound basis in electrical engineering. Notwithstanding, the auditors wondered whether the curricula facilitate the achievement of the intended learning outcomes. More specifically, the auditors questioned whether the modules in these degree programmes impart knowledge in the basic fields of radioengineering and telecommunications. According to the peers, problems occur especially because of the lack of necessary resources. Although listed in the self-assessment report, the panel did not see a well equipped laboratory of radio receiving and sending devices, of antenna-feeder devices and super-high-frequency devices in the gigahertz range. This lack of resources has consequences for the practical training of the students.

In accordance with the SSC the field of knowledge and understanding is covered in the Bachelor's programme by a sound basis in natural science and electrical engineering. But graduates have only the barest minimum of competences in the field of engineering analysis, engineering design and none in practice and product development. This problem is aggravated by the lack of prototypes in the laboratories. Students of the Bachelor's degree programme seemed not to be able to build a transmitter or to build antenna in the gigahertz range. For example, projecting of antenna devices is covered by the module "Computer modeling of radio electronic means" in the seventh semester, but the topics are actually taught via computer modeling and not via the use of hardware equipment. Modules covering aspects of the practical work are not sufficiently provided. In particular, competences that would enable graduates to work on the global market seemed not to be imparted. In addition, the peers did not have any information regarding industrial links and projects in English. Accordingly, the specific field of radioengineering and telecommunication must be expanded in the curriculum, while the range of modules in the field of electrical engineering is considered to be sufficiently broad. The panel also noted that the topic of S-Parameters should be explicitly included in one of the modules (for example in module 3 Radio circuits and signals). S-Parameter Measurements as well as Antenna measurements must also be an integral part of the practical training in the laboratory programme.

The panel stated that the curriculum of the Bachelor's degree programme must be expanded by the aforementioned fields. For the Master's programme they gained the impression that the current curriculum does not fit to the name of the programme. When

assessing the content they came to the conclusion that it is rather a Master's programme in the field of Electrical Engineering than in Radioengineering. In-depth competences in the field of Vector-analyzers and laboratory work in high-frequency laboratories are not provided by modules and resources. Similar to their findings for the Bachelor's programme, the panel stated with regard to the SSC that the fields of knowledge and understanding, investigations and assessment as well as transferable skills are covered in the curriculum. In contrast, competences in engineering analysis, design as well as practice in the field of radioengineering are not imparted so far. Therefore, the auditors reasoned that the name of the study programme has to be consistently aligned with the curriculum and the intended learning outcomes.

As stated above the panel found that the degree programmes in Information Systems are rather degree programmes in Information Technology. But even for degree programmes in Information Technology the auditors would question to which extent the curricula facilitate the achievement of the intended learning outcomes. When assessing the curriculum for the Bachelor's programme the auditors noted that only 40 percent of all credits involved (not counting the 17 ECTS for the Bachelor thesis) is in the field of Information Systems/Information Technology. The peers took into account that general-education subjects are partly prescribed by the ministry. Nevertheless, the curriculum in place has to ensure that the intended learning outcomes can be achieved by the time the degree is completed. Therefore the subject-specific curriculum must be expanded. The curriculum of the Bachelor's programme complies in general with the guidelines of the SSC: a fundamental understanding of central concepts and methods of the discipline is taught. Scientific foundations necessary for informatics, in particular the mathematical, logical, statistical, and physical tools are part of the curriculum, but not as strong as one would expect. Discrete mathematics, logic and probability theory are not covered in the modules. Central notions and conceptions of informatics, such as "algorithms" and "data structures" are taught, but not very extensively. Hence the auditors were not sure about the depth of understanding of the students in these areas.

Laudably, students seemed to have a sound basis in database systems and central paradigms of programming. Students learn Pascal and C++ in the module "Programming Technology". They are able to work out different applications, know concrete languages and are familiar with data structures. In module 15 "Applications programming" students are meant to solve non-standard problems and to do high-level programming. Methods of modelling and construction are part of several modules, especially of module 17 "Computer modelling of systems".

This also applies to the Master's degree programme. Formal, algorithmic and mathematic competences are part of module 4 "Development tendencies of the modern information

systems" and module 5 "Modern information system development". Analysis, design and implementation competences as well as methodological competences are imparted in the curriculum. Regarding the technological competences the auditors questioned whether the students would gain knowledge at the limit of today's knowledge and state-of-the-art technology. Project management is already included in the Bachelor's programme. The university mentioned for example a project regarding the automation of the departments processes organized as teamwork. But no project which gives students an idea of a software lifecycle forms part of the curriculum.

Altogether the Bachelor's and the Master's programme comply with general aspects of the SSC. But the percentage of informatics specific content is not very high and some fundamental contents of informatics were underrated. For these reasons the auditors doubted whether the imparted knowledge is sufficiently consolidated in the skills and competences to be achieved. They came to the conclusion that the subject-specific curriculum of information systems/information technology must be expanded at the expense of generic subjects. To ensure that all graduates achieve the intended fundamental competences which are expected from all graduates of informatics programmes, the compulsory curriculum should be expanded to include further fields of informatics such as discrete structures and logic.

The Bachelor's programme Computer Science is a programme targeting teacher's education. The percentage of informatics-specific content (with 27 percent of all credits, not counting 20 ECTS for the thesis and exam) is even lower than in the Bachelor's programme Information Systems. The curriculum pays particular attention to the pedagogical competences students should achieve. Although the university informed that informatics-specific content is provided also in the pedagogical courses, the auditors were not convinced whether the imparted knowledge is well founded. Module 4 "Bases of Computer Science and Programming" seems to be one of the most important modules. Students learn programming languages which are taught in Kazakh schools. They start with Pascal, proceed with Delphi and web programming on the basis of PHP. They work on a virtual project and realize it with Delphi. The auditors were aware of these subject-specific competences. However, they came to the conclusion that most of the fundamental contents of informatics are poorly represented in the curriculum. The curriculum seemed to train teachers with additional knowledge in informatics and not graduates of a degree programme in computer science which are able to teach in schools. If, however, the latter is the explicit aim of the university, the curriculum would have to be expanded in the fields of computer science in depth and in breath. For example designated courses in the fields of theoretical informatics, algorithms and data structures have to be added. In addition it has to be made transparent to external stakeholders that currently the professional ori-

entation is that of a school teacher and not that of a computer scientist. At the moment the auditors see rather a degree programme in “Pedagogics in Informatics” than in “Computer Science”. The program name "Computer Science" implicates mainly knowledge in fundamentals of computer science even if it is addressed to teachers. Skills in education are necessary but they are an addition.

Criterion 1.4 Admission requirements

Evidence:

- Admission requirements and the respective state regulations are described in the self-evaluation report

Preliminary assessment and analysis of the peers:
The auditors discussed the admission rules and procedures with the university representatives. The programme coordinators explained that admission for the Bachelor degrees is carried out by the admission rules developed by the Ministry of Education and Science of Kazakhstan based on regulation № 638 "On approval of the standard rules of admission to educational organizations, implementing professional training programs of higher education". It was further explained that applicants should possess knowledge at the level of secondary school graduates (gymnasium, lyceum, college), confirmed in a single national testing (SNT) or complex testing (CT). They must have a final certificate of secondary schools and a certificate of the passed SNT or CT. Applicants for part time programmes must provide a diploma of a secondary professional school. The SNT or CT for the degree programmes under review are held on four subjects: Kazakh or Russian (depending on the language of tuition), History of Kazakhstan, Mathematics and Physics. According to the results of testing, applicants must score at least 50 points, including at least 7 points in mathematics. Applicants with the highest number of points are awarded, on a competitive basis, with State Educational Grants. Applicants who have not succeeded in the competition, but reached the threshold score, may study on a payment basis. Altogether the auditors judged that the admission requirements were reasonable for maintaining the quality of the Bachelor degree programmes.

The auditors discussed with the representatives of the university to what extent the admission requirements for the Master’s degree programmes have an impact on the quality of the degree programmes. Admission for the Master’s degree programmes is defined by the admission rule developed by the Ministry of Education and Science of Kazakhstan based on regulation № 109 "Model Regulations, admission to educational organizations

that realize professional". Admission to the Master's degree programmes is realized on a competitive basis, based on the results of entrance examinations. Persons that apply for master degree programmes take the following examinations: one in foreign languages (English, French, German), and one in the specialty. Individuals who have mastered the curriculum of Bachelor level higher education as well as scored, by the sum of entrance examinations on specialty and foreign language, at least 150 points are permitted for the enrolment to the study financed by the government (State Educational Grant). The peer group concluded that this is an appropriate approach to secure the quality of the academic standard.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The peers deemed the relevant aspects of the said criterion partly met.

They thanked the university for submitting further explanation regarding the professional orientation of the graduates of the degree programmes. They also took into account the revised learning outcomes. They appreciated that the learning outcomes of the Bachelor's and the Master's programme Radioengineering, electronics and telecommunications now place a focus on the field of Radioengineering and telecommunications. They are described less general. The learning outcome of the Bachelor's and Master's degree programmes Information Systems were reworked as well. But the experts still missed a detailed description of the learning outcomes in the three pillars business administration, informatics and the specific core fields of information systems (according to ACM guidelines for example). Furthermore, the explanation of the university provided information regarding the difference between the scientific-pedagogical and the profiled Master's programme. But the learning outcomes of both directions still do not show any differences. Eventually the experts noted minor changes to learning outcomes number 7, 8 and 12 of the Bachelor's degree programme Computer Science. But also in this case the experts still missed a detailed description of the acquired specialist competences of the graduates. They insisted on the requirement that the qualifications profiles ("learning outcomes" at programme level) have to be more programme-specific and distinctive, thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programme.

The experts understood that the university has no possibility to change the name of the degree programmes. Still they point out that the names of the Master's programme Radioengineering, electronics and telecommunications as well as the Bachelor's and Master's programme Information Systems have to correspond with the learning outcomes and the curriculum. The curriculum and the module descriptions that were given to the

peers with the self assessment report do not seem to reflect the names of the degree programmes. Only very few modules seem to support a specialization in Radioengineering and Information Systems. The peers recognized that one of the modules in the Master's programme Radioengineering, electronics and telecommunications has changed its name: Instead of "Computerization of research in radioengineering, Modern technologies and tendencies in education" it is now called "Computerization of research and design of radar, radionavigation and space systems". But the experts did not have a new module description and were therefore not able to assess a potential change of the content. Altogether, the peers confirmed their assessment that the names of the study programmes have to reflect the curriculum and intended learning outcomes.

The auditors understood that the number of the degree programme clarifies that the Bachelor's programme Computer Science is a Bachelor of Education. Graduates of the degree programme teach Computer Science at secondary schools. Therefore the majority of the auditors dropped the corresponding requirement.

The auditors appreciated that some of the modules will be taught in English language in future. Until implementing these modules in English the experts recommended that the use of English language either in teaching, or via participation in external activities is enhanced and promoted in order to strengthen the curriculum.

The auditors thanked the university for submitting abstracts of projects/papers of Bachelors Radioengineering, electronics and telecommunications, Masters Radioengineering, and Bachelors Information systems. They are, according to the auditors related to real world applications mostly to be used in companies (industry), some are for in house (university) use.

Regarding the curricula no additional information is given that would change the peer's impression. The experts maintained their concern that some fundamental aspects are missing. Therefore they insisted on the requirement that the core curriculum of the Bachelor's programme Computer Science must be expanded in the field of computer science in depth and in breadth. The requirement to impart knowledge and understanding of the key aspects and concepts of their informatics discipline, including some at the forefront of that discipline, seemed to be not fulfilled at the moment.

To ensure that all graduates of the Bachelor's and the Master's programme Information Systems achieve the intended fundamental competences, the compulsory subject-specific curriculum must be expanded by further fields of informatics such as discrete structures and logic.

Regarding the Bachelor's programme Radioengineering, electronics and telecommunications, the auditors saw that the university seemed to have acquired new equipment which redresses the deficiency regarding essential modern instruments like Spectrum analyser and vector network Analyser. Still the majority of the experts deemed it necessary to enable students to work with S-Parameter measurements as well as Antenna measurements. This must be an integral part of the practical training in the laboratory programme.

2. The Degree Programme: Structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Recognition of qualifications: „The rules for filling the educational credits transfer"
- Model Curricula for all degree programmes
- Curriculum analysis in the self-evaluation report

Preliminary assessment and analysis of the peers:

Concerning the modularity the auditors understood that the "modules" in the study plans are large packages containing several courses and extending over several semesters. These blocks are labeled "modules" in the translations used by the university. The size of these modules is very uneven and the courses composing a module do not always perfectly fit together. However, the smaller units called "courses" in the curricular plans would rather fit the understanding of a "module" in the sense of the Bologna process, i.e. a coherent and comprehensive unit of teaching and learning. This impression is confirmed when considering the examinations, which also relate to these smaller teaching / learning units. Moreover, the model curriculum seems to be inconsistent with the module structure. For example, the module "Informatics" does not exist in the curriculum analysis in the self-assessment report, but it should. On the other hand, courses such as the course "Data bases in informational systems" are shown in the model curriculum, but, in fact, it cannot be taken by itself for credit, as it is only part of a larger module. The auditors therefore imposed upon the university that modules need to be defined accurately as coherent and consistent units of teaching and learning. The confusing terminology used also has consequences on the descriptions of the modules which are available. As these are provided on the module level as understood by the university, they cover very large packages of

teaching and learning, and thus do not provide sufficiently detailed information (cf. chapter 5.1).

The module blocks or groups of modules now referred to as “modules” in the study plans and module descriptions offer a wide range of individual electives in the programmes under consideration. Regarding the possibility for students to spend some time abroad without loss of time the peers took note that, in general, there are opportunities for study visits at other HEIs. In the discussion with the students the auditors also learned that all students have the opportunity to go abroad and that they are even financed to some extent. The auditors appreciated this information. Preconditions for outgoing students who are willing to study abroad are language skills and, more specifically, English language skills. In the discussion with students, it has not been easy to gather a reliable impression of the actual English language skills. Further efforts of the university in that respect seem to be recommendable. Furthermore, the panel recommended extending international relations and recruiting international students in order to create an atmosphere of internationality at the university.

As for the recognition of qualifications gained from other institutions of higher education, in particular abroad, competences are taken into consideration. Due to the fact that Kazakhstan is member of the European Higher Education Area (EHEA) and has adopted the Lisbon Convention as legal binding regulation, the peers understand the respective “rules for filling the educational credits transfer” in the light of these conditions and consider the chapters 4 to 6 of the “Rules” to be in accordance with the Lisbon Convention.

The auditors discussed the possibility to study all three Bachelor degree programmes also in a part-time mode. Firstly, the identical duration of the part-time and full-time version of the programmes seemed to be at odds with what would have been normally expected (longer duration of the part time study programme). But the peers learned that in the part-time mode 60 ECTS of a total 240 ECTS are awarded for previous learning achievements either in vocational schools or in other HEIs. 180 ECTS credits are awarded in the part time study term in the university. Students get their study material electronically and obtain most of the credits via self-study in which they are supported by e-learning elements. They attend courses and examinations at the university twice a year. Furthermore the university creates for all part-time students individual study plans, taking into account their previous education and knowledge. Students who do not have a certificate of a vocational school need by law five years to complete the Bachelor’s programme in part-time. The auditors considered these regulations as appropriate.

Criterion 2.2 Work load and credits

Evidence:

- Module descriptions
- Discussion with students
- "Regulation of educational organization process based on credit education technology"
- Self-Evaluation Report, chapter 3.2

Preliminary assessment and analysis of the peers:

It must be pointed out positively that the HEI has adopted the ECTS credit point system and thus transferred the original teaching-load-oriented Kazakh credit point system into the ECTS, which is designed as an instrument to measure and record students' workload in individual courses, per semester and per study year. According to the institution, 1 ECTS credit equates to 30 hours of student workload. Each semester 30 ECTS credits, each study year 60 ECTS credits are awarded. However, the panel questioned whether the university regularly checks the accordance between ECTS credits and actual workload of the students. They did not see an evaluation of the actual workload by the faculty in order to assess if the ECTS credits correspond to the actual workload. During the discussion with the students they learned that some of the modules (for example Computer networks) entail more work than one would expect when looking at the ECTS credits. Thus, the auditors recommended to closely monitor the actual workload in order to allow for adjustments of the corresponding credit allocation, if necessary.

Furthermore the panel learned during the discussion with the students that the workload is high in comparison with the students' workload in Germany. Students work 50 to 60 hours a week and spend approximately 6 to 8 hours a day at the university. However, the students explained that altogether the work load is reasonable and acceptable to them. They also seemed to be able to finish their studies within the standard period of time. Only 10 percent of the students do not graduate within the standard period of time.

Criterion 2.3 Teaching methodology

Evidence:

- Discussion with teaching staff

- Module descriptions
- Self-Evaluation Report, chapter 3.3

Preliminary assessment and analysis of the peers:
The auditors gained the impression that the teaching methods used for implementing the didactical concept are appropriate to support the attainment of the learning objectives. They appreciated especially the use of various distance-learning technologies such as webinars which are used in particular with regard to the part-time students.

The ratio of taught contact hours to self-study is properly indicated in the module descriptions. The auditors considered the ratio of contact time to individual self-study time to be adequate. The auditors appreciated furthermore that students have several possibilities to participate in scientific projects and conferences and that they are even financed by the university. Students of the Master's programme have the possibility to write articles and to gain insight the research work of the teachers. Altogether the panel gained the impression that students have sufficient opportunity to carry out independent academic work.

Criterion 2.4 Support and assistance

Evidence:

- Self-Evaluation Report, chapter 3.4
- Discussions with students and teaching staff

Preliminary assessment and analysis of the peers:
According to the self-assessment report, electronic and supporting materials are widely used in the educational process, and are published in the local area network in the system of electronic educational content management. Teachers provide additional consultations (1 hour per week). During the discussion with the students the panel learned that they are organized internally in groups and that each group is supported by an advisor. The auditors could see that sufficient resources were available for offering individual support, supervision and advice to students. The panel appreciated the good support system. In addition, they acknowledged a very good atmosphere between students and teachers.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

The peers considered the criteria to be partly fulfilled. They confirmed the requirement that modules need to be depicted accurately as coherent and consistent units of teaching and learning, and shall be assessed accordingly. They also recommended to recruit international students and to extent international relations. Furthermore they recommended to closely monitor the actual student's workload in order to allow for adjustments of the corresponding credit allocation, if necessary.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Regulation of educational organization process based on credit education technology
- Regulation on the computer-based testing
- Module descriptions
- Self-Evaluation Report, chapter 4

Preliminary assessment and analysis of the peers:

During the discussion with the university the panel learned that assessment is carried out in a three-tier manner: the current control (the work of a student at the seminar, practical, laboratory classes, and assessment of independent work), landmark control (verification of students' knowledge after the mastering of certain sections of a discipline), and the final control (examination). Written and oral examinations are scheduled. For their preparation a list of possible questions is handed out to the students. In the oral examinations students draw a question from a list of questions, prepare the answer within 30 minutes and orally present their result afterwards. Students who failed exams have the possibility to repeat them in the summer session immediately following the semester. The degree programmes comprise a thesis/dissertation which ensures that students work on a set task independently and at the level aimed for. The topic of the theses often derives from the practical work and internships students completed during their studies. The peers understood that students can carry out an assigned task independently and at the level of the qualification sought.

The peers gained the impression that type, organization and distribution of examinations are designed to support the attainment of the intended learning outcomes by the time the degree is completed. The timescale for marking exams does not interfere with individual academic progression which means that students can directly move on from the Bachelor's to the Master's degree programme. The peers also learned that students are informed at the beginning of the teaching term about the examination requirements.

However, as already stated above, the examinations do not relate to the "modules", but to the courses inside the modules. Thus, the peers confirmed their assessment that the modules need to be coherently and consistently defined units of teaching and learning and must be assessed accordingly.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The peers evaluated the requirements of the criterion as fulfilled (for the definition and assessment of modules see criterion 2.1).

4. Resources

Criterion 4.1 Staff

Evidence:

- Staff handbook
- Self-Evaluation Report, chapter 5.1

Preliminary assessment and analysis of the peers:

In the Bachelor's and the Master's programme Radioengineering, electronics and telecommunications two doctors of science (professors), 22 candidates of science (associated professors), four masters (assistant teachers and senior lecturers) and ten senior lecturers are involved. The courses in the Bachelor's and Master's programme Information Systems and in the Bachelor's programme Computer Sciences are provided by four doctors of science (professors), 23 candidates of science (associated professors), 15 masters (senior lecturers) and seven senior lecturers. In general the auditors considered the staff resources available as sufficient in quantity and quality for the successful implementation of the programmes.

Most of the teachers are graduates of the relevant fields at North-Kazakhstan State University but there are also external lectures coming from the industry which implement

mostly the practical components within the curricula. The panel appreciated this information. However, as most of the teachers are from the same university, surrounding region or regional industry the panel recommended including external, preferably even international experts in the educational programme. This would also support the integration of international state-of-the-art knowledge in the curricula.

The university stated in the self-assessment report that teachers have the possibility to attend international conferences and that they are financed by the university. They are also obliged to publish regularly, partly in internationally acknowledged journals. However, in the discussion with the teaching staff the panel gained a different impression. Particularly in the field of radioengineering none of the teacher seemed to have an individual research focus. This seemed to be the case mainly due to the lack of resources and due to the lack of time of the teachers. Therefore, the panel recommended intensifying the research profile by providing the necessary means in terms of time and funding. The staff involved in the Bachelor's programme Radioengineering, electronics and telecommunications specifically should have the possibility to get involved more strongly in the area of applied radioengineering. This would ensure that the core areas of the study field would be taught by qualified and specialized personnel.

Criterion 4.2 Staff development

Evidence:

- Self-Evaluation Report, chapter 5.2
- Information on professional development of staff of the department Information Systems
- Information on professional development of staff of the department of Radio-Electronics and Telecommunications
- Document "Procedure of Staff Training"

Preliminary assessment and analysis of the peers:

The institution reported on the following measures for didactical training of staff: self-study training, technical training, professional courses provided by the university's Institute of Training and Professional Development and other institutes of higher education, study courses provided by special training centres, participation in methodological seminars and conferences, exhibitions and other activities. Priority is the broadening of theoretical knowledge, improvement of pedagogical skills, adoption of different methods of educational work, and improvement of skills necessary for using modern technical means

of teaching. The auditors noted that all of the teaching staff members have sufficient possibilities to develop and train their didactic skills and that the teaching staff regularly makes use of these options.

Criterion 4.3 Funds and equipment

Evidence:

- Visitation of the laboratories
- Self-Evaluation Report, chapter 5.3
- Lists of equipment in the self-evaluation-report

Preliminary assessment and analysis of the peers:
In the discussion with the university the auditors discussed the financial basis of the programmes. They understood that the university receives state funding. Another part of the budget needed is financed by industry and by tuition fees. The auditors gained the impression that the financing of the programmes is assured, at least for the accreditation period.

The audit team had the possibility to visit the relevant laboratories. In general they appreciated the mostly good manuals and documentation for the laboratory setups. Concerning the degree programmes Computer science and Information Systems the peers had the impression that in general a sufficient infrastructure is provided. For the degree programmes Radioengineering, electronics and telecommunications the picture was different: Although listed in the self-assessment report, the panel found a lack of well-equipped laboratory of radio receiving and sending devices by today's standards. Antenna-feeder devices and super-high-frequency devices in the gigahertz range were not available for students. Furthermore, the panel noted a lack of the relevant international literature and access to relevant online-libraries. They acknowledged that the university offers Web of Science. But for the field of radioengineering access to IEEE Microwaves, IEEE Radio Engineers as well as IEEE Xplore would be essential. Therefore the panel recommended to improve the accessibility of relevant international journals and to make it accessible to all teaching staff and students, not least in light of the above-mentioned need for improving the research opportunities. In general, the university should intensify the research profile by providing the necessary resources and funding.

The university has cooperation agreements with universities abroad. The auditors welcomed that all students have the opportunity to go abroad and that they are even financed to some extent as detailed above.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The peers considered the criteria to be partly fulfilled. They confirmed their recommendation to include external (international) lecturers in the educational programme. Furthermore they recommended to intensify the research profile by providing the necessary means in terms of time and funding. Especially the staff of the Bachelor's programme Radioengineering, electronics and telecommunications should have the possibility to get involved more strongly in the area of applied radioengineering. Therefore the accessibility of relevant international journals should be improved and made accessible to all teaching staff and students (for example IEEEexplore directly or indirectly).

From what the auditors saw or was shown to them regarding the Bachelor's program Radioengineering, electronics and telecommunications, the university suffers from the lack of access to essential modern instruments like Spectrum analyser and vector network Analyser. If the university can organise student-access to such instruments, say with the help of industrial partners, the auditors would be more than content. According to the new inputs provided by the HEI there is an indication that this issue has been addressed. They seem to have acquired new equipment which redresses the deficiency. Still the majority of the experts deemed it necessary to enable students to work with S-Parameter measurements as well as Antenna measurements. This must be an integral part of the practical training in the laboratory programme.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module handbooks for all degree programmes

Preliminary assessment and analysis of the peers:

The modules are described in module handbooks which are available for students on the website and in the reading rooms. They are annually updated at the beginning of the academic year. The auditors confirmed that the module descriptions are detailed and provide, in general, all relevant information required to comprehend which knowledge, skills

and competences students are expected to acquire in the individual modules. The module descriptions contain information concerning the following: module identification code, person(s) responsible for each module, work load and credit points, intended learning outcomes, module content, applicability, examination requirements, form(s) of assessment as well as recommended literature.

However, the panel saw some room for improvement. As already stated above the "modules" in the study plans are large packages containing several courses and extending over several semesters. These modules are also described in the module handbooks, whereas no specific information regarding the smaller units called "courses" was available. These units would rather fit the understanding of a "module" in the sense of the Bologna process, i.e. a coherent and comprehensive unit of teaching and learning. As a consequence the current module descriptions do not provide any information whether a course in a module is elective or mandatory and which choice students have. Furthermore, the panel noted some discrepancies in the entry of students' workload. In addition the auditors gained the impression that knowledge, skills and competences are not always clearly separated in the module descriptions (for example: module 7 (Bases of Information Systems) has as a competence: to know the basic principles…). In some cases the auditors received information in the course of the discussions which had not been described in the module handbooks. For example, students work in the courses regarding network systems with Java which is not mentioned in the corresponding description. Additionally, the peers could not find the relation to practical work in the module descriptions. In this regard they deemed it necessary not only to revise the actual implementation of this but also the description in the module handbooks. For reason of transparency the auditors deemed it necessary to update the module descriptions.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Diploma Supplement for the Bachelor's degree programme Information Systems
- Appendix to the Diploma Supplement

Preliminary assessment and analysis of the peers:

A Diploma Supplement for the Bachelor's programme Information Systems was handed in. It provides detailed information on the study programme, study goals, intended learning outcomes, modules as well as the individual achievements of the graduate to external stakeholders. This includes, in particular, a conversion table for the national grading system and, exemplarily, statistical data so as to enable a comparative assessment of the

national final mark. The Diploma Supplements for all other degree programmes also need to be provided so that the panel can check them against the requirements.

Criterion 5.3 Relevant rules

Evidence:

- Regulations on the organisation of educational process on the credit technology at NKSU (put into force)
- Regulations on the computer-based testing (put into force)
- Ministry of Education and Science of the Republic of Kazakhstan, Procedure – Academic and Methodical Work (put into force)
- Ministry of Education and Science of the Republic of Kazakhstan, Procedure – Staff Training (put into force)
- Ministry of Education and Science of the Republic of Kazakhstan, Procedure – Quality Control of the Educational Process (put into force)

Preliminary assessment and analysis of the peers:
The regulations for study-relevant issues are in place and made available. These regulations include all the information necessary for the admission to the degree programmes, its courses, the study plans and the completion of the degree.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The experts thanked the university for submitting all required Diploma Supplements. They provide detailed information on the study programme, study goals, intended learning outcomes, modules as well as the individual achievements of the graduate to external stakeholders. This includes, in particular, a conversion table for the national grading system and, exemplarily, statistical data so as to enable a comparative assessment of the national final mark.

The experts confirmed their assessment regarding the module descriptions: These must be updated according to the comments above (electives, description of learning outcomes, workload).

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Evaluation Report, chapter 6
- Questionnaire survey forms
- Document Quality control of the educational process

Preliminary assessment and analysis of the peers:

The panel learned that the management of normative documents is a part of the quality management system certified in 2005 to ISO 9001. Strategic documents and quality assurance procedures are available on the university website. The monitoring of the effectiveness of quality assurance is conducted through internal audits, assessment of methodological support, evaluation and consideration of issues by collegiate bodies. Efficiency of the goals and deviations from these goals are determined. If necessary, the corresponding decisions are taken or plans are developed to improve the quality of teaching and educational activities. In order to assess the quality of the programmes, the centre of quality management of the university conducts several types of surveys: an annual survey of the graduates relating to the quality of educational services; a survey of employers relating to the quality of graduates' preparation for the job (once every two years); an annual survey of students relating the quality of teaching; an annual survey of the faculty relating to the organization of the educational process as well as a survey of students relating to additional areas (e.g. student government).

According to the auditors the means of quality assurance introduced, established and put into practice seemed to be suitable to ensure the achievement of the university's quality aims, to identify deficits and deficiencies and to promote strategies for removing them. At the end of each semester, lecturers are assessed by students and other staff members; the data is analysed and made available to the Management and the Head of Department. During the discussion with the students the auditors noted that they get feedback on the evaluation results and that they noted improvements in the curricula which were based on their requests for modification (for example they asked for a course in the field of Graphic Instruments, which was introduced by the university afterwards). Altogether the peers gained the impression that the quality assessment and monitoring seem to be very positive and effective.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The peers evaluated the requirements of the criterion as fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

D 1. Documentation of industrial links and projects

D 2. Diploma Supplement for all programmes except Bachelor's programme Information Systems

E Comment of the Higher Education Institution (03.06.2015)

The institution provided a detailed statement as well as the following additional documents:

- Diploma Supplement for all degree programmes
- List of final theses conducted in cooperation with the industry
- Description of new devices in the field of radioengineering, electronics and telecommunications

F Summary: Peer recommendations (10.06.2015)

Taking into account the additional information and the comments given by the university the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020
Ma Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020
Ba Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ma Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ba Computer Science	With requirements	Euro-Inf Refusal	30.09.2020

Requirements

For all degree programmes

A 1. (ASIIN 5.1) The module descriptions must be updated according to the comments made in the accreditation report (electives, description of learning outcomes, workload).

A 2. (ASIIN 2.1) Modules need to be depicted accurately as coherent and consistent units of teaching and learning, and shall be assessed accordingly.

For Ba Radioengineering, electronics and telecommunications

A 3. (ASIIN 1.3, 4.3) Students must be enabled to work with S-Parameter measurements as well as Antenna measurements. This must be an integral part of the practical training in the laboratory programme. The topic of S-Parameters should be explicitly included in one of the modules.

For Ma Radioengineering, electronics and telecommunications

A 4. (ASIIN 1.2) The name of the study program has to be aligned with the curriculum and intended learning outcomes of the study programme.

For Ba Ma Information System and Ba Computer Science

A 5. (ASIIN 1.1) The qualifications profiles ("learning outcomes" at programme level) have to be more programme-specific and distinctive, thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programme.

For Ba Ma Information System

A 6. (ASIIN 1.2) The name of the study program has to be consistently aligned with the curriculum and intended learning outcomes of the study programme.

A 7. (ASIIN 1.3) To ensure that all graduates achieve the intended fundamental competences, the compulsory subject-specific curriculum must be expanded by further fields of informatics such as discrete structures and logic.

For Ba Computer Science

A 8. (ASIIN 1.3) The core curriculum must be expanded in the field of computer science in depth and in breadth.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended that the use of English language either in teaching, or via participation in external activities is enhanced and promoted in order to strengthen the curriculum.

E 2. (ASIIN 2.1) It is recommended to recruit international students and to extent international relations.

E 3. (ASIIN 2.2) It is recommended to closely monitor the actual workload in order to allow for adjustments of the corresponding credit allocation, if necessary.

E 4. (ASIIN 4.1) It is recommended to include external (international) lecturers in the educational programme.

E 5. (ASIIN 4.1) It is recommended to intensify the research profile by providing the necessary means in terms of time and funding.

For the Ba Radioengineering, electronics and telecommunications

E 6. (ASIIN 4.3) The accessibility of relevant international journals should be improved and made accessible to all teaching staff and students (for example IEEEexplore directly or indirectly).

E 7. (ASIIN 4.1) The staff should have the possibility to get involved more strongly in the area of applied radioengineering.

G Comment of the Technical Committees

Technical Committee 02 - Electrical Engineering/Information Technology (12.06.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discussed the procedure. It noted the peers' general impression that the learning outcomes and curricular content of the Radioengineering programmes are largely related to what might be described and named more aptly as an "Electrical Engineering" programme with a special track in "Radioengineering and Telecommunications". While this seemed to be acceptable for the Bachelor's programme regarding the intended broad engineering education and primary specialization in the Radioengineering field, the peers have found it indispensable to adjust learning outcomes, curriculum and the name of the programme accordingly in the case of the Master's programme. Requirement 6 has been proposed for that purpose. To restrict this requirement merely to the Master's programme might, on the other hand, lead to unintended results, for instance in case of renaming the Master's programme only. Therefore, the Technical Committee considered it to be advisable extending the validity of the mentioned requirement to the Bachelor's programme as well, so as to make sure that the two programmes are worked on in close connection. Since the wording and meaning of requirements 6 and 7 (adaptation of learning outcomes, curriculum and name of the mentioned study programmes) are identical, the Technical Committee recommended integrating them (see below, requirement 6).

The Technical Committee also understood that requirement 5 (enlarging students' knowledge of and competences in the utilization of S-Parameter measurements) was considered to be a minimal prerequisite if the HEI wants to maintain the name of the programmes. From the audit report it could be learned that the inclusion of a related laboratory into the curriculum would be just one option to fulfill the requirement - apparently one the HEI has already announced to implement in the medium term. In the short term however, other curricular solutions might be conceived as well. To combine theoretical and practical learning units to this end would, of course, be most promising. In summary, the Technical Committee proposed to retain requirement 5, but deemed the first sentence as sufficiently expressing the shortcoming and thus deleted the following two sentences as essentially redundant.

From the Technical Committee's point of view, there is no plausible reason to restrict recommendations 6 (accessibility of international journals) and 7 (staff involvement in the area of Radioengineering) to the Bachelor's programme. It therefore deemed these recommendations suitable for the Master's programme as well.

While the HEI obviously has presented a more programme-specific description of the intended qualifications profiles of graduates of the Radioengineering programmes, evidence for the binding force and accessibility of these qualification profiles appeared to be still missing. Following that, the Technical Committee considered an additional requirement with regard to the Radioengineering programmes and, by way of precaution, an amendment of the respective requirement for the other study programmes necessary (see below, requirement 1).

For the rest, the Technical Committee fully agreed to the assessment and recommended resolution of the peers.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deemed that the intended learning outcomes of the Bachelor's and Master's degree programmes Radioengineering, electronics and telecommunications are essentially equivalent to the Subject-Specific Criteria of the Technical Committee 02 – Electrical Engineering and Information Technology.

The Technical Committee 02 – Electrical Engineering and Information Technology recommended the award of the seal as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020
Ma Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020

Requirements
For all degree programmes

A 1. (ASIIN 1.1) The *revised* qualifications profiles ("learning outcomes" at programme level) have to be well-anchored and easily accessible to the public, i.e. to students, teaching staff and anyone else interested.

A 2. (ASIIN 5.1) The module descriptions must be updated according to the comments made in the accreditation report (electives, description of learning outcomes, workload).

A 3. (ASIIN 2.1) Modules need to be depicted accurately as coherent and consistent units of teaching and learning and shall be assessed accordingly.

For the degree programmes BaMa Information Systems and Ba Computer Science

A 4. (ASIIN 1.1) The qualifications profiles ("learning outcomes" at programme level) have to be more programme-specific and distinctive, thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programme.

For BaMa Radioengineering, electronics and telecommunications

A 5. (ASIIN 1.3) Students must be enabled to work with S-Parameter measurements as well as Antenna measurements.

For BaMa Radioengineering, electronics and telecommunications and BaMa Information Systems

A 6. (ASIIN 1.2) The name of the study programme has to be consistently aligned with the curriculum and intended learning outcomes of the study programme.

For BaMa Information System

A 7. (ASIIN 1.3) To ensure that all graduates achieve the intended fundamental competences, the compulsory subject-specific curriculum must be expanded by further fields of informatics such as discrete structures and logic.

For Ba Computer Science

A 8. (ASIIN 1.3) It has to be clarified that the professional orientation is that of a school teacher.

A 9. (ASIIN 1.3) The core curriculum must be expanded in the field of computer science in depth and in breadth.

Recommendations
For all degree programmes

E 1. (ASIIN 1.3) It is recommended that the use of English language either in teaching, or via participation in external activities is enhanced and promoted in order to strengthen the curriculum.

E 2. (ASIIN 2.1) It is recommended to recruit international students and to extent international relations.

E 3. (ASIIN 2.2) It is recommended to closely monitor the actual workload in order to allow for adjustments of the corresponding credit allocation, if necessary.

E 4. (ASIIN 4.1) It is recommended to include external (international) lecturers in the educational programme.

E 5. (ASIIN 4.1) It is recommended to intensify the research profile by providing the necessary means in terms of time and funding.

For the BaMa Radioengineering, electronics and telecommunications

E 6. (ASIIN 4.3) The accessibility of relevant international journals should be improved and made accessible to all teaching staff and students (for example IEEEexplore directly or indirectly).

E 7. (ASIIN 4.1) The staff should have the possibility to get involved more strongly in the area of applied radioengineering.

Technical Committee 04 – Informatics/Computer Science (11.06.2015)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discussed the procedure. It clarified that the final degree of the Bachelor's programme Computer Science is a Bachelor of Education. Therefore the Technical Committee deemed a further clarification that the professional orientation of graduates is that of a school teacher as not necessary.

Assessment and analysis for the award of the Euro-Inf® Label:

The Technical Committee deemed that the intended learning outcomes of the Bachelor's and Master's degree programmes Information Systems comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics. In contrast, the Technical Committee deemed that the intended learning outcomes and especially the content of the teacher training programme Computer Science do not comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics.

The Technical Committee 04 – Informatics recommended the award of the seal as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ma Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ba Computer Science	With requirements	Euro-Inf Refusal	30.09.2020

H Decision of the Accreditation Commission (26.06.2015)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses the procedure. It agrees with the assessment of the peers and the modifications made by the Technical Committees. As the university regularly publishes the learning outcomes of the degree programmes the Accreditation Commission deletes requirement 1.

Assessment and analysis for the award of the EUR-ACE® Label:

The Accreditation Commission deems that the intended learning outcomes of the Bachelor's and Master's degree programmes Radioengineering, electronics and telecommunications do comply with the engineering specific parts of the Subject-Specific Criteria of the Technical Committee 02 – Electrical Engineering and Information Technology.

Assessment and analysis for the award of the Euro-Inf® Label:
The Accreditation Commission deems that the intended learning outcomes of the Bachelor's and Master's degree programmes Information Systems comply with the Subject-Specific Criteria of the Technical Committee 04 - Informatics. In contrast, the Accreditation Commission deems that the intended learning outcomes and especially the content of the teacher training programme Computer Science do not comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics.

The Accreditation Commission for Degree Programmes decides to award the following seals:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditaiton**
Ba Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020
Ma Radioengineering, electronics and telecommunications	With requirements	EUR-ACE With requirements	30.09.2020

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ma Information Systems	With requirements	Euro-Inf With requirements	30.09.2020
Ba Computer Science	With requirements	Euro-Inf Refusal	30.09.2020

Requirements

For all degree programmes

A 1. (ASIIN 5.1) The module descriptions must be updated according to the comments made in the accreditation report (electives, description of learning outcomes, workload).

A 2. (ASIIN 2.1) Modules need to be depicted accurately as coherent and consistent units of teaching and learning, and shall be assessed accordingly.

For BaMa Radioengineering, electronics and telecommunications

A 3. (ASIIN 1.3, 4.3) Students must be enabled to work with S-Parameter measurements as well as Antenna measurements.

For BaMa Information System and BaMa Radioengineering, electronics and telecommunications

A 4. (ASIIN 1.2) The name of the study programme has to be aligned with the curriculum and intended learning outcomes of the study programme.

For Ba Ma Information System and Ba Computer Science

A 5. (ASIIN 1.1) The qualifications profiles (“learning outcomes“ at programme level) have to be more programme-specific and distinctive, thereby clarifying the acquired competences of graduates and the intended areas of professional work in the respective programme.

For Ba Ma Information System

A 6. (ASIIN 1.3) To ensure that all graduates achieve the intended fundamental competences, the compulsory subject-specific curriculum must be expanded by further fields of informatics such as discrete structures and logic.

For Ba Computer Science

A 7. (ASIIN 1.3) The core curriculum must be expanded in the field of computer science in depth and in breadth.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended that the use of English language either in teaching, or via participation in external activities is enhanced and promoted in order to strengthen the curriculum.

E 2. (ASIIN 2.1) It is recommended to recruit international students and to extent international relations.

E 3. (ASIIN 2.2) It is recommended to closely monitor the actual workload in order to allow for adjustments of the corresponding credit allocation, if necessary.

E 4. (ASIIN 4.1) It is recommended to include external (international) lecturers in the educational programme.

E 5. (ASIIN 4.1) It is recommended to intensify the research profile of the staff by providing the necessary means in terms of time and funding.

For the BaMa Radioengineering, electronics and telecommunications

E 6. (ASIIN 4.3) The accessibility of relevant international journals should be improved and made accessible to all teaching staff and students (for example IEEEexplore directly or indirectly).

E 7. (ASIIN 4.1) The staff should have the possibility to get involved more strongly in the area of applied radioengineering.